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SCIENCE, TECHNOLOGY & INNOVATION AND INTELLECTUAL PROPERTY

Leveraging Openness for Sustainable Development in Africa

CAROLINE B NCUBE

Science, Technology & Innovation and Intellectual Property

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Caroline B Ncube

Published by Juta in association with the Department of Science and Innovation (DSI)/National Research Foundation (NRF) SARChI Research Chair in Intellectual Property, Innovation and Development.

SOUTH AFRICAN RESEARCH CHAIR:
Intellectual Property, Innovation and Development

Science, Technology & Innovation and Intellectual Property
Leveraging Openness for Sustainable Development in Africa

First edition: 2021

Juta and Company Ltd
First Floor
Sunclare Building
21 Dreyer Street
Claremont
7708

PO Box 14373, Lansdowne, 7779, Cape Town, South Africa

ISBN 978 1 48513 765 8 (Print)
ISBN 978 1 48513 776 4 (webPDF)

This book is published by Juta in association with the Department of Science and Innovation (DSI)/the National Research Foundation (NRF) SARChI Research Chair in Intellectual Property, Innovation and Development. This work was carried out with the aid of an award from the NRF (Grant number: 115716).

Print Production Specialist: Zainub Gamieldien
Proofreader: Sarah de Jager
Typesetter: Peter Howe
Cover Designer: Drag and Drop
Indexer: Lexinfo

Printed in South Africa by xxxxx

Typeset in 10.5 pt on 13 pt Stone Serif LT Std

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List of Abbreviations

10-Member Group	10 High-Level Representatives from Civil Society, the Private Sector and the Scientific Community
AAS	African Academies of Science
ABS	Access Benefit Sharing
ACBF	African Capacity Building Foundation
ACTA	Anti-Counterfeiting Trade Agreement
AEC	African Economic Community
AfCFTA	African Continental Free Trade Area
AfDB	African Development Bank
AI	artificial intelligence
AIDA	Accelerated Industrial Development for Africa
AIPLITL	South African Association of IP Law and Information Technology Law Teachers and Researchers
AMCOST	African Ministerial Conference on Science and Technology
AMU/UMA	Arab Maghreb Union
AOSP	African Open Science Platform
AOSTI	African Observatory for STI
APET	AU High Level Panel on Emerging Technologies
ARIPO	African Regional Intellectual Property Organisation
ASRIC	African Scientific Research and Innovation Council (ASRIC)
ASSAf	Academy of Science of South Africa
ASTIF	African STI Fund
ASTII	African STI Indicators Initiative
ATRIP	International Association for the Advancement of Teaching and Research in IP
AU	African Union
AU-STRC	Scientific, Technical and Research Commission
AUC	AU Commission
AUDA-NEPAD	African Union Development Agency-NEPAD
BIAT	Action Plan on Boosting Intra-Africa Trade
BRICS	Brazil Russia India China South Africa
CAADP	Comprehensive Africa Agriculture Development Programme
CAP	Common African Position on the post-2015 Development Agenda
CBD	Convention on Biological Diversity
CDIP	WIPO Committee on Development and Intellectual Property
CEN-SAD	Community of Sahel-Saharan States
CFTA	Continental FTA
CIPC	Companies and IP Commission
CODATA	ISC's Committee on Data

COMESA	Common Market for Eastern and Southern Africa
CPA	AU/NEPAD Science and Technology Consolidated Plan of Action
CU	Customs Union
DA	Development Agenda
DEIP	Design and Evaluation of Innovation Policies
DRC	Democratic Republic of the Congo
DSI	Department of Science and Innovation (South Africa) formerly Department of Science and Technology (DST)
DTI	Department of Trade and Industry (South Africa) now Department of Trade, Industry and Competition (DTIC)
EAC	East African Community
EASTECO	EAC Science and Technology Commission
ECA	Economic Commission for Africa
ECCAS	Economic Community of Central African States
ECJ	European Court of Justice
ECOPOST	ECOWAS Policy on STI
ECOWAS	Economic Community of West African States
ECSA-HC	East, Central and Southern African Health Community
EFTA	European Free Trade Association
EPA	Economic Partnership Agreement
EPO	European Patent Office
ESARIPO	Industrial Property Organisation for English-speaking Africa
ESC	UN Economic and Social Council
EU	European Union
FAO	Food and Agriculture Organisation
FDI	foreign direct investment
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GERD	global expenditure on R&D
GII	Global Innovation Index
GIs	Geographical Indications
GLAM	Galleries, Libraries, Archives and Museums
GO-SPIN	UNESCO's Global Observatory of STI Policy instruments
GR	Genetic Resources
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune-Deficiency Syndrome
HLPF	UN High-Level Political Forum on Sustainable Development
HRS&T	AU Human Resources, Science and Technology
IATT	UN Inter-Agency Task Team on Science, Technology and Innovation for the Sustainable Development Goals

ICESCR	International Covenant on Economic, Social and Cultural Rights
ICT	Information and Communications Technology
IDRC	International Development Research Centre
IGAD	Intergovernmental Authority on Development
IGC	Intergovernmental Committee
IGC	WIPO Intergovernmental Committee on IP and Genetic Resources, Traditional Knowledge and Folklore
IGOs	Intergovernmental Organisations
IK/IKS	Indigenous Knowledge/Indigenous Knowledge System
IP	Intellectual Property
IPDP	Intellectual Property Development Plan
IPLC	indigenous peoples and local communities
IPR	Intellectual Property Right
ISC	International Science Council
LDC	Least Developed Country
MDGs	Millennium Development Goals
MFN	most-favoured nation
MSF	Medecins Sans Frontieres
NCD	non-communicable diseases
NDAs	non-disclosure agreements
NEPAD	New Partnership for Africa's Development
NPCA	NEPAD Planning and Coordination Agency
NRF	National Research Foundation (South Africa)
NRS	National Recordal System (South Africa)
NSI	national system of innovation
NTD	neglected tropical diseases
OAPI	Organisation Africaine de la Propriété Intellectuelle (African Intellectual Property Organisation)
OAU	Organisation of African Unity
OECD	Organisation for Economic Co-operation and Development
OER	open educational resources
OpenAIR	Open African Innovation and Research
PAIPO	Pan-African Intellectual Property Organisation
PAU	Pan-African University
PBR	Plant Breeders Rights
PCT	Patent Cooperation Treaty
PIDA	Programme for Infrastructure Development in Africa
PPEs	personal protective equipment
PTA	Preferential Trade Agreement
PVP	Plant Variety Protection
R&D	research and development
REC	regional economic community

RIA	Regional Integration Arrangement
RISDP	Regional Indicative Strategic Development Plan
RSOC	Regional Strategic Orientation Committee
RSTI	Research, Science, Technology and Innovation
RTA	Regional Trade Agreement
SACU	Southern African Customs Union
SADC	Southern African Development Community
SAMCOST	SADC Sectoral Ministerial Committee on Science and Technology
SAMRC	South African Medical Research Council
SARChI	South African Research Chairs Initiative
SCCR	Standing Committee on Copyright and Related Rights
SDGs	Sustainable Development Goals
SME	Small and Medium Enterprises
SSHRC	Social Sciences and Humanities Research Council of Canada
STC-EST	AU Specialised Technical Committee on Education, Science and Technology
STI	Science, Technology and Innovation
STI Forum	Multi-Stakeholder STI Forum for the Sustainable Development Goals (STI Forum)
STISA-2024	Science, Technology and Innovation Strategy for Africa
T-FTA	Tripartite Free Trade Area
TCEs	traditional cultural expressions
TFM	UN Technology Facilitation Mechanism (TFM)
TK	Traditional knowledge
TRIPS Agreement	Agreement on Trade-related Aspects of Intellectual Property Rights including Trade in Counterfeit Goods
UDHR	Universal Declaration of Human Rights
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UPOV	International Union for the Protection of New Varieties of Plants
WCT	WIPO Copyright Treaty
WIPO	World IP organisation
WPPT	WIPO Performances and Phonograms Treaty
WTO	World Trade Organisation

Preface

2020 was an eventful year for the whole world, as a public health and economic crisis raged, bringing to the fore the perennial challenge of how to craft and use Intellectual Property (IP) institutions, law, policies and practices, collectively 'IP frameworks' to add to efforts to achieve sustainable development, and to consider recovery paths for economies. This coincided with intensified efforts to boost intra-African trade and enhance regional integration through the Agreement on the African Continental Free Trade Area (AfCFTA), which has been ratified at the fastest rate, to date, of any African Union (AU) instrument. The US entered into negotiations for a bilateral FTA with Kenya, which, if successful, would be the first in Southern Africa and the first since the coming into force of the AfCFTA Agreement.

This book engages with this challenge in its six chapters. The introductory Chapter One includes a brief overview of the AU, its member states, its institutions and legal norms to emphasise both the context and the diversity of the continent. It introduces and links STI and IP within a knowledge governance context as the analytical lens through which the book's further discussions are framed. The international and African development agendas are also explained and distinguished from each other to foreground the following chapters.

Chapter Two considers the global IP framework with an account of minimum standards in international agreements. Chapter Three turns to the African continent and provides a commentary on national and regional IP frameworks, as contrasted with the global framework. It considers plurilateral and bilateral agreements including the possibilities and significance of the US-Kenya FTA. It reprises the IP instruments of the regional IP organisations and the Regional Economic Communities. Chapter Four considers STI and sustainable development, paying specific attention to the creation of an enabling environment for STI and also to how STI policies interface with IP. Chapter Five reiterates the trade and sustainable development context of IP as the foundation to a consideration of examples of how openness is being leveraged to meet current developmental challenges through STI on the continent. It spotlights some entries at the COVID-19 Innovation Challenge held during the Africa Innovation and Investment Forum 2020 together with the continent's commitment to Open Science. Against the background of the preceding chapters, Chapter Six discusses the continental IP institutional reform and policy rejuvenation that would come from the operationalisation of PAIPO and the conclusion of the AfCFTA IP Protocol. It concludes with some policy legislative implications for IP and STI at continental level, that ought to be borne in mind as states calibrate their IP frameworks.

This work is based on research supported in part by the National Research Foundation (NRF) of South Africa (Grant number: 115716). Any opinion, finding and conclusion or recommendation expressed in this material is that of the author and the NRF does not accept any liability in this regard.

Foreword

This book is both timely and highly relevant to the current global crisis. An invisible object—COVID-19—has exposed the underlying weaknesses, asymmetries and contradictions in our world, our economies and our societies. Africa has been particularly impacted by the virus that has created a triple crisis in its healthcare system, economy and environment. The virus has also led to a contestation of the analysis, narratives and policy options to national and global challenges. The COVID-19 pandemic is regarded by scientists as the most devastating health pandemic since the Spanish flu in 1918–19, and by economists as the worst economic crisis since the Great Depression in the 1930s. The pandemic has also exacerbated a deepening climate change crisis observed in the floods, prolonged droughts and locust outbreaks in several parts of the African continent.

The book deliberately adopts the broad definition of development adopted by the United Nations in the concept of 'sustainable development' and then elaborated in the United Nations Sustainable Development Goals (SDGs). The international concepts of 'sustainable development' and SDGs are critically supported in the book by comparing the SDGs with Africa's own home-grown development agenda—Agenda 2063. The book draws the reader's attention to the history of Africa's regional integration process beginning with the OAU in 1963 and leading to the brilliant vision of one of Africa's foremost development thinkers, Dr Adebayo Adedeji, encapsulated in the Lagos Plan of Action and the Abuja Treaty of 1991. Since then, the formation of the African Union in 2002 and the launching of the New Partnership for African Development (NEPAD) advanced Africa's own perspective of its development path. The African Continental Free Trade Agreement (AfCFTA), the book argues, is also a part of this great lineage. This history is revisited to ground the book in Africa's own perspectives.

Developed countries' reflex response to the COVID-19 pandemic has been to restrict the exports of pharmaceutical products and personal protective equipment (PPEs) such as face masks and sanitizers and thus deprive many developing countries of these essential drugs and medical equipment. Africa is reliant on its external trading partners for more than 94% of its pharmaceutical products and medical equipment. In addition, several developed countries called for the shortening of global supply chains, reducing Africa's access to these vital products even further. African countries and their continental institutions, such as the African Union and the African Centre for Disease Control, moved with speed and were able to train thousands of healthcare workers in the techniques of testing for COVID-19 and create an African Procurement Portal. The lesson that Africa learnt from this experience was the need for African countries to build their own capacity to produce essential

drugs for public health diseases and reduce their dependence on their external trading partners. Thus building both healthcare resilience and healthcare security has become a growing strategic need and priority for Africa's institutions.

This book is mainly about how science, technology and innovation and intellectual property can be utilized at the service of human development and in harmony with nature and the environment. The book makes a strong case for the pragmatic use of intellectual property rights in favour of more open regimes such as open science, open data, open access and open educational resources. In the context of the current pandemic, the discussion on how the Trade Related Intellectual Property Rights Agreement (TRIPS) can be more flexible and support poorer developing countries, such as those in Africa, to gain access and affordability for pharmaceutical products and medical devices that are essential for public health diseases such as the COVID-19 pandemic, is highly relevant.

Almost 20 years ago, in Doha, Qatar, at the World Trade Organization (WTO) Ministerial Meeting in 2001, the world agreed to provide flexibilities to poor countries that had insufficient or no manufacturing capacity to access affordable medicines to save lives from the HIV/AIDs pandemic and other public diseases, such as TB and malaria. It took another two years before the WTO could agree on the implementation of this agreement. In the course of the negotiations in Geneva, I recall the representative of the Vatican to the WTO stating that the patent system is a 'social mortgage' which creates both rights and responsibilities. In other words, society confers certain privileges on patent holders (market exclusivity for a period of up to 20 years) and in return there are expectations that these 'privileges' will not be abused and access to affordable drugs shall be provided. In October 2020, a similar debate is taking place at the WTO in Geneva. The WTO representatives of South Africa and India submitted a joint-proposal for a waiver to be granted by the General Council of the WTO 'from certain provisions of the TRIPS Agreement for the prevention, containment and treatment of COVID-19'. Over 370 academic institutions and NGOs, such as OXFAM and Medecins Sans Frontieres (MSF), have supported the proposal for a waiver from the strictures of the WTO TRIPS agreement.

The African Continental Free Trade Area (AfCFTA) is a ground-breaking formation, advancing the dream of the Pan-African leaders and Africa's visionary thinkers such as Adebayo Adedeji. While the implementation of the agreement was delayed due to the pandemic, Africa's leaders' commitment to deepen and strengthen Africa's regional integration agenda has not waned. The second phase of the AfCFTA negotiations envisages the creation of a Pan-African set of rules on intellectual property rights, competition and investment. This book provides trade negotiators, academics and students, businesses and trade unions with an excellent set of concepts and theoretical

frameworks such as 'sustainable development', 'openness paradigm', and 'knowledge governance' to analyse the relationship between science, technology and innovation and intellectual property in Africa.

Caroline Ncube is a Professor of Law at UCT and also holds the DSI/NRF SARChI Research Chair in Intellectual Property, Innovation and Development. She has written extensively on intellectual property rights in Africa. In this book she has produced yet another outstanding research work. This book is an essential reader for students, policymakers and stakeholders engaged in the process of revitalizing knowledge governance institutions and advancing Africa's sustainable development.

Professor Faizel Ismail
Director of the Nelson Mandela School of Public Governance (UCT)
Former Ambassador of South Africa to the WTO
5 November 2020

Acknowledgements

This has been a book long in the making—all my academic work points to it and the award of the South African Research Chair in Intellectual Property (IP), Innovation and Development to me for the period 2019–2023, provided the perfect setting and opportunity to consolidate this work and complete the manuscript. Therefore my first acknowledgements are to the National Research Foundation (NRF), the Department of Science and Innovation (DSI) and the University of Cape Town for the award of the Chair, funding and institutional support that made this work possible.

The inspiration for the book's subject matter was primarily the scope of work agreed upon with my fellow members of the steering sub-committee of the African Policy, Research & Advisory Group on Science, Technology and Innovation (STI) following its establishment at the African Regional STI Forum held at Victoria Falls in February 2020. Hence, I would like to thank and acknowledge my Advisory Group sub-committee colleagues. I also thank Victor Konde of the New Technologies and Innovation Section, Special Initiatives Division, United Nations Economic Commission for Africa (ECA) for convening the group and for his comments on my book outline. Attending the ECA-hosted Africa Innovation and Investment Forum 2020, coupled with the COVID-19 Innovation Challenge in June 2020, provided an invaluable opportunity for me to observe innovation and was the source of the examples presented in Chapter Five. I am also grateful for my membership of the African Scientific Research and Innovation Council (ASRIC)'s taskforce on IP which enabled me to gain insight into the implementation of the AU's STI Agenda. I have also had the privilege of working with other ECA divisions on IP, specifically within the context of the African Continental Free Trade Area (AfCFTA) which has given me in-depth insight and informed many of the arguments I posit in this book. For that, my deep gratitude goes to Prof Melaku Desta (Principal Regional Advisor); David Luke (Coordinator, African Trade Policy Centre) and his colleagues at the centre with much appreciation to Jamie MacLeod; to Stephen Karingi (Director, Regional Integration and Trade Division) and his colleagues, with special mention to Dr Laura Páez at the Market Institutions Section. Over the last few years, I have benefited immensely from participating in several expert group meetings hosted by ECA where ideas were debated and refined. The people I met there are too many to mention by name, but I wish to note my gratitude to them all. Of this group, I would be remiss if I did not mention the team from the United Nations Conference on Trade and Development (UNCTAD), namely Ermias Biadgleng (IP Unit, Investment and Enterprise Division) and Dr Joy Kategwa

(former Head of the UNCTAD Regional Office for Africa). The discussions and joint publications with ECA and UNCTAD colleagues have been wonderful collaborations, for which I am very grateful.

My collaborators and partners in the Open African Innovation and Research (OpenAIR) partnership are a constant and consistent foundation for my research. The work for this book falls within the Laws and Policies theme of the partnership's work. Heartfelt thanks to every member of the OpenAIR family and specifically to my steering committee co-leaders Jeremy de Beer, Erika Kraemer-Mbula, Chidi Oguamanam, Nagla Rizk, Isaac Rutenberg and Tobias Schonwetter. Thanks to Nan Warner, Victoria Schorr, Phyllis Webb and Elsabe Gelderblom for managing and supporting the partnership. Thanks and acknowledgements are also due for current funding support from the partnership's funders: the International Development Research Centre (IDRC), the Social Sciences and Humanities Research Council of Canada (SSHRC) and the Canadian Queen Elizabeth II Diamond Jubilee Scholarships.

A few months into the writing of this book, South Africa went into hard lockdown in response to the global COVID-19 pandemic. Like everyone else, my work was severely disrupted and I almost gave up on the manuscript, but close friends and family rallied around me, as did colleagues and mentors. Two moments stand out. One was a series of emails from Prof Mammo Muchie to a group of us, urging us to use our research chairs to engage in work that would contribute to economic recovery interventions for South Africa and the African continent. Another was Prof Evance Kalula reaching out to offer encouragement. My inauguration into the Academy of Science of South Africa (ASSAf) was a timely affirmation and in perfect alignment with the book's focus on open science, an area where the Academy continues to lead. The encouragement, affirmation and prayers from family, friends and mentors was the impetus I needed to resume writing and I want to note my thanks to all of them.

At the IP Chair and the IP Unit at UCT, I'd like to thank my colleagues, our research fellows and students who contribute to an exciting and stimulating academic environment. Specifically, from the IP Chair, I'd like to thank postdoctoral researcher Desmond Oriakhogba for his reference checking and editorial assistance and one of our LLB research assistants, Angela Montandon, for her research on African STI policies.

I also would like to thank Prof Faizel Ismail and his team at the Nelson Mandela School of Public Governance at UCT and Prof James Gathii and his team at Afronomicslaw.org and the African International Economic Law Network for leading us, including me, in critically important discussions on the AfCFTA throughout 2020 via webinars and online symposia. I used these opportunities to refine my thinking on IP, STI and the AfCFTA. Thanks are also due to Prof Ismail for penning the foreword to this book and Prof Gathii for

his foreword to my first book, *Intellectual Property Policy, Law and Administration in Africa: Exploring Continental and Sub-regional Co-operation* (2016), which is a precursor to the present work.

None of the work I do would be possible without my family and our home from which this book was written. Thank you Phenias, Vuyiso and Wandile for all your sacrifices. Thank you to my parents, siblings, nephew and nieces for being my supporters and cheerleaders and especially to my sister Heather, my chief accountability partner, who kept me writing. Family—your humour and teasing kept me sane. Makwande.

Thanks to Marlinee Chetty, Frances Ngubeni and the team at Juta for being so accommodating and helpful as we worked on this book project as an open access offering. This was critically important to me because the very ethos of the book is to promote openness as a key component of knowledge governance for sustainable development.

Finally, to the motherland, Africa, thank you for birthing us, may all our striving be to your benefit, wherever in the world we are located.

Caroline B Ncube, PhD, MASSAf
Cape Town
9 November 2020

About the Author

Professor Caroline Ncube is the DSI/NRF SARChI Research Chair in Intellectual Property (IP), Innovation and Development at the Department of Commercial Law at the University of Cape Town (UCT) and an NRF B-rated researcher. She holds a PhD (UCT), LLM (University of Cambridge) and LLB (University of Zimbabwe). In addition to teaching and postgraduate research supervision at UCT, she also lectures on the Masters Degree in IP (MIP) jointly offered by the World IP Organisation (WIPO), the African Regional IP Organisation (ARIPO) and Africa University (AU). She is a member of various academic associations such as the International Association for the Advancement of Teaching and Research in IP (ATRIP), the South African Association of IP Law and Information Technology Law Teachers and Researchers (AIPLITL) and the Society of Law Teachers of Southern Africa (SLTSA). She is an Associate Member, Centre for Law, Technology and Society University of Ottawa.

Professor Ncube's primary research focus is how IP law and policy can be best calibrated to achieve national socio-economic goals in African states. These considerations centre on the promotion of innovation prevalent in African contexts, and most of this work is conducted with her collaborators within the Open African Innovation Research Network. Her publications consider copyright and patent laws specifically in the light of access imperatives grounded in the constitutional protection of fundamental and socio-economic rights. She has recently worked on how copyright impacts publication in neglected languages for under-served markets and access to works by persons with cognitive, aural, physical and other disabilities. She has also authored book chapters on the protection of indigenous knowledge and co-edited the volume *Indigenous Knowledge and IP* (2016). She is the author of *Intellectual Property Policy, Law and Administration in Africa: Exploring Continental and Sub-regional Co-operation* (2016). Most of her research is available at www.ipchair.uct.ac.za and www.carolinebncube.com.

She is a co-editor of the *South African IP Law Journal* and serves on the editorial boards of several journals including the *African Journal of IP*, *African Journal of International Economic Law* and the *Journal of World IP*. Professor Ncube is a member of the ECA African Policy, Research & Advisory Group on STI, the African Scientific Technical and Research Innovation Council (ASRIC) Taskforce on IP Protection in Joint Research and Collaboration During Outbreaks and of the Academy of Science of South Africa (ASSAf). She has served as an expert for national parliaments and various institutions including the Economic Commission for Africa, the International Trade Centre, the Southern African Development Community and WIPO.

Chapter 1

THE CONTINENTAL FRAMEWORK FOR SUSTAINABLE DEVELOPMENT

We need to start to converse about Africa's problems and challenges with the inclusion of hope as an ontological need for change. … Hope is an important variable in the way we wish to think, talk, reason, debate and mount intellectual reflection about Africa. Re-thinking African development through innovation, social-invention systems, mental images and the logocentric imagination of the productive Africa-nation … Mammo Muchie[1]

1.1 Introduction

This book will consider the openness paradigm in science, technology and innovation (STI) and intellectual property (IP) within the context of trade and sustainable development in Africa. It adds to the literature discussing these topics in other contexts.[2] Because of the size of the continent and the variations in its national regulatory frameworks, this book will select only some national approaches as examples. Its main focus will be to highlight the continental approach as articulated in African Union (AU) instruments. A continental approach is particularly apt in view of the Agreement on the African Continental Free Trade Area (AfCFTA),[3] a flagship project of the AU Agenda 2063, which came into force on 30 May 2019[4] and was operationalised in July 2019,[5] with trading intended to commence on 1 July 2020.[6] However, this implementation has been delayed because of the COVID-19

[1] M Muchie 'Resisting the deficit model of development in Africa: Re-thinking through the making of an African national innovation system' (2004) 18(4) *Social Epistemology* 315 at 315.

[2] Eg, see OECD *National Intellectual Property Systems, Innovation and Economic Development: With Perspectives on Colombia and Indonesia* (2014); OECD Boosting Kazakhstan's National Intellectual Property System for Innovation (2016).

[3] Agreement establishing the African Continental Free Trade Area (AfCFTA Agreement), 2018.

[4] Art 23(1) of the AfCFTA Agreement provides that the agreement would come into force 30 days after having received the 22nd instrument of ratification. This was achieved on 29 April 2019 and the agreement entered into force on 30 May 2019.

[5] The operational phase was launched at the 12th Extraordinary Session of the Assembly on the AfCFTA in Niamey in July 2019 by the Niamey Declaration on the Launch of the Operational Phase of the AfCFTA Ext/Assembly/AU/Dec.1(XII).

[6] African Union Assembly 'Report on the AfCFTA by HE Mahamadu Issoufou, President of the Republic of Niger and Leader on AfCFTA', Thirty-Second Ordinary Session, 10–11 February 2019, Addis Ababa, Ethiopia, Assembly/AU/4(XXXII).

pandemic to 1 January 2021.[7] The AfCFTA is a flagship project because the AU's vision of a prosperous Africa places inclusive trade at the centre of developmental initiatives.[8] IP-related negotiations, mandated to be concluded in phase two of the AfCFTA negotiations,[9] were scheduled to be completed by December 2020,[10] but due to COVID-19 pandemic travel restrictions they have had to continue virtually.[11] Importantly, the inclusion of IP in AfCFTA from the outset places IP at the centre of Africa's integration and development agenda.

From an economic development perspective, as at 2020, 33[12] of the world's 47 least developed countries (LDCs), which by definition are 'low-income countries confronting severe structural impediments to sustainable development', are in Africa.[13] Further, the Human Development Report 2019 reports that in terms of the base line of the $1.90 a day poverty line, 'more than half of people in extreme poverty live in Sub-Saharan Africa, where absolute numbers of people living in poverty are increasing. If current trends continue, nearly 9 of 10 people in extreme poverty will be in Sub-Saharan Africa in 2030'.[14] In addition to this, the COVID-19 pandemic has led to an economic and public health global crisis,[15] which provides the basis of this book's core argument that fully or partially open approaches to knowledge appropriation will unlock significant value and spur economic progress, including recovery from the current crisis. For instance, 'open science has the potential to reduce the amount of time that research findings take to make their way into the public domain where they can be read, drafted and translated into strategies, policies

[7] AfCFTA Secretariat 'Message from Secretary General AfCFTA Secretariat: Operationalisation of the AfCFTA' (12 June 2020), available at https://au.int/en/videos/20200518/message-secretary-general-afcfta-secretariat-operationalisation-african-continental.

[8] D Luke 'Making the case for the African Continental Free Trade Area' in D Luke & J MacLeod (eds) *Inclusive Trade in Africa: The African Continental Free Trade Area in Comparative Perspective* (2019) 5 at 5; L Páez 'A Continental Free Trade Area: Imperatives for Realizing a Pan-African Market' (2016) 50(3) *Journal of World Trade* 533.

[9] Art 7 AfCFTA Agreement; Decision on the Draft Agreement Establishing the African Continental Free Trade Area (AfCFTA) (Doc. Ext/Assembly/AU/2(X), 21 March 2018).

[10] African Union, 2020. *Decision on the African Continental Free Trade Area (AfCFTA)* Assembly/AU/Dec.751(XXXIII) para 22.

[11] HE Amb. AM Muchanga *Keynote Address,* Tralac 'Annual Conference 2020' (2020) at 10.

[12] The 33 African LDCs are Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, São Tomé and Príncipe, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Tanzania, Togo, Uganda and Zambia. Angola and São Tomé and Príncipe are expected to transition out of this category by 2021 and 2024, respectively.

[13] Department of Economic and Social Affairs of the United Nations Secretariat (UN/DESA) and the Committee for Development Policy (CDP) *The Least Developed Country Category: 2018 Country Snapshots* at 3 and 5.

[14] UNDP Human Development Report 2019. 'Beyond Income, Beyond Averages, Beyond Today: Inequalities in Human Development in the 21st Century' (2019) at 67.

[15] HE Amb W Mene *Keynote Address,* Tralac (2020) supra at 2.

and laws.'[16] There is already growing evidence that the use of open approaches is pivotal in the production of medical devices.[17] However, the African continent has had a long-standing need to entrench and enhance sustainable development prior to this pandemic, which will continue beyond it. Therefore, the book's focus will be informed by a broader concern for the continent's developmental and industrialisation imperatives, beyond disasters and pandemics. The book's original contribution to knowledge lies in its consideration of law and policy frameworks relating to IP and STI with a focus on the African continent. Such a contribution has great continental relevance, for example through alignment with the AU's African Regional STI Forum's ongoing work.

This introductory chapter comprises six further sections. Section 1.2 is a brief overview of the AU and its member states, intended to emphasise the diversity of the continent for those readers who are unfamiliar with it. Section 1.3 then introduces and links STI and IP. Section 1.4 defines knowledge, because the pivotal concept of knowledge is the starting premise for defining science, technology, technology transfer, technological learning and innovation. The section then explains knowledge governance as the analytical lens through which the book's further discussions are framed. Section 1.5 outlines the international and African development agendas as background to discussions of IP and sustainable development in Chapter Two, and STI and sustainable development in Chapter Four. The separate discussions of the international development agenda and the African regional agenda commitments in section 1.5 allow a clear analysis of differences and similarities, and their implications for the subject matter. Section 1.6 concludes the chapter by highlighting the factors that set the African development agenda apart. Section 1.7 outlines the structure and sequence of subsequent chapters.

1.2 The AU and its member states

Any book about Africa understandably raises eyebrows as readers wonder whether it will address the situation in every African state separately or whether it will treat the continent as a single entity, thereby making unjustifiable generalisations. This book treads carefully and attempts to do neither. As indicated in the introduction, it will not present a state-by-state overview of IP and STI nor will it seek to paint the continent with one brush by prescribing uncalibrated recommendations for such a diverse continent. Instead, it will focus on the AU's approach, institutions and instruments. This is a useful vantage point because it addresses continental consensus but understands that regional and national implementation will differ. There is substantial literature from the national perspective, some of which will be cited for the benefit of readers seeking state-specific information and views.

[16] D Pillay, B Damonse & M Ellis 'Coronavirus shows the urgency of ensuring that research gets into the public domain' *The Conversation* 22 April 2020.

[17] D Mahr & S Dickel 'Rethinking intellectual property rights and commons-based peer production in times of crisis: The case of COVID-19 and 3D printed medical devices' (2020) 15(9) *Journal of Intellectual Property Law & Practice* 711–717, doi.org/10.1093/jiplp/jpaa124.

The AU was established in July 2002 as the successor to the Organisation of African Unity (OAU), which was formed in May 1963.[18] It has 55 member states which are grouped into five regions,[19] as shown in Table 1:

Table 1: AU member states

Central Africa (9 states)	Burundi, Cameroon, Central African Republic, Chad, Congo Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon, São Tomé and Príncipe
Eastern Africa (14 states)	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania, Uganda
Northern Africa (7 states)	Algeria, Egypt, Libya, Mauritania, Morocco, Sahrawi Republic, Tunisia
Southern Africa (10 states)	Angola, Botswana, eSwatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe
Western Africa (15 states)	Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo

Source: Author

As already stated, the socio-economic conditions in these states vary, with 33 being LDCs while the rest are developing countries, albeit at different levels of economic development. Their national legal frameworks also differ, there being a mix of common law, civil law and Islamic law on the continent.[20] Each state has its national legal institutions, the discussion of which falls outside the scope of this book, which focuses on the regional IP organisations, the regional economic communities (RECs), and the AU.

There is a growing body of scholarship devoted to the study of AU law, which is defined as 'the body of treaties, resolutions and decisions that have direct and indirect application to the Member States of the AU'.[21] The following sources of AU law are evident from this definition: 'Treaties of the AU, decisions of the policy organs of the AU and African customary international law arising from the practice of member states'.[22] The AU has been described as a 'norm entrepreneur' for the role it is playing in setting normative standards through its instruments.[23] This book's consideration of AU approaches, instruments and institutions can therefore be said

[18] O Amao *African Union Law: The Emergence of a Sui Generis Legal Order* (2019) at 28.

[19] The African Union (AU) 'Member states', https://au.int/en/member_states/countryprofiles2.

[20] S Mancuso 'The new African law: Beyond the difference between common law and civil law' (2008) 14(1) *Annual Survey of International & Comparative Law* 39–60; A Christelow *African Studies: Islamic Law* (2019), last modified 27 February 2019.

[21] Amao (2019) supra at 22.

[22] Amao (2019) supra at 27.

[23] Amao (2019) supra at 32.

to be a study of AU law as it pertains to IP and STI within a trade and development context.

One level below the AU lie the RECs. Their role in the AU's regional integration plans which were initiated by UN Economic Commission for Africa (ECA)'s then Executive Secretary Adedeji Adebayo[24] and later set out in the Lagos Charter 1975, the Lagos Plan of Action 1980–2000[25] and the Treaty Establishing the African Economic Community (the Abuja Treaty) 1991.[26] The Abuja Treaty rectified the lack of a detailed implementation plan, which had been identified as a shortcoming of the Lagos Plan of Action.[27] Article 6 of the Abuja Treaty sets out a six-step plan to be implemented over 34 years to (i) establish RECs (by 1999), (ii) harmonise REC activities, stabilise tariffs and achieve sectoral integration (by 2007), (iii) establish Free Trade Areas and customs unions in each REC (by 2017), (iv) coordinate and harmonise REC tariff and non-tariff systems (by 2019), (v) create the African Common Market (by 2023) and (vi) create a Pan-African Economic and Monetory Union, the African Central Bank, a single African Currency and the Pan-African Parliament (by 2028). The RECs were created and soon AU member states had acquired overlapping REC membership leading to efforts to consolidate three of them through a Tripartite FTA,[28] discussed in Chapter Three. Eight RECs were identified as constituting 'building blocks' to further the AU's goal of creating the African Economic Community (AEC)[29] and the AfCFTA.[30] These eight RECs are:

i the Economic Community of West African States (ECOWAS)
ii the Economic Community of Central African States (ECCAS/CEEAC)
iii the Arab Maghreb Union (AMU/UMA)
iv the Southern African Development Community (SADC)[31]
v the Common Market for Eastern and Southern Africa (COMESA)[32]

[24] A Adebayo 'Two Prophets of Regional Integration: Prebisch and Adedeji' in B Currie-Alder, R Kanbur, DM. Malone & R Medhora (eds) *International Development: Ideas, Experience, and Prospects* (2014).

[25] Adopted with the Final Act of Lagos at the Second Extraordinary Session devoted to Africa's economic development. For commentary see RM D'Sa 'The Lagos Plan of Action – Legal mechanisms for co-operation between the Organisation of African Unity and the United Nations Economic Commission for Africa' (1983) 27(1) *Journal of African Law* 4–21.

[26] Treaty Establishing the African Economic Community (Abuja Treaty).

[27] F Ismail 'Advancing the Continental Free Trade Area (CFTA) and Agenda 2063 in the Context of the Changing Architecture of Global Trade' *Trade & Industrial Policy Strategies (TIPS) Working Paper* (TIPS 2016) at 5.

[28] Ismail (2016) supra at 6.

[29] AU Decision on the protocol on relations between the African Union and the Regional Economic Communities (RECs) DOC. EX.CL/348 (XI); G Gerout, J MacLeod & M Desta 'The AfCFTA as yet another experiment towards continental integration' in Luke & MacLeod (2019) supra at 24.

[30] Article 5(b) AfCFTA Agreement; CB Ncube *Intellectual Property Policy, Law and Administration in Africa: Exploring Continental and Sub-regional Co-operation* (2016) 73–6.

[31] Formed in 1992 to replace the Southern African Development Coordination Conference (SADCC) formed in 1980.

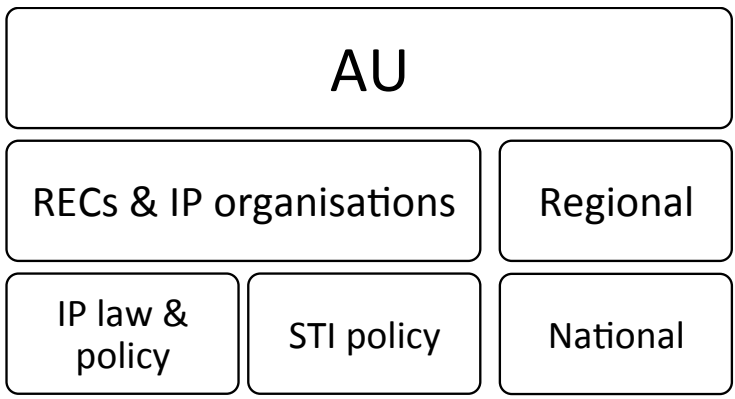
[32] Formed in 1994 to replace the Preferential Trade Area (PTA) formed in 1981.

vi the Inter-Governmental Authority of Development (IGAD)[33]
vii the Community of Sahel-Saharan States (CEN-SAD)
viii the East African Community (EAC).

The RECs also generate norms through their various instruments, usually in the form of protocols, policies and guidelines. In addition, they have well established judicial institutions such as the ECOWAS Court of Justice, the SADC Tribunal, East African Court of Justice and the COMESA Court of Justice.[34]

The regional IP organisations' IP instruments are also binding. In the Organisation Africaine de la Propriété Intellectuelle (OAPI) all member states are bound by protocols, while in the African Regional Intellectual Property Organisation (ARIPO) only contracting states are bound by protocols. Accordingly, the discussion of African IP frameworks in this book considers normative instruments from these regional institutions. Further, Gathii has made a compelling case for African regional trade agreements (RTAs) as legal regimes worthy of study on their own merits and not just by being measured against RTAs from other parts of the world.[35] Finally, the book gives some examples from the national sphere, but as indicated above, it does not give a detailed consideration of national law and policy. The regulatory layers considered in this book are as depicted below:

Figure 1: Regulatory layers



Source: Author

[33] Formed in 1996 to replace the Intergovernmental Authority on Drought and Development (IGADD) formed in 1986.

[34] NNA Fon 'An "African justice": Legal integration and the emergence of an African judicial system' (2019) 54(4) *Journal of Asian and African Studies* 485–97.

[35] JT Gathii *African Regional Trade Agreements as Legal Regimes* (2011); O Gbadebo & B Adekunle *Negotiating South-South Regional Trade Agreements: Economic Opportunities and Policy Directions for Africa* (2017).

1.3 Defining and linking science, technology and innovation and intellectual property

This definitional section aims to inform at least four types of readers. First, those who are knowledgeable about STI but not about IP will find the definition of IP useful. Second, those who are proficient in IP but not in STI will favour the STI sections. Third, those who lack advanced knowledge of either concept or are unfamiliar with both will find the entire section useful. Finally, those who do not fully appreciate how IP and STI are linked will also benefit from the whole section.

On the one hand, discussions of STI and how it contributes to sustainable development are well established. A recent example of this extensive literature is *Innovation Policy at the Intersection: Global Debates and Local Experiences*,[36] which comprehensively explores STI policymaking theories and approaches, including the role of policy advisory bodies and monitoring and evaluation systems. Several chapters in the book consider the South African context. A national, regional and continental overview of STI policies in Africa has been presented in several other texts.[37] On the other hand, IP-based discussions of how openness supports African innovation are gaining traction. The seminal text in this regard is *Innovation and Intellectual Property: Collaborative Dynamics in Africa*,[38] an edited volume of case studies examining innovators in Egypt, Nigeria, Ghana, Ethiopia, Uganda, Kenya, Mozambique, Botswana and South Africa across many sites of innovation and creativity, including music, leather goods, textiles, cocoa, coffee, auto parts, traditional medicine, book publishing, biofuels and university research. This volume considers various forms of IP protection, including copyrights, patents, trade marks, geographical indications and trade secrets, as well as traditional and informal mechanisms of knowledge governance. The case studies show that IP can play a positive role in collaborative innovation systems if policymakers prioritise the public interest and stakeholders adopt appropriate approaches to openness, using closed and open systems as dictated by the work in issue, by need and by context. The difference between the book by De Beer et al and *STI and IP – Leveraging Openness for Sustainable Development in Africa* is that the former focuses on African innovators and their collaborative dynamics while the latter focuses on the regulatory and policy frameworks within which innovators work.

[36] MBG Cele, TM Luescher & A Wilson Fadiji (eds) *Innovation Policy at the Intersection: Global Debates and Local Experiences* (2020).

[37] C Aguirre-Bastos, J Chaves-Chaparro & S Arico (eds) *Co-Designing Science in Africa: First Steps in Assessing the Sustainability Science Approach on the Ground* (2019); Economic Commission for Africa (ECA) *Country STI Profiles: A Framework for Assessing Science, Technology and Innovation Readiness in African Countries* (2018); African Capacity Building Foundation (ACBF) *Africa Capacity Report* (including case studies of Ethiopia, Morocco, Nigeria, Rwanda, Tanzania and Zimbabwe) (2017); ECA, AU & AfDB 'Africa's science, technology and innovation policies–national, regional and continental' in *Assessing Regional Integration in Africa (ARIA VII): Innovation, Competitiveness and Regional Integration* (2016) 83; K Nwuke 'Science, technology and innovation policy in Africa in the age of brilliant and disruptive technologies: An analysis of policies at the national, regional and continental levels' *Background paper for ARIA VII* (2015).

[38] J de Beer et al (eds) *Innovation and Intellectual Property: Collaborative Dynamics in Africa* (2013).

As indicated above, this section defines IP and explains its linkage to STI. It then provides definitions of the foundational concepts of knowledge, science, technology and innovation to enable a closer look at the related concept of 'knowledge governance' in section 1.4.

1.3.1 Intellectual Property (IP)

IP law and policy offer a regulatory framework that provides protection for the output of human creativity and inventions. In view of the increasing frequency of incidences of creativity and inventions by animals[39] and what can broadly be termed 'technology' (including computer programs, algorithms and artificial intelligence (AI)), there are current normative discussions, at both national and international levels, about how this framework can best respond to these developments.[40] These discussions are in nascent form; the prevailing position is that only human and technology-assisted intellectual output is protected by IP law, and protection does not currently extend to technology-generated works and inventions.[41] The distinction between technology-assisted and technology-generated output is that the former entails human contribution while the latter does not. A simple example is creative work (artwork) authored by a person using AI as opposed to creative work that is authored by AI without human intervention.[42]

IP law provides protection to IP rights (IPRs), which are granted in terms of statutory provisions (eg for patents and copyright) and, in some cases, common

[39] Eg, see CB Ncube & DO Oriakhogba 'Monkey selfie and authorship in copyright law: The Nigerian and South African perspectives' (2018) 21 *PER / PELJ,* DOI: http://dx.doi.org/10.17159/1727-3781/2018/v21i0a4979 and the authorities cited therein.

[40] Eg, see CB Ncube & I Rutenberg 'Intellectual property and 4IR technologies' in Z Mazibuko-Makena & E Kraemer-Mbula (eds) *Leap 4.0: African perspectives on the Fourth Industrial Revolution* (Mapungubwe Institute for Strategic Reflection (MISTRA 2020) 393; WIPO 'Revised issues paper on intellectual property policy and artificial intelligence WIPO/IP/AI/2/GE/20/1 REV'; WIPO 'Artificial intelligence and intellectual property policy: Database of submissions' n.d., https://www.wipo.int/about-ip/en/artificial_intelligence/policy.html#submissions; WIPO 'Draft issues paper on intellectual property policy and artificial intelligence WIPO/IP/AI/2/GE/20/1' (13 December 2019); WIPO 'Technology trends 2019: Artificial intelligence' (2019); USPTO, 'Request for comments on patenting artificial intelligence inventions' (2019) 84(166) *Federal Register* 44889 (*Federal Register* 22 August 2019).

[41] Ncube & Rutenberg (2021) supra; R Abbott 'Artificial intelligence, big data and intellectual property: Protecting computer-generated works in the United Kingdom' in T Alpin (ed) *Research Handbook on Intellectual Property and Digital Technologies* (2020) 322; D Crouch 'USPTO rejects AI-invention for lack of a human inventor' *PatentlyO* (27 April 2020), https://patentlyo.com/patent/2020/04/rejects-invention-inventor.html; European Patent Office (EPO) 'Grounds for the EPO Decision of 27 January 2020 on EP 18275163' (2020); EPO 'Grounds for the EPO Decision of 27 January 2020 on EP 18275174.3' (2020); UK Intellectual Property Office (UKIPO) 'Re Stephen L Thaler' (2019), BL O/741/19 (4 December 2019); D Gervais 'Is intellectual property law ready for artificial intelligence?' (2020) 69(2) *GRUR International* 117; M Iglesias, S Shamuilia & A Anderberg 'Intellectual property and artificial intelligence – A literature review' (2019), DOI:10.2760/2517; N Li & T Koay 'Artificial intelligence and inventorship: An Australian perspective' (2020) 15(5) *JIPLP* 399; E Bonadio, L McDonagh & C Arvidsson 'Intellectual property aspects of robotics' (2018) 9 *European Journal of Risk Regulation* 655.

[42] For examples of each category, see AIArtists.org: The world's largest community of artists exploring the impact of AI on art & society, https://aiartists.org/.

law (eg for trade secrets) to grant economic exclusivity over inventions in all fields of technology and a variety of works including in art and literature.[43] The exclusive economic rights are the mechanism through which the right holder controls reproduction, adaptation and distribution, among other types of economic exploitation. Copyright also affords what are known as moral rights, which entitle the author of a work to be identified as such—known as the right of paternity—and the right to object to distortions of the work—known as the right of integrity.

IPRs are typically classified into (a) copyright and related rights and (b) industrial rights, including patents, designs, trade marks and trade secrets. There are also some closely related customised rights granted to the outputs of knowledge, innovation and creativity, known as *sui generis* rights.

Chapters Two and Three are devoted to IP; they include a detailed overview of IPRs and substantive discussions. IPRs are relevant to STI because they apply at all stages of scientific, technological and innovative endeavours. For example, scholarly and scientific papers that are used to inform research are likely to be copyright protected and chemical compositions that are developed by researchers may be eligible for patent protection or be protected as a trade secret. Goods and services that are commercialised are typically initially secured by IPRs, which then form the basis of the right holder's proprietary claims that enable these innovations to be widely distributed. IP is closely linked to technology transfer, technological learning, standards and safety and the role they play in trade, investment and development, so it is critically important in discussions about harnessing STI as a driver of development. This AU vision, entrenched in its Agenda 2063, is further discussed below in section 1.5.2.

1.3.2 Science, Technology and Innovation (STI)

STI is a composite of three areas, namely science, technology and innovation, each inherently founded within a broad conceptualisation of knowledge, which is defined in section 1.4 below.[44] Chapter Four defines each of these aspects in detail to better understand the IP implications of each aspect.

Science, technology and innovation have generated much scholarship and many normative instruments. For example, technology and technology transfer are key components of technological growth and have been included in at least 80 international instruments, which include IP instruments.[45] Notably, the World Trade Organisation (WTO)'s Agreement on Trade-related Aspects of Intellectual

[43] CB Ncube 'Harnessing intellectual property for development: Some thoughts on an appropriate theoretical framework' (2013) 16(4) *Potchefstroom Electronic Law Journal* 370 at 373.

[44] UNCTAD *STI Capacity Development Course, Module 1: Innovation, Policy and Development* UNCTAD/DTL/STICT/INF/2019/1 (2019) at 8.

[45] UNCTAD *Compendium of International Arrangements on Transfer of Technology: Selected Instruments: Relevant Provisions in Selected International Arrangements Pertaining to Transfer of Technology* UNCTAD/ITE/IPC/Misc.5 (2001).

Property Rights including Trade in Counterfeit Goods (TRIPS Agreement)[46] expressly mentions technological innovation and its transfer. First, it addresses the goal of IP protection of technology in art 7, which provides:

> The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

Second, it addresses technology transfer in art 66.2, which places the following obligation upon member states:

> Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base.

Elsewhere I have argued that these provisions form the basis of a public interest approach to IP, which 'seeks to equitably balance the interests of creators and users in a manner that is beneficial to society generally'.[47] African developmental aspirations, strategies and plans place STI firmly and strongly within their arsenal of tools. This aspect will be considered in section 1.5.2 below.

1.4 Knowledge governance

Crafting a standard and universally accepted definition of knowledge remains elusive; scholars use various definitions in diverse contexts.[48] These contexts include knowledge management in organisations[49] and conceptualisations of the 'knowledge economy' in developmental literature.[50] Following Hess and Ostrom, this book defines knowledge as:[51]

> all types of understanding gained through experience or study, whether indigenous, scientific, scholarly, or otherwise non-academic. It also includes creative works, such as music and the visual and theatrical arts.

Knowledge has many attributes, including being able to serve both as a 'a commodity and as a constitutive force of society' as well as being 'cumulative' which means that its pursuit has academic, economic and social implications.[52] Viewing knowledge

[46] Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, adopted 15 December 1993, entered into force 1 January 1995, (1994) 33 *ILM* 81.

[47] Ncube (2013) supra at 374.

[48] T Trautmann 'An epistemological literature review on knowledge and knowledge management (2000), https://hal.archives-ouvertes.fr/hal-00461993; E Bolisani & C Bratianu 'The elusive definition of knowledge' in E Bolisani & C Bratianu *Emergent Knowledge Strategies: Strategic Thinking in Knowledge Management* (2018) 1–22, DOI: 10.1007/978-3-319-60656_1.

[49] Eg, see T Gao, Y Chai & Y Liu 'A review of knowledge management about theoretical conception and designing approaches' (2018) 2(1) *International Journal of Crowd Science* 42.

[50] RM Unger 'The knowledge economy verso' (2019), https://www.oecd.org/naec/THE-KNOWLEDGE-ECONOMY.pdf.

[51] C Hess & E Ostrom (eds) *Understanding Knowledge as a Commons: From Theory to Practice* (2006) 8.

[52] Ibid.

in such a multidimensional way enables one to conceptualise it as a public good requiring a public interest-infused approach to its pursuit, use and governance.[53]

The knowledge governance approach, according to Burlamaqui, seeks to develop 'a better way to understand the interaction among knowledge production, appropriation and diffusion and, from a public policy/public interest point of view, to open up the space for a set of rules, regulatory redesign and institutional coordination which would favour the commitment to distribute (disseminate) over the right to exclude'.[54] This imperative to distribute and disseminate knowledge and innovation is encapsulated in the openness paradigm, which is discussed in Chapter Five. It manifests in various ways encompassing both commercial and non-commercials modes. One way to describe the latter mode, is the 'socialisation of knowledge', which involves the adoption or uptake of norms, customs and ideologies through which social, cultural and economic continuity is sustained in order to integrate knowledge and its benefits into society.[55] Another manifestation of this approach is open innovation, specifically when it is harnessed for development.[56] Both these concepts will be explored in Chapter Five. This section seeks to define knowledge governance and to link it with 'openness' as used in this book. Each of these aspects is outlined below.

1.4.1 Defining knowledge governance

The concept of knowledge governance is relatively new, having been developed and popularised by scholars in the last 20 years. Armstrong and Schonwetter provide a literature review and distillation of the concept that canvasses the usage of the term in various contexts, as listed below.[57]

[53] M Sunder *From Goods to a Good Life: Intellectual Property and Global Justice* (2012).

[54] L Burlamaqui 'Knowledge governance: An analytical approach and its policy implications' in L Burlamaqui, AC Castro & R Kattel (eds) *Knowledge Governance: Reasserting the Public Interest* (2012) 3–26.

[55] CB Ncube, L Abrahams & T Akinsanmi 'Effects of the South African IP regime on generating value from publicly funded research: An exploratory study of two universities' in J de Beer et al (2013) supra at 286.

[56] J de Beer 'Open innovation in development: Integrating theory and practice across open science, open education, and open data' (26 January 2017). *Open AIR Working Paper* No 3/17, http://dx.doi.org/10.2139/ssrn.3008675.

[57] C Armstrong & T Schonwetter 'Conceptualising knowledge governance for development' (2016) 19 *The African Journal of Information and Communication (AJIC)* 1 at 7–8.

(i)	national, regional and international public institutions and their interaction with private and civil society stakeholders
(ii)	norm-setting on international forums
(iii)	private sector management and organisational economics[58]
(iv)	industrial public policy[59]
(v)	regulation of science[60]
(vi)	dynamics at universities and other knowledge-producing institutions[61]
(vii)	collective action and social learning[62]
(viii)	the knowledge modalities of sustainable development initiatives[63]
(ix)	communal resource governance[64]
(x)	sustainable development[65]
(xi)	comprehensive approach including 'on-the-ground practices of innovators all the way to the realities of high-level policymaking and law-making at national, regional, continental and international/global levels'.[66]

Source: Author, adapted from Armstrong and Schonwetter

Each of the above conceptualisations of knowledge governance sets out its frame of reference, then develops the key aspects of a suitable way to regulate knowledge

[58] L van Kerkhoff 'Knowledge governance for sustainable development: A review' (revised 2014), originally published in: (2013) 1(2) *Challenges in Sustainability* 8. DOI: 10.12924/cis2013.01020082.

[59] Burlamaqui (2012) supra; L Burlamaqui, AC Castro & R Kattel (eds) *Knowledge Governance: Reasserting the Public Interest* (2012); L Burlamaqui & M Cimoli 'Industrial policy and IPR: A knowledge governance approach' in M Cimoli et al (eds) *Intellectual Property Rights: Legal and Economic Challenges for Development* (2014) 477.

[60] N Stehr (ed) *The Governance of Knowledge* (2004).

[61] S Fuller 'In search of vehicles for knowledge governance: On the need for institutions that creatively destroy social capital' in N Stehr (ed) (2004) supra 46; J Wilbanks & C Rossini 'An interoperability principle for knowledge creation and governance: The role of emerging institutions' in Burlamaqui, Castro & Kattel (2012) supra 199.

[62] AL Gerritsen, M Stuiver & CJAM Termeer 'Knowledge governance: An exploration of principles, impact, and barriers' (2013) 40(5) *Science and Public Policy* 60415.

[63] Van Kerkhoff (2013) supra.

[64] E Ostrom *Governing the Commons: The Evolution of Institutions for Collective Action* (1990); E Ostrom Understanding Institutional Diversity (2005); C Hess & E Ostrom 'Introduction: An overview of the knowledge commons' in C Hess & E Ostrom (eds) *Understanding Knowledge as a Commons: From Theory to Practice* (2007) 3–26; J Boyle *The Public Domain: Enclosing the Commons of the Mind* (2008). M Madison, B Frischmann & K Strandburg 'Constructing commons in the cultural environment' (2010) 95 *Cornell Law Review* 657.

[65] D Manuel-Navarrete & GC Gallopin 'Feeding the world sustainably: Knowledge governance and sustainable agriculture in the Argentine Pampas' (2011) 14(3) *Environment, Development and Sustainability* 321–33; Van Kerkhoff (2013) supra.

[66] J de Beer, K Fu & S Wunsch-Vincent 'The informal economy, innovation and intellectual property – Concepts, metrics and policy considerations' E*conomic Research Working Paper No. 10* (2013); J de Beer, C Oguamanam & T Schonwetter 'Innovation, intellectual property and development narratives in Africa' in J de Beer et al (2013) supra 1; E Kraemer-Mbula & S Wunsch-Vincent (eds) *The Informal Economy in Developing Nations: Hidden Engine of Innovation?* (2016).

created by various actors. For example, in the first two instances listed above, the frame of reference is the creation of binding rules or norms at international level,[67] with an emphasis on the institutions where negotiations take place and the stakeholders who are involved in the process, as well as the dynamics at play between them.[68] The key aspects highlighted by scholars include the contrast between the priorities of the global south (developing countries), and the global north's (developed countries) priorities.[69]

This book's approach aligns closely with the approach of these scholars with regards to emphasising that global south contexts present different challenges and priorities from global north settings and accordingly require appropriately nuanced or calibrated frameworks, within the binding international framework.[70] Since the book also considers the use of STI as a developmental tool, it finds affinity with some scholars who write on the regulation of science, sustainable development and the adoption of a comprehensive approach, listed above under items (v), (x) and (xi) respectively and particularly the comprehensive approach that considers all actors, including innovators, and all norm-setting forums from the national to the international. In summary, this book adopts such an approach, prioritising an African context, as eloquently summarised by Armstrong and Schonwetter:[71]

> as African-based researchers, our bias is towards conceptions of knowledge governance – whether at the grassroots, or at an institution such as a tech hub, or in an international intergovernmental context – that treat it as a process inextricable from matters of human and socio-economic development.

[67] Eg, see A Abdel-Latif et al 'Overcoming the impasse on intellectual property and climate change at the UNFCCC: A way forward' (2011) (11) *Policy Brief*; M Cimoli et al 'The role of intellectual property rights in developing countries: Some conclusions' in M Cimol et al (2014) supra 503; Commission on Intellectual Property Rights (CIPR) 'Integrating intellectual property rights and development policy' (2002); CM Correa 'Intellectual property rights, the WTO and developing countries: The TRIPS agreement and policy options' (2000); P Drahos & J Braithwaite *Information Feudalism: Who Owns the Knowledge Economy?* (2002); R Ramcharan *International Intellectual Property Law and Human Security* (2013); SK Sell *Private Power, Public Law: The Globalization of Intellectual Property Rights* (2003).

[68] RL Okediji 'The international relations of intellectual property: Narratives of developing country participation in the global intellectual property system' (2003) 7 *Singapore Journal of International and Comparative Law* 315–85; P Yu 'Currents and crosscurrents in the international intellectual property regime' (2004) 38 *Loyola of Los Angeles Law Review* 323–443; M Chon 'Global intellectual property governance (under construction)' (2011) 12(1) *Theoretical Inquiries in Law* 349–80; P Drahos *The Global Governance of Knowledge: Patent Offices and Their Clients* (2010); C May *The Global Political Economy of Intellectual Property Rights: The New Enclosures* 2e (2010); C Oguamanam *Intellectual Property in Global Governance: A Development Question* (2011); T Lemmens 'Pharmaceutical knowledge governance: A human rights perspective' (2013) 41(1) *The Journal of Law, Medicine & Ethic*s 163–84, DOI: 10.1111/jlme.12012.

[69] Abdel-Latif et al (2011) supra; Cimoli et al (2014) supra; Correa (2000) supra; Drahos & Braithwaite (2002) supra; Sell (2003); Okediji (2003) supra; Yu (2004) supra; Chon (2011); Drahos (2010) supra; May (2010) supra; Oguamanam (2011) supra; Lemmens (2013) supra.

[70] Armstrong & Schonwetter (2016) supra at 6; Ncube (2013) supra at 371–2.

[71] Armstrong & Schonwetter (2016) supra at 10.

1.4.2 Knowledge governance and openness

As indicated above, the knowledge governance approach used in this book is animated by an imperative to distribute and disseminate knowledge and innovation that is encapsulated in the openness paradigm that is set out in Chapter Five. This paradigm has been articulated with respect to open science,[72] open data and open access.[73] Chapter Five will consider the various strands of openness to provide a comprehensive view of what may be called the 'openness paradigm'. It will include definitions of open science, open access and open data, which are linked to core industries with developmental impact and significance. For instance, Africa has a significant disease burden, including that of neglected tropical diseases, such as malaria. To this, there is the added burden of HIV/AIDs and now the COVID-19 pandemic. This book's main proposition is that openness and collaboration hold the key to finding solutions. It is against this background that Chapter Five considers open science, which is related to debates about the appropriate leveraging of publicly funded research. This consideration is intended to be a timely contribution to the development of Open Science Policies by several African governments, including South Africa.[74]

Another example of a context where openness is generating value is the education sector. Much has been written about Africa's need for hard copy learning materials in order for the right to education to be realised and the impact that copyright regimes have on this.[75] The current pandemic that has forced a switch to emergency remote teaching has exacerbated the issues and trained focus on collective licensing within the context of digital delivery. Chapter Five comments on these issues alongside the roles of open access and open educational resources.

1.5 A sustainable development context

This book adds to the literature on STI and IP by making the African continent its focal point. This is done by contextualising the discussion within the continental framework for sustainable development including the Sustainable Development Goals (SDGs), Agenda 2063 and the national development plans discussed in section 1.5.2 below. The section also examines the relevance of regional integration and the AfCFTA. To place the African agenda in context and to highlight its unique features, section 1.5.1 will provide a brief overview of the international development agenda. Section 1.5.2 will set out the African development agenda.

[72] L Chanet al (eds) *Contextualizing Openness: Situating Open Science* (2019).

[73] G Krikorian & A Kapczynski (eds) *Access to Knowledge in the Age of Intellectual Property* (2010); Armstrong & Schonwetter (1016) supra; C Armstrong et al (eds) *Access to Knowledge in Africa: The Role of Copyright* (2010).

[74] Department of Science & Innovation (DSA) 'White Paper on Science, Technology and Innovation 2018' *GG* 41909 of 14 September 2018.

[75] SI Strba *International Copyright Law and Access to Education in Developing Countries: Exploring Multilateral Legal and Quasi-Legal Solutions* (2016).

Due to the importance of the concept of sustainable development to the international and African development agendas, it is critical to start with a definition of the concept. At its most basic and literal level, one could say it is about development that is sustainable, but the amount of scholarly writing and commentary on the concept is evidence that it is not as simple as that.[76] However, a thorough engagement with the history,[77] key tenets of[78] and debates surrounding this concept are beyond the scope of this book. The following definition is used for purposes of discussion:[79]

> Sustainable development relates to the principle of meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend.

Three aspects of development are evident in this definition, namely economic, environmental and social. The classic definition of economic development is 'the process by which per capita income and economic welfare of a country improve over time'.[80] Working from this definition, economic development would then be measured by tracking gross domestic product (GDP) trends. The current[81] and more progressive conceptualisation of economic development is that it is not only about 'formal economic opportunities' but is about human 'freedoms and capabilities to have basic economic needs fulfilled'.[82] Therefore the measurement of real growth in economic welfare is not measured by the growth of GDP alone[83] but includes a

[76] Eg, see J Mensah 'Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review' (2019) 5(1) *Cogent Social Sciences* 1653531, https://doi.org/10.1080/23311886.2019.1653531; PB Cobbinah, MO Erdiaw-Kwasie & P Amoateng 'Rethinking sustainable development within the framework of poverty and urbanisation in developing countries' (2015) 15 *Environmental Development* 18–32; RW Kates, TM Parris & AA Leiserowitz 'What is sustainable development? Goals, indicators, values, and practice' (2005) 47(3) *Environ. Sci. Policy Sustainable Dev* 8–21.

[77] The concept of 'sustainable development' was 'officially' introduced in World Commission on Environment and Development (WCED) *Our Common Future, Report of the Brundtland Commission* (1987) (Brundtland Commission). For a historical overview, see PB Cobbinah, R Black & R Thwaites 'Reflections on six decades of the concept of development: Evaluation and future research' (2011) 23(7) *Journal of Sustainable Development in Africa* 134–49.

[78] Eg, see CJ Barrow 'Sustainable development: Concept, value and practice' (1995) 17(4) *Third World Plann. Rev.* 369.

[79] Mensah (2019) supra at 12.

[80] TR Jain et al *Development Economics* (2008) 2.

[81] For a discussion of how the understanding of economic development has changed over time see I Adelman *Theories of Economic Growth and Development* (1961) 1; HW Arndt *Economic Development: The History of an Idea* (1989) 1–5; and A Sen 'Development and thinking at the beginning of the 21st century' (1997) *LSE STICERD Research Paper* No. DEDPS/2 1–2, 26.

[82] A Sen 'What is the role of legal and judicial reform in the development process?' Paper presented at Role of legal and judicial reform in development, World Bank Legal Conference, Washington DC, 5 June 2000. See also A Sen 'A decade of human development' (2000) *Journal of Human Development* 17 at 18.

[83] S Anand & A Sen 'Human development and economic sustainability' (2000) *World Development* 2029 at 2032: 'Many countries have grown fast without a commensurate impact on living conditions, and more importantly, some countries have achieved high quality of life despite relatively moderate growth of GNP or GDP per head.'

more comprehensive and systematic reckoning of how people live.[84] Environmental aspects of development encompass concerns about the proper stewarding of the planet Earth and its natural resources. Social aspects include 'notions of equity, empowerment, accessibility, participation, cultural identity and institutional stability', with the primary goal of poverty alleviation.[85] Figure 2 in section 1.5.1 below illustrates how these elements interconnect. The following subsections explore how the concept of sustainable development has been articulated and is being implemented at international and African continental levels.

1.5.1 The international development agenda

Development has been a global priority since the end of the Second World War. The United Nations (UN) and its agencies have given it considerable attention. After initially being addressed in a fragmented way by multiple agencies, a coherent approach was provided by the Millennium Development Goals (MDGs) in 2000.[86] The eight MDGs, meant to be achieved by 2015 and working from a 1990 baseline, were to: (1) eradicate extreme poverty and hunger; (2) achieve universal primary education; (3) promote gender equality and empower women; (4) reduce child mortality; (5) improve maternal health; (6) combat HIV/AIDS, malaria, and other diseases; (7) ensure environmental sustainability; and (8) develop a global partnership for development. Commentary on the success of the MDGs varies, with some writers critiquing their limited success,[87] while others laud their significant gains, particularly in relation to hunger reduction, health and education goals.[88] Either way, the Millennium Declaration did usher in a coherent and consolidated approach to global development.

The MDGs were superseded by the SDGs in 2015. The opportunity was taken to enhance and strengthen the global development agenda in the transition. For instance, much thought went into how the pursuit of development could be more

[84] A Sen 'A decade of human development' (2000) supra. Working from this premise, the United Nations Development Program (UNDP) has been publishing Human Development Reports annually since 1990.

[85] Mensah (2019) supra at 9.

[86] United Nations Millennium Declaration General Assembly resolution 55/2 of 8 September 2000; S Kumar et al 'Millennium Development Goals (MDGs) to Sustainable Development Goals (SDGs): Addressing unfinished agenda and strengthening sustainable development and partnership' (2016) 41(1) *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine* 1 at 1.

[87] UNDP & World Bank *Transitioning from the MDGs to SDGs* (2017) 9–10, 14, https://www.undp.org/content/undp/en/home/librarypage/sustainable-development-goals/transitioning-from-the-mdgs-to-the-sdgs.html; M Fehling, BD Nelson & S Venkatapuram 'Limitations of the Millennium Development Goals: a literature review' (2013) 8(10) *Global Public Health* 1109–22, DOI: 10.1080/17441692.2013.845676.

[88] M Lomazzi et al 'Millennium Development Goals: How public health professionals perceive the achievement of MDGs' (2014) 7(1) *Global Health Action, DOI*: 10.3402/gha.v7.24352; M Lomazzi, B Borisch & U Laaser 'The Millennium Development Goals: Experiences, achievements and what's next' (2014) 7(1) *Global Health Action, DOI*: 10.3402/gha.v7.23695.

inclusive, which led to the adoption of the concept of leaving no-one behind.[89] A consequence of this transition with modification is that the MDGs and SDGs differ 'in their very purpose, conception, and the political process that drove their elaboration'.[90] The distinction in the conceptualisation and crafting of each agenda is seen in the MDGs being developed by a small group of UN technocrats and the SDGs being the product of a much larger and more inclusive consultative process.[91] African states, as a collective, participated in this process through the development of the Common African Position on the post-2015 Development Agenda (CAP).[92] The CAP articulated the following six pillars of developmental priorities for Africa:[93]

> (i) structural economic transformation and inclusive growth; (ii) science, technology and innovation; (iii) people-centred development; (iv) environmental sustainability, natural resources management, and disaster risk management; (v) peace and security; and (vi) finance and partnerships.

These priorities all find expression in the SDGs. Therefore, there is clear alignment between African priorities and the global development agenda.

The scope of the SDGs, with 17 goals (listed below) and 169 indicators, is considerably broader than the MDGs, which had 8 goals and 63 indicators.[94] Unlike the MDGs, which focused only on social development, the SDGs also address economic and environmental aspects of development. Two other distinguishing attributes of the SDGs are complexity[95] and universalism.[96] In contrast, the MDGs were relatively simple and applied only to developing countries.[97] The SDGs have the following 17 aspirations with 169 targets:[98]

[89] E Stuart & J Woodroffe (2016) 'Leaving no-one behind: Can the Sustainable Development Goals succeed where the Millennium Development Goals lacked? (2016) 24(1) *Gender & Development* 69–81 at 72, DOI: 10.1080/13552074.2016.1142206.

[90] S Fukuda-Parr 'From the Millennium Development Goals to the Sustainable Development Goals: Shifts in purpose, concept, and politics of global goal setting for development' (2016) 24(1) *Gender & Development* 43–52 at 44, DOI: 10.1080/13552074.2016.1145895.

[91] UN *A New Global Partnership: Eradicate Poverty and Transform Economies Through Sustainable Development: The Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda* (2013); P van Bergeijk & R van der Hoeven 'The challenge to reduce income inequality (introduction and overview)' in PAG van Bergeijk & R van der Hoeven (eds) *Sustainable Development Goals and Income Inequality* (2017) 1 at 1.

[92] AU *The Common African Position on the post-2015 Development Agenda (CAP).*

[93] AU *CAP* supra at 7.

[94] Kumar et al supra.

[95] S Türkeli 'Complexity and the Sustainable Development Goals: A computational intelligence approach to support policy mix designs' (2020) 2(1) *J Sustain Res* e200006, https://doi.org/10.20900/jsr20200006; B Fu et al 'Unravelling the complexity in achieving the 17 sustainable-development goals' (2019) 6(3) *National Science Review* 386–8, https://doi.org/10.1093/nsr/nwz038.

[96] G Long 'The idea of universality in the Sustainable Development Goals' (2015) 29(2) *Ethics & International Affairs* 203–22, DOI:10.1017/S0892679415000076.

[97] UNDP *Universality and the 2030 Agenda for Sustainable Development from a UNDG Lens: Discussion note*, https://www.un.org/ecosoc/sites/www.un.org.ecosoc/files/files/en/qcpr/undg-discussion-note-on-universality-and-2030-agenda.pdf.

[98] General Assembly of the United Nations Resolution on the 2030 Agenda for Sustainable Development (Post2015 Development Agenda) adopted by the General Assembly on 25 September 2015 A/RES/70/1.

1	No poverty	10	Reduced inequalities
2	Zero hunger	11	Sustainable cities and communities
3	Good health and well-being	12	Responsible consumption and production
4	Quality education	13	Climate action
5	Gender equality	14	Life below water
6	Clean water and sanitation	15	Life on land
7	Affordable and clean energy	16	Peace, justice, and strong institutions
8	Decent work and economic growth	17	Partnerships for the goals
9	Industry, innovation, and infrastructure		

The SDGs are encapsulated in the '5 Ps': People, Planet, Prosperity, Peace and Partnerships, which are graphically represented as follows

Figure 2: The five Ps

Source: UN Staff College.[99]

The people/social category consists of the first five SDGs: no poverty, zero hunger, good health and well-being, quality education and gender equality. It also consists of SDG 10, reduced inequalities, which is common to all three spheres, as depicted above. Other cross-cutting SDGs are clean water and sanitation (SDG 6), which straddles people and planet; affordable and clean energy (SDG 7), which features in both planet and prosperity; and no poverty (SDG 1), which falls under both people and prosperity. The planet/environmental category consists of clean water and sanitation (SDG 6), climate action (SDG 13), life below water (SDG 14), and

[99] UN Staff College 'What is sustainable development and why should we care?', https://www.unssc.org/news-and-insights/blog/sustainable-development-what-there-know-and-why-should-we-care/.

life on land (SDG 15). The prosperity/economic category consists of decent work and economic growth (SDG 8), industry, innovation and infrastructure (SDG 9), sustainable cities and communities (SDG 11), and responsible consumption and production (SDG 12). The final two categories are peace (SDG 16) and partnerships (SDG 17).

The importance of STI for achieving the SDGs cannot be overstated and several steps at global level have been taken to leverage STIs through resolutions and implementing structures. For instance, a resolution on STI for sustainable development was adopted by the UN General Assembly in 2019,[100] and in previous years.[101] An annual collaborative Multi-Stakeholder STI Forum for the Sustainable Development Goals (STI Forum) was established as part of the UN Technology Facilitation Mechanism (TFM).[102] Other components of the TFM are its online platform and 'the UN Inter-Agency Task Team on Science, Technology and Innovation for the Sustainable Development Goals (IATT) together with a Group of 10 High-Level Representatives from Civil Society, the Private Sector and the Scientific Community (10-Member Group)'.[103]

The STI Forum provides input to the annual High-Level Political Forum on Sustainable Development, which was established by General Assembly resolution in July 2012[104] and has been meeting since 2013. Its annual meetings are held under the auspices of the Economic and Social Council (ESC) and it is convened every four years by the General Assembly as a meeting of Heads of State and Government.[105] Since 2016, the HLPF has been conducting voluntary state-led regular reviews 'on the follow-up and implementation of sustainable development commitments and objectives'.[106] A similar implementation approach has been adopted by the AU as set out in section 1.5.2 below. This is couched in the regional forum infrastructure set up under Agenda 2030.[107] Further information about the African Regional Forum is presented in section 1.5.2.

1.5.2 The African development agenda

Alongside the international development agenda, Africa has her own development agenda informed by her unique circumstances and priorities, which has spurred

[100] Resolution adopted by the General Assembly on 19 December 2019, STI for sustainable development A/RES/74/229. Also see the Economic and Social Council Resolution on 23 July 2019 on STI for development E/RES/2019/25.

[101] Resolution adopted by the General Assembly on 20 December 2017, STI for sustainable development A/RES/72/228.

[102] UN 'STI Forum', https://sustainabledevelopment.un.org/TFM/STIForum2020.

[103] Ibid.

[104] Resolution adopted by the General Assembly on 27 July 2012: The future we want A/RES/66/288.

[105] Paras 6 and 7 Resolution adopted by the General Assembly on 9 July 2013 on the Format and organizational aspects of the high-level political forum on sustainable development A/RES/67/290.

[106] Para 8 Resolution A/RES/67/290.

[107] General Assembly Resolutions 67/290, 70/1 and 70/299.

scholarship on its various aspects.[108] This agenda, currently articulated as Agenda 2063, builds on many previous developments such as the Lagos Plan of Action 1980–2000 and the Treaty Establishing the African Economic Community (the Abuja Treaty) 1991, which led to the creation of institutions and programmes to support and facilitate development.[109] These include the Comprehensive Africa Agriculture Development Programme (CAADP), the Programme for Infrastructure Development in Africa (PIDA), the New Partnership for Africa's Development (NEPAD), the AU/NEPAD Science and Technology Consolidated Plan of Action (CPA), the Accelerated Industrial Development for Africa (AIDA) strategy and the Minimum Integration Programme. Further, there are supplementary regional plans and programmes as well as national development plans.

As is shown below, the African Agenda has been articulated in several instruments, the chief of which is the AU's Agenda 2063, a 50-year plan 'for inclusive growth and sustainable development for Africa' adopted in 2013.[110] The African Development Agenda has been discussed by many scholars, each highlighting different aspects, such as its institutional implementation mechanisms, and evaluating its prospects for success.[111] This section outlines the main instruments and the goals articulated in the Agenda. The next section, 1.6, analyses the Agenda, briefly considering the distinctions between the international and African sustainable development agendas.

AU member states committed to the vision of Agenda 2063 through the AU's 50th Anniversary Solemn Declaration.[112] The declaration set out the following eight priorities:

1 African identity and renaissance
2 Continue the struggle against colonialism and the right to self-determination
3 The integration agenda
4 Agenda for social and economic development
5 Peace and security agenda
6 Democratic governance
7 Determining Africa's destiny
8 Africa's place in the world.

Following this commitment, the AU Commission (AUC), together with the New Partnership for Africa's Development (NEPAD) Planning and Coordinating Agency

[108] Eg, see GJS Dei & PB Adjei *Emerging Perspectives on 'African Development': Speaking Differently* (2014); LA Deng *Rethinking African Development: Toward a Framework for Social Integration and Ecological Harmony* (1998).

[109] AUC Directorate of Strategic Policy Planning 'AGENDA 2063: A Shared Strategic Framework for Inclusive Growth and Sustainable Development' (undated), https://www.un.org/en/africa/osaa/pdf/au/agenda2063-presentation.pdf.

[110] AU Commission (AUC) *Background Note: Agenda 2063: The Africa We Want* (2015) 2.

[111] Eg, see KT Hanson, KP Puplampu & TM Shaw *From Millennium Development Goals to Sustainable Development Goals: Rethinking African Development* (2017); Muchie (2004) supra.

[112] AU Solemn Declaration, 50th Anniversary, https://au.int/sites/default/files/documents/36205-doc-50th_anniversary_solemn_declaration_en.pdf.

(NPCA, now transformed into the African Union Development Agency-NEPAD (AUDA-NEPAD)), the African Development Bank (AfDB) and the UN Economic Commission for Africa (ECA), led the consultative process that led to the drafting of Agenda 2063. There are thirteen key documents for Agenda 2063,[113] of which three are considered to be the principal documents, namely its Framework Document,[114] its Popular Version[115] and the First Ten-Year Implementation Plan (2013–2023). There will be four further ten-year implementation plans to cover the period 2024–2063. Agenda 2063 has three core components: (1) the AU vision and the Agenda 2063 aspirations, (2) a transformational framework of 'goals, priority areas, targets and indicative strategies' with results matrices at national, regional and continental levels, and (3) achievement through 'implementation, monitoring and evaluation principles and responsibilities; financing; partnerships; capacities for implementation; and communication and outreach'.[116]

The first component comprises the AU vision of 'an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena'.[117] Agenda 2063 is premised on the following seven aspirations, which are closely aligned to the AU Vision:[118]

1 A prosperous Africa based on inclusive growth and sustainable development.
2 An integrated continent, politically united and based on the ideals of Pan-Africanism and the vision of Africa's Renaissance.
3 An Africa of good governance, democracy, respect for human rights, justice and the rule of law.
4 A peaceful and secure Africa.
5 An Africa with a strong cultural identity, common heritage, shared values and ethics.
6 An Africa whose development is people-driven, relying on the potential of African people, especially its women and youth, and caring for children.
7 Africa as a strong, united, resilient and influential global player and partner.

[113] AU Key Documents of Agenda, https://au.int/en/documents/20141012/key-documents-agenda2063. These are (1) Background Note, (2) Email from the Future, (3) Popular Version, (4) Key Agenda 2063 Flagship Programs, (5) Critical Factors for Success, (6) The Vision, (7) Linkage with the SDGs, (8) Financing Agenda 10 Year Plan, (9) Overview of Aspiration, (10) Overview of Agenda 2063, (11) Press Release, (12) First Ten Year Implementation Plan, (13) Framework Document.

[114] AUC *Framework Document Agenda 2063: The Africa We Want* (AUC 2015), https://au.int/sites/default/files/documents/33126-doc-framework_document_book.pdf.

[115] AUC *Popular Version Agenda 2063: The Africa We Want* (AUC 2016), https://au.int/sites/default/files/documents/33126-doc-03_popular_version.pdf.

[116] AUC Framework Document Agenda 2063 (2015) supra at 11.

[117] AUC Framework Document Agenda 2063 (2015) supra at 29.

[118] Ibid.

The second component comprises goals and priority areas set out in the transformational framework linked to each aspiration, which are detailed in Annexes 3[119] and 4[120] of the Framework Document. They are summarised in Table 2.

Table 2: Overview of aspirations, goals and priority areas of Agenda 2063

7 aspirations	20 goals	Priority areas
1. A prosperous Africa, based on inclusive growth and sustainable development	1. A high standard of living, quality of life and well-being for all citizens.	• Incomes, jobs and decent work • Poverty, inequality and hunger • Social security and protection, including persons with disabilities • Modern, affordable and livable habitats and quality • Basic services
	2. Well-educated citizens and skills revolution underpinned by science, technology and innovation	• Education and STI-driven skills revolution
	3. Healthy and well-nourished citizens	• Health and nutrition
	4. Transformed economies	• Sustainable and inclusive economic growth • STI-driven manufacturing, industrialisation and value addition • Economic diversification and resilience • Tourism/hospitality
	5. Modern agriculture for increased productivity and production	• Agricultural productivity and production →

[119] AUC Framework Document Agenda 2063 (2015) supra, *Annex 3. Agenda 2063 Results Matrix National Level: Goals, Priority Areas, Targets and Indicative Strategies* at 136–59.

[120] AUC Framework Document Agenda 2063 (2015) supra, *Annex 4. Agenda 2063 Results Matrix on Regional & Continental Level: Goals, Priority Areas, Targets and Indicative Strategies* at 160–71.

7 aspirations	20 goals	Priority areas
	6. Blue/ocean economy for accelerated economic growth	• Marine resources and energy • Port operations and marine transport
	7. Environmentally sustainable and climate-resilient economies and communities	• Sustainable natural resource management • Biodiversity conservation, genetic resources and ecosystems • Sustainable consumption and production patterns • Water security • Climate resilience and natural disasters preparedness and prevention • Renewable energy
2. An integrated continent, politically united, based on the ideals of Pan-Africanism and the vision of Africa's Renaissance	8. A United Africa (Federal or Confederate)	• Frameworks and institutions for a United Africa
	9. Continental financial and monetary institutions established and functional	• Financial and monetary institutions
	10. World class infrastructure criss-crosses Africa	• Communications and infrastructure connectivity
3. An Africa of good governance, democracy, respect for human rights, justice and the rule of law	11. Democratic values, practices, universal principles of human rights, justice and rule of law entrenched	• Democracy and good governance • Human rights, justice and rule of law
	12. Capable institutions and transformative leadership in place	• Institutions and leadership • Participatory development and local governance
4. A peaceful and secure Africa	13. Peace, security and stability is preserved	• Maintenance and preservation of peace and security
	14. A stable and peaceful Africa	• Institutional structure for AU instruments on peace and security • Defence, security and peace
	15. A fully functional and operational African Peace and Security Architecture (APSA)	• Fully operational and functional APSA

→

7 aspirations	20 goals	Priority areas
5. An Africa with a strong cultural identity, common heritage, values and ethics	16. African cultural renaissance is pre-eminent	• Values and ideals of Pan-Africanism • Cultural values and African Renaissance • Cultural heritage, creative arts and businesses
6. An Africa whose development is people-driven, relying on the potential offered by African people, especially its women and youth, and caring for children	17. Full gender equality in all spheres of life	• Women and girls' empowerment • Eradicate violence and discrimination against women and girls
	18. Engaged and empowered youth and children	• Youth empowerment and children's rights
7. An Africa as a strong, united and influential global player and partner	19. Africa as a major partner in global affairs and peaceful coexistence	• Africa's place in global affairs • Partnerships
	20. Africa takes full responsibility for financing her development	• African capital markets • Fiscal systems and public sector revenue • Development assistance

Source: Framework Document, 104–105.

As can be seen above, STI is expressly mentioned in aspiration 1. The implementation regarding STI is primarily driven through the STI Strategy for Africa (STISA-2024),[121] which is discussed in Chapter Four. The chapter will also consider the African Science and Technology Consolidated Plan for Action,[122] which was the precursor to STISA.

There are several Agenda 2063 flagship projects that were identified, which include expediting the establishment of the AfCFTA,[123] the Integrated High Speed Train network, a Pan-African E-University, a communications strategy, an Annual African forum, a common African Passport, silencing the guns, the Grand Inga Dam Project and the Pan-African E-network.[124]

The third and last component of Agenda 2063 concerns its implementation. The continental development agenda is to be realised by the coordinated efforts of actors at various levels. At the national level, states draw up appropriate National Development Plans. At sub-regional level, RECs may craft common agendas and ultimately, at continental level, the AU's instruments articulate a common vision,

[121] AU *On the Wings of Innovation, Science, Technology and Innovation for Africa 2024 Strategy* (2014).

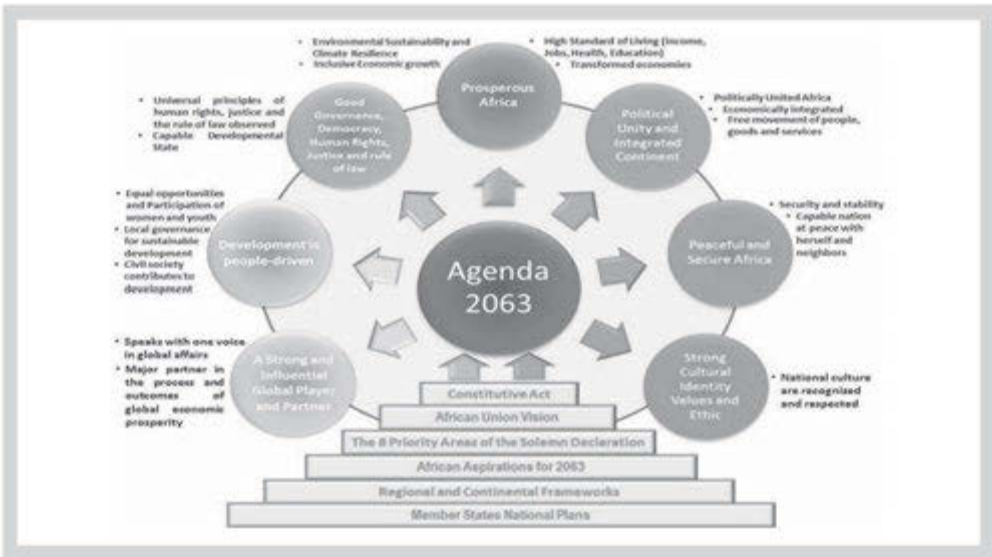
[122] J Mugabe & A Ambali *Africa's Science and Technology Consolidated Plan of Action* (2006).

[123] Decision of the Assembly of the Heads of State and Government of the African Union, 18th Ordinary Session Addis Ababa, Ethiopia, in January 2012, (Assembly/ AU/Dec.394 [XVIII]).

[124] AUC Framework Document Agenda 2063 (2015) supra at 107.

purpose and agenda. The above outline of the African Development Agenda is graphically summarised in Figure 3 below:

Figure 3: Schematic of Agenda 2063



Source: Framework Document, 11.

Following the approach at global level, the AU has established the African STI Forum through a resolution of the Conference of Ministers in 2018.[125] This resolution mandated ECA, the AUC and their partners to convene the African STI Forum, which would provide input to the Africa Regional Forum on Sustainable Development and the UN's Multi-stakeholder STI Forum described in section 1.5.1 above.[126] The Africa Regional Forum on Sustainable Development was instituted by a series of resolutions[127] to serve as a locale for continental consultations and discussions. It is convened by ECA, the AUC, AfDB and the UN and held its sixth session in 2020.[128] The first STI Forum was held in tandem with the fifth regional forum in 2019[129] and the second in 2020, at which the Steering Committee of the

[125] Conference of Ministers Resolution 960 (LI) of 15 May 2018.

[126] ECA 'Background and mandate of the African STI Forum', https://www.uneca.org/asti-background/pages/background-and-mandate-african-science-technology-and-innovation-forum.

[127] Resolution 930 (XLVIII) and resolution 939 (XLIX) of the Joint Annual Meetings of the African Union Specialized Technical Committee on Finance, Monetary Affairs, Economic Planning and Integration, and the Economic Commission for Africa (ECA) Conference of African Ministers of Finance, Planning and Economic Development of 2015 and 2016; and resolution 961 (LI) of the ECA Conference of African Ministers of Finance, Planning and Economic Development of 2018.

[128] ECA 'Sixth session of the Africa Regional Forum on Sustainable Development: 2020–2030: A Decade to Deliver a Transformed and Prosperous Africa through the 2030 Agenda and Agenda 2063'.

[129] ECA 'Key Messages from the First "Africa STI Forum (AfriSTI Forum) for the SDGs" Marrakesh, Morocco 16 April 2019'.

African Policy, Research & Advisory Group on STI was announced.[130] Monitoring of progress towards developmental goals in Africa proceeds at both the global and continental levels, under the Regional Forum infrastructure.[131] The key messages from the regional forum feed into the global discussions at annual HLPF sessions. Continentally, AUDA-NEPAD hosts a dashboard on its website that depicts country achievement scores and an overall continental score for the achievement of both Agenda 2063 and the SDGs.[132]

1.6 Conclusion: Setting the African development agenda apart

Even a cursory analysis of the summation of the international and African development agendas, outlined in sections 1.5.1 and 1.5.2 above, shows that there are commonalities and divergences. The commonalities pertain to the three primary focus areas of economic development, social inclusion and responsible environmental stewardship. The main difference is with respect to the articulation of the goals, which is not a matter of semantics but is the outcome of historical development and the contexts within which the agenda were framed and continue to be implemented. Other significant differences pertain to the implementing institutions and the time frames for achieving the goals. The operationalisation of the international agenda is driven by UN international development agencies, while the African agenda is driven primarily by AU organs. The SDGs have a target attainment date of 2030, and, having started in 2015, have a 15-year lifespan. Agenda 2063, on the other hand, has a 50-year lifespan.

The African development agenda, as currently encapsulated in Agenda 2063, has been developed within the context of continental milestones such as the Lagos Plan of Action and the Abuja Treaty. It thus has a very distinct history that has shaped its development, as the global agenda has had its own unique background. The process of developing Agenda 2063 was also different from that of the global agenda. As shown above in section 1.4.1, the development of the SDGs was a more open and consultative process, compared to the development of the MDGs. Similarly, the development of Agenda 2063 was opened up and included consultation. The process was led by the AUC working with NEPAD's NPCA (now AUDA-NEPAD), the AfDB and ECA. The way in which the African agenda is phrased is the direct outcome of these consultative processes and how the stakeholders who were consulted articulated and prioritised their needs. These differences notwithstanding, it is possible to map the goals of Agenda 2063 against the SDGs to show alignment in the core aspects. Indeed, the AU itself has engaged in such a mapping exercise,[133] as represented in Table 3 below:

[130] ECA 'African Policy, Research & Advisory Group on STI', https://www.uneca.org/afsti-ag/pages/members-african-policy-research-advisory-group-sti.

[131] Eg see ECA '2020–2030: A Decade to Deliver a Transformed and Prosperous Africa through the Sustainable Development Goals and Agenda 2063, Sixth Session Africa Regional Forum on Sustainable Development, Victoria Falls Zimbabwe ECA/RFSD/2020/6'.

[132] AUDA-NEPAD, https://www.nepad.org/agenda-dashboard.

[133] AUC 'Agenda 2063 Linkages with the Sustainable Development Goals', https://au.int/sites/default/files/documents/33126-doc-07_linkage_with_the_sdg.pdf.

Table 3: Agenda 2063 goals and SDGs

Agenda 2063		SDGs
1.	A high standard of living, quality of life and well-being for all citizens.	1. No poverty 2. Zero hunger 8. Decent work and economic growth 11. Sustainable cities and communities
2.	Well-educated citizens and skills revolution underpinned by science, technology and innovation.	4. Quality education
3.	Healthy and well-nourished citizens.	3. Good health and well-being
4.	Transformed economies.	8. Decent work and economic growth 9. Industry, innovation and infrastructure
5.	Modern agriculture for increased productivity and production.	3. Zero hunger
6.	Blue/ocean economy for accelerated economic growth.	14. Life below water
7.	Environmentally sustainable and climate-resilient economies and communities.	6. Clean water and sanitation 7. Affordable and clean energy 13. Climate action 15. Life on land
8.	A United Africa (Federal or Confederate).	
9.	Continental financial and monetary institutions established and functional.	
10.	World class infrastructure criss-crosses Africa.	9. Industry, innovation and infrastructure
11.	Democratic values, practices, universal principles of human rights, justice and the rule of law entrenched.	16. Peace, justice and strong institutions
12.	Capable institutions and transformative leadership in place.	16. Peace, justice and strong institutions
13.	Peace, security and stability is preserved.	16. Peace, justice and strong institutions
14.	A stable and peaceful Africa.	
15.	A fully functional and operational African Peace and Security Architecture (APSA).	
16.	African cultural renaissance is pre-eminent.	
17.	Full gender equality in all spheres of life.	5. Gender equality
18.	Engaged and empowered youth and children.	4. Quality education 5. Gender equality
19.	Africa as a major partner in global affairs and peaceful coexistence.	17. Partnership for the goals
20.	Africa takes full responsibility for financing her development goals.	10. Reduced inequalities 17. Partnerships for the goals

Source: Author adapted from AUC.

As is clear from the above there is a lot of congruence between the international and African development agendas. However, the African development agenda has a uniquely African focus, with some goals that are specific to the continent (goals 8, 9, 14, 15 and 16).

1.7 Book overview

The rest of this book is organised as follows. Chapter Two provides further context by considering the global IP framework. It sets out the minimum standards in international agreements, with emphasis on the TRIPS Agreement. Its overview of the substantive requirements of IP protection forms the starting point from which the rest of the book will weave IP and STI together. Chapter Three turns to the African continent and provides a commentary on national and regional IP frameworks. Chapter Four considers STI and sustainable development, paying specific attention to the creation of an enabling environment for STI through regional and national STI policies. Chapter Five begins with a re-iteration of the trade and sustainable development context of IP as the foundation to a consideration of examples of how openness in IP approaches can be leveraged to meet current developmental challenges through STI on the continent. Chapter Six then weaves all the previous chapters' arguments together by discussing the continental IP framework, specifically with regard to the institutional reform and policy rejuvenation that would come from the operationalisation of PAIPO and the conclusion of the AfCFTA IP Protocol. It concludes with policy recommendations and legislative implications for IP and STI at continental level.

Chapter 2

INTELLECTUAL PROPERTY: GLOBAL FRAMEWORK

2.1 Introduction

This chapter will discuss the global framework for IP, which has been defined in Chapter One. As stated in the introductory chapter, IP law is used in the governance of innovation systems, specifically with regards to technology transfer, technological learning, standards and safety. Therefore, as noted in art 7 of the TRIPS Agreement, IP frameworks have to be designed and implemented to enable and support technology transfer, industrialisation and to contribute to developmental goals.[1] This transitional chapter provides an overview of IPRs. Its purpose is to equip the reader with a foundation upon which to engage with the discussions in Chapters Three to Six. It is neither possible, nor desirable, to provide an in-depth articulation of the intricacies of IP law in this chapter and readers are pointed to other resources for this from an international perspective[2] and a specific African continental or regional focus.[3] This chapter sets out the minimum standards agreed to in the TRIPS Agreement and other multilateral agreements. Chapter Three will focus on the African regional IP organisations, the RECs and where relevant, will highlight any special features of the national IP laws of African states.

The links between IP, trade and sustainable development will be explained fully in Chapter Five as a prelude to discussing openness. For this chapter, it is sufficient to note that most states have an express intention to use IP as part of their arsenal of tools to further sustainable development. Legal theorists would

[1] N Syam & VM Tellez, 'Innovation and Global Intellectual Property Regulatory Regimes: The Tension between Protection and Access' (2016) *South Centre Research Paper 67* at 41.

[2] Eg, see G Dutfield & U Suthersanen *Global Intellectual Property Law* 2ed (2020); I Calboli & JC Ginsburg (eds) *The Cambridge Handbook of International and Comparative Trademark Law* (2020); P Goldstein & PB Hugenholtz *International Copyright: Principles, Law, and Practice* 4ed (2019); R Dreyfuss & J Pila (eds) *The Oxford Handbook of Intellectual Property Law* (2018); ABL Brown & Charlotte Waeld (eds) *Research Handbook on Intellectual Property and Creative Industries* (2018); DJ Gervais (ed) *International Intellectual Property: A Handbook of Contemporary Research* (2015); M David & D Halbert *The Sage Handbook of Intellectual Property Law* (2014); RL Okediji & MA Bagley (eds) *Patent Law in Global Perspective* (2014); D Bainbridge *Intellectual Property* 10ed (2018); L Bently, B Sherman, D Gangjee & P Johnson *Intellectual Property Law* 5ed (2018).

[3] O Owoeye *Intellectual Property and Access to Medicines in Africa: A Regional Framework for Access (*2019); Ncube *Intellectual Property Policy* (2016) supra; De Beer et al (2013) supra; T Kongolo *African Contributions in Shaping the Worldwide Intellectual Property System* (2016); Armstrong et al (2010) supra; Adams & Adams *Practical Guide to Intellectual Property in Africa* (2012); C Deere *The Implementation Game: the TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries* (2009).

label this as an instrumentalist approach that seeks to deploy IP to contribute to the 'improvement of human conditions and experience'.[4] IP's cross-cutting nature, due to its relevance to many industrial sectors, means that diverse stakeholder interests arise and have to be equitably catered for. Such equity can be achieved if cognisance is taken of fundamental rights, as articulated in international agreements and national constitutions. As already noted in Chapter One, the TRIPS Agreement's arts 7 and 8 take clear cognisance of these competing interests and call for their equitable balancing in the furtherance of the public interest in socio-economic and technological development.[5] In sum: 'IP law is expected to provide equitable protection for eligible kinds of works in virtually all industries; to achieve fair treatment of creator, user and societal interests; and to contribute to a country's efforts to achieve economic development.'[6] Further, a proper understanding of the linkage between IP, investment and economic development has to inform IP policymaking and legislative decisions.

IPRs can be distinguished from each other in various ways such as by the protection they offer, the duration of protection, the subject matter they protect and the eligibility criterion for protection. For instance patents protect novel, non-obvious inventions capable of industrial application for a term of 20 years whilst trade marks protect signs or symbols capable of distinguishing goods or services for a renewable ten-year term.[7]

This chapter does not address registration processes, costs and their timelines as such practical matters are best addressed elsewhere.[8] Therefore, information about IPR registers and international systems for facilitating applications is not given.[9] Similarly, the chapter does not provide details on the enforcement of IPRs under each section as they are primarily a matter for national legislation and comprehensive analysis of continental and international enforcement standards that have been canvassed elsewhere.[10]

Suffice it to note that the general standards for civil enforcement are required by arts 41–50 of the TRIPS Agreement. Typically, national legislation makes provision for civil action for damages or a reasonable royalty and a prohibitory interdict to prevent further infringement. In the case of trade marks, the right holder may also seek the removal of the infringing mark or destruction of the articles on which

[4] P Drahos *A Philosophy of Intellectual Property* ([1996] 2016) at 254.

[5] Drahos ([1996] 2016) supra at 375.

[6] Ncube (2013) supra.

[7] Article 18 TRIPS Agreement provides that the minimum term of protection shall be for seven years but in practice most jurisdictions provide for a ten-year term.

[8] See Adams & Adams (2012) supra.

[9] For example, in the case of patents the Patent Cooperation Treaty and the Patent Law Treaty are relevant and for trade marks the Madrid Agreement, Madrid Protocol, the Trademark Law Treaty, the Singapore Treaty and the Nice Classification are relevant.

[10] M Schneider & V Ferguson *Enforcement of Intellectual Property Rights in Africa* (2020), V Ferguson & M Schneider 'Enforcement of intellectual property rights in Africa' (2015) 10(4) *Journal of Intellectual Property Law & Practice* 269, X Seuba *The Global Regime for the Enforcement of Intellectual Property Rights* (2017).

the infringing mark is used. In addition to the statutory remedies provided for in the relevant legislation, the wronged party may also have recourse to common-law remedies provided by the law regulating unlawful competition,[11] such as basing their claim on 'passing-off'.[12] Passing-off occurs when a person makes a misrepresentation that his goods or services are those of another, or are associated with those of another.[13] Misrepresentation may be made through express oral or written expressions, the use of identical or confusingly similar marks or impressions created by advertising campaigns.[14] The right holder may also ask for an order for legal costs, should the infringement action succeed. Articles 51–60 provide for border control of IPRs.[15] Article 61 addresses criminal sanctions. These are required only for 'wilful trade mark counterfeiting or copyright piracy on a commercial scale', in other instances, they are at the discretion of jurisdictions. Criminal sanctions are a controversial topic which has been canvassed at length by other scholars.[16]

This chapter proceeds in ten further sections. Section 2.2 gives an overview of multilateral IP agreements. The rest of the chapter follows the structure of the TRIPS Agreement, which sets out minimum standards for IPRs in the following sequence: Copyright and Related Rights (covered here in sections 2.3–2.4); Trade marks (in section 2.5); 3. Geographical Indications (section 2.6); Industrial Designs (in section 2.7); Patents (in section 2.8); Layout-Designs (Topographies) of Integrated Circuits (in section 2.9); Protection of Undisclosed Information (in section 2.10).[17] Section 2.11 concludes.

2.2 Multilateral agreements

The international organisation with primary responsibility for the global IP framework is the World IP Organisation (WIPO). A few other organisations have competency in this area, including the WTO, the Food and Agriculture Organisation (FAO), the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the International Union for the Protection of New Varieties of Plants

[11] HJO van Heerden & J Neethling *Unlawful Competition* (2008) at 4.

[12] J Neethling 'The passing-off action: requirements and protected interests—a conceptual and critical analysis' (2007) 124 *SALJ* 459 at 459.

[13] Neethling (2007) supra at 459–60.

[14] M von Siedel (ed) *Intellectual Property* (1998) at 62. For example, in *Kwik Kopy (SA) (Pty) (Ltd) v Van Haarlem and another* [1998] 2 All SA 362 (W), the court held that a former franchisee who continued to trade under the franchise banner was competing unlawfully with the franchisor and ordered it to stop such passing-off.

[15] For examples of how these requirements are implemented by African states see CB Ncube 'South Africa' in Blackeney, M (ed) *Border Control of Intellectual Property Rights* (2010); CB Ncube 'Zimbabwe' in M Blackeney (ed) *Border Control of Intellectual Property Rights* (2010).

[16] Eg, see E Haber *Criminal Copyright* (2018); C Geiger (ed) *Criminal Enforcement of Intellectual Property: A Handbook of Contemporary Research* (2012); C Geiger 'The rise of criminal enforcement of intellectual property rights and its failure in the context of copyright infringements on the Internet' in S Frankel & DJ Gervais (eds) *The Evolution and Equilibrium of Copyright in the Digital Age* (2014) 113.

[17] Portions of sections 2.3–2.5 and 2.8 are drawn from Caroline B Ncube *Intellectual Property Protection for e-Commerce Business Methods in South Africa: Envisioning an Equitable Model for SMEs in the Tourism Industry* (unpublished PhD thesis, University of Cape Town, 2011) 73–83, 122–32, 162–66, 176–82.

(UPOV) and the Secretariat of the Convention on Biological Diversity (CBD). Identifying these organisations is important because it explains some of their initiatives and programmes in relation to IP and development, some of which are highlighted in section 5.2 below.

There is consensus that the most significant multilateral IP treaty is the WTO's TRIPS Agreement.[18] It forms part of the Marrakesh Agreement Establishing the WTO, being its Annex 1C. Therefore, it is binding on all WTO member states. However, there are several African states which are not members of the WTO and are therefore not bound by the TRIPS Agreement. These are Algeria, Ethiopia, Equatorial Guinea, Comoros, Libya, São Tomé and Príncipe, Somalia, Sudan and South Sudan, all of which are in the process of accession.[19]

A detailed examination of the TRIPS Agreement is beyond the scope of this book, and it has been comprehensively and authoritatively been done elsewhere.[20] For present purposes it is adequate to highlight three key features of the agreement. First, it is the first and only comprehensive IP multilateral agreement that covers various types of IPRs. Specifically, its provisions apply to (1) copyright and related rights (the rights of performers, producers of sound recordings and broadcasting organisations); (2) trade marks; (3) geographical indications including appellations of origin; (4) industrial designs; (5) patents including the protection of new varieties of plants; (6) the layout-designs of integrated circuits; and (7) confidential information. Most agreements typically cover one IPR, for instance the Berne Convention on Copyright or two IPRs, as the Paris Convention for the Protection of Industrial Property. The TRIPS Agreement sets minimum standards of protection for the IPRs it addresses. It then also provides standards for the enforcement of these rights. However, it is important to note that, although there are minimum standards prescribed by the TRIPS Agreement, WTO member states have flexibility to (1) attach specific meanings to some concepts; (2) decide on appropriate protection in some cases; and (3) set their own implementation agenda within the transition periods provided for in the agreement.

To take each of these three aspects in turn, as an example of the first aspect, while the TRIPS Agreement uses the concepts of 'invention', 'new', 'inventive step' and 'industrial application' as the criteria for patent protection in art 27, it does not define them and each country defines them in national legislation or through

[18] H Ruse-Khan 'Protecting intellectual property rights under BITs, FTAs and TRIPS: Conflicting regimes or mutual coherence?' in C Brown & K Miles (eds) *Evolution in Investment Treaty Law and Arbitration* (2011) 485; M El Said 'The Road from TRIPS Minus, to TRIPS, to TRIPS Plus' (2005) 8(1) *Journal of World Intellectual Property* 53.

[19] WTO Summary Table of Ongoing Accessions (Updated March 2020) https://www.wto.org/english/thewto_e/acc_e/status_e.htm.

[20] CM Correa *Trade Related Aspects of Intellectual Property Rights: A Commentary on the TRIPS Agreement* 2 ed (2020); J Malbon & C Lawson *Interpreting and Implementing the TRIPS Agreement: Is It Fair?* (2008); J Watal *Intellectual Property Rights in the WTO and Developing Countries* (2001); CM Correa & AA Yusuf (eds) *Intellectual Property and Trade: The TRIPS Agreement* (1998); M Blakeney *Trade Related Aspects of Intellectual Property Rights: A Concise Guide to the TRIPS Agreement* (1996).

case law. Second, regarding the leeway to set appropriate protection, three examples will suffice to make the point. Article 6[21] leaves it to member states to decide what form of the principle of exhaustion of IP rights to use, art 22.2 leaves it to countries to determine which form of protection would be appropriate for geographical indications, and art 27.3(b) presents the choice of the protection of plant varieties either by patents or an effective *sui generis* system or a combination of the two.

Regarding the last aspect, arts 65 and 66 of the TRIPS Agreement set several transition periods.[22] Of particular relevance to Africa, is art 66's Least Developed Countries (LDCs) transition period which permits LDCs to delay TRIPS implementation (except for the principle of non-discrimination) for a renewable initial period of ten years, which has been renewed several times and is currently valid until 1 July 2021 or when they cease to be an LDC.[23] However, as has been noted by others, several LDCs have already surrendered this flexibility and enacted IP legislation that meets or exceeds TRIPS minimum standards.[24] A proposal for the extension of the LDC transition period beyond 2021 was discussed, but not decided, at the TRIPS Council meeting of 15–16 October 2020 as member states agreed to keep the discussion open for consultation.[25] There is a further current LDC transition period relating to pharmaceutical products which is valid until 1 January 2033 or when the LDC ceases to be an LDC, whichever occurs first.[26] On the one hand, Angola, Bangladesh, Burundi, Cambodia, Madagascar, Rwanda, Uganda and Zanzibar (of the United Republic of Tanzania) introduced provisions in their national patent laws to implement this transition period.[27] On the other hand, research showed that in 2012, pharmaceutical patents were already provided for by the following African LDCs: Benin, Burkina Faso, Burundi, Chad, Central African Republic, Democratic Republic of Congo, Gambia, Guinea, Guinea-Bissau, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Sierra

[21] Art 6 reads: 'For the purposes of dispute settlement under this Agreement, subject to the provisions of Articles 3 and 4 nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights.' For commentary see I Calboli and E Lee (eds) *Research Handbook on Intellectual Property Exhaustion and Parallel Imports* (2016).

[22] WTO Analytical Index TRIPS Agreement – Article 65 (Jurisprudence) Current as of June 2020, https://www.wto.org/english/res_e/publications_e/ai17_e/trips_art65_jur.pdf; WTO Analytical Index TRIPS Agreement – Article 66 (Practice) Current as of February 2019, https://www.wto.org/english/res_e/publications_e/ai17_e/trips_art66_oth.pdf.

[23] Council for Trade-Related Aspects of Intellectual Property Rights Extension of the Transition Period Under Article 66.1 for Least Developed Country Members Decision of the Council for TRIPS of 11 June 2013. IP/C/64.

[24] Deere (2009) supra.

[25] South Centre 'WTO TRIPS Council discusses major proposals for waiving certain TRIPS obligations and extension of transition period for LDCs' No. 347 *South News*, 23 October 2020, https://us5.campaign-archive.com/?u=fa9cf38799136b5660f367ba6&id=a9b27dc5a8.

[26] Council for Trade-Related Aspects of Intellectual Property Rights Extension of the Transition Period Under Article 66.1 of the TRIPS Agreement for Least Developed Country Members for Certain Obligations with Respect to Pharmaceutical Products. Decision of the Council for TRIPS of 6 November 2015, IP/C/73.

[27] ECA, AU, AfDB & UNCTAD *Assessing Regional Integration in Africa ARIA IX: Next Steps for the African Continental Free Trade Area* (2019) 115.

Leone, eSwatini, Tanzania, Togo, Uganda and Zambia.[28] This is unfortunate as the transition periods could have been leveraged to secure time for these states to address their public health needs.

Second, the TRIPS Agreement incorporates pre-existing IP agreements. This is the case with arts 1–12 and 19 of the Paris Convention (1967)[29] and arts 1–21, but excluding art 6bis of the Berne Convention (1971).[30] Further, it also preserves party states' pre-existing obligations under the Paris Convention, the Berne Convention, the Rome Convention and the Treaty on IP in Respect of Integrated Circuits.[31] Third, it is the only IP agreement which is ensconced in the WTO and falls within the joint competence of WTO and WIPO.[32] Due to its location within the Marrakesh Agreement establishing the WTO, it relies on the WTO's dispute settlement system, which includes the possibility of trade sanction.[33] Other IP agreements do not have such significant enforcement mechanisms. The reasons for its inclusion in the trade context of the WTO suite of agreements will be set out in section 5.3 below.

In addition to the TRIPS Agreement, there are many other multilateral IP agreements of relevance to the African continent. Recent research has identified 34 treaties (inclusive of the TRIPS Agreement) that meet the following three criteria:

(a) the instrument is multilateral;
(b) at least one African country is a party to the instrument; and
(c) the instrument has binding provisions on IPRs, namely copyright; patents; trade marks; trade secrets; traditional knowledge; biodiversity; and/or genetic resources.[34]

Instruments on Plant Genetic Resources and Access and benefit sharing are included since IP is often relevant to their negotiation and conclusion 'because the proposed utilisation of genetic resources is expected to lead to innovations or new knowledge that might be subject to IP rights' which would then have to be equitably owned and shared.[35] These are tabulated below.

[28] P Adusei *Patenting of Pharmaceuticals and Development in Sub-Saharan Africa: Laws, Institutions, Practices, and Politics* (2012) 15.

[29] Art 2.1 TRIPS Agreement.

[30] TRIPS Agreement, art 9. For commentary see, WTO Analytical Index TRIPS Agreement – Article 9 (Jurisprudence) (Current as of: June 2020), https://www.wto.org/english/res_e/publications_e/ai17_e/trips_art9_jur.pdf.

[31] Art 2.2 TRIPS Agreement.

[32] There is a co-operation agreement between WIPO and WTO on the implementation of the TRIPS Agreement which addresses (1) mutual notification of, and access to, the organisations' databases of national laws and regulations, (2) protection of national emblems, and (3) technical co-operation. See Agreement Between the World Intellectual Property Organization and the World Trade Organisation 1995.

[33] Art 64 TRIPS Agreement; WTO Analytical Index TRIPS Agreement TRIPS Agreement – Article 64 (Practice) (Current as of: February 2019), https://www.wto.org/english/res_e/publications_e/ai17_e/trips_art64_oth.pdf.

[34] J de Beer, J Baarbé & CB Ncube 'Evolution of Africa's Intellectual Property Treaty Ratification Landscape' (2018) 22 *African Journal of Information and Communication* 53 at 58.

[35] WIPO *A Guide to Intellectual Property Issues in Access and Benefit-sharing Agreements* (2018) 8 and 10.

Table 4: International IP treaties

IP regime	Agreement (year) – source *arranged alphabetically in each category
Access and Benefit Sharing	Nagoya Protocol on Access and Benefit Sharing (2010) – CBD Secretariat
Comprehensive	TRIPS Agreement – WTO & WIPO
Copyright	Berne Convention for the Protection for Literary and Artistic Works (1886) – WIPO Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print Disabled (2013) – WIPO Rome Convention for the Protection of Performers, Producers of Phonographs, and Broadcasting Organisations (1961) UN Convention on WIPO (1967) – WIPO Universal Copyright Convention (UCC) (1952) – UNESCO Universal Copyright Convention (UCC) (1971) – UNESCO WIPO Copyright Treaty (WCT) (1996) – WIPO
Neighbouring Rights	Beijing Treaty on Audiovisual Performances (2012) – WIPO Brussels Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite (1974) – WIPO Convention for the Protection of Producers of Phonograms against Unauthorised Duplication of Their Phonograms (1971) – WIPO WIPO Performances and Phonograms Treaty (WPPT) (1996) – WIPO
Industrial Designs	Hague Agreement Concerning the International Registration of Industrial Designs (1925) – WIPO Locarno Agreement Establishing an International Classification for Industrial Designs (1968) – WIPO
Geographical Indications	Lisbon Agreement for the Protection of Appellations of Origin and their International Registration (1958) – WIPO
Patents	Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (1977) – WIPO Paris Convention for the Protection of Industrial Property (1883) – WIPO Patent Cooperation Treaty (PCT) (1970) – WIPO Patent Law Treaty (2000) – WIPO Strasbourg Agreement Concerning the International Patent Classification (1971) – WIPO
Plant Genetic Resources	International Treaty on Plant Genetic Resources for Food and Agriculture (2001) – FAO
Plant Varieties	International Convention for the Protection of New Varieties of Plants (UPOV Convention) (1961) – UPOV International Convention for the Protection of New Varieties of Plants (UPOV Convention) (1978) – UPOV International Convention for the Protection of New Varieties of Plants (UPOV Convention) (1991) – UPOV →

IP regime	Agreement (year) – source *arranged alphabetically in each category
Trade marks	Madrid Agreement for the Repression of False or Deceptive Indications of Sources of Goods (1891) – WIPO Madrid Agreement Concerning International Registration of Marks (1891) – WIPO Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks (1989) – WIPO Nairobi Treaty on the Protection of the Olympic Symbol (1981) – WIPO Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (1957) – WIPO Paris Convention for the Protection of Industrial Property (1883) – WIPO Singapore Treaty on the Law of Trademarks (2000) – WIPO Trademark Law Treaty (1994) – WIPO Vienna Agreement Establishing an International Classification of the Figurative Elements of Marks (1973) – WIPO

Source: Author, adapted from De Beer, Baarbé & Ncube (2018) supra at 58

An account of the rate and timing of ratifications by African states has been provided in other work,[36] and is not necessary for present purposes. It is important to note, though, that where they are not members of multilateral treaties, it provides more policy space. Eritrea and Ethiopia are not party to the Paris Convention, therefore they have significant leeway to craft their IP frameworks.[37] Historical overviews of the manner of the adoption of many IP agreements during the colonial period have also been given elsewhere.[38] It remains important to note that when IP agreements were adopted during the colonial era it was largely in the interest of the colonising state and not the colonial subject. Consequently, many African states, upon the attainment of independence, inherited a body of international IP obligations that were not necessarily negotiated and concluded in their best interest. Therefore, since their independence, several African states have worked to appropriately craft their national IP frameworks in a way that meets their developmental needs, within the prescripts of their international obligations. However, it is equally important to note that African states have made, and continue to make, significant contributions to shaping the international IP system.[39]

[36] De Beer, Baarbé & Ncube (2018) supra at 58.

[37] Syam and Tellez (2016) supra at 41.

[38] CB Ncube 'Three Centuries and Counting: The Emergence and Development of Intellectual Property Law in Africa' in RC Dreyfuss & J Pila (eds), *The Oxford Handbook of Intellectual Property Law* (2018) 409–30.

[39] T. Kongolo *African Contributions in Shaping the Worldwide Intellectual Property System* (2013); P Drahos Developing Countries and International Intellectual Property Standard-Setting' (2002) 5 *The Journal of World Intellectual Property* 765.

2.3 Copyright and related rights

Article 9 of the TRIPS Agreement incorporates arts 1–21 of the Berne Convention (1971) and its Appendix but excludes art 6bis from applicability. Accordingly, the minimum standards for copyright protection are as set out in these provisions of the Berne Convention, and any additional TRIPS provisions which are summarised below. The WIPO Copyright Treaty (WCT) and WIPO Performances and Phonograms Treaty (WPPT) of 1996, which entered into force in 2002, and the Beijing Treaty on Audiovisual Performances (Beijing Treaty), which entered into force on 28 April 2020, provide further copyright norms and standards, but these are not discussed in detail here as most African countries are not yet party to them. As at 6 October 2020, the WCT was in force for 16 African states (Algeria, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Gabon, Ghana, Guinea, Madagascar, Mali, Morocco, Nigeria, São Tomé and Príncipe, Senegal and Togo);[40] the WPPT was in force for 15 states (Algeria, Benin, Botswana, Burkina Faso, Cabo Verde, Gabon, Ghana, Guinea, Madagascar, Mali, Morocco, Nigeria, São Tomé and Príncipe, Senegal and Togo);[41] and the Beijing Treaty was in force for 10 states (Algeria, Botswana, Burkina Faso, Central African Republic, Gabon, Kenya, Mali, Nigeria, Tunisia and Zimbabwe).[42] As at 17 October 2020, the Marrakesh Treaty, which provides limitations and exceptions for persons with a visual disability, was in force for 18 AU member states (Botswana, Burkina Faso, Cabo Verde, Central African Republic, Côte d'Ivoire, Ghana, Kenya, Lesotho, Liberia, Malawi, Mali, Morocco, Nigeria, Trinidad and Tobago, Tunisia, Uganda, Tanzania and Zimbabwe).[43]

The Berne Convention provides for the copyright protection of literary and artistic works which it defines as including:[44]

> every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramaticomusical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science.

National legislation provides a list of works that are eligible for copyright protection. These lists may be exhaustive or non-exhaustive but typically include (1) literary

[40] WIPO 'WIPO-Administered Treaties - Contracting Parties: WCT' (total contracting parties: 107), https://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=16.

[41] WIPO 'WIPO-Administered Treaties - Contracting Parties: WPPT' (total contracting parties: 106), https://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=20.

[42] WIPO 'WIPO-Administered Treaties - Contracting Parties: Beijing Treaty' (total Contracting Parties: 34) https://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=841.

[43] WIPO 'WIPO-Administered Treaties - Contracting Parties Marrakesh VIP Treaty (Total Contracting Parties: 72) https://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=843.

[44] Art 2(1) of the Berne Convention for the Protection of Literary and Artistic Works, September 9, 1886, revised at Paris July 24, 1971, 1161 U.N.T.S. 3.

works; (2) dramatic works; (3) musical works; (4) artistic works; (5) sound recordings; (6) films; (7) broadcasts; and (8) the typographical arrangement of published editions. Copyright legislation generally subsumes computer programs as general literary works, following TRIPS[45] and, by implication, Berne.[46] An exception is the South African Copyright Act which provides for computer programs as a separate category of eligible works, which presents some peculiarities but is permissible under the international framework.[47] Whether or not national legislation requires that work be fixed or in material form to be eligible for copyright protection is left at the discretion of states.[48] National legislation typically provides that copyright protects original works which embody the expression of an idea,[49] that has been reduced to fixed form, provided the creator of the work is eligible for protection in that jurisdiction or the work was first published there or another country to which protection is extended.[50]

The originality requirement is interpreted and applied differently across jurisdictions, although it would be accurate to describe its essence as, that in order to qualify for protection, a work must be the result of its author's 'independent creation and not novelty'.[51] The fixation requirement is based on the idea-expression dichotomy which is a fundamental principle of copyright law that restricts copyright protection to the expression or embodiment of an idea and not to the abstract idea, its functionality or its application.[52] This exclusion of ideas and functionality from copyright protection, is intended to enhance and support further creativity by keeping 'the building blocks' of innovation in the public domain.[53] National applications of this principle have shown that the boundaries between idea and

[45] Art 10.1 TRIPS provides: 'Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971)'.

[46] Art 10 TRIPS Agreement. The Berne Convention does not specifically provide for the protection of computer programs as literary works, but it is widely accepted that computer programs do in fact find protection as such under it. See T Dreier and PB Hugenholtz *Concise European Copyright Law* (2016) 12.

[47] Sec 2(1)(i) South African Copyright Act 98 of 1978. For commentary, see L-A Tong 'Copyright protection for computer programs in South Africa: aspects of generis categorisation' (2009) 12(4) *Journal of World Intellectual Property* 266.

[48] Art 2(2) Berne Convention,

[49] Article 9.2 TRIPS Agreement provides 'copyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such'. WIPO Copyright Treaty 36 ILM 65 (WCT), art 2 provides that 'copyright protection extends to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such'.

[50] Art 3 Berne Convention.

[51] MB Nimmer & D Nimmer *Nimmer on Copyright* (1978) para 2.01[A] 2-7 and the authorities cited therein. Further discussed at para 2.01[A] 2-8–para 2.01B 2-18.

[52] For discussion, see A Drassinower 'A Rights-Based View of the Idea/Expression Dichotomy in Copyright Law' (2003)16(1) *Canadian Journal of Law & Jurisprudence* 3.

[53] J Rubin 'Television formats: caught in the abyss of the idea/expression dichotomy' (2006)16 *Fordham Intellectual Property, Media & Entertainment Law Journal* 663 at 675: 'The principle of the idea/expression dichotomy assures that an author cannot take ideas out of circulation just because she employs them, especially when those ideas are the building blocks upon which scientific research may be advanced'.

expression are often difficult to establish, for example in the context of television formats[54] and computer programs.[55]

Copyright law has the dual 'economic instrumentalist' purpose of enabling 'the orderly production and distribution of, and access to, works of art and intellect'.[56] These works must be 'of sufficient substance'[57] to warrant protection, fall into an eligible category and meet certain criteria, as outlined below. Copyright law rewards authors, through control of exclusive economic rights, to encourage them to produce work for the benefit of society.[58] The economic rights include translation,[59] reproduction,[60] public performance and communication to the public of a performance of dramatical and musical works,[61] broadcasting and related rights,[62] public recitation of literary works,[63] adaptation, arrangements and other alteration.[64] The WCT added the further economic rights of the right of distribution,[65] the right of rental[66] and a broader right of communication to the public.[67] However, as noted above, the provisions of the WCT are not binding on most African states and they will not be discussed further.

Once in possession of such rights, an author controls the economic exploitation of the work and can permit or prevent others from doing the same.[68] Under the

[54] See for example U Klement Rubin 'Protecting Television Show Formats under Law: New Developments in Common Law and Civil Law Countries' (2007) 29 *European Intellectual Property Review* 52; D Rose 'Format rights: a never-ending drama (or not)' (1999) 10 *Entertainment Law Review* 170; FL Fine 'A case for the federal protection of television formats: testing the limit of expression' (1985–1986) 17 *Pac LJ* 49.

[55] Eg, see *Computer Associates International v Altai Inc*. 982 F 2d 693 (2d Cir 1992); RH Stern 'Scope of protection problems with patents and copyrights on methods of doing business' (1999) 10 *Fordham Intellectual Property, Media and Entertainment Law* 108; C de Villers & T Tshaya 'Software and Business Methods Patents' (2008) 2 *Journal of Information Law & Technology*, https://warwick.ac.uk/fac/soc/law/elj/jilt/2008_2/devilliersandtshaya/devilliersandtshaya.pdf; JD Lipton 'IP's problem child: shifting the paradigms for software protection' (2006) 58(2) *Hastings Law Journal* 205 at 207.

[56] DJ Gervais, 'The purpose of copyright law in Canada' (2005) *University of Ottawa Law and Technology Journal* 316 at 317; SL Dogan & JP Liu 'Copyright law and subject matter specificity: the case of computer software' (2005) 61 *NYU Annual Survey of American Law* 203 at 203 and 206.

[57] OH Dean *Handbook of South African Copyright Law* (1987) 1-5.

[58] A Smith *Copyright Companion* (1995) 1; Dean (1987) ibid at 1-1–1-2; V van Coppenhagen 'Copyright and the WIPO Copyright Treaty, with specific reference to the rights applicable in a digital environment and the protection of technological measures' (2002) 119 *SALJ* 429 at 430.

[59] Art 8 Berne Convention.

[60] Art 9 Berne Convention.

[61] Art 11 Berne Convention.

[62] Art 11bis of the Berne Convention.

[63] Art 11ter of the Berne Convention.

[64] Art 12 Berne Convention.

[65] Art 6 WCT.

[66] Art 7 WCT.

[67] Art 8 WCT. Defined as 'the exclusive right of authorizing any communication to the public of their works, by wire or wireless means, including the making available to the public of their works in such a way that members of the public may access these works from a place and at a time individually chosen by them'.

[68] SK Mathur 'Trade–related aspects of intellectual property rights and copyright provisions: some issues with special reference to developing countries' (2003) 6(1) *Journal of World Intellectual Property* 65 at 74; Dean (1987) supra at 1-33.

Berne Convention, authors also have the moral rights of paternity and integrity which entitle them to be identified as the author of the work and to object to its distortion, respectively.[69] These rights are expressly excluded from the TRIPS Agreement and states that incorporate them into national copyright legislation do so based on their obligations under Berne. The term of moral rights is reckoned separately from the term of economic rights. The main benefit to society that follows access to copyright protected works is the improvement of its 'knowledge, entertainment and cultural experience'.[70] In addition, society benefits from ideas and functionality related to, or contained in, the protected works.[71] These ideas and functionality are not protected by copyright and remain in the public domain.[72] When copyright protection over a work expires it also enters the public domain.

The Berne Convention provides that the term of protection of the economic rights in copyright is the life of the author plus 50 years.[73] Where the work is anonymous or pseudonymous the term will be 50 years after publication of the work, but should the identity of the author be known or be later disclosed by the author, the term would become the standard life plus 50 formulation.[74] For cinematographic works, Berne contracting states may grant protection for 50 years after the work has been made available to the public with the consent of the author, or, failing which, 50 years after the making of the work.[75] The term of protection for photographic works and works of applied art is prescribed to be at least 25 years from the making of such work, under Berne.[76] TRIPS incorporates these terms and adds that the term of copyright protection, which is reckoned without reference to the life of a natural person or a human being, will be a minimum of 50 years from authorised publication or failing which, from the year the work was made.[77] Some bilateral agreements go beyond minimum terms of protection and party states then become obliged to extend their term of copyright protection. In Africa, this is the case for Morocco, as a consequence of the US-Morocco FTA.[78] Several other African states also have copyright terms that go beyond Berne and TRIPS minimum terms. For example, Burkina Faso grants copyright for life plus 70 years for works generally, with the exception of works of 'applied art' which are protected

[69] Art 6bis of the Berne Convention.

[70] T Schonwetter 'The implications of digitizing and the internet for "fair use" in South Africa' (unpublished LLM Thesis, University of Cape Town, 2005) 1.

[71] Dogan and Liu (2005) supra at 206.

[72] See for example *Baker v Seldon* 101 US 99 (1879) at 102, *Brief English Systems v Owen* 48 F 2d 555 (2d) at 556.

[73] Art 7(1) Berne Convention.

[74] Art 7(3) Berne Convention.

[75] Art 7(2) Berne Convention.

[76] Art 7(4) Berne Convention.

[77] Art 12 TRIPS Agreement.

[78] S Aghrib, N El Moujaddidi & A El Ouazzani 'Morocco' in Armstrong et al (2010) supra at 136–37; arts 26, 27(1) and 28 as amended by Law No. 34 05 amending and supplementing Law No. 2 00 on Copyright and Related Rights (promulgated by Dahir No. 1 05 192 of 15 Moharrem 1427 (February 14, 2006)).

for 30 years from 'the date of production'.[79] Ghana,[80] Madagascar,[81] Mozambique,[82] Nigeria,[83] São Tomé and Príncipe[84] and Senegal[85] also have copyright terms of life plus 70, or 70 years where the term is not calculated with reference to the life of a human author. For Senegal, an OAPI member state, the adoption of this TRIPS plus standard would be due to arts 22–25 of Annex VII of the Bangui Agreement, which then provided for a term of life plus 70 years, or just 70 years where a person's lifetime is not used to calculate copyright terms, but it is not clear what motivated the adoption of longer copyright terms in the other African states listed as examples here.[86] The benefits and public interest justifications of TRIPS plus copyright terms are a highly contested area of copyright law with several scholars arguing that they are detrimental to development as they delay the entry of works into the public domain and have not been shown to ensure better economic returns for individual authors.[87]

2.3.1 Limitations and exceptions

A key feature of copyright law is its limitations and exceptions which are public interest mechanisms that enable use of the protected work in specific instances without the need to seek permission from the copyright holder. Again, this is an aspect that has generated much scholarship and debate,[88] which will not be recanted here as it is not necessary in this foundational section. The section will merely provide the basic provisions in TRIPS and Berne and then highlight current aspects under discussion at WIPO, as this will be of interest to African states in setting national, regional and continental copyright agendas.

Copyright holders have exclusive economic rights that have been set out above, and the process for the lawful use of a substantial amount of copyright protected materials requires obtaining permission (or authorisation) by the copyright holder.

[79] Arts 34–38 Burkina Faso Law No. 032-99/AN of December 22, 1999, on the Protection of Literary and Artistic Property.

[80] Secs 12–16 Ghana Copyright Act, 2005 (Act 690).

[81] Arts 52 and 54 Madagascar Law No. 94-036 of September 18, 1995, on Literary and Artistic Property. Note that the term of protection for computer programs is 20 years under art 57.

[82] Sec 22(1) Mozambique Law No. 4/2001 of February 27, 2001 (Copyright Law).

[83] Sec 2, 1st Schedule Copyright Act, Cap C28, Laws of the Federation of Nigeria, 2004. For literary, musical and artistic works the term is life plus 70 years. It is 70 years for government works or works authored by a corporate author, anonymous and pseudonymous works provided that the term will change to life plus 70 if the author becomes known.

[84] Arts 31–36 of the São Tomé and Príncipe Code on Copyright and Related Rights (approved by Decree-Law No. 02/2017).

[85] Arts 51–54 of the Senegal Law No. 2008-09 of January 25, 2008, on Copyright and Related Rights.

[86] C Armstrong, J de Beer, D Kawooya, A Prabhala & T Schonwetter 'Summary and conclusions' in Armstrong et al (2010) supra at 321.

[87] R Giblin 'Reimagining copyright's duration' in R Giblin & K Weatherall (eds) *What if We Could Reimagine Copyright?* (2017) 177.

[88] Eg, see S Balganesh, WL Ng-Loy & H Sun (eds) *The Cambridge Handbook of Copyright Limitations and Exceptions* (2020); RL Okediji (ed) *Copyright Law in an Age of Limitations and Exceptions* (2017); DJ Gervais (*Re)structuring Copyright: A Comprehensive Path to International Copyright Reform* (2017) 216–30.

So typically, a prospective user would need to identify the copyright holder, then approach them to negotiate a license which may be granted subject to the payment of a royalty. Where the copyright holder is unknown, the work is orphaned, and it is not possible to obtain the necessary permission. In certain cases, it is in the public interest to eliminate this default negotiation and licensing process, so statutory provisions exclude certain works from protection or limit the right holder's rights.

National copyright legislation may contain limitations and exceptions such as those permitting quotations[89] and illustrations for teaching,[90] as well as those excluding certain works from copyright protection such as (a) political speeches and speeches delivered in the course of legal proceedings,[91] (b) public lectures,[92] and (c) news of the day and mere items of press information.[93] Further, states may formulate provisions that permit reproduction of work or the exercise of the other economic rights protected by copyright. However, in accordance with art 13 of the TRIPS Agreement, these provisions must be (1) limited to certain special cases (2) that do not conflict with the normal exploitation of the work; and (3) do not unreasonably prejudice the legitimate interests of the rights holder. This 'three step test' is also found in art 9(2) of the Berne Convention where it applies only to the right of reproduction in literary and artistic works, in art 10 of the WCT and in art 16 of the WPPT.[94] It is also found in some FTAs and national legislation.

Research on limitations and exceptions in the African context has centred on their impact on access to learning materials and the right to education and pointed out their inadequacies specifically in relation to availing print copies of works in local languages and catering for distance and online learning.[95] Current issues under discussion at international level relate to access for persons with visual and other

[89] Art 10(1) Berne Convention.

[90] Art 10(2) Berne Convention.

[91] Art 2bis (1) Berne Convention.

[92] Art 2bis (2) Berne Convention.

[93] Art 2(8) Berne Convention.

[94] For discussion see PR Goold 'The Interpretive Argument for a Balanced Three-Step Test? (2017) 33(1) *American University International Law Review* 187; R Wright 'The "Three Step Test" and the Wider Public Interest: Towards a More Inclusive Interpretation' (2009) 12(6) *Journal of World Intellectual Property* 600; MRF Senftleben *Copyright, Limitations, and the Three-Step Test: An Analysis of the Three-Step Test in International and EC Copyright Law* (2004).

[95] H Chuma-Okoro 'Nigerian copyright reform and implications for access to teaching and learning materials (TLMs) in the digital age' (2018) 22 *The African Journal of Information and Communication (AJIC)* 1; CB Ncube 'Using Human Rights to Move Beyond Reformism to Radicalism: A2K for Schools, Libraries and Archives' in M Callahan & J Rogers (eds) *A Critical Guide to Intellectual Property* (2017) 117; CB Ncube 'Key copyright issues in African distance education: a South African case study' (2011) 32(2) *Distance Education* 269; T Schonwetter & CB Ncube 'New hope for Africa? Copyright and access to knowledge in the digital age' (2011) 13(3) *Info* 64; SI Štrba 'Institutional and Normative Considerations for Copyright and Access to Education in Developing Countries: Rethinking Incremental Solutions through Limitations and Exceptions' (2013) 3(2) *Queen Mary Journal of Intellectual Property* 96; SI Štrba *International Copyright Law and Access to Education in Developing Countries: Exploring Multilateral Legal and Quasi-Legal Solutions* (2012); Armstrong et al (2010) supra.

disabilities, educational and research flexibilities, the Galleries, Libraries, Archives and Museum (GLAM) sector and software.[96] Norm-setting at the international level for access for persons with visual disabilities was achieved through the adoption of the Marrakesh Treaty,[97] but access for persons with other disabilities remains on the international normative agenda.[98] Most African states are yet to enact domestic provisions to ensure access for persons with visual and other disabilities. As indicated in Chapter Three, ARIPO has published a Marrakesh domestication guide for its member states.

Limitations and exceptions for Libraries, Archives, Museums and Educational and Research Institutions were the subject of a WIPO conference held in October 2019, which was conducted as a 'fact-finding and information gathering' exercise.[99] They were each based on studies and/or typology analysis[100] and are currently the focus of the normative agenda at the Standing Committee on Copyright and Related Rights (SCCR).[101]

2.4 Related rights

Related rights relate to performance and similar depictions of work and are provided for in art 14 of the TRIPS Agreement. Specifically, they provide protection for the rights of performers, producers of phonograms and broadcasting organisations. As stated in Chapter Two, the Rome Convention regulates related rights. This agreement is not incorporated into the TRIPS Agreement in the way that the Berne Agreement is, but its eligibility criteria are adopted by art 1.3 of the TRIPS Agreement. Further, the TRIPS Agreement makes any limitations and exceptions, conditions and reservations enacted by member states subject to the Rome Convention.[102] Article 14.1 of TRIPS provides that 'performers shall have the possibility of

[96] Eg, see P McKimmy 'Free Software and Open Source Movements from Digital Rebellion to Aaron Swartz: Responses to Government and Corporate Attempts at Suppression and Enclosure' in M Callahan & J Rogers (2017) supra at 117; E Maxwell 'Open standards, open source, and open innovation: Harnessing the benefits of openness' (2006) 1(3) *Innovations: Technology, Governance, Globalization* 119.

[97] For a comprehensive discussion of the treaty see LR Helfer, MK Land, RL Okediji & JH Reichman *The World Blind Union Guide to the Marrakesh Treaty* (2017).

[98] CB Ncube, BE Reid & DO Oriakhogba 'Beyond the Marrakesh VIP Treaty: Typology of copyright access enabling provisions for persons with disabilities' (2020) 23(3–4) *Journal of World Intellectual Property* 149.

[99] WIPO International Conference on Copyright Limitations and Exceptions for Libraries, Archives, Museums and Educational & Research Institutions, 18–19 October 2019 https://www.wipo.int/meetings/en/2019/international_conference_copyright.html.

[100] D Sutton 'Background Paper on Archives and Copyright', SCCR/38/9 March 29 2019; M Torres & R Xalabarder 'Interim Report on Practices and Challenges in Relation to Online Distance Education and Research Activities', SCCR/38/9 March 29, 2019; D Seng 'Limitations and Exceptions in Copyright Law for Educational Activities: A Typology Analysis', SCCR 38/4 March 29, 2019; D Seng 'Educational Activities Copyright Exceptions: Typology Analysis', SCCR 38/8 March 29, 2019; KD Crews 'Copyright Exceptions for Libraries: A Typology Analysis', SCCR38 April 4, 2019; Y Benhamou 'Copyright Limitations and Exceptions for Museums: Typology Analysis' SCCR 38/6 March 29, 2019.

[101] WIPO SCCR Action Plan on Limitations and Exceptions Through SCCR/39 (2nd Meeting in 2019) SCCR/36/7.

[102] Art 14.6 TRIPS Agreement.

preventing' the following unauthorised acts relating to phonograms: (i) the fixation of their unfixed performance and the reproduction of such fixation and (ii) the broadcasting by wireless means and the communication to the public of their live performance. The producers of phonograms shall be granted the 'right to authorise or prohibit the direct or indirect reproduction of their phonograms'.[103] The term of the protection afforded to performers and producers is a minimum term of 50 years from the end of the year the fixation was made or the performance was staged.[104] Producers of phonograms also have a rental right which is akin to that granted to computer programs except for WTO member states who had an 'equitable remuneration' system for the rental of phonograms by 15 April 1994.[105] These member states may retain these systems if 'the commercial rental of phonograms does not lead to the material impairment of the exclusive rights of reproduction of right holders'.[106]

The TRIPS Agreement grants broadcasting organisations the right to prohibit the following unauthorised acts: 'the fixation, the reproduction of fixations, and the rebroadcasting by wireless means of broadcasts, as well as the communication to the public of television broadcasts of the same'.[107] Should a WTO member state not grant these rights to broadcasting organisations, they are required to grant them to the copyright holder, subject to the provisions of the Berne Convention.[108] The term of the rights granted to broadcasting organisations is a minimum of 20 years from the end of the calendar year in which the broadcast was made.[109]

The WPPT provides performers the economic rights of reproduction,[110] distribution,[111] rental rights[112] and the right of making available[113] their performances fixed in phonograms.[114] For unfixed or live performances, it grants them broadcasting rights (except in the case of rebroadcasting), right of communication to the public and fixation rights.[115] The treaty also grants performers moral rights.[116] Producers of

[103] Art 14.2 TRIPS Agreement.
[104] Art 14.5 TRIPS Agreement.
[105] Art 14.4 TRIPS Agreement.
[106] Ibid.
[107] Art 14.3 TRIPS Agreement.
[108] Ibid.
[109] Art 14.5 TRIPS Agreement.
[110] Art 7 WPPT.
[111] Art 8 WPPT.
[112] Art 9 WPPT.
[113] Art 10 WPPT.
[114] Art 2 WPPT defines 'phonograms' as 'the fixation of the sounds of a performance or of other sounds, or of a representation of sounds, other than in the form of a fixation incorporated in a cinematographic or other audiovisual work'.
[115] Art 6 WPPT.
[116] Art 5 WPPT.

phonograms are granted the rights of reproduction,[117] distribution,[118] rental[119] and making available.[120]

The Beijing Treaty grants performers the additional economic rights of reproduction,[121] distribution,[122] rental rights[123] and the right of making available[124] for their performances in audiovisual fixations.[125] For unfixed or live performances, it grants them broadcasting rights (except in the case of rebroadcasting), right of communication to the public and fixation rights.[126] It also grants them moral rights.[127] However, as noted above, the provisions of the WPPT and the Beijing Treaty are not binding on most African states, accordingly they are not discussed further.

2.5 Trade marks

The minimum standards for trade mark protection set out in the TRIPS Agreement incorporate arts 1–12 and 19 of the Paris Convention (1967).[128] Article 15.1 of the TRIPS Agreement provides that 'any sign or combination of signs, capable of distinguishing the goods and services of one undertaking from those of other undertakings, shall be capable of constituting a trade mark'. This provision marked a change from the Paris Convention which limited mandatory trade mark protection to marks applied to goods. Protection for marks applied to services (known as 'service marks') was optional and not provided by many Paris Convention contracting states.[129] Increasingly, many jurisdictions are extending protection to non-traditional signs such as colour or combinations of colours, shapes, packaging, smell, fragrances, sound or movement or any combinations of these. This development can be linked to the Singapore Treaty on the Law of Trade Marks, which, while not setting an obligation for the protection of non-traditional marks, indicates an acceptance of these marks.[130]

Similar to copyright law, trade mark law has a twofold economic instrumentalist purpose. First, it 'seeks to balance incentives to create and access ideas' by granting trade mark holders exclusive economic rights as a reward and incentive for further

[117] Art 11 WPPT.
[118] Art 12 WPPT.
[119] Art 13 WPPT.
[120] Art 14 WPPT.
[121] Art 7 Beijing Treaty.
[122] Art 8 Beijing Treaty.
[123] Art 9 Beijing Treaty.
[124] Art 10 Beijing Treaty.
[125] Art 2 Beijing Treaty defines an 'audiovisual fixation' as 'the embodiment of moving images, whether or not accompanied by sounds or by the representations thereof, from which they can be perceived, reproduced or communicated through a device'.
[126] Art 6 Beijing Treaty.
[127] Art 5 Beijing Treaty.
[128] Art 2.1 TRIPS Agreement.
[129] WTO 'Module III: Trademarks' (n.d.) 50, https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/modules3_e.pdf.
[130] For a detailed discussion, see I Calboli & M Senftleben 'Introduction' in I Calboli & M Senftleben (eds) *The Protection of Non-Traditional Trademarks: Critical Perspectives* (2018) 1.

innovation.[131] This enables control of that mark through statutory or common law rights to exploit it for profit or to prevent others from doing so. Secondly, it protects consumers by reducing or eliminating 'confusion in the consumer market as to the source of a given product' or service.[132] Therefore trade mark protection entails consumer protection as a 'badge of origin' through which consumers can tell the products or services of one provider from another.[133]

WTO member states may make registrability dependent on use of the mark but actual use shall not be a condition for lodging applications.[134] Publication of trade marks is mandatory, prior to, or promptly after, registration.[135] The provision of a reasonable period during which interested parties can seek the cancellation of a trade mark is also mandatory.[136] A trade mark registration opposition procedure may be provided at the option of WTO member states.[137] A mark may not be refused registration because of the nature of goods or services to which it is to be applied,[138] or because it has not been registered in its country of origin.[139] Where it has been registered in its country of origin, WTO member states are required to register the mark 'in that form "as is"', unless it infringes third party rights, is not distinctive or is contrary to morality or public order.[140] Applications for registration will be refused for not being distinctive and national law may add other grounds for refusal such as lack of 'visual perceptibility'.[141]

Article 18 provides that the initial term of protection, and subsequent renewals, shall be for at least seven years. As noted in the introduction, in most jurisdictions, the duration of trade mark registration is an initial period of ten years, which may be renewed indefinitely for further periods of ten years at a time. A trade mark is registered in respect of particular goods or services in a specific class of the trade marks register. Registered trade marks are protected from infringement by the use of an identical or a similar mark on identical or similar goods or services in the jurisdiction of registration.[142] These are the principles of speciality and territoriality,

[131] L Fisher Keller 'Trade dress protection for computer user interface "look and feel"' (1994) 61 *University of Chicago Law Review* 1011 at 1018.

[132] Ibid.

[133] M Senftleben 'Function theory and international exhaustion: why it is wise to confine the double identity rule in EU trade mark law to cases affecting the origin function' (2014) 36 (8) *European Intellectual Property Review* 518; A Kur 'Trade Marks Function, Don't They? CJEU Jurisprudence and Unfair Competition Principles' (2014) 45 *International Review of Intellectual Property and Competition Law* 434.

[134] Art 15.2 TRIPS Agreement.

[135] Art 15.5 TRIPS Agreement.

[136] Art 15.5 TRIPS Agreement.

[137] Art 15.5 TRIPS Agreement.

[138] Art 15.3 TRIPS Agreement.

[139] Art 6(2) Paris Convention for the Protection of Industrial Property, as last revised at the Stockholm Revision Conference, Mar. 20, 1883 21 U.S.T. 1583; 828 U.N.T.S.

[140] WTO Module III (n.d.) supra at 53; art 6 of the Paris Convention. See US – Section 211 Appropriations Act (DS176) and Australia – Tobacco Plain Packaging (DS435, 441, 458, 467) on the meaning of 'in that form'.

[141] WTO Module III (n.d.) supra at 58; Art 15.1–15.2 TRIPS Agreement.

[142] Art 16.1 TRIPS Agreement.

respectively.[143] WTO member states may legislate 'limited exceptions' on trade mark rights, for example 'fair use of descriptive terms' subject to the exceptions taking the 'legitimate interests of the owner of the trade mark and of third parties' into account.[144]

Protection for well-known marks is provided for by art 6bis of the Paris Convention and art 16.2 and 16.3 of TRIPS. Under these provisions, well-known marks that are not registered in a jurisdiction are protected because applications to register marks for identical or similar goods and services may confuse or mislead the public as to the source of the goods or services. The Paris Convention provisions are limited to goods and art 16.2 of TRIPS extends the protection to service marks. Further, such protection is available even where the goods or services are not similar to those protected by the well-known mark if that mark is registered and such use of the mark 'would indicate a connection between those goods or services and the owner of the registered trade mark ... provided that the interests of the owner of the registered trade mark are likely to be damaged by such use'.[145]

Article 7bis of the Paris Convention provides for the registration of marks by a group or an association which can then use and enforce the mark collectively ('collective marks'). These marks may serve to show membership of an association. They may also serve to certify or confirm certain qualities or attributes of the goods to which they are applied ('certification marks').[146]

2.6 Geographical indications

The protection of geographical indications is highly controversial and has generated significant scholarship with both an international[147] and African focus.[148]

[143] R Kelbrick 'The new trade-mark infringement provisions: How have the courts interpreted them?' (2007) 19 *SA Merc LJ* 86 at 86.

[144] Art 17 TRIPS Agreement.

[145] Art 16.3 TRIPS Agreement. For discussion see R Kelbrick 'The Term "Well-Known" in South African Trade-Mark Legislation: Some Comparative Interpretations' (2005) 38(3) *The Comparative and International Law Journal of Southern Africa* 435.

[146] WTO Module III (n.d.) supra at 54.

[147] Eg, see I Calboli and WL Ng-Loy (eds) *Geographical Indications at the Crossroads of Trade, Development, and Culture: Focus on Asia-Pacific* (2017); DS Gangjee (ed) *Research Handbook on Intellectual Property and Geographical Indications* (2016).

[148] Eg, see G Mengistie & M Blakeney 'Geographical Indications and the Scramble for Africa' (2017) 25(2) *African Journal of International and Comparative Law* 199; D Barjolle et al 'The Role of the State for Geographical Indications of Coffee: Case Studies from Colombia and Kenya' (2016) 98 *World Development* 105; OS Sibanda 'The Prospects, Benefits and Challenges of *Sui Generis* Protection of Geographical Indications of South Africa' (2016) 51(3) *Foreign Trade Review* 213; SB Hirko 'The Legal Framework for the Protection of Geographical Indications in Ethiopia: A Critical Review' (2014) 58(2) *Journal of African Law* 210; TW Dagne *Intellectual Property and Traditional Knowledge in the Global Economy* (2014); C Oguamanam & TW Dagne 'Geographical Indication (GI) Options for Ethiopia Coffee and Ghanaian Cocoa' in De Beer et al (2013) supra 77; A Adebambo, H Chuma-Okoro & A Oyewunmi 'A Consideration of Communal Trade Marks for Nigerian Leather and Textile Products' in De Beer, et al (2013) supra 109; M Blakeney, T Coulet, GA Mengistie & MT Mahop (eds) *Extending the Protection of Geographical Indications: Case Studies of Agricultural Products in Africa* (2012).

'Geographical indications' encompass 'the various legal mechanisms used to protect geographical designators that tell consumers both the geographic origin of a product *and* something about the product's quality and characteristics'.[149] This protection serves various purposes including consumer protection.

The Paris Convention provides protection for 'indications of source or appellations of origin' which includes protection against false or misleading indications of source per art 10bis. There are other multilateral conventions[150] that addressed geographical indications, but they are not discussed here as they have not had a significant threshold of contracting states and, more importantly, have not gained traction in Africa. Consequently, they are not part of the data set of multilateral IP agreements presented and tabulated in section 2.2 above. The Lisbon Agreement for the Protection of Appellations of Origin and their International Registration is listed in that section because it has some African contracting states.[151] However, it was not a very successful treaty in that it only garnered 30 contracting parties globally.[152] The TRIPS Agreement's provisions are therefore much more significant because of their extensive reach and due to their binding force on WTO member states. Accordingly, its provisions are detailed below.

Article 22.1 of the TRIPS Agreement defines geographical indications as 'indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin'. WTO member states are required to provide 'legal means' for the protection of geographical indications without prescription as to the specific type or form that protection is to take.[153] Instead, only the substance of the protection is prescribed. It is supposed to give 'interested parties' the right to prevent:[154]

> '(a) the use of any means in the designation or presentation of a good that indicates or suggests that the good in question originates in a geographical area other than the true place of origin in a manner which misleads the public as to the geographical origin of the good;
> (b) any use which constitutes an act of unfair competition within the meaning of Article 10bis of the Paris Convention (1967).'

Geographical indications differ from trade marks in three main ways. First, trade marks are used to distinguish the goods and services from a trader from competitors, so descriptive or generic marks are not registrable as trade marks. In contrast,

[149] J Hughes 'The Limited Promise of Geographical Indications for Farmers in Developing Countries' in Calboli & Ng-Loy (2017) supra 61 at 62.

[150] The Madrid Agreement for the Repression of False or Deceptive Indications of Source of Goods, 1891 and the International Convention on the Use of Appellations of Origin and Denominations of Cheeses, 1951.

[151] WIPO 'Contracting Parties: Lisbon Agreement (total contracting parties: 30) lists Algeria, Burkina Faso, Congo, Gabon, Morocco, Togo and Tunisia as contracting states, https://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=10.

[152] Ibid.

[153] Art 12.2 TRIPS Agreement.

[154] Ibid.

geographic indications are 'generic descriptions' that may be used by all traders in a particular geographic location to goods originating from that location.[155] Second, trade marks can only be enforced or protected by the registered owner of the mark, whilst geographical indications can be protected from wrongful appropriation by all traders from the relevant geographical location which is usually done through the auspices of a producers' association.[156] Third, trade mark owners may freely transfer them to others but geographical indications are not tradable in that sense because they are only available to producers with 'the appropriate association with the geographical region' and are in compliance 'with the production practices of that region'.[157]

However, there is a clear intersection between geographical indications and trade marks therefore the TRIPS Agreement addresses this. Article 22.3 provides that registrations for trade marks containing geographical indications attached to goods that do not come from the indicated territory which would be misleading to the public as to the true place of origin of the goods should be refused or invalidated.[158] Such refusal or invalidation could be as a result of the request of an interested party or upon the state's own initiative if national legislation permits such action. However, this does not apply to trade marks which were 'registered in good faith' or 'acquired through use in good faith' prior to the coming into force of these provisions in the relevant country or 'before the geographical indication is protected in its country of origin'.[159]

Article 22.4 states that the above protection against misleading and unfair competition-based uses of geographical indications is also available 'against a geographical indication which, although literally true as to the territory, region or locality in which the goods originate, falsely represents to the public that the goods originate in another territory'. This provision addresses homonyms, where two or more places share a place name that is spelt or pronounced in the same way.

Article 23.1 provides enhanced protection for geographical indications for wines and spirits 'where the true origin of the goods is indicated or the geographical indication is used in translation or accompanied by expressions such as "kind", "type", "style", "imitation" or the like'.[160] For instance, a wine producing region in Africa, or any other place, is not permitted to style its goods as 'champagne-style'. The descriptor 'champagne' is limited to wine from the Champagne region. This protection differs from that offered by art 22 because there is no requirement that the 'offending' mark must be misleading as to the place of origin or must constitute

[155] M Blakeney 'Geographical Indications and TRIPS' in Blakeney et al (2012) supra at 9.
[156] Ibid.
[157] Ibid.
[158] Art 22.3 TRIPS Agreement.
[159] Art 24.5 TRIPS Agreement.
[160] I Calboli 'Geographical Indications between Trade, Development, Culture, and Marketing: Framing a Fair(er) System of Protection in the Global Economy' in Calboli & Ng-Loy (2017) supra 3 at 12.

unfair competition. This makes this protection 'absolute'.[161] Article 23.2 provides that applications for the registration of trade marks that consist of a geographical indication identifying wines or spirits should be refused and where the mark has been registered, it should be invalidated upon application by an interested party or upon the state's own initiative if this is permitted by national legislation. Homonymous geographical indications for wines will all be protected as long as there is no misrepresentation as to the place of origin, and practical conditions need to be established to differentiate the wines from each other in an equitable way.[162]

Due to the controversy surrounding the protection provided for in art 23 and the desire of some member states to continue negotiations on additional provisions, art 24.1 provides for future negotiations. Further, art 24.4 provides for a 'built-in agenda' for the negotiation of a multilateral notification and registration system.

Article 24 also provides for limitations and exceptions to the protection of geographical indications. These include indications that have become generic or common and have therefore lost their association with a place of origin, for example, as has been the case with cheddar cheese.[163] Further, the provision of protection of geographical indications under TRIPS should not detract from the protection of geographical indications that preceded the entry into force of the TRIPS Agreement.[164] The exceptions relate to preserving rights acquired before the entry into force of the TRIPS Agreement or before the relevant geographical indication was afforded protection,[165] prior trade mark rights[166] and prior use of geographical indications.[167]

Similar to other rights addressed by the TRIPS Agreement, geographical indications form part of FTAs.

2.7 Industrial designs

Article 25.1 of the TRIPS Agreement provides for industrial design protection for new or original designs. At their discretion, member states may provide that the test for novelty or originality is that the design must 'significantly differ from known designs or combinations of known designs'.[168] Member states may also exclude 'designs dictated essentially by technical or functional considerations' from protection.[169] They are enjoined to ensure that protection for textile designs

[161] WTO 'Module IV: Geographical Indications' (n.d.) 84, https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/modules4_e.pdf.

[162] Art 23.3 TRIPS Agreement.

[163] WTO 'Module IV: Geographical Indications' (n.d.) supra at 86.

[164] Art 24.3 TRIPS Agreement.

[165] Art 24.5 TRIPS Agreement.

[166] Art 24.5 TRIPS Agreement.

[167] Art 24.4 TRIPS Agreement.

[168] Art 25.1 TRIPS Agreement.

[169] Art 25.1 TRIPS Agreement.

is reasonably accessible and not hindered by 'cost, examination or publication' requirements.[170] Protection may be provided either by industrial design or copyright.

Member states may enact limited exceptions to industrial designs subject to the three-step test. The duration of industrial design protection is required to be at least ten years[171] and the holder of the industrial design will have exclusive economic rights to prevent others from making, selling or importing articles embodying the design or a copy of the design for commercial purposes.[172] Some jurisdictions, such as South Africa, provide protection for aesthetic designs.[173]

2.8 Patents

As already stated, the Paris Convention's arts 1–12 and 19 are incorporated into the TRIPS Agreement. Patent law has numerous economic instrumentalist purposes which include rewarding creators, incentivising further innovation and the dissemination of new, useful information.[174] In return for disclosure of the relevant invention, a patent holder has exclusive rights in an invention which excludes others from exploiting the invention through manufacture and domestic or international distribution of the invention without the patent holder's consent[175] for a standard term of 20 years.[176] However, art 30 provides that 'limited exceptions' to patent rights may be enacted subject to the three-step test.

To qualify for patent protection, an invention[177] in any field of industry must meet specific criteria. It must be new, include an inventive step and have industrial application.[178] Further, the patent application must adequately disclose the invention.[179] Before summarising the import of these patentability criteria, it is important to note that WTO member states have some flexibility in enacting provisions on what constitutes an invention. They are required to make patent protection available for all 'fields of technology' but they may still set out exclusions to patentability and exceptions to patent rights. Setting standards or substantive tests for meeting the patentability criteria also constitutes an important flexibility. These aspects are both summarised in section 2.8.1 below.

The details relating to the standards or tests for patentability requirements are set out in national legislation. To meet the novelty requirement, an invention must be new at the priority date which is the date on which the application was lodged.

[170] Art 25.2 TRIPS Agreement.
[171] Art 26.3 TRIPS Agreement.
[172] Art 26.2 TRIPS Agreement.
[173] Secs 1 and 14 of the SA Designs Act 195 of 1993.
[174] Dutfield & Suthersanen (2020) supra at 149.
[175] Art 28 TRIPS Agreement.
[176] Art 33 TRIPS Agreement.
[177] WIPO *Intellectual Property Handbook Policy, Law and Use* 2ed (2004) 17 defines an invention as a product or process created to solve a specific problem in any field of technology, https://www.wipo.int/edocs/pubdocs/en/wipo_pub_489.pdf.
[178] Art 27.1 TRIPS Agreement.
[179] Art 29.1 TRIPS Agreement.

An invention will be novel if it does not form part of the state of the art and is not anticipated by some prior art. Generally, in the context of absolute novelty, prior art or 'the state of the art' refers to all information which is publicly available worldwide by written or oral description or by demonstration. It also extends to information contained in patent applications with earlier priority dates.[180] Most national legislation provides for non-prejudicial disclosures such as unauthorised disclosures, authorised disclosures at exhibitions and reasonable technical trials.[181]

The crux of the utility/industrial application requirement is that the claimed invention should be reducible to practical use.[182] National legislation typically provides that an invention is capable of industrial application if it can be produced or used in industry, trade or agriculture.[183] However, methods of surgical, therapeutical and diagnostic treatment of the human or animal body are usually expressly excluded from having industrial applicability,[184] in the exercise of the option to exclude them from patentability provided by art 27.3(a). Plants and animals other than microorganisms and essential biological processes for the production of plants or animals other than non-biological and microbiological processes may also be excluded from patentability.[185] However, member states are required to provide plant variety protection by patents or an effective *sui generis* system or a combination of the two.[186]

To fulfil the inventive step requirement, an invention must differ sufficiently from previous inventions so that it would not be obvious to someone with skill in that field.[187] Patents are issued by a state patent office after a procedural or substantive examination for a period of 20 years.

2.8.1 Patent exceptions and flexibilities

This section will be brief because flexibilities and their implementation have been discussed at length in other scholarly writing[188] and in several preceding sections of

[180] WIPO (2014*)* supra at 19.

[181] See for example s 26 South Africa Patents Act 57 of 1978.

[182] WIPO (2014*)* supra at 18.

[183] Ibid.

[184] Eg, see art 52.4 of the Convention on the Grant of European Patents (European Patent Convention), 1973, 16208 UNTS 1065 at 199 (EPC); s 4 (2) UK Patents Act 1977; s 25(11)–(12) South Africa Patents Act.

[185] Art 27.3(b) TRIPS Agreement.

[186] Ibid.

[187] WIPO (2014) supra at 20; s 25(10) of the South Africa Patents Act; s 3 of the UK Patents Act; art 56 of the EPC; s 103 of the US Patent Act 35 USC.

[188] Eg, see Y Vadwa & B Shozi 'Eighteen Years After Doha: An Analysis of the Use of Public Health TRIPS Flexibilities in Africa' (2020) *South Centre Research Papers 103*; B Baker 'A Full description of WTO TRIPS Flexibilities Available to ARIPO Member States and a Critique of ARIPO's Comparative Study Analyzing and Making Recommendations Concerning Those Flexibilities' (2019); O Soyeju & J Wabwire 'The WTO–TRIPS Flexibilities on Public Health: A Critical Appraisal of the East African Community Regional Framework' (2018) 17(1) *World Trade Review* 145; Ncube *Intellectual Property Policy* (2016) supra at 15–31; IE Kameni 'Implementation of TRIPS Public Health Flexibilities in the African Intellectual Property Organisation (OAPI) Region: Problems and Prospects' (Unpublished LLD Thesis, University of Pretoria, 2015), http://hdl.handle.net/2263/52384; P Adusei *Patenting of Pharmaceuticals and Development in Sub-Saharan Africa: Laws, Institutions, Practices, and Politics* (2012); FM Abbott & JH Reichman 'The Doha

this book, such as in section 2.2 above. Suffice it to say that exceptions and flexibilities are important public interest mechanisms that enable states to tailor-make their patent regimes to achieve certain developmental ends. These mechanisms include transition periods, parallel importation, exceptions to patent rights, exclusions to patentability and provisions on compulsory licenses and government use.

Section 2.2 above has already set out the transition periods for LDCs and pharmaceutical products. As indicated above, the policy space around setting the parameters to ascertain patentability criteria, such as what an invention is, enables WTO member states to tailor-make their approach to certain matters including access to medicines and public health, for example, the exclusion of new uses of pharmaceutical compounds or compositions to curb evergreening.[189] Further member states have policy space pertaining to regulating patentability criteria with regards to:[190]

- the standards or test for ascertaining whether an invention has an inventive step;
- the amount and type of disclosure that is required in a patent application;
- the examination of patent applications; and
- whether or not substances existing in nature are patentable.

Article 31 provides for 'other use without authorisation of the right holder', including by the government or third parties, and sets out conditions applicable to such use in paras (a)–(l). These compulsory license and government use provisions have raised some ire, particularly the limitation to supplying domestic markets by art 31(f) because most developing countries do not yet have pharmaceutical manufacturing capacity. This has led to modification of the position by the provision of a waiver of the domestic market restriction by the 'paragraph 6 solution' of the 2003 Waiver Decision,[191] which was then incorporated into TRIPS as art 31bis by the 2005 amendment of the Agreement and members have until 31 December 2021 to accept

round's public health legacy: Strategies for the Production and diffusion of patented medicines under the amended TRIPS provisions' 2007) 10(4) *Journal of International Economic Law* 921; SW Andemariam 'The Cleft-stick Between Anti-Retroviral Drug Patents and HIV/AIDS Victims: An In-Depth Analysis of the WTO's TRIPS Art 31bis Amendment Proposal of 6 December 2005 (2007) 4 *Intellectual Property Quarterly* 414; T Avafia, J Berger & T Hartzenberg 'The ability of select sub-Saharan African countries to utilize TRIPs Flexibilities and Competition Law to ensure a sustainable supply of essential medicines: A study of producing and importing countries' (2006), https://unctad.org/system/files/official-document/ictsd-tralec2006d3_en.pdf.

[189] Ncube *Intellectual Property Policy* (2016) supra at 17; SF Musungu, S Villanueva & R Blasetti *Utilizing TRIPS Flexibilities for Public Health Protection Through South-South Regional Frameworks* (2004) 15.

[190] Ncube ibid; CM Correa 'Multilateral Agreements and Policy Opportunities' in M Cimoli et al (eds) *Intellectual Property Rights: Legal and Economic Challenges for Development* (2014) 417 at 419–423; M Sibanda 'Patent-related Flexibilities in Multilateral Treaties and their Importance for Developing Countries and LDCs', 2nd WIPO Inter-Regional Meeting on South-South Cooperation on Patents, Trade Marks, Geographical Indications, Industrial Designs and Enforcement (May 2013).

[191] Doha Decision on the implementation of para 6 of the Doha Declaration (2003). Doc. WT/L/540 and Corr.1.0.

the amendment.[192] The waiver decision remains applicable until that date for states who have not yet accepted the amendment. The amendment came into force on 23 January 2017 and is in implementation for WTO member states who have accepted it, instead of the 2003 waiver. As at October 2020, 26 African states have accepted the amendment, namely Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Congo, Côte d'Ivoire, Egypt, Gabon, Gambia, Guinea, Kenya, Lesotho, Malawi, Mali, Morocco, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda and Zambia.[193]

The modification of the waiver and amendment is that WTO members may export pharmaceuticals produced under compulsory license to other member states with limited manufacturing capacity.[194] However, this modification is not without its challenges[195] and will have to be used with effective procedures to ensure that its intended benefits are achieved.[196]

2.8.2 Second tier patents

Second tier patent protection systems are intended to provide protection for inventions that do not meet standard patentability requirements, commonly referred to as sub-patentable inventions. Generally, these systems provide monopolistic property rights, without substantive examination.[197] However, they have registration criteria that include novelty.[198] There are various forms of second tier patent protection worldwide[199] and many African states provide it in the form of utility models. Both the Harare Protocol and the Bangui Agreement provide for utility models as summarised in Chapter Three below.

The lack of substantive examination creates an imbalance as the utilitarian justification for patents is that they are granted as rewards to inventors who have

[192] Amendment of the TRIPS Agreement – Seventh Extension of the Period for the Acceptance by Members of the Protocol Amending the TRIPS Agreement, Decision of 10 December 2019, WT/L/1081.

[193] WTO 'Amendment of the TRIPS Agreement', https://www.wto.org/english/tratop_e/trips_e/amendment_e.htm.

[194] WTO Analytical Index: TRIPS Agreement – Article 31bis (Practice), https://www.wto.org/english/res_e/publications_e/ai17_e/trips_art31_bis_oth.pdf.

[195] ML Nkomo 'Rwanda's New Intellectual Property Law and Compulsory Licensing for Export Under the WTO: Not Quite a Panacea (2013) 21(2) *African Journal of International and Comparative Law* 279; Musungu, Villanueva & Blasetti supra at 17; *Canada – Patent Protection of Pharmaceutical Products*, Report of the Panel adopted on April 7, 2000 (WT/DS114/R of March 17, 2000).

[196] CM Correa 'Will the Amendment to the TRIPS Agreement Enhance Access to Medicines?' (January 2019) *South Centre Policy Brief No. 57,* https://www.southcentre.int/wp-content/uploads/2019/01/PB57_Will-the-Amendment-to-the-TRIPS-Agreement-Enhance-Access-to-Medicines_EN-1.pdf.

[197] U Suthersanen & G Dutfield 'Utility models and other alternatives to patents' in U Suthersanen, G Dutfield & KB Chow (eds) *Innovation Without Patents: Harnessing the Creative Spirit in a Diverse World* (2007) 19 have ascertained that all second tier patent systems exclude substantive examination prior to patent grant.

[198] Ibid.

[199] Suthersanen & Dutfield (2007) supra at 19–20 state that the major points of departure relate to the subject matter protected by the system, the granting procedure used and the substantive criteria for protection.

created useful inventions, yet second tier patent rights are granted for untested inventions. In particular, their usefulness is not tested. Second tier patent systems try to correct the imbalance by granting patent protection for a relatively short time ranging from six to fifteen years.[200] The Bangui Agreement provides for a ten-year term for utility models.[201]

The main cause for concern is that the system may result in 'legal uncertainty and excessive litigation'. [202] Australia's second tier patent system alleviates this discomfort by requiring substantive examination and certification before enforcement of an innovative patent.[203] An innovative patent can also be opposed after substantive examination and certification.[204]

2.9 Integrated circuits

Article 35 of the TRIPS Agreement notes that WTO member states agree to provide protection to the layout-designs (topographies) of integrated circuits as set out in arts 2, 4–7, 12 and 16 of the Treaty on IP in Respect of Integrated Circuits. Once protected, the right holder has exclusive rights to import, sell, or otherwise distribute the layout design for commercial purposes,[205] for a period of ten years, from the date of filing an application for registration or from the first commercial exploitation wherever in the world it occurs.[206] Article 37 provides for some exceptions including the extension of compulsory and government use as provided for in art 31(a)–(k).

2.10 Undisclosed information

Article 39.1 of the TRIPS Agreement requires WTO member states to provide protection for undisclosed information in accordance with art 10bis(2) of the Paris Convention (1967) and for data submitted to governments or governmental agencies in accordance with art 10bis(3). Undisclosed information will be protected if it meets these criteria:

1 it must be secret or confidential, and therefore not be 'generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question;[207]
2 it must be of economic, commercial or business value because it is secret;[208]
3 reasonable steps have been taken to keep it secret.[209]

When undisclosed test or other data is submitted as part of applications for approval of marketing of pharmaceutical or agricultural chemical products, it should be

[200] Suthersanen & Dutfield (2007) supra at 20.
[201] Art 6 Annex II Bangui Agreement.
[202] Suthersanen & Dutfield (2007) supra at 38.
[203] Sec 120(1A) of the Australian Patents Act No. 83, 1990.
[204] Sec 101M of the Australian Patents Act.
[205] Art 36 TRIPS Agreement.
[206] Art 38.1 TRIPS Agreement.
[207] Art 39.2(a) TRIPS Agreement.
[208] Art 39.2(b) TRIPS Agreement.
[209] Art 39.2(c) TRIPS Agreement.

protected against disclosure and unfair commercial use.[210] Where it has to be disclosed to protect the public, it still has to be protected against unfair commercial use.[211]

There is no registration of trade secrets or undisclosed information. Establishing and maintaining a trade secret is totally within the control of the owner, who may set up expensive (or inexpensive) appropriate modes of protection within his or her enterprise. In some cases this may be as simple as keeping documents under lock and key. Trade secret protection may be maintained indefinitely as long as the information is kept in confidence.

Protection from disclosure or misappropriation is typically secured by obtaining contractual undertakings from employees and third parties who have access to the information through non-disclosure agreements (NDAs) and restraint of competition clauses in employment contracts. In addition, in the absence of such contractual undertakings, in certain circumstances such as within an employment relationship, an equitable duty arises to maintain confidentiality.

Any misappropriation,[212] unauthorised use and disclosure of trade secrets is unlawful. Where the alleged misappropriation occurred in breach of a contractual undertaking, a court has to rule on the validity and currency of the contract. However, where restraint of competition clauses are in issue, the courts will only enforce reasonable and fair clauses.[213] This approach involves much more than simply ruling on the validity of a contract, as the court has to take certain public policy considerations into account.

2.11 Conclusion

This outline of minimum global IP standards as set out above is essential to an understanding of the African IP context in Chapter Three and the relationship between IP and STI in Chapter Four which lead to the case made for openness in Chapter Five. African states are party to the global IP framework but came to it in a disadvantageous way, having been taken into it prior to their independence, and, since then, have been working with other developing states to nuance the system in a more equitable and context-sensitive way.[214] These efforts are often thwarted, as recently seen in the initiative to adopt the waiver at the TRIPS Council meeting of October 2020, which will be discussed in Chapter Five below. The lesson to be drawn from this is that African or localised solutions to some of these intractable problems need to be found so that the continent's fortunes do not lie solely at the global level where geopolitics is not in favour of the South.

[210] Art 39.3 TRIPS Agreement.

[211] Art 39.3 TRIPS Agreement.

[212] Examples of the means by which information is misappropriated include theft, bribery, espionage, breach of confidence and fraud.

[213] W Cornish, D Llewelyn & T Aplin *Intellectual Property: Patents, Copyrights, Trademarks and Allied Rights* 9ed (2019) 348 para 8–26.

[214] Ncube (2018) supra.

Chapter 3

INTELLECTUAL PROPERTY: AFRICAN FRAMEWORKS

3.1 Introduction

This chapter builds on Chapter Two by focusing on African continental, regional and national IP frameworks. It follows the approach of Chapter Two and does not focus on registration and enforcement because these aspects have been adequately covered by others.[1] This chapter proceeds in six further sections. Section 3.2 gives an overview of plurilateral and bilateral agreements to which African states are party.

It points out that some bilateral agreements have upped TRIPS minimum standards. For example, they raise TRIPS minimum enforcement requirements and mandate that party states enforce IPRs to the 'highest international standards', as will be shown below. Section 3.3. comments on national IP frameworks. Sections 3.4–3.5 discuss the regional IP organisations and their IP instruments. The substantive provisions in the IP instruments follow the sequence used in Chapter Two fashioned on the TRIPS Agreement. Section 3.6 turns to the RECs and their IP instruments. The section closes with some comments on the national and regional instruments as compared to the minimum standards set out in Chapter Two. Chapter Six will relate this to PAIPO and the AfCFTA IP Protocol, as continental initiatives that can be used to leverage openness for sustainable development.

3.2 Plurilateral and bilateral agreements

Some African states have entered into trade agreements with states outside the continent, either with several other states, known as plurilateral agreements, or with a single state or regional block, such as the European Union (EU), known as bilateral agreements. It is important to consider these agreements to the extent that they address IP issues. The main area of concern, from a developmental perspective, is that they often impose standards beyond the minimum required by the TRIPS Agreement, or deprive member states of options under the agreement, which are known as TRIPS-plus standards.[2] Whilst each WTO member state is at liberty to adopt TRIPS-plus standards, the concern is that doing so may not always be in the public interest and that the power asymmetries between the negotiating parties mean that

[1] Seuba (2017) supra; Schneider & Ferguson (2020) supra; Ferguson & Schneider (2015) supra.

[2] P Drahos 'BITs and BIPs: Bilateralism in Intellectual Property' (2001) 4(6) *Journal of World Intellectual Property* 791 at 792–3.

the interests of the more powerful parties dominate the resultant agreement.[3] The EU and the US have expressly articulated their intention to use bilaterals as a means of securing TRIPS-plus standards.[4] A second concern is the inevitable creep of TRIPS-plus standards through plurilateral and bilateral agreements as a consequence of the most-favoured nation (MFN) in art 4 of the TRIPS Agreement.[5] In accordance with this principle, 'any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members'. Consequently, it is possible to ratchet up minimum IP standards set in multilateral agreements through trade agreements. This raises a third concern regarding the negative impact of TRIPS-plus provisions on developmental aspirations of states.[6] These consequences are wide-ranging and include access to medicines[7] and access to knowledge which are critically important to the rights to health and education, respectively.

The Anti-Counterfeiting Trade Agreement (ACTA), had it succeeded, would have been a plurilateral agreement involving the EU, US and several countries, including Morocco. It was negotiated by Australia, Canada, the EU and its member states, represented by the European Commission and the EU Presidency (Belgium), Japan, Korea, Mexico, Morocco, New Zealand, Singapore, Switzerland and the US.[8] It was ultimately only signed by the US, Australia, Canada, Korea, Japan, New Zealand, Morocco, and Singapore in October 2011,[9] thereafter it was signed by some, but not all, EU member states.[10] The required six ratifications were not filed and this

[3] J-F Morin & J Surbeck 'Mapping the New Frontier of International IP Law: Introducing a TRIPs-plus Dataset' (2020) 19 *World Trade Review* 109 at 110; A Moerland 'Do Developing Countries Have a Say? Bilateral and Regional Intellectual Property Negotiations with the EU' (2017) 48(7) *International Review of Intellectual Property and Competition Law* 760.

[4] D Shabalala 'Intellectual Property in European Partnership Agreements with the African, Caribbean and Pacific Group of Countries' (2006) *South Centre IP Quarterly Update,* https://www.ciel.org/wp-content/uploads/2015/03/IP_Update_4Q06.pdf; P Roffe 'Bilateral Agreements and a TRIPS-plus World: The Chile-USA Free Trade Agreement (2004) *TRIPS Issues Papers 4*.

[5] Morin & Surbeck (2020) supra. For a general commentary see WTO Analytical Index TRIPS Analytical Index TRIPS Agreement – Article 4 (Jurisprudence) current as of: June 2020, https://www.wto.org/english/res_e/publications_e/ai17_e/trips_art4_jur.pdf.

[6] Ibid.

[7] CM Correa 'Implications of Bilateral Free Trade Agreements on Access to Medicines' (2006) 94(5) *Bulletin of the World Health Organization* 399; J Morin 'Tripping up TRIPS Debates: IP and Health in Bilateral Agreements' (2006) 1(1/2) *International Journal of Intellectual Property Management* 37; GP Krikorian & DM Szymkowiak 'Intellectual Property Rights in the Making: The Evolution of Intellectual Property Provisions in US Free Trade Agreements and Access to Medicine' (2007) 10(5) *Journal of World Intellectual Property* 388.

[8] CB Ncube 'Copyright Enforcement: The Graduated Response Takes Centre Stage' (2012) 24(2) *SAMercLJ* 133 at 135. The text of the agreement is available at https://www.mofa.go.jp/policy/economy/i_property/pdfs/acta1105_en.pdf.

[9] Office of the US Trade Representative (USTR) 'ACTA', https://ustr.gov/acta.

[10] CB Ncube 'Copyright Enforcement: The Graduated Response Takes Centre Stage' (2012) 24(2) *SAMercLJ* 133 at 136.

agreement has not eventuated. Accordingly, its IP provisions will not be discussed, save to note that they were TRIPS-plus and heavily critiqued by scholars[11] and developing countries.[12]

The following subsections discuss relevant bilateral agreements between African states and (a) the EU and (b) the US focusing on how they compare to the TRIPS Agreement and to each other.

3.2.1 The EU

The EU concluded bilateral Euro-Mediterranean Association Agreements between 1998 and 2005 with eleven countries in the southern Mediterranean, including the following African countries: Algeria,[13] Egypt,[14] Libya, Morocco[15] and Tunisia.[16] However, the agreement with Libya is not in force.[17] These agreements are based on the Euro-Mediterranean Partnership, which was replaced by the Union for the Mediterranean in 2008.[18] The agreements are wide-ranging;[19] only their IP related

[11] For commentary, see A Metzger 'A Primer on ACTA: What Europeans Should Fear About the Anti-Counterfeiting Trade Agreement' (2010) 1(2) *Journal of Intellectual Property, Information Technology and Electronic Commerce* 109; K Weatherall 'Politics, Compromise, Text and the Failures of the Anti-Counterfeiting Trade Agreement' (2011) 33(2) *The Sydney Law Review* 229; A Shepard 'ACTA on Life Support: Why the Anti-Counterfeiting Trade Agreement Is Failing and How Future Intellectual Property Treaties Might Avoid a Similar Fate' (2013) 12(3) *Washington University Global Studies Law Review* 673; M Geist 'The Trouble with the Anti-Counterfeiting Trade Agreement (ACTA)' (2010) 30(2) *The SAIS Review of International Affairs* 137.

[12] A Abdel-Latif 'Developing Countries and the Contestation of ACTA at the TRIPS Council' in P Roffe & X Seuba (eds) *The ACTA and the Plurilateral Enforcement Agenda: Genesis and Aftermath* (2014) 357.

[13] Euro-Mediterranean Agreement Establishing an Association between the European Community and its Member States and the People's Democratic Republic of Algeria [OJ L 265 of 10.10.2005]; Decision 2005/690/EC Concluding the Euro-Mediterranean Agreement establishing an Association between the European Community and its Member States and the People's Democratic Republic of Algeria.

[14] Euro-Mediterranean Agreement Establishing an Association between the European Communities and their Member States, and the Arab Republic of Egypt [OJ L 304 of 30.9.2004]; Decision 2004/635/EC Concluding the Euro-Mediterranean Agreement establishing an Association between the European Communities and their Member States and the Arab Republic of Egypt.

[15] Euro-Mediterranean Agreement Establishing an association between the European Communities and their Member States and the Kingdom of Morocco [OJ L 070, 18.3.2000]; Decision 2000/204/EC, ECSC Concluding the Euro-Mediterranean Agreement establishing an association between the European Communities and their Member States and the Kingdom of Morocco.

[16] Euro-Mediterranean Agreement Establishing an association between the European Communities and their Member States and the Republic of Tunisia [OJ L 97 of 30.3.1998]; Decision 98/238/EC, ECSC on the Conclusion of a Euro-Mediterranean Agreement establishing an association between the European Communities and their Member States and the Republic of Tunisia.

[17] European Commission 'Euro-Mediterranean partnership', https://ec.europa.eu/trade/policy/countries-and-regions/regions/euro-mediterranean-partnership/.

[18] EUR-Lex 'Euro-Mediterranean Association Agreements', https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Ar14104.

[19] For a general overview and evaluation, see F De Ville & V Reynaert 'The Euro-Mediterranean Free Trade Area: An Evaluation on the Eve of the (Missed) Deadline' (2010) 365 (2) *L'Europe en Formation* 193.

clauses are of interest to this section. Generally, these provisions are TRIPS-plus.[20] Specifically, they require the African partners to join UPOV 1991 and the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure.[21]

An example of the wording in relation to UPOV 1991 is the following provision in Annex 6 of the EU-Algeria Association Agreement:

> By the end of the fifth year after the entry into force of this Agreement, Algeria and the European Community and/or its Member States shall, to the extent they have not yet done so, accede to, and ensure an adequate and effective implementation of the obligations arising from, the International Convention for the Protection of New Varieties of Plants (Geneva Act, 1991), known as 'UPOV'. Accession to this Convention may be replaced by the implementation of an adequate and effective *sui generis* system of protection of plant varieties if both parties agree.

These treaties have been selected for special mention because, as indicated in the discussion of the TRIPS Agreement above, WTO member states have the flexibility to select *sui generis* protection for plant varieties, which is effectively removed by the bilateral Association Agreements. This is so despite the wording of the Association Agreements seeming to present a choice 'if both parties agree'. The choice is not really a choice since it is subject to the agreement of the EU, as opposed to it being purely at the discretion of a WTO member state under the TRIPS Agreement. Consequently, Morocco, Tunisia and Egypt have joined UPOV.[22]

These EU Association Agreements also require African partners to provide 'suitable and effective protection of intellectual, industrial and commercial property rights, in line with the highest international standards',[23] which is beyond the minimum standards set by art 41 of the TRIPS Agreement[24] and lacks clarity for

[20] MK El-Said 'The European Trips-Plus Model and The Arab World: From Co-Operation to Association—A New Era in the Global IPRS Regime?' (2007) 28 *Liverpool Law Review* 143 at 149. Also see J Drexl 'Intellectual Property and Implementation of Recent Bilateral Trade Agreements in the EU' in J Drexl, H Grosse Russ-Khan & SN Phlix (eds) *EU Bilateral Trade Agreements and Intellectual Property: For Better or Worse* (2014) 265–291; Moerland (2017) supra.

[21] Art 44 and Annex VI EU – Algeria Association Agreement; Art 37 and Annex VI EU-Egypt Association Agreement; Art 39 and Annex VII EU-Morocco Association Agreement; Art 37 and Annex VII EU-Tunisia Association Agreement.

[22] UPOV 'UPOV Status in Relation to the International Union for the Protection of New Varieties of Plants (UPOV) as of September 25, 2020', https://www.upov.int/export/sites/upov/members/en/pdf/status.pdf.

[23] Art 44.1 EU – Algeria Association Agreement; Art 37.1 EU-Egypt Association Agreement; Art 39.1 EU-Morocco Association Agreement; Art 37.1 EU-Tunisia Association Agreement.

[24] Which reads, in part: 1. 'Members shall ensure that enforcement procedures as specified in this Part are available under their law so as to permit effective action against any act of infringement of intellectual property rights covered by this Agreement, including expeditious remedies to prevent infringements and remedies which constitute a deterrent to further infringements. These procedures shall be applied in such a manner as to avoid the creation of barriers to legitimate trade and to provide for safeguards against their abuse. 2. Procedures concerning the enforcement of intellectual property rights shall be fair and equitable. They shall not be unnecessarily complicated or costly, or entail unreasonable time-limits or unwarranted delays.'

lack of definition of the meaning of 'highest international standards'.[25] Further, they require partners to adhere to dispute settlement procedures outside the WTO, as is the case in art 39.2 of the EU-Morocco Association Agreement. The difficulty with such an approach is that it commits parties to a 'more sophisticated one-to-one dispute settlement procedure (in which they neither have the resources nor the expertise to compete against the other European industrialised country) thus depriving these states from resorting to a more stable and fair multilateral dispute settlement procedure'.[26]

The EU has been negotiating Economic Partnership Agreements (EPAs) with African RECs and to date has only concluded and implemented one, with the SADC.[27] In the other regions of Africa, individual countries have signed EPAs but the regional EPAs are yet to be concluded and/or signed by all parties.[28] The EU-SADC EPA was signed on 10 June 2016 between Botswana, Lesotho, Mozambique, Namibia, South Africa and eSwatini (SADC EPA Group).[29] The EPA became provisionally operational in October 2016 and fully operational in February 2018 after Mozambique's ratification and implementation.[30] Angola has an option to join the EPA in the future and the other members of the SADC (Democratic Republic of the Congo, Madagascar, Malawi, Mauritius, Zambia and Zimbabwe) are negotiating EPAs through other RECs.[31]

The EU-SADC EPA's art 16 which addresses IP will be set out in detail because it is the first regional EPA in Africa and, as such, has great significance for future EPAs with other African regions. Further, there has not been much scholarly commentary on these provisions. Article 16.1 reaffirms the partners' obligations under art 46 of the Cotonou Agreement and their rights, obligations and flexibilities as set out in the TRIPS Agreement. Under art 16.2 the partners agree:

> to grant and ensure adequate, effective and non-discriminatory protection of intellectual property rights ('IPRs'), and provide for measures for the enforcement of such rights against infringement thereof, in accordance with the provisions of the international agreements to which they are a party.

This provision is closely aligned to the TRIPS Agreement's art 41 and is markedly different from the TRIPS-plus framing of the Mediterranean Association Agreements discussed above.

[25] El-Said (2007) supra at 160.

[26] El-Said (2007) supra at 161.

[27] European Commission 'Overview of Economic Partnership Agreements' updated September 2020, https://trade.ec.europa.eu/doclib/docs/2009/september/tradoc_144912.pdf.

[28] Ibid.

[29] European Commission 'Southern African Development Community (SADC)', https://ec.europa.eu/trade/policy/countries-and-regions/regions/sadc/; Economic Partnership Agreement between the European Union and its Member States, of the one part, and the SADC EPA States, of the other part, https://trade.ec.europa.eu/doclib/docs/2015/october/tradoc_153915.pdf.

[30] Ibid.

[31] Ibid.

Article 16.3 then moves to specifics by providing that the partners agree that they 'may cooperate' in matters related to Geographical Indications (GIs) in accordance with the relevant articles of the TRIPS Agreement and record their recognition of 'the importance of GIs and origin-linked products for sustainable agriculture and rural development'. Article 16.4 records the partners' agreement 'that it is important to respond to reasonable requests to provide information and clarification to each other on GI and other IPR related matters' and that 'without prejudice to the generality of such cooperation' they 'may by mutual agreement involve international and regional organizations with expertise in the areas of GIs'. This carefully worded provision makes no firm commitments and principally reaffirms existing IP obligations with the possibility of future co-operation on GIs. Again, this commendably steers clear of TRIPS-plus standards. Similarly, art 16.5 holds out the promise of the possibility of co-operation with regard to the protection of traditional knowledge in the future.

Article 16.6 notes that if the partners enter into future negotiations on the protection of IPRs, the SADC EPA states would 'endeavour to negotiate as a collective' and the EU would 'consider including provisions on co-operation and special and differential treatment'. Significantly, the parties agree in art 16.8 that any future negotiation should generate outcomes that are compatible with the future development of an SADC regional IPRs framework. This twofold commitment to negotiate collectively and to ensure alignment with an SADC IPR framework is supportive of, and enables, the alignment of IP approaches on the continent.

The careful and conservative wording of this article which avoids TRIP-plus standards preserves policy space secured under the TRIPS Agreement. In addition, the EU-SADC EPA's non-prescriptive treatment of GIs and its open-ended treatment of traditional knowledge (TK) means that these issues can be addressed further in an appropriate way under other instruments.

3.2.2 The US

The US's approach of using bilateral trade agreements to ratchet up IP protection has been the focus of sustained study for a long time.[32] This section focuses only on US bilateral agreements that involve African partners and highlights certain features.

In 2004, Morocco entered into a Free Trade Agreement (FTA) with the US which entered into force on 1 January 2006.[33] This FTA is highly significant because it is the first FTA between the US and an African state and, as such, provides important clues as to what future FTAs may contain in relation to IP. Similar to the approach taken in the EU-Algeria Association Agreement, the US-Morocco FTA's IP provisions

[32] Krikorian & Szymkowiak (2007) supra; I Osgood and Y Feng 'Intellectual Property Provisions and Support for US Trade Agreements' (2018) 13(3) *The Review of International Organizations* 421; J Morin & ER Gold 'An Integrated Model of Legal Transplantation: The Diffusion of Intellectual Property Law in Developing Countries' (2014) 58(4) *International Studies Quarterly* 781.

[33] Office of the US Trade Representative (USTR) 'Morocco Free Trade Representative' https://ustr.gov/trade-agreements/free-trade-agreements/morocco-fta.

are TRIPS-plus. Specifically, art 15.9(2) of the FTA goes beyond art 27.3(b) of the TRIPS Agreement[34] by extending patent protection to plants, animals and 'any new uses or methods of using a known product, including new uses of a known product for the treatment of humans and animals'.[35] El-Said lists the following further instances of TRIPS-plus provisions in the US-Morocco FTA:[36]

i Grounds for patent revocation (art 15.9(5));
ii The extension of the term of protection of industrial designs from TRIPS' minimum of 10 years to 15 years (Annex 5 art 3.1);
iii Article 15.5.5(a) provides for a copyright term of life plus 70 years which goes beyond Berne and the TRIPS Agreement's minimum term of life plus 50 years term or 50 years where the term is not calculated based on the life of a natural person;
iv The requirement to join UPOV, which, as explained at 3.2.1 above, negates a choice offered by the TRIPS Agreement (art 15.1(2–3));
v Trade marks for visual, scent and sound marks (art 15.2(1));
vi Dispute settlement procedures (art 20.1 to 20.7).

The US-Morocco FTA's above provisions have been criticised for their negative impact on developmental priorities articulated in SDG 3 of attaining good health and well-being, together with Agenda 2063's goal to have a continent of healthy and well-nourished citizens.[37]

On 7 July 2020, the US and Kenya commenced negotiation of a Kenya US-FTA.[38] This development has stimulated much discussion, particularly pertaining to how it will relate to the first US FTA on the continent, the US-Morocco FTA, and how it would impact any future US-FTAs on the continent.[39] In view of Kenya's

[34] Which reads: 'Members may also exclude from patentability: [...] (b) plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof.'

[35] El-Said (2005) supra at 59; C Fink & P Reichenmiller 'Tightening TRIPS: Intellectual Property Provisions of U.S. Free Trade Agreements' in R Newfarmer, R (ed) *Trade, Doha, and Development: A Window into the Issues* (2006) 289.

[36] El-Said 2005 supra at 59–61.

[37] For instance, see 3D Trade, Human Rights-Equitable Economy 'Trade-related intellectual property rights, access to medicines and human rights – Morocco' (April 2006), https://www2.ohchr.org/english/bodies/cescr/docs/info-ngos/access_to_medicines_and_hr.pdf; EM Jamea & A Finco 'Overview and Empirical Analysis of the Free Trade Agreement between the United States and Morocco' (2008) 2 *New Medit* 41.

[38] USTR 'Joint Statement Between the United States and Kenya on the Launch of Negotiations Towards a Free Trade Agreement', 8 July 2020, https://ustr.gov/about-us/policy-offices/press-office/press-releases/2020/july/joint-statement-between-united-states-and-kenya-launch-negotiations-towards-free-trade-agreement.

[39] Eg, E Naumann 'The United States-Kenya Free Trade Area (FTA): insights into the bilateral trade relationship and early progress on setting terms for an FTA' (June 2020) *Tralac Working Paper No. US20WP03/2020*; JT Gathii 'An Early Assessment of the Prospective Kenya-United States Trade Agreement' (13 February 2020) *Afronomicslaw,* https://www.afronomicslaw.org/2020/02/13/an-early-assessment-of-the-prospective-kenya-united-states-trade-agreement/.

membership of COMESA and the ECA, any commitments and standards which Kenya undertakes will have an impact on these RECs. Finally, within the context of the AfCFTA, positions adopted by, or foisted upon, these two RECs will ultimately impact the entire continent. It is for this reason that the most favoured nation principle provided in art 4(2) of the AfCFTA Protocol on Trade in Goods provides:

> Nothing in this Protocol shall prevent a State Party from concluding or maintaining preferential trade arrangements with Third Parties, provided that such trade arrangements do not impede or frustrate the objectives of this Protocol, and that any advantage, concession or privilege granted to a Third Party under such arrangements is extended to other State Parties on a reciprocal basis.

Accordingly, Kenya's commitments to the US should not 'impede or frustrate the objectives' of the Protocol and any advantage, concession or privilege given to the US would have to be matched by Kenya for the benefit of her African trade partners within the AfCFTA on a reciprocal basis. The requirement for reciprocity is important as it is a condition of Kenya's offering the same benefits to fellow AU states. Since the negotiations have only recently commenced, there is as yet, no text to comment upon but it would be reasonable to expect that the US would seek to adopt a TRIPS-plus approach as taken in the US-Morocco FTA. Both the US and Kenya have published their intended positions[40] as well as agreed-on priority aspects which include IP. As expected, the FTA has raised considerable interest[41] and several stakeholders are already following the negotiations.[42] Further, a suit by two attorneys was filed in March 2020 at the East African Court of Justice, alleging that the proposed FTA would prejudice the interest of Kenya's EAC partners.[43] Specifically the applicants claim that Kenya[44]

> without due regard to provisions of the East African Community Treaty and the Protocols for the Establishment of the Customs Union and Common Market to which it is a party, entered into, negotiated and/or expressed intention to negotiate a bilateral Free Trade Agreement with the United States of America in total violation of the Treat[y] and the Protocols.

The matter is pending, and it will be illuminating to see Kenya's response and the ultimate EACJ decision.

[40] USTR US-Kenya Summary of Specific Negotiating Objectives, May 2020; Ministry of Industrialization, Trade and Enterprise Development Republic of Kenya Proposed Kenya - United States of America Free Trade Area Agreement Negotiation Principles, Objectives, and Scope (22 June 2020).

[41] USTR Submissions on US-Kenya FTA, https://beta.regulations.gov/document/USTR-2020-0011-0001 for the submissions received by the Office of the USTR on the proposed FTA, which, as at 29 September 2020, numbered 5 001.

[42] Eg, see Kenya Library and Information Services Consortium (KLISC) EIFL (Electronic Information for Libraries) Fact Sheet Proposed U.S.-Kenya Free Trade Agreement, https://www.eifl.net/system/files/resources/202009/eifl_klisc_fta_factsheet_sept_2020.pdf.

[43] *Christopher Ayieko & Emily Osiemo vs The Attorney General of the Republic of Kenya & The Secretary General of the East African Community* (Reference No. 5 of 2020, 13 March 2020) East African Court of Justice, Registry/Pending cases, https://www.eacj.org/?page_id=5986&fwp_textsearch=Kenya; Bilaterals.org 'Lawyers file suit at EAC court to block Kenya-US trade deal' (13 July 2020), https://www.bilaterals.org/?lawyers-file-suit-at-eac-court-to.

[44] *Christopher Ayieko* (2020) supra.

3.3 African national IP frameworks

Each AU member state has a national IP framework consisting of policies and laws together with the necessary administrative and enforcement institutions which include registration offices. An ideal national IP framework would comprise of a policy to inform the content and approach of regulatory instruments, administrative structures and enforcement mechanisms. In such a setting, a clear and detailed policy would serve as a blueprint of a state's approach to IP by specifying what its goals and objectives are and how these may best be achieved in a way that enhances or aids the attainment of national developmental goals. Upon their independence, many African states inherited IP frameworks that lacked an express national policy as the framework had previously been informed by the colonising state's policy. Therefore, national IP policymaking became a priority for African states, and many have adopted policies or embarked on crafting with technical support from WIPO through one of its Development Agenda projects.[45] Some states subscribe to regional IP policies, adopted by RECs to which they belong.

As indicated above, this section will not provide a detailed outline of individual African states' IP policies and laws which are accessible on many databases[46] for such analysis. Indeed, I and many others have engaged in such analysis elsewhere.[47] Instead, the section comments broadly on their purpose and on the effectiveness of their enabling or supporting institutions. Ideally, national IP laws are enacted 'to give legal effect to a government policy decision for deliberate change to address a social, economic or political need'.[48] In addition, they have to give effect to the state's international and national obligations to meet certain standards, protect and promote fundamental rights and meet developmental aspirations.

IPR registration capabilities are not discussed in detail, following the approach taken in Chapter Two with respect to the global IP framework. A few comments are made about patent office capacity as it has received significant scholarly commentary. On the African continent, many offices do not conduct substantive examinations. For example, the Companies and IP Commission (CIPC) which serves as the South African Patent Office and the Nigerian Patent Office do not conduct substantive examination.[49] As stated below, ARIPO undertakes substantive examination of patent applications for contracting states under the Harare Protocol on Patents, Industrial Designs and Utility Models, its regulations and the Guidelines

[45] Ncube *Intellectual Property Policy* (2016) supra at 43–4 and 47–60.

[46] Notably on WIPO's WIPOLex, https://wipolex.wipo.int/en/main/legislation, the websites of the regional intellectual property organisations and the relevant national departments of each state.

[47] Ncube *Intellectual Property Policy* (2016) supra.

[48] VE Aitken 'An exposition of legislative quality and its relevance for effective development' (2013), http://www.luc.edu/media/lucedu/prolaw/documents/AITKEN%20FINAL%20Art.pdf.

[49] I Mgbeoji 'African Patent Offices Not Fit for Purpose' in De Beer et al (2013) supra, 238. See also A Vanni *Patent Games in the Global South: Pharmaceutical Patent Law Making in Brazil, India and Nigeria* (2019); DO Oriakhogba & AI Fenemigho 'Making the Nigerian patent system more efficient through pre-grant opposition mechanisms: Lessons from India and Botswana' (2016) 4 *South African Intellectual Property Law Journal* 64.

for Examination.[50] However, national IP offices retain a patent registration function. In contrast, OAPI conducts substantive examination of patent applications on behalf of its member states granting patents valid in all 17 states and national IP offices have no patent registration function.

Research has shown that many African patent offices are not fit for purpose due to limited resources.[51] This then raises questions about the quality or validity of patents issued by these offices on the continent. However, there are offices that have such capacity and that are reputed to be issuing patents in appropriate circumstances. A case in point is the Egyptian patent office which conducts substantive examination.[52] Other states such as South Africa have passed policy reforms that are intended to introduce substantive patent examination[53] which will be followed by the necessary legislative reforms.

Most analysis of African IP laws has focused on whether they meaningfully utilise the policy space extended to developing and least-developed countries by the TRIPS Agreement.[54] Generally, such scholarship reaches consensus that this policy space has not been leveraged effectively and many states have prematurely foregone the LDC transition periods available to them and negated viable options to pursue *sui generis* approaches by adopting UPOV.[55] As explained above, in section 2.4, some of this policy space has been narrowed through the adoption of TRIPS-plus provisions in bilateral trade agreements. This is unfortunate because, in most instances, national socio-economic conditions were not yet suitable for full TRIPS implementation, hence the provision of the transition periods in the first place.[56] Therefore, the full transition period would have been better spent improving physical infrastructure and other aspects of their economies. Indeed, it is difficult to say that the early adoption of TRIPS standards has resulted in increased economic development for these states.

[50] Guidelines for Examination at the African Regional Intellectual Property Organization (ARIPO).

[51] Mgbeoji (2013) supra.

[52] UNECA, AU, AfDB & UNCTAD (2019) supra at 120–1.

[53] Department of Trade and Industry Intellectual Property Policy of the Republic of South Africa Phase 1 (2018) para 7.1.2, https://www.gov.za/documents/intellectual-property-policy-south-africa-%E2%80%93-phase-i-2018-13-aug-2018-0000.

[54] Eg, see Ncube *Intellectual Property Policy* (2016) supra at 14–31; Deere (2009) supra; Musungu, Villanueva & Blasetti (2004) supra, S Musungu 'Pharmaceutical Patents, TRIPS Flexibilities and Access to Medicines in SADC' (September 18, 2012) *Report for an SADC Member States Consultation*; FM Abbott *The Doha Declaration on the TRIPs Agreement and Public Health and the Contradictory Trend in Bilateral and Regional Free Trade Agreements* (2004); G Ghidini 'On TRIPS impact on "least developed countries": the effects of a double-standard approach' in G Ghidini, JR Rudolph & PM Ricolfi (eds) *TRIPS and Developing Countries: Towards a New Intellectual Property World Order?* (2014) 132.

[55] Ibid.

[56] CB Ncube *Study on Developing an Intellectual Property Rights (IPR) Framework in the Southern African Development Community* (2017) 11–12.

3.4 African regional IP organisations' frameworks

In addition to the international IP landscape canvassed above in Chapter Two, the African continent has legal instruments and institutions that pertain to the regulation of IP. These come from two main sources, namely those emanating from either the regional IP organisations or regional economic communities. A detailed account of the history and working of these organisations and RECs is not necessary for present purposes and has been provided in other publications.[57] Therefore, only a summary is provided here. There are two African regional IP organisations, namely the African Regional IP Organisation (ARIPO) and the Organisation Africaine de la Propriété Intellectuelle (OAPI). There is also a continental IP organisation, the Pan-African IP Organisation (PAIPO) which has not yet been operationalised, which is considered in section 6.2.1 below. The following sub-sections consider ARIPO and OAPI's mandates and legal instruments.

3.4.1 ARIPO

ARIPO's current membership comprises of 20 states, namely Botswana, eSwatini, Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mauritius, Mozambique, Namibia, Rwanda, São Tomé and Príncipe, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, Zambia and Zimbabwe.[58] Notably some of the largest markets on the continent, such as Nigeria and South Africa, are not members, although both South Africa and Nigeria hold observer status. ARIPO operates on the basis of harmonisation, and, whilst retaining their national instruments and institutions, its members have, at their option, become party to the following protocols, which they then domesticate into their national frameworks:

i Harare Protocol (1982) for the protection of Patents, Industrial Designs and Utility Models;[59]

ii Banjul Protocol (1993) for the protection of Trade Marks and its implementing regulations;[60]

[57] Eg, see Ncube (2018) supra at 409; ES Nwauche 'An evaluation of the African Regional Intellectual Property Rights Systems' (2003) 6(1) *Journal of World Intellectual Property* 101 at 105; Ncube *Intellectual Property Policy* (2016) supra.

[58] ARIPO 'Member states', https://www.aripo.org/member-states/; ARIPO 'Accession of The Republic of Mauritius to the Lusaka Agreement' 25 September 2020, https://www.aripo.org/accession-of-the-republic-of-mauritius-to-the-lusaka-agreement/.

[59] Protocol on Patents and Industrial Designs within the Framework of the African Regional Intellectual Property Organization (ARIPO) adopted on December 10, 1982, at Harare (Zimbabwe), as amended; Regulations for Implementing the Protocol on Patents and Industrial Designs within the Framework of ARIPO, text entered into force on April 25, 1984, as amended.

[60] Banjul Protocol on Marks adopted by the Administrative Council at Banjul, The Gambia, on November 19, 1993 as amended; Regulations for Implementing The Banjul Protocol adopted by the Administrative Council at Kariba, Zimbabwe, on November 24, 1995 as amended.

iii Swakopmund Protocol (2010) for the Protection of Traditional Knowledge and Folklore and its implementing regulations.[61] The party states are Botswana, Malawi, Namibia, Rwanda, Gambia, Liberia, Zambia and Zimbabwe;

iv Arusha Protocol (2015) for the Protection of New Varieties of Plants.[62] This protocol has not yet entered into force as the requisite number of ratification instruments have not yet been filed.[63]

Further, the organisation adopted a Policy Framework on Access and Benefit Sharing Arising from the Use of Genetic Resources in the ARIPO Member States in 2016,[64] the African Agenda on Copyright and Related Rights in 2017,[65] and the ARIPO Model Law on Copyright and Related Rights.[66] It has also published an implementation guide on the Marrakesh Treaty in 2016.[67]

ARIPO provides a centralised administration process for the registration of (1) patents, utility models and industrial design applications on behalf of parties to the Harare Protocol; and (2) trade marks on behalf of parties to the Banjul Protocol. Its member states designate one or more party states for the registration rights. Substantive examination of applications is undertaken for patents and utility designs whilst only pro forma examinations are undertaken for designs and trade marks. No registration of rights is undertaken under the Swakopmund Protocol, although ARIPO maintains a database of protected works.[68]

ARIPO has only recently become active in providing policy guidance to its member states on developmental aspects, as evidenced by these policy instruments adopted

[61] Swakopmund Protocol on the Protection of Traditional Knowledge and Expressions of Folklore Within the Framework of ARIPO adopted by the Diplomatic Conference of ARIPO at Swakopmund (Namibia) on August 9, 2010 as amended; Regulations for Implementing the Swakopmund Protocol on Traditional Knowledge and Expressions of Folklore within the Framework of ARIPO, text entered into force on May 11, 2015, and amended on December 6, 2016.

[62] Arusha Protocol for the Protection of New Varieties of Plants within the Framework of ARIPO, adopted by a Diplomatic Conference of ARIPO at Arusha, (Tanzania) on July 6, 2015; Regulations for Implementing the Arusha Protocol for the Protection of New Varieties of Plants within the Framework ARIPO adopted by the Administrative Council of ARIPO at Lilongwe (Malawi) on November 22, 2017.

[63] ARIPO 'Rwanda takes the lead in joining the Arusha Protocol for the Protection of New Varieties of Plants within the framework of ARIPO' (7 June 2019), https://www.aripo.org/rwanda-takes-the-lead-in-joining-the-arusha-protocol-for-the-protection-of-new-varieties-of-plants-within-the-framework-of-aripo/.

[64] Policy Framework on Access and Benefit Sharing arising from the Use of Genetic Resources in the ARIPO Member States: A Guide for ARIPO Member States, 2016, https://www.aripo.org/wp-content/uploads/2018/11/Policy-Framework-on-ABS.pdf.

[65] ARIPO 'ARIPO holds the Second Symposium on Copyright and Related Rights', https://www.aripo.org/aripo-holds-the-second-symposium-on-copyright-and-related-rights/.

[66] ARIPO 'Model Law on Copyright and Related Rights', https://www.aripo.org/wp-content/uploads/2019/10/ARIPO-Model-Law-on-Copyright-and-Related-Rights.pdf.

[67] ARIPO 'Guidelines for the Domestication of the Marrakesh Treaty, 2016', https://www.aripo.org/wp-content/uploads/2018/12/ARIPO_Guidelines_for_the_Domestication_of_the_Marrakesh_Treaty.pdf.

[68] Administrative Instructions under the Regulations for Implementing the Swakopmund Protocol for the Protection of Traditional Knowledge and Expressions of Folklore within the Framework of ARIPO 2019, https://www.aripo.org/wp-content/uploads/2019/06/Administrative-Instructions_Swakopmund-Protocol-2.pdf.

in 2016 and beyond. Prior to that, member states were getting policy guidance from WIPO and the RECs. As a result of ARIPO's belated issuance of written policy guidance, the approach of its member states to developmental aspects has been varied, and in some cases, sub-optimal, for instance in relation to maximally leveraging TRIPS policy space to enhance access to medicines.[69] Analysis of the UPOV 1991 approach adopted by the Arusha Protocol has also raised developmental concerns about possible negative impacts on African farmers and plant breeders.[70]

3.4.2 OAPI

OAPI's membership consists of Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Republic of Congo, Comoros, Côte d'Ivoire, Gabon, Guinea, Guinea Bissau, Equatorial Guinea, Mali, Mauritania, Niger, Senegal and Togo.[71] Its constitutive instrument, the Agreement relating to the creation of OAPI (Bangui Agreement),[72] is a uniform code for the regulation of intellectual property. A revision of the Bangui Agreement was adopted in 2015,[73] has been in the ratification process and revised annexes came into force on 14 November 2020.[74]

The scope of the Bangui Agreement encompasses the following subject matter covered in ten annexes to the agreement: (i) patents; (ii) utility models; (iii) trade marks and service marks; (iv) industrial designs; (v) trade names; (vi) geographical indications; (vii) literary and artistic property; (viii) unfair competition; (ix) layout designs of integrated circuits; and (x) plant varieties which adopted the 1991 UPOV Convention's approach to protecting plant varieties.[75] Annexes VI, VII, VIII and X were revised in 2015, and the revisions have come into force.[76] This is largely the same scope of coverage of IP rights as addressed by ARIPO, with the notable difference that the Bangui Agreement does not cater for the protection of traditional knowledge, whilst ARIPO does this via its Swakopmund Protocol.

The OAPI Secretariat administers IP rights on behalf of its member states and undertakes both formal and substantive examinations for the registration of

[69] Baker (2019) supra; Musungu, Villanueva & Blasetti (2004) supra at 55–6.

[70] Eg, see P Munyi, B de Jonge & B Visser 'Opportunities and Threats to Harmonisation of Plant Breeders' Rights in Africa: ARIPO and SADC' (2016) 24(1) *African Journal of International and Comparative Law* 86; HM Haugen 'Inappropriate Processes and Unbalanced Outcomes: Plant Variety Protection in Africa Goes Beyond UPOV 1991 Requirements' (2015) 18 *Journal of World Intellectual Property* 196.

[71] OAPI 'Member States', http://www.oapi.int/index.php/fr/oapi/presentation/etats-membres.

[72] Bangui Agreement Relating to the Creation of an African Intellectual Property Organization, Constituting a Revision of the Agreement Relating to the Creation of an African and Malagasy Office of Industrial Property (Bangui (Central African Republic), adopted on 2 March 1977.

[73] Bangui Agreement Revised in Bamako, Mali on 14 December 2015.

[74] OAPI Decision 003/OAPI/PCA 27 October 2020, Décision fixant la date d'entrée en vigueur de certaines annexes de l'Accord de Bangui Acte du 14 décembre 2015, https://oapi.int/Ressources/accord_bangui/03112020/Decision_Accord_Bangui.pdf.

[75] OAPI became a member of the UPOV 1991 Convention in 2014. For an overview of the Revised Bangui Agreement's approach see WR Gazaro 'Plant variety protection: Which system of protection in the member states of OAPI?' (2006) 28 *World Patent Information* 127.

[76] OAPI Decision 003/OAPI/PCA.

rights which are valid across all member states. It undertakes only formal examination for design applications[77] and undertakes substantive examination for patent applications.[78]

Analysis of the OAPI IP framework has found fault with it for the premature abandonment of the LDC transition periods[79] detrimentally affecting public health.[80] For instance, as noted above, the following OAPI member states already provide pharmaceutical patent protection: Benin, Burkina Faso, Chad, Central African Republic, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Togo.[81] Other critiques lament the approach taken to using other flexibilities, including that relating to plant variety protection.[82] The first of these criticisms has been met with the amendment of the Bangui Agreement in 2015, to implement the LDC transition period for the protection of pharmaceutical products for the above listed OAPI member states and the Comoros.[83] However, as noted above, this amendment is yet to come into force. Further, if and when it does come into force, its effect would be to revert from a TRIPS-plus position to one that comports with the minimum standards required of LDCs.

3.4.3 Co-operation and harmonisation between OAPI and ARIPO

Over the last few years, the possibility of harmonisation of the two regional IP organisations has been mooted and the organisations have deepened their co-operation. They co-operate bilaterally and also with other organisations. An example of the latter is their quadripartite co-operation agreement of 1985 with WIPO and the African Regional Centre for Technology.[84] Another example is their tripartite co-operation with WIPO created through a memorandum of understanding (MOU) concluded in 2018.[85] The MOU created the WIPO, ARIPO and OAPI Tripartite Committee which works on capacity building and provides technical assistance.

Bilaterally, they have signed co-operation agreements in 1996, 2005 and 2017 with the last agreement being valid through 2021, as it has a four-year term.[86] The 2017

[77] JFM Zambo 'The Implementation of a Substantive Examination in OAPI's Design Registration System – Lessons from the Japanese Experience' (2018) *JPO Study-Cum Research Fellowship Program,* https://www.jpo.go.jp/e/news/kokusai/developing/training/thesis/document/index/2018_04.pdf.

[78] Issoufou, K 'Effective Utilization of the Patent Cooperation Treaty (PCT) and International Work Sharing Initiatives: Challenges in Examination' (2013), https://www.wipo.int/edocs/mdocs/aspac/en/wipo_reg_pct_tyo_13/wipo_reg_pct_tyo_13_t2l.pdf.

[79] Deere (2009) supra.

[80] Kameni (2015) supra; Adusei (2012) supra at 15.

[81] Adusei ibid.

[82] M Coulibaly, RAB de la Perrière & S Shashikant 'A Dysfunctional Plant Variety Protection System: Ten Years of UPOV Implementation in Francophone Africa' (April 2019) GRAIN Working Paper; Haugen (2015) supra.

[83] ECA, AU, AfDB & UNCTAD (2019) supra at 115.

[84] Ncube *Intellectual Property Policy* (2016) supra at 97.

[85] WIPO 'Memorandum of Understanding between WIPO, ARIPO and OAPI' WO/CC/75/1, Seventy-Fifth (49th Ordinary) Session Geneva, September 24 to October 2, 2018.

[86] ARIPO 'OAPI and ARIPO Sign New Cooperation Agreement' 9 February 2017, https://www.aripo.org/oapi-and-aripo-sign-new-cooperation-agreement/.

co-operation agreement includes a variety of aspects for collaboration, including document and technical information exchange, capacity building programmes, mutual technical assistance and the adoption of common positions on IP matters of relevance to their member states. These matters are attended to in terms of biannual work plans implemented through the OAPI-ARIPO Joint Commission which meets annually.[87] The organisations also agreed to collaborate on the harmonisation of their systems. Whilst general co-operation is both feasible and beneficial, the organisations' harmonisation plans are harder to conceptualise. First, it is not clear how they intend to harmonise as such detail is not publicly available. So one operates in the realm of possibilities put forward by scholars and commentators.[88] It has been suggested that the two organisations could merge into one[89] or simply merge their efforts in relation to specific IP rights such as trade marks.[90] This is because their IP systems are markedly different, with OAPI operating a unified IP system with centralised IPR registration whilst ARIPO operates a harmonised IP system that has a registration system but with its members states' national IP offices also registering rights as explained in section 3.4.1 above. Further, there are important substantive differences in that there are differences in the provisions of the Bangui Agreement and ARIPO's Protocols,[91] and OAPI has adopted some TRIPS-plus provisions with its LDC member states foregoing the LDC transition periods.

3.5 Substantive IP provisions in ARIPO and OAPI instruments

3.5.1 Copyright

Annex VII of the Bangui Agreement sets out copyright protection for OAPI member states. A full overview of the annex will not be given here, but several noteworthy aspects will be highlighted. As already stated, it contains some TRIPS-plus standards, for instance in its provision for a life-plus-70-years term for copyright reckoned with reference to the life of a person and 70 years where the reckoning is not based on a person's lifespan.[92] The recent revision of the annex has reduced the term to the

[87] See for example, ARIPO 'ARIPO-OAPI Fifth Joint Commission Adopts a Revised Work Plan for 2019–2020' (2 August 2019), https://www.aripo.org/aripo-oapi-fifth-joint-commission-adopts-a-revised-work-plan-for-2019-2020/.

[88] Ncube *Intellectual Property Policy* (2016) supra at 121.

[89] T Kongolo 'The African IP organisations – the necessity of adopting one uniform system for all Africa' (2000) 3(2) *The Journal of World Intellectual Property* 265; OH Dean 'A unified intellectual property law system for southern Africa. Part 1: International arrangements and European conventions' (1994) 2(3) *Juta's Business Law* 111; OH Dean 'A unified intellectual property law system for southern Africa. Part 2: Multinational registrations in Africa' (1994) 2(4) *Juta's Business Law* 165.

[90] Y Mupangavanhu 'African Union rising to the need for continental IP protection?' (2015) 59 *Journal of African Law* 1; Y Mupangavanhu 'The integration of trade mark laws in the European Union: lessons for Africa?' (2014) 2 *South African Law Journal* 109; A Adewopo 'Trade mark systems in Africa: A proposal for the harmonization of the ARIPO and the OAPI Agreements on Marks' (2003) 6 *Journal of World Intellectual Property* 473.

[91] Ncube *Intellectual Property Policy* (2016) supra at 120–1.

[92] Arts 22–25 Annex VII Bangui Agreement.

Berne and TRIPS minimum term of life plus 50 years and 50 years.[93] Other notable provisions are its inclusion of 'expressions of folklore'[94] and works derived from folklore as subject matter eligible for copyright.[95] It also contains provisions on the protection and promotion of cultural heritage[96] at arts 67–99, in terms of which protection is to be provided by the state.[97] Article 73 prohibits the following acts 'to denature, destroy, exploit, sell, dispose of or transfer illegally any or a part of the property that makes up the cultural heritage'.

The annex includes the protection of moral rights in art 8, even though the TRIPS Agreement expressly excludes them. However, this would be on the basis of some of its member states being party to the Berne Convention. Articles 11–21 provide for limitations and exceptions for private use, quotations, teaching, reprographic reproduction for libraries and archives, reproduction for judicial and administrative purposes, informatory purposes, use of images permanently located in public places, for computer programs, ephemeral recording by broadcasting organisations, free public performances and imports for personal purposes. Section II of the Annex addresses special contracts. Specifically, art 39 requires that publishing contracts be in writing and states that they are subject to national codes on civil and commercial transactions. Articles 40–42 regulate other aspects of publishing contracts and the obligations of the publisher. Articles 43 and 44 regulate performance contracts and also require that they be in writing. Article 45 sets out the obligations of entertainment promoters, which include the obligation to 'ensure the intellectual and moral rights of the author'.[98]

The annex predates the WCT, WPPT, Beijing Treaty and the Marrakesh Treaty. Therefore, it does not contain any of their standards. However, as stated in Chapter Two, ARIPO has become increasingly active in the copyright space in the last few years and has generated a Guidelines on Audiovisual Contracts (2020); a Model Law on Copyright (2019); an African Agenda on Copyright (2017) and the Marrakesh Treaty Implementation Guidelines (2016).

The Model Law is intended to serve as a template for ARIPO member states' copyright law and is based on the policy decisions reflected in the Agenda on Copyright. The Model Law comprises of nine parts and an annex. Part I entitled

[93] S Hollis, D Luvhimbi & L Mosala 'Annexes to the Revised Bangui Agreement Come Into Force – 14 November 2020' *Mondaq.com,* 24 November 2020, https://www.mondaq.com/southafrica/copyright/1005038/annexes-to-the-revised-bangui-agreement-come-into-force-14-november-2020.

[94] Defined by art 2(xx) as 'the production of characteristic elements of the traditional artistic heritage developed and perpetuated by a community or by individuals recognized as meeting the expectations of such community, and includes folk tales, folk poetry, folk songs and instrumental music, folk dancing and entertainments as also the artistic expressions of rites and productions of folk art.'

[95] Art 5.1(xii) Annex VII Bangui Agreement.

[96] Art 67 Annex VII Bangui Agreement defines cultural heritage as 'all those material or immaterial human productions that are characteristic of a nation over time and space, which relate to (i) folklore; (ii) sites and monuments; (iii) ensembles'.

[97] Art 72 Annex VII Bangui Agreement.

[98] Art 45.2 Annex VII Bangui Agreement.

'Copyright' encompasses works eligible for protection,[99] derivative works,[100] excluded subject matter,[101] economic rights,[102] authorship[103] and moral rights.[104] Part II on related rights consists of provisions on the scope of protection,[105] performer's rights,[106] moral rights of performers and directors;[107] rights of producers of sound recordings;[108] equitable remuneration for performers, producers of sound recordings and performers of audiovisual works[109] and the rights of broadcasting organisations.[110] The provisions on audiovisual works are supplemented by the Guidelines on Audiovisual Contracts published in October 2020. Part III provides for exceptions and limitations and includes private reproduction for personal purposes,[111] temporary reproduction,[112] quotation,[113] educational purposes,[114] reproduction by libraries and archives, educational institutions and museums,[115] reproduction, broadcasting and other communication to the public for information purposes,[116] computer programs,[117] persons with print disabilities,[118] the activities of authorised entities,[119] ephemeral recordings,[120] use for public security and for the performance or reporting of proceedings[121] and caricature, parody and pastiche.[122] Part IV entitled 'General Provisions' addresses ownership,[123] duration of copyright,[124] the public domain[125] and a private copying levy.[126] Assignment, licensing and extended collective licensing are the subject of Part V.[127] Artists' resale right ('droit de suite') and the calculation of royalties for the resale right are

[99] Sec 4.
[100] Sec 5.
[101] Sec 6.
[102] Sec 7.
[103] Secs 8–9.
[104] Sec 10.
[105] Sec 11.
[106] Sec 12.
[107] Sec 13.
[108] Sec 14.
[109] Secs 15 and 17.
[110] Sec 16.
[111] Sec 19.
[112] Sec 20.
[113] Sec 21.
[114] Sec 22.
[115] Sec 23.
[116] Sec 24.
[117] Sec 25.
[118] Sec 26.
[119] Sec 27.
[120] Sec 28.
[121] Sec 29.
[122] Sec 30.
[123] Sec 31.
[124] Sec 34.
[125] Sec 35.
[126] Sec 36.
[127] Secs 37 and 38.

addressed in Part VI[128] and the Annex. Enforcement and limitations on the liability of online service providers are covered by Parts VII[129] and VIII,[130] whilst Part IX contains administrative provisions.[131]

The Model Law contains TRIPS minimum provisions, in relation to various aspects including the term of copyright. Notably, its TRIPS minimum standards approach means that its member states such as Ghana, Mozambique and São Tomé and Príncipe who have adopted terms of life plus 70 are out of step with both international minimum standards and the preferred stance of ARIPO member states. It also contains the provisions of later treaties such as the WCT,[132] WPPT,[133] the Beijing Treaty[134] and the Marrakesh Treaty.[135] With regard to the latter, the Model Law incorporates the provisions recommended in the Marrakesh Implementation Guidelines.

3.5.2 Trade marks and trade names

ARIPO's Banjul Protocol on Marks and its Implementation Regulations are mostly about the application and registration processes for securing a trade mark through the ARIPO Secretariat ('office').[136] All applications are considered 'in accordance with the national laws of a designated state',[137] and the office only carries out a pro forma examination. The protocol does not contain any provisions about the substantive requirements for eligibility for protection as these are contained in national legislation. It only includes provisions as to the duration, renewal and restoration of trade mark registrations[138] and the effect of registration.[139]

Annex III of OAPI's Bangui Agreement on trade marks and service marks is much more detailed than the Banjul Protocol because it contains substantive standards on trade mark protection. It is comprised of eight parts, known as titles, dealing with the following: (i) general provisions,[140] (ii) filing, registration and publication,[141] (iii) renunciation, cancellation and invalidity,[142] (iv) transfer and assignment

[128] Sec 39.
[129] Secs 40–47.
[130] Secs 48–55.
[131] Secs 56–62.
[132] The ARIPO Model Law on Copyright includes definitions based on the WCT, see its drafting notes (footnotes 5 and 7) on the section 1 definitions of 'rights management information' and 'technological protection measures'.
[133] Sec 13 on moral rights of performers and directors, footnote 14.
[134] Ibid. Also see s 17 on equitable remuneration for performers of audiovisual works and drafting note at footnote 15.
[135] Secs 27.
[136] Secs 2–5 Banjul Protocol on Marks, https://www.aripo.org/wp-content/uploads/2018/11/Banjul-Protocol-2019.pdf.
[137] Sec 6.1 Banjul Protocol on Marks.
[138] Sec 7 Banjul Protocol on Marks.
[139] Sec 8 Banjul Protocol on Marks.
[140] Arts 1–7 Annex III Bangui Agreement.
[141] Arts 8–21 Annex III Bangui Agreement.
[142] Arts 22–25 Annex III Bangui Agreement.

of marks and contractual licenses,[143] (v) collective marks,[144] (vi) penalties,[145] (vii) jurisdiction[146] and (viii) transitional and final provisions.[147]

To be eligible for registration, a mark must be a:

> visible sign used or intended to be used and capable of distinguishing the goods or services of any enterprise …, including in particular surnames by themselves or in a distinctive form, special, arbitrary or fanciful designations, the characteristic form of a product or its packaging, labels, wrappers, emblems, prints, stamps, seals, vignettes, borders, combinations or arrangements of colors, drawings, reliefs, letters, numbers, devices and pseudonyms.[148]

This definition is cited in its entirety to show how it differs from the definition in art 15.1 of the TRIPS Agreement,[149] in two main respects. First, it has a longer list of the marks which are eligible for registration than that in TRIPS. Secondly, whilst TRIPS makes the visual perceptibility requirement optional, it is mandatory in the Bangui Agreement.

The provisions in the Bangui Agreement's Annex generally accord with the TRIPS Agreement, although they are, of necessity, more detailed as is to be expected of provisions to be implemented at national level. The Annex provides that marks become collective marks:

> where the conditions for their use are laid down in rules approved by the competent authority and where they may be used only by enterprises of public character, unions or groups of unions, associations, groups of producers, manufacturers, craftsmen or tradesmen, provided that the latter are officially recognized and have legal personality.[150]

Collective marks for goods and services may be owned by 'the State, public companies, unions or groups of unions and associations or groups of producers, manufacturers, craftsmen and tradesmen, provided that they are officially recognized and have legal status'.[151] The Bangui Agreement has a separate annex, Annex V on trade names, which accords with art 8 of the Paris Convention. Well known marks are protected under art 6.

[143] Arts 26–31 Annex III Bangui Agreement.
[144] Art 32 Annex III Bangui Agreement.
[145] Arts 37–46 Annex III Bangui Agreement.
[146] Arts 47–49 Annex III Bangui Agreement.
[147] Arts 50–51 Annex III Bangui Agreement.
[148] Art 2.1 Annex III Bangui Agreement.
[149] Art 15.1 TRIPS Agreement reads:
'Any sign, or any combination of signs, capable of distinguishing the goods or services of one undertaking from those of other undertakings, shall be capable of constituting a trade mark. Such signs, in particular words including personal names, letters, numerals, figurative elements and combinations of colours as well as any combination of such signs, shall be eligible for registration as trade marks. Where signs are not inherently capable of distinguishing the relevant goods or services, Members may make registrability depend on distinctiveness acquired through use. Members may require, as a condition of registration, that signs be visually perceptible.'
[150] Art 2.2 Annex III Bangui Agreement.
[151] Art 32–36 Annex III Bangui Agreement.

3.5.3 Geographical indications

As indicated in Chapter Two, OAPI's Bangui Agreement contains an annex on GIs (Annex VI) and the AU has adopted a Continental Strategy for GIs in Africa. The strategy expressly states that 'GIs do not refer to a particular legal protection measure but encompass both *sui generis* and trade mark legal approaches'.[152] It contains a comprehensive study of the state of protection for geographical indications and classifies states into three categories. These are states with (i) 'complete systems' meaning those that 'have adapted their trade mark legislation to protect geographical names and that also provide for a specific system to protect GIs';[153] (ii) states with 'incomplete systems' meaning those that are WTO members but do not provide the standard and enhanced protection required by the TRIPS Agreement; and (iii) those with no protection at all.

OAPI's Bangui Agreement is identified as a complete system since it provides protection to GIs through collective trade marks and the *sui generis* protection provided in Annex VI.[154] ARIPO does not have an instrument on *sui generis* protection of GIs but some of its members, such as Mozambique and São Tomé, have national laws that provide both trade mark and *sui generis* protection.[155] The continental strategy recommends that the protection of GIs should be included in all EPAs.

3.5.4 Industrial designs

Both the Harare Protocol and Annex IV of the Bangui Agreement provide for industrial designs. Annex IV uses the TRIPS Agreement's protection eligibility criteria and extends protection to new industrial designs.[156] Industrial design protection is not extended to designs that are contrary to public policy or morality.[157] The duration of protection is an initial period of five years,[158] renewable for 'a further two consecutive periods of five years on payment of a renewal fee'.[159]

3.5.5 Patent and utility models

3.5.5.1 *Patents*

ARIPO's Harare Protocol provides for both procedural and substantive aspects of patent protection. The protocol contains the TRIPS patentability requirements of novelty, inventive step and industrial applicability.[160] However, it omits a general comprehensive patentability exclusion clause, as contained in art 27.2–3. of the

[152] African Union *Continental Strategy for GIs in Africa 2018–2023* 1.
[153] AU *Continental Strategy for GIs* at 30.
[154] AU *Continental Strategy for GIs* at 31.
[155] AU *Continental Strategy for GIs* at 32.
[156] Art 2.1 Annex IV Bangui Agreement.
[157] Art 2.4 Annex IV Bangui Agreement.
[158] Art 12.1 Annex IV Bangui Agreement.
[159] Art 12.2 Annex IV Bangui Agreement.
[160] Sec 3(10) Harare Protocol.

TRIPS Agreement. Contracting states therefore provide for such exceptions in domestic patent legislation. The Harare Protocol's only provisions pertaining to subject matter exclusions are in relation to biotechnological inventions.[161] In accordance with the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedures, it also provides for patents for microorganisms.[162] As indicated earlier, this chapter's focus is on the substantive provisions. Suffice it to note that the ARIPO Office carries out both formal and substantive examination of patent applications.[163] Where the application is found to be substantively sound, designated state parties are given an opportunity to indicate to ARIPO whether the patents would not be valid in their territory.[164] After the expiry of the six-months period within which states must make this indication, the ARIPO Office will grant the application.[165]

In OAPI, Annex I of the Bangui Agreement similarly provides for procedural and substantive aspects of patent protection. It contains the same patentability criterion of novelty, inventive step and industrial applicability.[166] The Annex provides for exclusions to patentability in art 6. This is necessary because OAPI's unitary IP system requires comprehensive coverage of all patent law aspects in the Bangui Agreement because member states rely on it for the bulk of their IP laws.

The Annex also provides for compulsory licenses for non-working[167] and for dependent patents,[168] which may be appealed by the holder of the senior patent.[169] *Ex officio* licenses may be granted where the relevant patent 'is of vital interest to the economy of the country, public health or national defense, or where non-working or insufficient working of such patents seriously compromises the satisfaction of the country's needs'.[170] This is achieved by the passing of an 'administrative enactment' subjecting the patent to the non-voluntary license regime by the relevant ministry in member states.[171] The enactment would detail all relevant information such as 'the beneficiary administration or organisation, the conditions, term and scope of the non-voluntary license and the amount of royalties payable'.[172] A civil court would be approached to determine the conditions of the *ex officio* license, in the event that the patent holder and the ministry fail to agree on them.[173] The exclusion of importation from these compulsory license provisions makes them TRIPS-plus in

[161] Rule 7bis(1)(c) Regulations for Implementing the Protocol on Patents and Industrial Designs within the Framework of ARIPO 1984.
[162] Sec 3(1)(b) Harare Protocol.
[163] Sec 3(2)(a) and (3) Harare Protocol.
[164] Sec 3(6) Harare Protocol.
[165] Sec 3(7) Harare Protocol.
[166] Art 2.1 Annex I Bangui Agreement, expounded in arts 3–5.
[167] Art 46 Annex I Bangui Agreement.
[168] Art 47 Annex I Bangui Agreement.
[169] Art 53 Annex I Bangui Agreement.
[170] Art 56.1 Annex I Bangui Agreement.
[171] Art 56.1 Annex I Bangui Agreement.
[172] Art 56.1 Annex I Bangui Agreement.
[173] Art 56.2 Annex Bangui Agreement.

character, because they exclude 'the possibility of parallel importation as a means to obtain access to patented technology such as pharmaceuticals'.[174]

Much scholarship and commentary has focused on the implementation of flexibilities by African states individually or collectively through the positions or approaches of RECs or the regional IP organisations. As indicated above, the regional IP organisations' approach to flexibilities has been criticised for being sub-optimal, for instance in relation to maximally leveraging TRIPS policy space to enhance access to medicines.[175] The RECs' IP instruments set out below in section 3.6 are primarily with regard to patent related flexibilities, and analysis has focused on the implementation of TRIPS flexibilities since this has been their chosen area of focus.[176]

3.5.5.2 *Utility models*

Both the Harare Protocol and the Bangui Agreement (Annex II) provide for utility models. Article 1 of the Annex II of OAPI's Bangui Agreement provides as follows:

> Within the meaning of this Annex, utility models protected by registration certificates granted by the Organization shall be implements of work or objects to be utilized or parts of such implements or objects in so far as they are useful for the work or employment for which they are intended on account of a new configuration, a new arrangement or a new component device, and are industrially applicable.

In contrast s 3ter of the Harare Protocol provides the following, much longer and more detailed definition:

> any form, configuration or disposition of elements of some appliance, working tools and implements as articles of everyday use, electrical and electronic circuitry, instrument, handicraft, mechanism or other object or any part thereof in so far as they are capable of contributing some benefit or new effect or saving in time, energy and labour or allowing a better or different functioning, use, processing or manufacture of the subject matter or that gives utility advantages, environmental benefit, and includes microorganism or other self-replicable material, products of genetic resources, herbal as well as nutritional formulations which give new effects.

The requirements for protection are the same, namely novelty and industrial applicability.[177] The Harare Protocol does not provide for 'compulsory licences, forfeiture or the use in the public interest of registered utility models' and these

[174] Ncube *Intellectual Property Policy* (2016) supra at 115; Musungu, Villanueva & Blasetti (2004) supra at 55.

[175] Baker (2019) supra; Musungu, Villanueva & Blasetti (2004) supra at 55–6.

[176] EFM t'Hoen, T Kujinga & P Boulet 'Patent challenges in the procurement and supply of generic new essential medicines and lessons from HIV in the southern African development community (SADC) Region' (2018) 11 *Journal of Pharmaceutical Policy and Practice* 31, https://doi.org/10.1186/s40545-018-0157-7; C Banda 'Intellectual property and access to essential pharmaceuticals: Recent law and policy reforms in the Southern Africa Development Community region' (2016) 31(1) *Maryland Journal of International Law* 44.

[177] Sec 3ter(2) Harare Protocol.

aspects are left to member states.[178] A utility model registered by the ARIPO Office is subject to the national provisions in each designated state on these aspects. As is to be expected, due to the nature of the OAPI system, Annex II is much more detailed, providing for exclusions from protection by utility models[179] and exceptions.[180] Notably, these exceptions include 'experimental use of a utility model in the course of scientific and technical research'. This is of significance to the book's subject matter.

3.5.6 Integrated circuits

ARIPO does not have an instrument on layout designs and its member states provide protection under national law. Annex IX of the Bangui Agreement provides protection for layout-designs (topographies) of integrated circuits. Protection is extended to original layout designs[181] that have 'not yet been commercially exploited or, if commercially exploited, for not more than two years anywhere in the world'.[182] A layout design will be original 'if it is the result of its creator's own intellectual effort and is not commonplace among creators of layout-designs and manufacturers of integrated circuits'. [183] Article 5 provides for the same protection provided for in the TRIPS Agreement, for a ten-year term,[184] and art 6 provides for exceptions, which include 'reproduction for private purposes or for the sole purpose of evaluation, analysis, research or teaching'.[185] Compulsory licenses are provided for by arts 25–31 and ex-officio licenses granted to a public body or a third party are provided for by art 32. The rest of the Annex covers diverse aspects including licensing contracts.[186]

3.5.7 Trade secrets instruments

ARIPO does not have an instrument on unfair competition and members regulate it under national law. Annex VIII of the Bangui Agreement provides for protection against unlawful competition. Its art 6.1 provides that

> any act or practice which, in the course of industrial or commercial activities, leads to the disclosure, acquisition or use by third parties of confidential information without the consent of the person legally entitled to possess such information (hereinafter referred to as 'the lawful holder'), in a manner contrary to honest commercial practice, shall constitute an act of unfair competition.

[178] Sec 3ter(13) Harare Protocol.
[179] Arts 4.1–4.2 Annex II Bangui Agreement.
[180] Art 9 Annex II Bangui Agreement.
[181] Art 2.1 Annex IX Bangui Agreement.
[182] Art 2.2 Annex IX Bangui Agreement.
[183] Art 3.1 Annex IX Bangui Agreement.
[184] Art 7 Annex IX Bangui Agreement.
[185] Art 6.1 Annex IX Bangui Agreement.
[186] Art 20 Annex IX Bangui Agreement.

The Annex contains the TRIPS criteria for protection.[187] It also provides the requisite protection for undisclosed test or other data.[188]

3.5.8 *Sui generis* types of protection in Africa

Sui generis or unique protection is needed when conventional IP protection is unsuited to the knowledge and work in question. For example, *sui generis* protection has been provided for databases in the EU,[189] TK and traditional cultural expressions (TCE) in several parts of the world. Although a persuasive case has been made for *sui generis* protection for computer programs,[190] it has not been crafted.[191] This section will focus on *sui generis* for TK and TCEs because they are the most contentious and are of importance to Africa because it is very rich in both.

Ample evidence and arguments have shown that IP laws are ill-suited to TK and TCEs on several grounds,[192] only two of which will be summarised here. First, IP is fundamentally premised on the concept of private creation and ownership of works, for instance as shown by copyright law's conceptualisation of the individual author or a fairly limited concept of joint authorship that was not conceived for community-based authorship and ownership. Patent law's concept of inventorship also exhibits the same lack of suitability for community inventorship. Second, TK and TCEs do not readily meet IP's requirements for protection. To illustrate, copyright protects original works created by a person eligible for protection on the basis of citizenship or domicile, or first published in the jurisdiction in question, that are fixed in material form through writing or recording for example. WTO member states have varying standards for originality as noted above. Be that as it may, TK and TCEs do not meet the originality and material fixation requirements.

[187] Art 6.3 Annex VIII Bangui Agreement.

[188] Art 6.4 Annex VIII Bangui Agreement.

[189] Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, 1996 O.J. (L77) 20; JH Reichman 'Database Protection in a Global Economy' (2002) *La R.I.D.E.: Revue Internationale de Droit Economique* 455.

[190] VN Vasudeva 'A Relook at Sui Generis Software Protection Through the Prism of Multi-Licensing' (2013) 16(1–2) *Journal of World Intellectual Property* 87; Pamela Samuelson 'The Uneasy Case for Software Copyrights Revisited' (2011) 79 *George Washington Law Review* 1746; CB Ncube 'Equitable Intellectual Property Protection of Computer Programs in South Africa: Some Proposals for Reform' (2012) 3 *Stellenbosch Law Review* 438.

[191] WIPO 'Copyright Protection of Computer Software', https://www.wipo.int/copyright/en/activities/software.html.

[192] CB Ncube 'Sui Generis Legislation for the Protection of Traditional Knowledge in South Africa: An Opportunity Lost' in CB Ncube & EWJ du Plessis *Indigenous Knowledge & Intellectual Property* (2016) 29 at 34; L-A Tong 'Does the Intellectual Property system offer adequate protection for traditional knowledge?' in H Klopper, T Pistorius, B Rutherford, L-A Tong, A van der Merwe & P van der Spuy (eds) *Law of Intellectual Property in South Africa* (2010) 375; Y Daya & N Vink 'Protecting traditional ethno-botanical knowledge in South Africa through the intellectual property regime' (2006) 45(3) *Agrekon* 319; A van der Merwe 'Can Traditional Knowledge be effectively covered under a single "umbrella"?' (2010) 13(4) *Potchefstroom Electronic Law Journal* 1 at 2; CA Masango 'Indigenous traditional knowledge protection: prospects in South Africa's intellectual property framework?' (2010) 76(1) *South African Journal of Libraries and Information Science* 74.

In the context of patents, TK, because of its long generational history, generally lacks novelty and due to its non-technical character cannot fulfil the inventive step requirement. Consequently, the creation of a *sui generis* system of protection for TK and TCEs is essential. There are various models for such protection, a few examples of which will be given.

At global level, the WIPO Intergovernmental Committee on IP and Genetic Resources, Traditional Knowledge and Folklore (IGC) has been working on a binding text for the protection for TK, TCEs and genetic resources since 2000[193] and its work has been the focus of extensive scholarship and commentary.[194] However, it is yet to generate any normative instruments. In Africa, the continental initiative is the African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources.[195] ARIPO's Swakopmund Protocol on the Protection of Traditional Knowledge and Expressions of Folklore[196] is a noteworthy normative instrument. Unlike the AU Model Law, which is non-binding, the Swakopmund Protocol has binding force on its contracting states.

At national level, two regulatory approaches to the protection of TK and TCEs are evident,[197] namely (1) reliance on existing IP legislation, and (2), which is of interest to this section, the creation of new types or forms of existing regulation such as '*sui generis* IPR- or non-IPR-related systems'.[198] In some jurisdictions, other regulatory frameworks are also drawn upon to complement the protection of TK and TCEs,

[193] WIPO 'The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore' (2015) *Background Brief No. 2*. Also see WIPO 'Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore'.

[194] Eg, see C Oguamanam 'Understanding African and Like-Minded Countries' Positions at WIPO-IGC' (2020) 60(2) *IDEA* 151; DF Robinson, A Abdel-Latif, & P Roffe *Protecting Traditional Knowledge: The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore* (2019); V Gordon 'Appropriation without representation? The limited role of indigenous groups in WIPO's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge, and Folklore' (2014) 16(3) *Vanderbilt Journal of Entertainment and Technology Law* 629.

[195] Council of Ministers of the Organization of African Unity, *African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources* (2001). For commentary see L Ferris 'Protecting Traditional Knowledge in Africa – Considering African Approaches' (2004) 4(2) *African Human Rights Journal* 242; P Kuruk 'The Role of Customary Law under Sui Generis Frameworks of Intellectual Property Rights in Traditional and Indigenous Knowledge' (2007) 17 *Indiana International & Comparative Law Review* 67 at 71–72; P Munyi, MT Mahop, P du Plessis, J Ekpere & K Bavikatte *A Gap Analysis Report on the African Model Law on the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources* (2012).

[196] For commentary see L Ngombe 'The Protection of Folklore in the Swakopmund Protocol Adopted by the ARIPO' (2011) 14(5) *Journal of World Intellectual Property* 403; ML Nkomo 'South Africa's proposed Intellectual Property Law: the need for improved regional cooperation' (2012) 46 *Comparative and International Law Journal of Southern Africa* 257.

[197] G Dutfield 'Developing and Implementing National Systems for Protecting Traditional Knowledge: Experiences in Selected Developing Countries' in S Twarog & P Kapoor (eds) *Protecting and Promoting Traditional Knowledge: Systems, National Experiences and International Dimensions* (UN 2004) 141 at 146.

[198] Dutfield (2004) ibid.

such as customary law, unfair competition and contractual arrangements.[199] Under the second approach, non-IPR-related systems include biodiversity regulatory frameworks.

Examples of *sui generis* national legislation in Africa, all enacted during the period 2016–2019, include Kenya's Protection of Traditional Knowledge and Cultural Expressions Act,[200] Zambia' s Protection of Traditional Knowledge, Genetic Resources and Expressions of Folklore Act[201] and South Africa's Protection, Promotion, Development and Management of IK Systems Act.[202] The above examples show that jurisdictions have been crafting *sui generis* protection for TK and TCEs prior to the establishment of the WIPO IGC in 2000 and are continuing to do so, whilst the IGC's work, which has now spanned two decades, continues.

3.6 RECs IP instruments

A significant role exists for RECs in the IP space, specifically to provide guidance and support for the design of 'nationally appropriate IP policies' and 'robust national IP offices' which will enable the 'transfer and dissemination of technology for the development of local industries'.[203] As stated in Chapter One, Agenda 2063 carries forward the AU's goal to create the African Economic Community (AEC), a major step of which will be the creation of the AfCFTA which will be constituted by the eventual amalgamation of eight RECs.[204] As indicated in Chapter One, these eight RECs are AMU/UMA, COMESA, CEN-SAD, EAC, ECCAS/CEEAC, ECOWAS, IGAD and SADC.

The RECs derive their IP mandate from their constitutive agreements, or trade-related protocols. However, for the most part, they have not adopted any IP-specific regulatory instruments. As is evident from the list of their dates of establishment given in Chapter One, five of the eight RECs shortlisted to constitute the AEC predate the TRIPS Agreement. Since the coming into force of the TRIPS Agreement, some of the RECs have been actively assisting their members to be TRIPS compliant. Unlike the regional IP organisations, the RECs' approach is founded on a trade and regional integration context.[205] The following IP initiatives have emanated from some of these RECs.

[199] Dutfield (2004) ibid.

[200] Protection of Traditional Knowledge and Cultural Expressions Act, 2016 (No. 33 of 2016) (Kenya).

[201] Protection of Traditional Knowledge, Genetic Resources and Expressions of Folklore Act, 2016 (No. 16 of 2016) (Zambia).

[202] Protection, Promotion, Development and Management of Indigenous Knowledge Act 6 of 2019 (South Africa).

[203] Syam & Tellez (2016) supra at 41.

[204] Art 5(b) of the AfCFTA Agreement; Ncube *Intellectual Property Policy* (2016) supra at 73–6.

[205] Musungu, Villanueva & Blasetti (2004) supra at 55–6.

COMESA,[206] EAC[207] and ECOWAS[208] have crafted regional IP policies with extensive reach across the continent. The combined membership of these RECs is 35 states, taking into account the significant membership overlap between COMESA and the EAC. Only Tanzania is not a member of both COMESA and the EAC, the other four EAC members are also members of COMESA.

Article 104(1)(d) of the COMESA Treaty[209] provides for information sharing on 'legislation on patents, trade marks and designs'. Further, art128(e) provides that:

> In order to promote co-operation in science and technology development, the member States agree to jointly develop and implement suitable patent laws and industrial licensing systems for the protection of industrial property rights and encourage the effective use of technological information contained in patents.

This article is quoted to show the express linkage that COMESA member states make between IP and science and technology. Flowing from this mandate in its Treaty, COMESA has adopted a Regional Policy on IP rights and Cultural Industries (COMESA IP Policy). Part A, entitled 'COMESA Policy on Intellectual Property Rights' expressly addresses IP and economic development,[210] as well as IP and trade.[211] It also considers industrial property and encourages member states 'to utilize and exploit to the full the flexibilities provided in IP international treaties such as the Doha Declaration on the TRIPS Agreement and Public Health so as to facilitate access to medicines for all people particularly the marginalised of society'.[212] Another noteworthy provision, in the context of regional integration and trade, is the agreement to 'promote harmonization of industrial property legislation within the COMESA in view of the establishment of the Custom Union'.[213] Part B entitled 'The COMESA Policy on copyright and copyright related policies' then addresses copyright extensively. Of particular interest to this section is its assertion that the main copyright policy objective is to 'encourage and promote copyright protection for socio-economic development within the COMESA member States, recognising that copyright is a major component of intellectual property'.[214] In 2011, COMESA finalised Guidelines for Preparing a National IP Policy in accordance with this policy to assist its member states to domesticate the regional policy approach.[215]

[206] COMESA's 19 member states are: Burundi, Comoros, Congo, Dem Rep., Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, eSwatini, Uganda, Zambia and Zimbabwe.

[207] EAC's 5 member states are: Burundi, Kenya, Rwanda, Tanzania and Uganda.

[208] ECOWAS' 15 member states are: Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

[209] Treaty Establishing the Common Market for Eastern and Southern Africa (1993).

[210] At paras 11–14.

[211] At paras 15–20.

[212] Para 39(d).

[213] Para 39(e).

[214] Part B para 8.

[215] COMESA Official Gazette para 90(f); COMESA Report para 249.

The Treaty for the Establishment of the EAC (EAC Treaty)[216] also makes the express link between IP, science and technology and economic developments in art 103(1)(i) which reads:

> Recognising the fundamental importance of science and technology in economic development, the Partner States undertake to promote co-operation in the development of science and technology within the Community through: the harmonisation of policies on commercialisation of technologies and promotion and protection of intellectual property rights.

Based on this article and the mandate to secure the health of its citizenry in art 118 the EAC adopted a Regional IP Policy on the Utilisation of Public Health-Related WTO-TRIPS Flexibilities and the Approximation of National Intellectual Property Legislation.[217] It provides guidance on how EAC member states may effectively domesticate and implement TRIPS Flexibilities through 11 policy statements.[218] The EAC also published a draft Policy on Anti-Counterfeiting, Anti-Piracy and Other IPRs Violations and a draft Anti-Counterfeit Bill, 2010. Had they been adopted and implemented, it would have led to incoherence with the TRIPS Flexibilities Policy due to their impact on the production and distribution of generic medication in the region.[219] These were, however, not adopted and EAC partner states' legislation based on them was successfully challenged in courts.[220] The draft East African Regional IP Policy has been recently validated.[221]

ECOWAS' West African Health Organisation (WAHO) drafted the ECOWAS TRIPS Policy and Implementation Guidelines,[222] which were adopted in 2012. The policy's guidelines seek to enhance access to essential medicines through the provision

[216] Treaty for the Establishment of the East African Community, Adopted on November 30, 1999 at Arusha, Tanzania. Entry into force on July 7, 2000 (as amended) 2144 UNTS 255.

[217] EAC Regional Intellectual Property Policy on the Utilisation of Public Health-Related WTO-TRIPS Flexibilities and the Approximation of National Intellectual Property Legislation, 2013, http://repository.eac.int/handle/11671/1847.

[218] For analysis, see Soyeju & Wabwire (2018) supra; Ncube *Intellectual Property Policy* (2016) supra at 14–29.

[219] Syam & Tellez (2016) supra at 42–43; UNCTAD and UNIDO *TRIPS Flexibilities and Anti-Counterfeit Legislation in Kenya and the EAC: Implications for Generic Producers* (2016) 9; EQUINET 'Anti-counterfeiting laws and access to essential medicines in East and Southern Africa' *EQUINET Policy Brief Number 22*; SF Musungu 'The Potential Impact of the Proposed East African Community (EAC) Anti-Counterfeiting Policy and Bill on Access to Essential Medicines' (March 2010) *UNDP BDP HIV Practice/March 2010 Discussion Paper*.

[220] *Patricia Asero Ochieng, Maurine Atieno and Joseph Munyi v The Republic* (in the High Court of Kenya, 20 April 2012 Petition No. 409 of 2009), http://kelinkenya.org/wp-content/uploads/2012/04/Judgment-Petition-No-409-of-20092.pdf; J Nyachae & P Ogendi 'Anti-counterfeiting and access to generic medicines in Kenya: Reviewing Patricia Osero Ochieng & 2 Others v Attorney General (2012)' (2012) 13(3) *ESR Review: Economic and Social Rights in South Africa* 12.

[221] EAC Press Release: 'Regional Stakeholder Workshop on EAC Regional Policy for Intellectual Property (IP) set for 25th September 2018 in Nairobi, Kenya, 24 September 2018, https://www.eac.int/press-releases/1222-regional-stakeholder-workshop-on-eac-regional-policy-for-intellectual-property-ip-set-for-25th-september-2018-in-nairobi,-kenya.

[222] Guidelines for Implementation of TRIPS Flexibilities in National Legislation to Improve Access to Medicines in the West African Region, 2012.

of advice on how ECOWAS member states may best use TRIPs flexibilities.[223] The guidelines were based on a review of member states' legislation as are the very specific recommendations pertaining to:

1 The protection of test data in a way that 'should not unreasonably prevent or hamper the development of generic medicines'.[224]
2 The inclusion of the experimental (research) and Bolar exceptions in national law which permit the exercise of certain rights by a third party in relation to a valid patent to enable the third party to obtain regulatory approvals.[225]
3 The requirement of patent application disclosure provisions for the 'best mode' of implementation of the relevant invention.[226]
4 The exclusion of 'the extension of existing patents and patenting of trivial and/or non-efficacious variants of existing chemical substances. Product derivatives of a known chemical substance should be patentable only if, when compared to the original substance, they show significant improvements in therapeutic efficacy.'[227]
5 The inclusion of international exhaustion in national law.[228]
6 The domestication of TRIPS art 31(b) and (k).[229]

SADC locates its IP initiatives within its Protocol on Trade, art 23 of which states that member states shall 'adopt policies and implement measures within the Community for the protection of Intellectual Property Rights, in accordance with the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)'. Other relevant SADC instruments include the Protocol on Health,[230] the Industrialization Strategy and Road Map (2015–2063), the Revised Regional Indicative Strategic Development Plan (RISDP 2020–2030) and the Protocol on STI. One of the objectives of the Protocol on STI is to 'enhance and strengthen the protection of intellectual property rights'.[231]

An audit of SADC activities in 2012 noted that its IPR related activities were limited and recommended the following:[232]

> … in order to jump-start SADC work on IPR, strong capacity building initiatives are required to encourage aims which could include among others: (1) Establishment of detailed information regarding Member States' progress in implementation of TRIPS; (2) Establishment of Member States' needs in capacity building in the area; (3) Drafting of a work program for the future work

[223] ECOWAS TRIPS Policy at 11–12.
[224] ECOWAS TRIPS Policy at 25–6.
[225] ECOWAS TRIPS Policy at 28.
[226] ECOWAS TRIPS Policy at 28.
[227] ECOWAS TRIPS Policy at 30.
[228] ECOWAS TRIPS Policy at 32.
[229] ECOWAS TRIPS Policy at 37.
[230] Protocol on Health in SADC, 1999.
[231] Art 2(m) of the SADC Protocol on Science, Technology and Innovation, 2008.
[232] Southern Africa Trade Hub *Technical Report: 2012 Audit of the Implementation of the SADC Protocol on Trade* (2012) at 99.

regarding IPR. SADC work on IPR should focus on implementation of the TRIPS flexibilities through a comprehensive review of laws, policies and capacities to support implementation of IPR regulation.

SADC has been engaged in several strategies to enhance its work on TRIPS flexibilities[233] under the mandate of its Protocol on Health, 1999, which include a Pharmaceutical Business Plan 2007–2013[234] and a Strategy for Pooled Procurement of Essential Medicine and Health commodities 2013–2017.[235] In view of the relevance of IP to trade and its initiatives,[236] the built-in agenda on IP and the audit review of its activities, SADC embarked on a process to draft and adopt IPR Framework and Guidelines[237] for its member states. These were considered by the SADC Ministers Responsible for Education & Training, Science, Technology and Innovation in 2018.[238] The draft guidelines appear to have not yet been adopted, as there is no public record of such adoption.

Analysis and reviews of the RECs' IP initiatives has focused on the Implementation of TRIPS Flexibilities since this has been the RECs' chosen area of focus.[239] As is apparent from the above overview, COMESA, EAC and SADC have been the most active in relation to IP. Therefore, it comes as no surprise that they have included it in their Tripartite FTA, which is discussed in the following subsection.

3.6.1 COMESA-EAC-SADC Tripartite FTA

As noted in Chapter One, to resolve the challenges posed by overlapping REC memberships, the AU began a rationalization process and the creation of a Tripartite FTA, with preparations for the latter dating back to 2008.[240] The COMESA-EAC-SADC Tripartite FTA Agreement was signed and opened for signature simultaneously

[233] SADC 'The SADC Pharmaceutical Programme', available at https://www.sadc.int/themes/health/pharmaceuticals/.

[234] SADC Pharmaceutical business plan 2007–2013 (2007), available at http://apps.who.int/medicinedocs/documents/s19282en/s19282en.pdf.

[235] SADC 'Strategy for pooled procurement of essential medicines and health commodities, 2013–2017' (2013).

[236] ML Nkomo 'Regional integration in the area of intellectual property: the case for Southern African Development Community involvement' (2014) 18 *Law, Democracy and Development* 317 at 324.

[237] M Sibanda & CB Ncube *Draft SADC IPR Framework and Guidelines 2018*; CB Ncube (2017) supra; UNECA & SADC 'Opportunities and Challenges in Using Intellectual Property (IP) Systems to Strengthen Regional Cooperation through Policy Harmonization in SADC', https://repository.uneca.org/bitstream/handle/10855/22686/b11546864.pdf?sequence=1&isAllowed=y.

[238] SADC Secretariat 'SADC Ministerial Meeting Statement: Joint meeting of the SADC Ministers Responsible for Education & Training, Science, Technology and Innovation 22 June 2018 Zimbali Resort, Durban South Africa', https://www.sadc.int/files/4415/2972/9961/Statement_-_Joint_meeting_for_Ministers_Responsible_for_Education_and_Science_and_Innovation.pdf.

[239] Hoen, Kujinga & Boulet (2018) supra; Banda (2016) supra.

[240] Ismail (2014) supra at 6–7.

with the launch of the Tripartite FTA by the Sharm El Sheikh Declaration of 2015.[241] As of 22 September 2020, only Libya, Eritrea and South Sudan have not yet signed the Declaration.[242] As at the same date, the Agreement has been signed by 22 member countries namely Angola, Botswana, Burundi, Comoros, Democratic Republic of Congo (DRC), Djibouti, Egypt, Kenya, Libya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, South Africa, Sudan, eSwatini, Tanzania, Uganda, Zambia and Zimbabwe.[243] The agreement requires 14 ratifications to enter into force and only 8 countries have so far ratified it, namely Botswana, Burundi, Egypt, Kenya, Namibia, Rwanda, South Africa and Uganda.[244]

The position taken on IP in the COMESA-EAC-SADC Tripartite is very significant because it reflects the consolidated position of 26 AU members, which is more than 50% of the AU members participating in the AfCFTA negotiations.[245] Like AfCFTA negotiations, the Tripartite placed IP in the second phase of negotiations. Regarding IP, art 27 of the Tripartite Agreement provides:

1. Tripartite member States shall protect intellectual property rights in a balanced manner that promotes the social economic welfare of society through ensuring that the people of the region meaningfully benefit from and participate in advancements in the arts and science and technology in accordance with Annex 9 on Intellectual Property Rights.
2. Tripartite member States shall adopt policies on intellectual property rights including the protection and promotion of cultural industries in accordance with international agreements.
3. Tripartite member States shall cooperate and develop capacity to implement and utilise the flexibilities in all relevant international agreements on intellectual property rights.

The matters that had been flagged for possible inclusion in Tripartite IP negotiations are:[246] (a) the adoption of a regional IP exhaustion regime and the ratification of the TRIPS amendment to facilitate use of the regional mechanism for re-exportation of products produced or imported under a compulsory license within the regional market; (b) drafting and adopting a Tripartite regional policy, informed by the EAC Regional IP TRIPS Flexibilities Policy and the consideration of whether to endorse the Nairobi Statement on Investment in Access to Medicines, or adopting similar commitment; (c) crafting of a regional PBR regime within the realm of what is

[241] The Agreement establishing the COMESA-EAC-SADC Tripartite FTA and the Sharm El Sheikh Declaration Launching the COMESA-EAC-SADC Tripartite FTA were signed and adopted by the Heads of State and Government or duly Authorised Representatives of the Member States of COMESA, EAC and SADC at Sharm El Sheikh, the Arab Republic of Egypt on 10 June 2015; Communiqué of the Third COMESA-EAC-SADC Tripartite Summit; all available at https://www.eac.int/documents/category/comesa-eac-sadc-tripartite.

[242] Tralac SADC-EAC-COMESA *Tripartite Free Trade Area Legal Texts and Policy Documents*, https://www.tralac.org/resources/our-resources/4856-sadc-eac-comesa-tripartite-free-trade-area-legal-texts-and-policy-documents.html.

[243] Ibid.

[244] Ibid.

[245] UNECA 'Synergies between the AfCFTA and Tripartite FTA will benefit Africa's traders and consumers, says ECA Chief' (2018), https://www.uneca.org/stories/synergies-between-afcfta-and-tripartite-fta-will-benefit-africa%E2%80%99s-traders-and-consumers-says.

[246] ECA, AU, AfDB & UNCTAD (2019) supra at 109.

possible in view of the membership of UPOV by OAPI member states, Kenya, Morocco, South Africa, Tunisia and Tanzania, all of whom are members of UPOV 1998, with the exception of South Africa which is a member of UPOV 1978;[247] (d) considering a commitment for all partner states to ratify the Marrakesh Treaty; (e) considering a commitment for a mandatory disclosure requirement regarding the use of genetic resources and associated traditional knowledge in patent and PBR laws; (f) considering a Tripartite agreement or position that stipulates that measures in accordance with the WHO Framework Convention on Tobacco Control FCCT do not constitute an expropriation of IP assets nor an infringement of IP rights; and (g) considering commitment and mechanism for cooperation in patent examination to overcome some of the capacity and resource constraints that affect partner states.

Phase 2 of the Tripartite was expected to generate a consolidated position on IP that would be taken forward to AfCFTA IP Protocol negotiations. However, the reality is that AfCFTA phase 2 negotiations will now commence whilst the Tripartite phase 2 negotiations have not yet been concluded. Therefore, the anticipation that the Tripartite would generate positions to be taken in AfCFTA negotiations has not materialized and it appears that AfCFTA phase 2 negotiations may even be completed whilst the Tripartite negotiations lag behind. Therefore, it has been suggested that, to leverage the AfCFTA negotiations on phase two, it might be both more economical and efficient for the Tripartite partners to adopt the AfCFTA phase 2 outcomes.[248] That is to say, the phase 2 negotiations should be consolidated.

3.7 Conclusion: African IP instruments and international minimum standards

This chapter has set out minimum standards of IP protection and highlighted some noteworthy aspects of continental, regional and national instruments that apply to African states. African IP instruments pertaining to patents have focused exclusively on TRIPS flexibilities. Here, the IP organisations have fallen behind and leadership has been assumed by the RECs which have passed policies to guide their member states' domestic policymaking and legislative efforts. In relation to copyright the IP organisations have been more visible and both of them have adopted instruments, with the distinction that ARIPO's copyright instruments are non-binding, being in the form of a Model Law, an Agenda and Guidelines, whilst OAPI's Annex on Copyright is binding. As indicated above, for the most part ARIPO's instruments retain TRIPS standards and its copyright model law includes standards from other IP multilateral treaties. COMESA also has a policy that addresses copyright, which maintains TRIPS minimum standards.

The TRIPS Agreement provides some flexibility for the type of protection provided for plant varieties and both organisations have adopted the heavily critiqued UPOV 1991 approach. However, ARIPO's Arusha Protocol has not yet entered into force.

[247] UPOV (2020) supra.
[248] ECA, AU, AfDB & UNCTAD (2019) supra at 109.

As mentioned above, the AU adopted a Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources in 2000, which is a *sui generis* approach. The TRIPS Agreement does not address the protection of TK and work is still ongoing at WIPO IGC on an appropriate normative instrument. This leaves a gap for African states to take the lead and set their own approach. OAPI provides copyright protection for expressions of folklore but ARIPO provides for *sui generis* protection in its Swakopmund Protocol. As stated above, Kenya, South Africa and Zambia have enacted *sui generis* legislation.

Chapter 4

SCIENCE, TECHNOLOGY AND INNOVATION AND SUSTAINABLE DEVELOPMENT

4.1 Introduction

This chapter further considers the relationship between STI and sustainable development, with a focus on the creation of an enabling framework. As indicated in Chapter One, STI is a major component of the African Development Agenda, as expressly stated in the Common African Position. It is reflected in the Agenda 2063 aspirations, goals and priority areas, for instance, in the quest for 'well educated citizens and skills revolution underpinned by science, technology and innovation' (goal 1) and transformed economies (goal 3) with their affiliated priority areas of 'education and STI driven skills revolution' and 'STI driven manufacturing, industrialization and value addition'. STISA-2024 aligns with and is a strategic ten-year implementation framework for the realisation of these goals, with the over-arching mission and objective of 'accelerat[ing] Africa's transition to an innovation-led, knowledge-based economy'.[1] The chapter seeks to discuss these goals and their implementation. Further, sections 1.5.1 and 1.5.2 have shown how STI considerations are woven into the development agenda infrastructure through STI fora held at regional and global level.

It is also important to note that STI responses have been called upon to meet emergency needs, such as the COVID-19 pandemic, in addition to its above-standard role in relation to national economies. Some of these responses have been elicited in an OECD survey that included South Africa.[2] The chapter proceeds in four further sections. Section 4.2 returns to the concept of STI to define its composite parts and comment on their linkage with IP. Section 4.3 reprises the key AU supplementary instruments that elaborate on the STI and sustainable development agenda. Specifically, it considers STISA-2024 and its predecessor, Africa's Science and Technology Consolidated Plan of Action (CPA). It also considers some of the implementing structures. Section 4.4 considers the regional STI policy frameworks and section 4.5 considers national STI policy frameworks. The discussion of national

[1] AU (2014) supra at 11.

[2] OECD 'International Database on STI Policies (STIP Compass) OECD Survey on the STI policy responses to Covid-19', https://stiplab.github.io/Covid19/Q3.html.

STI policies is a high-level discussion that does not enter into an evaluation of individual national policies. Section 4.6 concludes.

4.2 STI: a triumvirate concept

As noted in Chapter One, STI is a triumvirate concept and each of its components is worthy of separate definition to ensure that its linkage to IP is clearly delineated. Each of these concepts is grounded in a broad conceptualisation of knowledge which has been defined in Chapter One, section 1.4 above.

4.2.1 Science

Definitions of science abound. An example of a widely accepted definition is that used by the UK's Science Council, a scientific community, which states: 'Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence.'[3] Scholarly examination has mapped the historical and philosophical development of the definition of science and some have considered what this conceptualisation may mean for Africa.[4] The definition of science has proven to be controversial from a measurement or statistical perspective as shown by studies of the development of the measurement indicators by governments and development agencies.[5] It has been noted that the current 'official' measurement metrics concentrate on research and specifically 'institutionalised and systematic' research and development (R&D), as classically represented in the OECD's Frascati Manual, which has become the global standard.[6] It has been rightly pointed out that this approach does not capture all relevant developments in African contexts, which occur outside institutions, and what are considered systematic approaches, for example in the informal sector.

The linkage between scientific research and IP is primarily in the IP protection of research outputs, for example in copyright protection for scholarly output and patent protection for inventions. Measurement of research productivity centres on these aspects, as do some university ranking systems. In the last decade some African states have made or enacted Bayh-Dole[7] inspired STI policies and legislation that require publicly funded research institutions to protect their research output and to commercialise it, for example, South Africa's IPR from Publicly Financed

[3] Science Council 'About Science: Our definition of Science' (n.d.), https://sciencecouncil.org/about-science/our-definition-of-science/.

[4] Eg, see CC Mavhunga 'Introduction: What Do Science, Technology, and Innovation Mean from Africa?' in CC Mavhunga (ed) *What Do Science, Technology, and Innovation Mean from Africa*? (2017) 1–27.

[5] B Godin 'What is Science? Defining Science by Numbers, 1920–2000' *Project on the History and Sociology of S&T Statistics Working Paper No. 35* (2007), http://www.csiic.ca/PDF/Godin_35.pdf.

[6] Godin (2007) supra at 3–4. The latest edition of the Frascati Manual is OECD *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities* (OECD Publishing 2015), DOI: http://dx.doi.org/10.1787/9789264239012-en.

[7] Patent and Trademark Law Amendments Act (Pub. L. 96-517, December 12, 1980) codified at 94 Stat. 3015 and 35 U.S.C. § 200–212. Also see 37 C.F.R. 401.

Research and Development Act 51 of 2008 and Ethiopia's STI Policy 2012.[8] These approaches, which prioritise patenting, have been critiqued for their potential to chill scholarly publishing and open approaches to knowledge socialisation.[9]

4.2.2 Technology

As is the case with definitions of science, it is reasonably easy to locate various definitions of technology emanating from various quarters including scholarly commentary and developmental agencies' literature. One example of the latter is UNCTAD's following definition:

> the systematic theoretical and practical knowledge and skill used in the process of production or service delivery. Technology is not a finished product or service. Technology includes the entrepreneurial expertise and professional know-how needed to deliver products and services.[10]

Scholarly definitions vary, as do the theoretical approaches upon which they are based, and this has been shown by in-depth academic scrutiny of the concept.[11] A definition that places technology within the same parameters as knowledge is adopted for the purposes of this text. Bozeman puts it thus:

> Simply focusing on the product is not sufficient to the study of transfer and diffusion of technology; it is not merely the product that is transferred but also knowledge of its use and application. This approach resolves a major analytical problem: the difference between technology and knowledge transfer. By Sahal's concept the two are not separable—when a technological product is transferred or diffused, the knowledge upon which its composition is based is also diffused.[12]

Defining technology in the above way does not limit it to any sphere of knowledge nor any scientific or technical field. The definition is inclusive of all fields. Critical academic engagement with the development of the definitions of technology has highlighted some areas of concern for Africa, specifically that of being primarily viewed as a recipient of technology and not a creator or generator.[13] In other words, the continent is always at the receiving end of technology transfer. This then extends to the notion that the continent is not innovative. This may partially be because the knowledge, technology and innovation being generated on the continent does not comport to prevailing conceptualisations of which types of knowledge, technology and innovation are valued and how they are measured. This point will be elaborated further below, after innovation is defined.

[8] Science, Technology and Innovation (STI) Policy of Ethiopia (2012), Federal Democratic Republic of Ethiopia, Addis Ababa (FDRE, 2012).

[9] CB Ncube, L Abrahams & T Akinsanmi 'Effects of the South African IP Regime on Generating Value from Publicly Funded Research: An Exploratory Study of Two Universities' in De Beer et al (2013) supra 282; W Belete 'Towards University-Industry Innovation Linkages in Ethiopia' in De Beer et al (2013) supra 316 at 328–30, NO Ama 'Perspectives on Intellectual Property from Botswana's Publicly Funded Researchers' in De Beer et al (2013) supra 335 at 338.

[10] UNCTAD (2019) supra at 8.

[11] B Bozeman 'Technology transfer and public policy: a review of research and theory' (2000) 29(4–5) *Research Policy* 627.

[12] Bozeman (2000) supra at 629.

[13] Eg, see Mavhunga (2017) supra at 3–8.

As is the case with the other concepts defined in this section, there is a substantial body of literature on what technology transfer entails, from different disciplinary perspectives.[14] Technology transfer may literally be said to be the transmission of technology from one entity to another. I have selected 'entity' as a word broad enough to encompass persons, businesses of all sizes, organisations and even countries. Other scholars use the phrase 'organisational setting' to reflect this diversity of players in technology exchange.[15]

The Draft International Code of Conduct on the Transfer of Technology defined technology transfer as 'the transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service and does not extend to the mere sale or lease of goods',[16] and provided a non-exhaustive list of five types of technology transfer transactions.[17] These were the

> (a) assignment, sale and licensing of all forms of industrial property, except for trade marks, service marks and trade names when they are not part of technology transfer transactions; (b) provision of know-how and technical expertise …; (c) provision of technological knowledge necessary for the installation, operation and functioning of plant and equipment, and turnkey projects; (d) provision of technological knowledge necessary to acquire, install and use machinery, equipment, intermediate goods and/or raw materials which have been acquired by purchase, lease or other means; [and] (e) provision of technological contents of industrial and technical cooperation arrangements.

The modes of technology transfer vary by context, but it would be fair to say that generally they involve some form of knowledge appropriation that serves as the basis for exchange or transfer. In institutional contexts, like universities, it has been described as 'using intellectual property to create protections and provide rewards'.[18] Universities use the typical 'entrepreneurial methods' to transfer technology which include licensing IPRs and establishing start-ups.[19] In business or organisational contexts, technological learning is an important aspect of technology transfer.

IP is of relevance to technology and its transfer because it may protect technology and thus impact further creativity and invention. Technology and technology transfer are considered to be key components of technological growth and have been included in at least 80 international instruments.[20] Amongst these, the IP instruments are of relevance to this section. The TRIPS Agreement's provisions are noteworthy in two ways. First, the TRIPS Agreement addresses the goal of IP protection of technology in art 7, which provides:

[14] Bozen (2000) supra at 629.

[15] Ibid.

[16] Para 1.2 UNCTAD 'The Draft International Code of Conduct on the Transfer of Technology as at the close of sixth session of Conference on June 1998' (1985).

[17] UNCTAD (1985) supra at para 1.3.

[18] JH Rooksby 'Introduction to the Research Handbook on Intellectual Property and Technology Transfer' in JH Rooksby (ed) *Research Handbook on Intellectual Property and Technology Transfer (*2020).

[19] J Carter-Johnson 'University technology transfer structure and intellectual property policies' in Rooksby (ed) 2020 supra 4–40 at 4.

[20] UNCTAD (2001) supra.

> The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

Secondly, technology transfer is addressed in art 66.2 which places the following obligation upon member states:

> Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base.

Elsewhere, I have argued that these provisions form the basis of a public interest approach to IP, which 'seeks to equitably balance the interests of creators and users in a manner that is beneficial to society generally'.[21] The role of IP in spurring technology and its transfer is contested. While some scholars argue that IP is a prerequisite to technology transfer in all contexts, others counter-argue that this is not the case, especially in less industrialised national contexts.[22] IP is but one of several factors, such as 'market size, infrastructure and effective governance'.[23] Consequently, both IP and STI policies need to take a carefully nuanced approach to ensure that IP does not impede, but supports technological innovation and its transfer.

4.2.3 Innovation

Innovation is a nebulous concept which has been the subject of much scholarly research and writing,[24] which has traced its historical evolution to its current usage and meaning, 'understood as technological innovation, [which] has become an instrument of economic policy',[25] based on Schumpeterian conceptualization.[26] The current pervasive definition of innovation is that it is 'the commercialization of an invention'.[27] Or, as expounded by Garcia and Calabone, it is

> an iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based invention which leads to development, production, and marketing tasks striving for the commercial success of the invention.[28]

[21] Ncube (2013) supra at 374.

[22] D Baker, A Jayadev & J Stiglitz *Innovation, Intellectual Property, and Development: A Better Set of Approaches for the 21st Century* (2017) at 30; Maskus (2004) supra.

[23] Baker et al ibid.

[24] See, for example, J Fagerberg, DC Mowery & RR Nelson (eds) *The Oxford Handbook of Innovation* (2005).

[25] Godin, B 'Innovation and creativity' in C Antonelli and AN Link (eds) *Routledge Handbook of the Economics of Knowledge* (2014) 7 at 9.

[26] Benoit (2014) supra at 12.

[27] Benoit (2014) supra at 13.

[28] R Garcia & R Calantone 'A critical look at technological innovation typology and innovativeness terminology: a literature review' (2002) 19 *Journal of Product Innovation Management* 110 at 112, DOI:10.1111/1540-5885.1920110.

The international standard for defining and measuring innovation is the Oslo Manual, which was first published in 1992 and is now in its fourth edition.[29] The manual defines innovation as a process and as an outcome.[30] As a process, the innovative activities undertaken and measured are 'all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm'.[31] The outcome of the process of innovation is 'an innovation' in the singular and 'innovations' in the plural. The fourth edition of the Oslo Manual goes beyond previous versions by conceptualising innovation in all sectors of the economy, inclusive of the informal sector. This is done through broadening the definition of innovation to render it applicable to 'business, government, non-profit institutions serving households and households'. This broad applicability is seen in the following definition of an innovation:

> An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process).[32]

The word 'unit' as used here incorporates all the above-listed contexts, which include the informal sector, which as the manual acknowledges, can 'play a very significant economic role, not only in low- and middle-income countries, but also in high-income countries'.[33] Within the business context, the manual defines business innovation, then distinguishes between a product innovation and a business process innovation as shown below.

Table 5: Business innovation

Business innovation	A new or improved product or business process (or combination thereof) that differs significantly from the firm's previous products or business processes and that has been introduced on the market or brought into use by the firm.
Product innovation	A new or improved good or service that differs significantly from the firm's previous goods or services and that has been introduced on the market.
Business process innovation	A new or improved business process for one or more business function(s) that differs significantly from the firm's previous business processes and that has been brought into use by the firm.

Source: Oslo Manual, 2018 at 33–4.

[29] OECD/Eurostat *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, The Measurement of Scientific, Technological and Innovation Activities*, 4th Edition (2018) at 20.

[30] OECD/Eurostat (2018) supra at 20.

[31] OECD/Eurostat (2018) supra at 33.

[32] OECD/Eurostat (2018) supra at 60.

[33] OECD/Eurostat (2018) supra at 52.

This is a revision from the previous edition of the manual, which catered for four types of business innovation, namely product, process, organisational and marketing.[34]

There is substantial scholarship on innovations canvassing various aspects, including their typology.[35] More value and significance is ascribed to radical innovation in the formal sector as captured by conventional matrices including patents. Such an approach undervalues or overlooks innovation in the informal sector.[36] In order to rectify this, the latest version of the Oslo Manual has broadened the definition of innovation to apply it to more contexts as stated above.

As indicated above, knowledge is an integral part of innovation and the Oslo Manual captures the relationship between the two thus:

> Key components of the concept of innovation include the role of knowledge as a basis for innovation, novelty and utility, and value creation or preservation as the presumed goal of innovation. The requirement for implementation differentiates innovation from other concepts such as invention, as an innovation must be implemented, i.e. put into use or made available for others to use.[37]

The interconnectedness between IP and innovation has spurred significant scholarly attention,[38] ranging from examinations of when IP protection ought to be extended to innovation, to how it is being used for the governance of innovation,[39] and the impact of such protection on further innovation. Further, as will be shown below, the IP framework is accepted as a core component of a national system of innovation (NSI). The linkages between innovation, IP and sustainable development are most evident in technology specific studies. For example, scholarly discussions of IP and clean energy hinge on the IP protection of the technology and its transfer.[40]

Further, the relationship between IP, innovation and development is not as linear as it has been made out to be, as indicated in Chapter One. IP is often lauded as a sure-fire incentive for innovation. Whilst this is true of some industries such as the pharmaceuticals industry,[41] it is not true of all industries,[42] especially in less

[34] OECD/Eurostat (2018) supra at 34.

[35] Garcia & Calantone (2002) supra.

[36] See for example, Kraemer-Mbula & Wunsch-Vincent (eds) (2016) supra.

[37] OECD/Eurostat (2018) supra at 20.

[38] Eg, see S Ghosh (ed) *Intellectual Property and Innovation* (2017).

[39] O Granstrand 'Intellectual Property Rights for Governance in and of Innovation Systems' in B Andersen (ed) *Intellectual Property Rights: Innovation, Governance and the Institutional Environment (*2006) 311–44.

[40] D Shabalala 'Climate Change, Technology Transfer, and Intellectual Property: A "Modest Proposal" for an IP Enforcement Moratorium' (2020) 31 *Fordham Environmental Law Review* 1; D Shabalala 'Intellectual Property, Climate Change and Development' (2016) 8(1) *WIPO Journal* 64; DB Shabalala *Climate Change, Technology Transfer and Intellectual Property: Options for Action at the UNFCCC* (2014); M Rimmer (ed) *Intellectual Property and Clean Energy: The Paris Agreement and Climate Change* (2017); M Rimmer *Intellectual Property and Climate Change Inventing Clean Technologies* (2011).

[41] M Boldrin & D Levine *Against Intellectual Monopoly* (2008) at 212–42.

[42] Boldrin & Levine (2008) supra at 184–211.

industrialised contexts.[43] Some industries would continue to thrive without the incentive of IP as they rely on other knowledge appropriation approaches. It has been suggested that 'subsidies, prizes, or monopoly regulated through mandatory licensing' would be better incentives.[44] Heightened levels of IP protection do not inevitably lead to more innovation and technology transfer.[45] Indeed, it has been argued that, in some contexts, IP protection may impede further innovation by hindering the 'free and open exchange of technology, culture and knowledge that form the core of innovative and creative modalities'.[46] This would be the case where such protection creates thickets that hinder further innovation due to licensing requirements, which are beyond the reach of some innovators and entrepreneurs. This argument is most easily made in the context of the software industry where computer programmers rely on modularisation of code to facilitate further coding.[47] Speaking more generally, low levels of innovation and technology transfer are not due to 'inadequate IPR protection, but … lack of capabilities'.[48] Finally, the reliance on IP, specifically patents, as an indicator of innovation is not inclusive of incremental grassroots innovation that occurs in most African contexts, as indicated in section 4.2.5 below.

4.2.4 STI and knowledge in policymaking

The concept of knowledge is heavily utilised in national policy instruments, which locate it within STI contexts and envisage knowledge generation leading to its exploitation and ultimately its contribution to public interest through 'sustainable livelihoods projects, rural development (water and energy), health, education and the economic competitiveness of local industries'.[49] These instruments typically link knowledge and innovation within NSI,[50] of which many definitions exist.[51]

[43] Y Qian 'Do National Patent Laws Stimulate Domestic Innovation in a Global Patenting Environment? A Cross-Country Analysis of Pharmaceutical Patent Protection, 1978–2002' (2007) 89(3) *The Review of Economics and Statistics* 436.

[44] M Boldrin, DK Levine & TJ Sargent 'The Economics of Ideas and Intellectual Property' (2005) 102(4) *Proceedings of the National Academy of Sciences of the United States of America* 1252–6, http://www.jstor.org/stable/3374410.

[45] UNCTAD *Technology and Innovation Report 2018: Harnessing Frontier Technologies for Sustainable Development* (2018) at 60, https://unctad.org/system/files/official-document/tir2018_en.pdf.

[46] De Beer, Oguamanam & Schonwetter (2013) supra at 2.

[47] Ncube *Intellectual Property Protection for e-Commerce Business Methods* (2011) supra at 205.

[48] UNCTAD (2018) supra at 60.

[49] M Cele 'South Africa's National Innovation System' Presentation to the Foresight Exercise Training 27 March 2018, http://www.naci.org.za/STIForesight2018/index.php/relevant-documents/foresight/foresight-training-presentations/583-presentation-to-foresight-exercise-2018/file. Also see Department of Science and Innovation (DST 'Draft White Paper on Science, Technology and Innovation' (2018), adopted by Cabinet in 2018 at 27.

[50] For instance, the National Advisory Council on Innovation (NACI)'s *Strategic Plan 2016–20 and Performance Plan 2016/17* at 7, http://www.naci.org.za/wp-content/uploads/2019/02/NACI-Strategic-Plan-2016-2021-and-Annual-Perfomance-Plan-2016-2017.pdf.

[51] B Oyelaran-Oyeyinka 'The state and innovation policy in Africa' (2014) 6(5) *African Journal of Science, Technology, Innovation and Development* 481 at 484, DOI: 10.1080/20421338.2014.983731.

However, one of the more enduring and most often cited is Freeman's definition which states that the NSI is 'the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies'.[52]

At the continental level, the same approach is articulated by the AU's instruments, which will be discussed in section 4.3 below.

This linkage in policy instruments is based on, and mirrors, scholarly development of the concept of STI as explained in seminal works on conceptual development generally[53] and with specific reference to Africa.[54] Martin's extensive literature review has shown how the terminology evolved over a 50-year period from 'science policy' to 'innovation' as an all-encompassing term for STI and 'innovation studies' being the preferred term instead of 'policy'.[55] He then puts forward the following comprehensive definition of studies in this field:

> ... studies devoted to analyzing, understanding and effectively responding to the economic, policy, management, organizational, environmental and other challenges posed by innovation, technology, R&D and science. This includes a number of related activities concerned with the creation of knowledge (through research), the diffusion and acquisition of knowledge (e.g. through organizational learning), and its exploitation in the form of new or improved products, processes or services.[56]

He concludes that the field has matured and has a coherent focus 'on the adoption of an evolutionary (or neo-Schumpeterian) economics framework, an interactive model of the innovation process, and (a few years later) the concept of "systems of innovation" and the resource-based view of the firm'.[57]

Sections 4.4 and 4.5 below discuss policy and institutions for enabling and facilitating STI at the regional and national levels. There are various approaches to STI policymaking but the favoured approach is to contextualise it within the NSI.[58] In this setting, STI policy sits alongside (a) other regulatory and policy instruments; (b) institutions and governance structures; (c) entrepreneurial ecosystems; (d) human capital; and (e) technical and R&D infrastructure.[59] The list of relevant regulatory and policy instruments is extensive and this comprehensive, but non-exhaustive list has been compiled by UNCTAD:

i The regulatory framework comprising of 'environmental and health protection; product and industrial process standardisatIon; consumer protection, labels and certification; IPRs, Competition Law and Bankruptcy Law;

[52] C Freeman *Technology Policy and Economic Performance: Lessons from Japan* (1987) at 1.

[53] BR Martin 'The Evolution of Science Policy and Innovation Studies' (2012) 41 *Research Policy* 1219.

[54] C Daniels 'Science, Technology, and Innovation in Africa: Conceptualizations, Relevance and Policy Directions' in Mavhunga (2017) supra at 169.

[55] Martin (2012) supra at 1220.

[56] Ibid.

[57] Martin (2012) supra at 1238.

[58] UNCTAD (2018) supra at 55.

[59] Ibid.

ii economic instruments for R&D funding;
iii fiscal instruments pertaining to tax incentives and other taxation aspects;
iv demand support relating to procurement;
v regional innovation strategy and networks;
vi trade policy;
vii capacity building and information provision; and
viii information and cultural instruments.[60]

The institutions and infrastructure that cohere in the NSI have the shared goal of creating, adapting and disseminating or distributing technological knowledge and innovation.[61] The proper calibration of the NSI is a delicate exercise that needs to be context-sensitive and be in alignment with national socio-economic, other development goals and national development plans.[62] There are multiple role players whose contributions and activities need to be carefully aligned.[63] These include schools, colleges, universities and other higher educational institutions, publicly funded research institutions, industry, civic society, government, regional and global partners.[64] As explained in sections 4.2.1–4.2.3 above, IP instruments and institutions relevant to STI are therefore part of the NSI, hence their inclusion in the list above. The NSI of each state can be mapped in detail and closely analysed to assess the role of IP.[65] States also work together to create regional innovation ecosystems to support the NSI.[66]

4.2.5 Measuring STI performance

The study of the proper measurement of STI performance is a distinct discipline,[67] expressed in a variety of global and national approaches,[68] which present both

[60] UNCTAD *A Framework for Science, Technology and Innovation Policy Reviews Harnessing Innovation for Sustainable Development* (UNCTAD 2019) at 11–12, https://unctad.org/system/files/official-document/dtlstict2019d4_en.pdf.

[61] ST Manzini 'The national system of innovation concept: An ontological review and critique' (2012) 108(9/10) *S Afr J Sci* 1–7, DOI: 10.4102/sajs.v108i9/10.1038.

[62] UNCTAD (2018) supra at 62.

[63] I Petersen & G Kruss 'Towards a Coherent and Inclusive NSI: Building Network Alignment through Strengthening Dynamic Interactive Capabilities' in Cele et al (eds) (2020) supra 48–59 at 48.

[64] M Sibanda *Enabling Intellectual Property and Innovation Systems for South Africa's Development and Competitiveness* PhD Thesis, University of South Africa (2018).

[65] Eg, see Sibanda (2018) supra.

[66] M Madikizela 'Building Regional Innovation Ecosystems and the Role of Government' in Cele et al (eds) (2020) supra 60–74.

[67] See for example, F Gault (ed) *Handbook of Innovation Indicators and Measurement* (2013); F Gault *Innovation Strategies for a Global Economy: Development, Implementation, Measurement and Management* (2010); L Earl & F Gault (eds) *National Innovation, Indicators and Policy* (2006).

[68] For discussions of national approaches in Africa see National Advisory Council on Innovation (NACI) *2020 South African Science, Technology and Innovation Indicators Re*port (2020); A Pouris 'STI Measurements in South Africa: The state of affairs' in Cele et al (eds) 2020 supra 77–84; AE Manyuchi & JO Mugabe 'The production and use of indicators in science, technology and innovation policy-making in Africa: Lessons from Malawi and South Africa' (2018) 9(1) *Journal of Science and Technology Policy Management* 21; ST Manzini 'Measurement of innovation in South Africa: An analysis of survey metrics and recommendations' (2015) 111(11/12) *Afr J Sci* 1–8, http://dx.doi.org/10.17159/sajs.2015/20140163.

opportunities and challenges for Africa.[69] A full discussion of this discipline and its practice is beyond the scope of this book. However, it is important to highlight some observations about STI performance and Africa and the role of IP in its measurement. Another noteworthy marker of innovation is national global expenditure on R&D (GERD) as a percentage of GDP ('research intensity'). Most African states have committed to a 1% target,[70] whilst South Africa has set the GERD target at 1.5%,[71] but it has not yet managed to meet this target, falling behind other regions. As indicated above, the standard definitions and approaches to measuring scientific, technological and innovative progress do not do justice to Africa.

One of the reasons for this is that the metrics used to capture innovation, such as formal IPRs registration, often overlook and exclude African innovation, typically by individuals, indigenous communities and SMEs in the informal sector, as shown by in-depth research on many sites of innovation across the continent. The Open African Innovation Research (OpenAIR) partnership has researched many sites of innovation in 13 African countries since 2008 and has proven that most innovative activity does not accord with conventional IP-centred approaches.[72] This is because marginalised constituencies do not primarily rely on registered IPRs as a tool of knowledge appropriation. Instead they rely on more accessible and affordable rights such as copyright and trade secrets and, in many cases, opt for open approaches that do not appropriate IP at all. Further, their innovations, due to their incremental, grassroots or frugal nature, often do not even qualify for IP protection, for example patents, for lack of novelty and inventive steps. Finally, in those cases where a registrable IPR may be within reach, such as the possibility of registering a trade mark or a design, this may be inaccessible due to lack of the requisite knowledge or experience of formal registration processes, as well as inadequate financial resources to pay the necessary registration and renewal fees. Therefore, the low ranking of African states on innovation indices has to be considered within this context.

The Global Innovation Index (GII) is arguably the most authoritative index, so it will be used to illustrate the basis of the above comments about IP and GERD. By the GII's own admission, the measurement of innovation is a difficult and complex task, and it uses a set of factors classified into two sub-indices, that it refines, when appropriate, to measure innovation and generate an average GII

[69] F Gault 'Science, Technology and Innovation Indicators: Opportunities for Africa' (2008) 6 *African Statistical Journal* 141; F Gault, A Ambali & T Mangwende 'Innovation in Africa: Measurement, Policy and Global Issues' (2016), https://www.merit.unu.edu/publications/uploads/1491823855.pdf.

[70] AU (2014) supra at 41; AU Executive Council, Eighth Ordinary Session 16 -21 January 2006, Khartoum Decision (EX.CL/Dec.254 (VIII) Decision on the Report on the Conference of Ministers of Science and Technology – Doc. EX.CL/224 (VIII); ECA *Towards Achieving the African Union's recommendation of expenditure of 1% of GDP on Research and Development* Policy Brief No. ECA/18/004 at 1.

[71] NACI (2020) supra at 1.

[72] See www.openair.africa; J de Beer et al 'Open Innovation in Africa: Current Realities, Future Scenarios, and Scalable Solutions' in ML Smith and RK Seward (eds) *Making Open Development Inclusive: Lessons from IDRC Research* (MIT Press, IDRC 2020) 403–430; De Beer et al (eds) 2013 supra.

score.[73] The first sub-index is the innovation input sub-index that considers these five pillars of an enabling environment for innovation: (a) institutions, (b) human capital and research, (c) infrastructure, (d) market sophistication, and (e) business sophistication.[74] The second sub-index is the innovation output sub-index which consists of two pillars, namely (a) knowledge and technology outputs and (b) creative outputs. Each of these pillars has three sub-pillars.[75] GERD and IP are expressly mentioned in the business sophistication, knowledge and technology outputs and creative outputs pillars, as depicted below:

Table 6: IP and GERD in the Global Innovation Index

PILLAR	BUSINESS SOPHISTICATION	KNOWLEDGE & TECHNOLOGY OUTPUTS	CREATIVE OUTPUTS
Sub-pillars	**5.1 Knowledge workers** – GERD performed by business – GERD financed by business **5.2 Innovation linkages** – Patent families **5.3 Knowledge absorption** – IP payments	**6.1 Knowledge creation** – Patents by origin – PCT patents by origin – Utility models by origin **6.2 Knowledge impact** **6.3 Knowledge diffusion** – IP property receipts	**7.1 Intangible assets** – Trademarks by origin **7.2 Creative goods and services** **7.3 Online creativity**

The GII 2018 identified seven African states as 'Innovation Achievers', but Africa collectively still ranks as the lowest region on overall innovation scores.[76] The GII 2019 listed seven African states as innovation achievers and this was the largest number of achievers from any other region in the world, namely South Africa, Kenya, Mauritius, Botswana, Rwanda, Senegal and Tanzania.[77] The GII 2020 lists Kenya, Malawi, Rwanda, Mozambique, Madagascar, South Africa, Tunisia, Tanzania, Morocco and Niger as innovation achievers.[78] With the exception of Niger, all these states had previously been listed as innovation achievers in the previous ten years,

[73] Cornell University, INSEAD & WIPO '2020 Global Innovation Index (GII): Who Will Finance Innovation?' (2020), Appendix 1 at 204, https://www.wipo.int/publications/en/details.jsp?id=4514&plang=EN.

[74] Ibid.

[75] Ibid.

[76] Cornell University, INSEAD & WIPO '2018 Global Innovation Index (GII): Energising the World with Innovation' (2018), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2018.pdf, identified these African innovation achievers: Kenya, Malawi, Mozambique, Rwanda, Madagascar, South Africa and Tunisia.

[77] Cornell University et al (2020) supra at 18. Also see Cornell University, INSEAD & WIPO 'GII 2019: Creating Healthy Lives—The Future of Medical Innovation' (2019), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf.

[78] Cornell University et al (2020) supra at 22.

with Kenya having been listed annually since 2010 whilst Malawi, Rwanda and Mozambique had been listed eight times.[79] This shows consistency amongst these African states. Their low scores are partially attributable to the reliance on patents, utility models and trade marks as indicators of innovation, because it largely overlooks innovation that occurs in the informal sector for the reasons stated above.

Consequently, nuanced applications of standard approaches have been developed for measuring STI in Africa.[80] A case in point is ECA's Country STI Profiles which were published to inform STI policymaking. The study was intentionally crafted to include:

> innovation in Africa [that] takes place in the informal sector — a sector not included in the Oslo Manual. Further, Governments are responsible for much of the spending on research and development (R&D) in African countries, a notion at variance with the main premise of the Frascati Manual.[81]

It is important to note that this comment on the exclusion of the informal sector by the Oslo Manual was made before the publication of the fourth edition of the manual which, as explained above, now has an expanded definition of innovation that considers the informal sector. Other notable studies of STI performance on the continent include the African Capacity Building Foundation (ACBF)'s 2017 Africa Capacity Report[82] and the African STI Indicators Initiative (ASTII)'s African Innovation Outlook Reports.[83] The latest Innovation Outlook, published in 2019, takes the informal sector into account as it was published after the fourth edition of the Oslo Manual. It is also the first in this series to be published after the adoption of STISA-2024.[84]

4.3 AU STI instruments, institutions and initiatives

Continental STI initiatives and related institutional reforms continue to develop apace. This section will not give a comprehensive overview of all initiatives and institutional reforms. Rather, it will highlight two recent developments and then focus on two key instruments, namely the CPA and STISA-2024. As mentioned in Chapter One, NEPAD was reformed following a 2018 AU Heads of State and Government decision to the change NEPAD Planning and Coordination Agency (NPCA) into the African Union Development Agency-NEPAD (AUDA-NEPAD).[85]

[79] Ibid.

[80] J Charmes, F Gault & S Wunsch-Vincent 'Formulating an Agenda for the Measurement of Innovation in the Informal Economy' in Kraemer-Mbula and Wunsch-Vincent *(*2016) supra at 332; J Charmes, F Gault & S Wunsch-Vincent 'Measuring Innovation in the Informal Economy — Formulating an Agenda for Africa' (2018) 19 *Journal of Intellectual Capital*, DOI: 10.1108/JIC-11-2016-0126.

[81] ECA (2018) supra at xi.

[82] ACBF (2017) supra.

[83] ACBF (2017) supra at 34; AUDA-NEPAD *African Innovation Outlook 2019* (2019); NPCA *African Innovation Outlook* 2014 (2014); AU-NEPAD *African Innovation Outlook 2010* (2010).

[84] AUDA-NEPAD *African Innovation Outlook 2019* supra at 3.

[85] Adoption of Decision Assembly/AU/Dec.691 (XXXI) July 2018 (creation of AUDA-NEPAD); Decision Ext/Assembly/AU/Dec.1(XI) (mandate of AUDA-NEPAD).

AUDA-NEPAD's mandate and functions include Agenda 2063 thematic priority areas, two of which are directly relevant to this book's subject matter. These are (i) technology, innovation and digitalisation and (ii) knowledge management.[86] For example, in 2019 the AU Heads of State and Government endorsed the establishment of five centres of excellence, with one in each of the five AU regions, four of which fall under STISA-2024.[87] These four STISA-2024 related centres of excellence are for (i) climate resilience, (ii) rural resources and food systems, (iii) science and technology and innovation hub and (iv) human capital and institutions development.

4.3.1 The CPA

The CPA was adopted in 2005 by the African Ministers Council on Science and Technology (AMCOST) and endorsed by the AU Heads of State and government in 2006.[88] The plan consolidated the AU and NEPAD's science and technology programmes[89] and was adopted following the decisions of the first African Ministerial Conference on Science and Technology in November 2003.[90] The CPA's vision was of an 'Africa that is free of poverty and well-integrated into the global knowledge economy'.[91] Its central goals are:

> to enable Africa to harness and apply science, technology and related innovations; to eradicate poverty and achieve sustainable development; and to ensure that Africa contributes to the global pool of scientific knowledge and technological innovations.[92]

Initially, the CPA encompassed 12 R&D programmes organised into four clusters to be implemented during 2006–2010.[93] These four clusters are (1) biodiversity, biotechnology and indigenous knowledge; (2) energy, water and desertification; (3) material sciences, manufacturing, laser and post-harvest technologies; and (4) information and communication technologies and space science and technology. An additional cluster and programmes were approved to add a fifth cluster on mathematical sciences: including the Next Einstein Initiative.[94] A significant aspect of the CPA is its Programme 5 which encompasses work on the African STI Indicators Initiative (ASTII), improving regional co-operation in science and

[86] AUDA-NEPAD *2019 Annual Report* supra at 5 and 11.

[87] AUDA-NEPAD *2019 Annual Report* at 27.

[88] International Institute for Sustainable Development (IISD) 'Extraordinary Conference of the African Ministerial Council on Science and Technology' 2006 (3)1 *AMCOST Bulletin* 5, https://enb.iisd.org/africa/pdf/arc0301e.pdf.

[89] In accordance with the decision of the Second Ordinary Session of the Assembly of the AU held in July 2003 in Maputo, Mozambique to integrate the NEPAD Programme into the AU structures and processes (Assembly/AU/Decl. 8(II)).

[90] AU Africa's Science & Technology Consolidated Plan of Action (CPA) (2005) at 5.

[91] AU (2005) supra at 10.

[92] Ibid.

[93] AU (2005) supra at 12–34.

[94] NEPAD 'Advancing science and technology in Africa' (28 December 2015), https://www.nepad.org/news/advancing-science-and-technology-africa; AU (2014) supra at 14.

technology and building science and technology policy capacity.[95] ASTII publishes African Innovation Outlook Reports.[96]

CPA was reviewed after five years, as planned, under the auspices of a High Level Panel on STI,[97] supported by a Working Group comprising of representatives from various agencies.[98] The High Level Panel's report noted considerable progress regarding several aspects including the creation of networks of excellence, AU competitive research grants, capacity development, better policy frameworks and innovation mechanisms.[99] The following shortcomings were noted: dependence on external funding, inadequate scope of human and sustainable development and the lack of robust and deep linkages between the CPA and other continental blueprints.[100] Following this review, it was decided to transition to STISA-2024 as the blueprint to further the continent's STI agenda. The High Level Panel and Working Group developed STISA-2024, taking on board the CPA review findings, input from their consultations with various stakeholders[101] and a situational analysis of STI on the continent.[102]

4.3.2 STISA-2024

STISA-2024 was adopted in 2014 as the first ten-year strategy for the continent's STI related aspirations, goals and priority areas.[103] It seeks to enable 'social transformation and economic competitiveness, through human capital development, innovation, value addition, industrialisation and entrepreneurship'.[104] Implementation, as with other elements of Agenda 2063, is three-tiered at (1) national level through national development plans; (2) regional level through the RECs and regional research institutions and actors; and (3) continentally, primarily driven by the AUC, NEPAD Agency and their partners.[105] A phased implementation plan with five stages is set out for the strategy, with a final evaluation and definition of the next ten-year strategy in 2024.[106] The strategy proposed that the necessary targets

[95] AU (2005) supra at 38–48.

[96] ACBF (2017) supra at 34; AUDA-NEPAD African Innovation Outlook 2019 supra; AUDA-NEPAD (2014) supra; AU-NEPAD (2010) supra.

[97] AU 'Press Release: African Union establishes High Level Panel on STI 23 July 2012', https://au.int/sites/default/files/pressreleases/25005-pr-press_release_-_au_establishes_high_level_panel_on_science_techonology_and_inovation_22-07-12.pdf; Fifth Ordinary Session of the African Ministerial Conference on Science & Technology (AMCOST V) 12–15 November 2012, Brazzaville, Congo AU/MIN/ST/Dec.(V) para. 2.2.10.

[98] AU (2014) supra at 14.

[99] Ibid.

[100] Ibid.

[101] AU (2014) supra at 15.

[102] AU (2014) supra at 16–18.

[103] 23rd Ordinary Session of AU Heads of State and Government Summit.

[104] AU (2014) supra at 28.

[105] AU (2014) supra at 10.

[106] AU (2014) supra at 27.

and indicators, data collection, monitoring and evaluation mechanisms, as well as financing arrangements, be put into place.[107] For internal national funding, each state is encouraged to spend at least 1% of its GDP on R&D (GERD)[108] and to set up appropriate structures such as national research funds.[109] Continentally, it was proposed that an African STI Fund (ASTIF) be established.[110]

STISA-2024 has the following six priorities, informed by Agenda 2063:[111]

1 Eradication of hunger and achieving food security;
2 Prevention and control of diseases;
3 Communication (physical & intellectual mobility);
4 Protection of our space;
5 Live together—build the society;
6 Wealth creation.

Each priority area has affiliated research and/or innovation areas.[112] STISA-2024 rests on these four pillars: (i) infrastructure development; (ii) technical competences; (iii) innovation and entrepreneurship; and (iv) an enabling environment.[113] The first pillar necessitates the provision of 'science laboratories (for teaching, engineering and clinical trials), teaching hospitals, ICT equipment and infrastructure, innovation spaces, living labs and national research and education networks'.[114] The second pillar requires African states to improve and grow postgraduate education and PhD graduates in order to provide the human capital needed to reach the full potential of STI.[115] The express mention of 'collaborative open innovation and entrepreneurship' in relation to the third pillar, is noteworthy and will be revisited in Chapter Five. The fourth pillar, which requires each state to have 'a coherent national framework' is the subject of sections 4.4–4.5 below. The same section also outlines STISA-2024's institutional arrangements.

The five-year Implementation Report of STISA-2024 reported significant progress with regard to the creation of eight critical institutions, including PAIPO.[116] This organisation is singled out for mention here because its creation within the STISA-2024 confirms the link between IP and STI. The report notes the lack of progress regarding the operationalisation of the organisation and what is refers to as 'a

[107] AU (2014) supra at 10, 48–51.
[108] AU (2014) supra at 41.
[109] AU (2014) supra at 42.
[110] AU (2014) supra at 42.
[111] AU (2014) supra at 22–23.
[112] AU (2014) supra at 24.
[113] AU (2014) supra at 30–33.
[114] AU (2014) supra at 30.
[115] Ibid.
[116] Third Ordinary Session for the Specialized Technical Committee on Education, Science and Technology (STC-EST) 10th to 12th December 2019, Addis Ababa, Ethiopia *Contextualising STISA-2024: Africa's STI Implementation Report 2014–2019* HRST/STC EST/EXP (III) 1.5 para 10 (hereafter 'Implementation Report').

consequent lack of activity in the critical area of intellectual property management and technology transfer'.[117]

One of the shortcomings of the CPA had been its inadequate linkage with other continental linkages and STISA-2024 was crafted to remedy that. The Implementation Report noted that STISA-2024 had done well in this regard and had been complemented by the Continental Education Strategy for Africa (CESA 2016–2025), the AfCFTA and the creation of the African Space Policy.[118] In addition, the Strategy for Technical and Vocational Education and Training[119] and the Action Plan on Boosting Intra-Africa Trade (BIAT)[120] are also complementary to and support STI initiatives.[121] The educational policies (CESA-2016 and TVET 2007) contribute to efforts to generate a skilled workforce whilst the space programme flowing from the Space Policy is an opportunity for co-operation in a specific technical area intended to spur research and innovation. The Implementation Report noted significant movement in relation to national STI policymaking as well as related REC initiatives, which contributes to an enabling environment for STI.[122] Sections 4.4–4.5 below will consider the STI policy landscape further, at regional and national levels.

Other achievements noted by the report included advances in African research, innovation and training and growing funding and progress in STISA-2024's six priority areas. Notably, GERD as a percentage of GDP ('research intensity') had improved across the continent but still fell short of the 1% target and continued to be low as compared to other parts of the world.[123] Innovation indices such as the African Innovation Outlook series and the GII noted some growth in African innovation. Despite this growth and the identification of several states as 'Innovation Achievers', Africa collectively still ranks the lowest on overall innovation scores.[124] Innovation indices published after the Implementation Report confirm this placing of African states, as noted in the comments on GII 2019 and GII 2020 in section 4.2.5 above. As noted in that section, the measurement of innovation and innovation indices have spurred much debate and commentary for several reasons, including the inability of formal IP rights registration to capture innovation by individuals, indigenous communities and SMEs in the informal sector. The Implementation Report also considered progress made towards the creation of an enabling environment for STI.

[117] Ibid.

[118] Ibid.

[119] Continental Strategy for Technical and Vocational Educational and Training (TVET) to Foster Youth Employment, at https://au.int/en/documents/20181022/continental-strategy-technical-and-vocational-educational-and-training-tvet.

[120] AU 'Action Plan for Boosting Intra-Africa Trade'; ECA 'BIAT: Issues Affecting Intra-African Trade, Proposed Action Plan for boosting Intra-African Trade and Framework for the fast tracking of a Continental Free Trade Area', https://www.uneca.org/pages/action-plan-boosting-intra-africa-trade.

[121] Implementation Report (2019) supra at 46–9.

[122] Implementation Report (2019) supra paras 12–14.

[123] Implementation Report (2019) supra paras 18–21; ACBF (2017) supra at 24–5.

[124] Implementation Report (2019) supra para 26. The seven innovation achievers according to the GII 2018 were Kenya, Malawi, Mozambique, Rwanda, Madagascar, South Africa and Tunisia.

4.3.3 AU institutional and procedural arrangements

The institutional framework for implementing STISA-2024 comprises of AU structures at which decisions are made following prescribed processes such as the Assembly of Heads of State and Government, the Specialised Technical Committee on Education, Science and Technology (STC-EST) and the African Scientific Research and Innovation Council (ASRIC).[125] The STC-EST's work on open science is revisited in section 5.5 below. ASRIC is a specialised AU Technical Advisory Body launched in November 2018,[126] with the AU Scientific, Technical and Research Commission (AU-STRC) serving as its secretariat.[127] Its objective is 'to promote scientific research and innovation in order to address the challenges of Africa's socio-economic development'.[128] It is of specific interest to this work that ASRIC established a taskforce on IP Protection in Joint Research and Collaboration During Outbreaks in 2020. This illustrates the inextricable relationship between STI and IP in mounting comprehensive health responses to outbreaks.

Further implementing procedures and institutions comprise of AUDA-NEPAD, the African Development Bank (AfDB), RECS, African governments, specialised agencies and institutions such as the Pan-African University (PAU), PAIPO and the African Observatory for STI (AOSTI) and other stakeholders and partners.[129] For the purposes of this book's discussion, the inclusion of PAIPO as an implementing structure is notable. It reinforces the significant role afforded to IP in this context. A significant aligned platform to note is the African Regional Forum at which the STI Forum is held, as described in section 1.5.2 above. This is an illustration of how the STI agenda implementation structure interfaces with the sustainable development implementation structure at both continental and global level. These institutional arrangements and procedures are intended to work together as depicted below:[130]

[125] AU (2014) supra at 34–5. ASRIC was created by the AU's Executive Council Decision (EX.CL/Dec.747 (XXII)) and Decision Ex/CL/Dec.216(VII) on the establishment of ASRIC as the institutional setting for the implementation of STISA-2024.

[126] ASRIC *First Congress Report*, November 2018, https://asric.africa/documents/Congress-Nov-2018/First-ASRIC-Congress-Report.pdf.

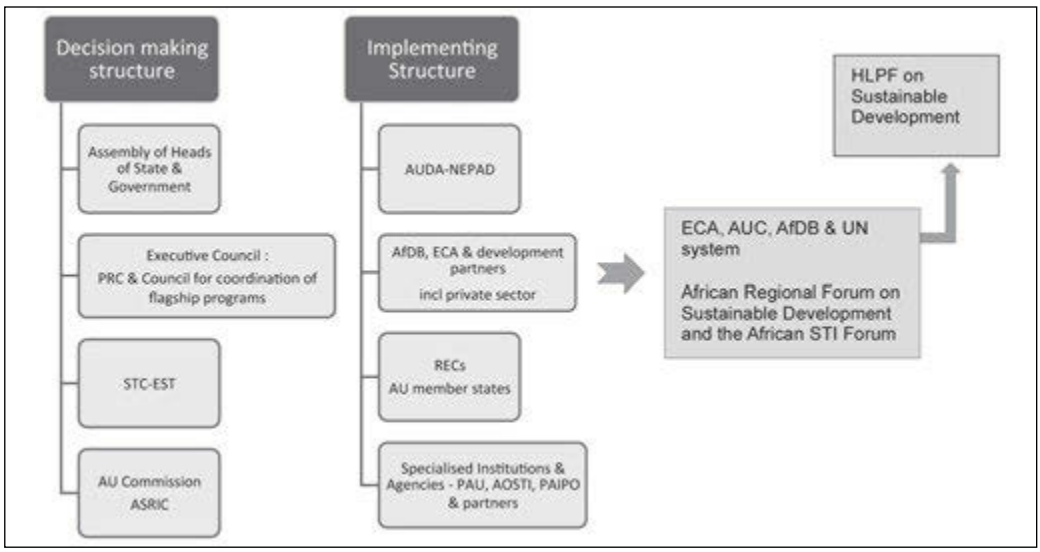
[127] Art 8.1 Statute of the ASRIC, adopted by the 26th Ordinary Session of the Assembly, Addis Ababa, 31 January 2016.

[128] Art 3 Statute of the ASRIC.

[129] AU (2014) supra at 36.

[130] AU (2014) supra at 34.

Figure 4: AU STISA-2024 Implementing institutions' interface with the Development Agenda



Source: Author, adapted from STISA-2024 *Institutional Architecture for implementation of STISA-2024*

The 2019 Implementation Report noted significant progress, but not full attainment, of the proposed institutional structures, as PAIPO is yet to be operationalised. Chapter Six will discuss PAIPO and its operationalisation. STISA-2024 envisions a two-pronged approach to creating an enabling environment for STI on the continent consisting of institutions and policies. The focus areas in relation to policy are (i) continental level policy development; (ii) sub-regional and national policy developments; and (iii) linking STI policies and actions to African integration. Sub-regional and national policy developments are discussed in turn below. As noted above, in section 1.5.2, the African STI Forum serves as an important platform for the discussion of STI and sustainable development.

4.4 Regional STI policies

Regionally, there are several REC STI instruments, institutions and initiatives. The ones commented upon here originate from the eight RECs which will form the building blocks of the African Economic Community, namely COMESA, EAC, ECCAS, ECOWAS, IGAD, CEN-SAD, SADC and AMU. Amongst these, COMESA, EAC, ECOWAS and SADC have the more well-developed STI co-operation instruments and institutions. The others only have foundational provisions in their constitutive treaties, but they have not developed supplementary STI instruments and their requisite implementing structures.[131] They have some related plans or strategies and

[131] AU (2014) supra at 49–50; ARIA VII supra 91–92, citing arts 7 and 13A of the Agreement Establishing IGAD.

institutions, but these are not detailed or elaborate STI instruments and institutions. For purposes of completeness, they are listed below in alphabetical order:[132]

i AMU's University of Maghreb and the Maghreb Bank for Investment and Foreign Trade;
ii CEN-SAD's Sahel-Saharan Bank for Investment and Trade;
iii IGAD includes STI as one of its programme areas in its Strategy Implementation Plan (2016–2020).

The basis of COMESA STI co-operation is found in several articles of the Treaty establishing COMESA.[133] COMESA established its Innovation Council in 2012[134] and launched it in 2013. The Innovation Council is convened by the COMESA Secretary General and is serviced by the COMESA Secretariat.[135] The terms of reference of the Innovation Council list 13 items[136] which include (1) advising the COMESA committee on STI, members states and regional centres of excellence; (2) participating in the drafting of the COMESA Innovation Roadmap and advising on its implementation; (3) promoting STI collaboration with international and regional institutions; (4) overseeing the design and launch of an annual innovation forum and (5) overseeing the design and launch of the COMESA Innovation Award. The Innovation Council comprises of ten persons from academia, government, business and civic society who meet annually.[137]

The basis of EAC STI co-operation is found in several articles of the EAC Treaty.[138] EAC's Science and Technology Commission's (EASTECO) main objective is to 'promote and coordinate the development, management and application of Science and Technology in the Partner States'.[139] The Protocol lists seven specific items flowing from this broad objective, which include promoting '(a) cooperation in the development of regional science and technology policies; (b) the joint development and application of Science and Technology for the Community; and (c) cooperation in the joint research and development in science and technology'.[140] EASTECO's current Strategic Plan (2017/18–2021/22)[141] sets out these four priorities: (1) support

[132] AU (2014) supra at 49–50.
[133] Arts 3, 94, 127 and 128.
[134] Terms of Reference for the COMESA Innovation Council and Innovation Awards (2012) 17(6)*Official Gazette COMESA* November 20.
[135] *Comesa Gazette* (2012) supra para 5.
[136] Ibid.
[137] *Comesa Gazette* (2012) para 6.
[138] Arts 80, 102 and 103.
[139] Art 5 Protocol on the Establishment of the East African Science and Technology Commission (EASTECO); Also see https://easteco.org/.
[140] Ibid.
[141] EASTECO Strategic Plan (2017/18-2021/22), https://easteco.org/wp-content/uploads/2020/06/EASTECO-Strategic-Plan-Jan-130427-Approved-by-35th-Council_4th-April-2017-1.pdf.

for evidence-based policies;[142] (2) promotion of STI knowledge and innovation;[143] (3) application of STI for socio-economic development[144] and (4) EASTECO foundational commitments.[145] It also sets out an implementation plan,[146] financial projections and a resource mobilisation plan[147] and a monitoring and evaluation framework.[148] EASTECO is developing the East African STI Policy, the lack of which was identified as a weakness by its Strategic Plan (2017/18–2021/22).[149] A draft East African STI Policy was validated at a stakeholder workshop on 24 September 2018, convened by EASTECO.[150] This workshop proceeded on the following day to validate the draft East African Regional IP Policy.[151] The EAC's Inter-University Council for East Africa has also been identified as a significant role player in the regional STI landscape.[152] It has a broad mandate relating to the co-operation between institutions of higher learning in the EAC and advises partner states.[153]

ECOWAS' STI co-operation is founded on art 27 of the ECOWAS Treaty. It has several STI related instruments, namely the Protocol on Education and Training;[154] the ECOWAS Policy on STI (ECOPOST) and its Plan of Action;[155] and the Directive on STI.[156] The directive states that the broad objective of the ECOWAS STI co-operation is to 'achieve sustainable economic and social development through the implementation of a policy of "Science, Technology and Innovation" to meet the current and future needs of the peoples and guarantee them a better quality of life'.[157] It then sets out detailed specific objectives which include (a) developing the STI institutional framework, policy and plan of action in each member state; (b) attending to the 'financial capacities of scientific and technological research institutions'; (c) 'strengthen[ing] human and technical capacities in science and

[142] EASTECO Strategic Plan supra at 65–6.
[143] EASTECO Strategic Plan supra at 66–8.
[144] EASTECO Strategic Plan supra at 69–72.
[145] EASTECO Strategic Plan supra at 72–4.
[146] EASTECO Strategic Plan supra at 87–104.
[147] EASTECO Strategic Plan supra at 105–108.
[148] EASTECO Strategic Plan supra at 121–26.
[149] ACR (2017) supra at 6.
[150] EAC Press Release: EASTECO holds Regional Stakeholder Workshop on the EAC Science, Technology and Innovation Policy, 12 October 2018, https://www.eac.int/press-releases/138-education,-science-technology-news/1245-easteco-holds-regional-stakeholder-workshop-on-the-eac-science,-technology-and-innovation-policy.
[151] EAC Press Release: 'Regional Stakeholder Workshop on EAC Regional Policy for Intellectual Property (IP) set for 25th September 2018 in Nairobi, Kenya, 24 September 2018, https://www.eac.int/press-releases/1222-regional-stakeholder-workshop-on-eac-regional-policy-for-intellectual-property-ip-set-for-25th-september-2018-in-nairobi,-kenya.
[152] AU (2014) supra at 51.
[153] See the Inter-University Council for East Africa Act, 2009 (as amended in 2012) and https://iucea.org/about-us/.
[154] ECOWAS Protocol A/P3/1/03 on Education and Training.
[155] ECOWAS Supplementary Act *A/SA.2/06/12* Adopting the ECOWAS Policy on Science, Technology and Innovation and Its Plan of Action.
[156] ECOWAS Directive A/DIR.1/06/12 on STI.
[157] Art 2.

technology; and (d) promot[ing] technological development and transfer'.[158] The regional structures for STI cooperation in ECOWAS are the meeting of ECOWAS Ministers of STI, the ECOWAS Commission, the meeting of ECOWAS Experts in STI and the Regional Strategic Orientation Committee (RSOC).[159]

The SADC Treaty has some foundational provisions for STI co-operation, although they are not as detailed as those found in other REC treaties.[160] The Regional Indicative Strategic Development Plan (RISDP) in both its original formulation (RISDP 2005–2020) and its revised form (RISDP 2015–2020) prioritises STI.[161] In RISDP 2005–2020, science and technology were included in the category of cross-cutting issues under priority D: Social and Human Development.[162] Priority D was revised in RISDP 2015–2020 to 'Improved human capacities for socio-economic development' but it still includes STI as a cross-cutting theme.[163] SADC has formulated and adopted SADC Vision 2050 and the RISDP 2020–2030, which similarly prioritise STI in alignment with Agenda 2063.[164] The preamble to the SADC Protocol on STI, 2008, notes that it is premised on 'the critical importance given to STI' by the RISDP and notes 'the importance of IPR protection in promoting the development and application of STI'. The broad objective of the protocol 'is to foster cooperation and promote the development, transfer and mastery of STI in Member States' to meet detailed specific objectives.[165] These specific objectives include strategic planning, gender,[166] indigenous knowledge systems (IKS),[167] and IPRs.[168] It entered into force in 2017 and its institutional structure consists of 'the SADC Sectoral Ministerial Committee on Science and Technology (SAMCOST), a Committee of Senior Officials and the SADC Secretariat through the STI Unit and Technical Committees'.[169] Monitoring and evaluation is conducted under the RISDP and appropriate STI indicators are to be developed for this purpose.[170]

[158] Ibid.

[159] Art 5.1 ECOWAS Directive on STI. For an example of some of these meetings, see ECOWAS 'Science, technology and innovation experts meet on way forward for ECOWAS' regional development' (5 December 2018), https://www.ecowas.int/science-technology-and-innovation-experts-meet-on-way-forward-for-ecowas-regional-development/.

[160] ARIA VII supra p. 92; citing arts 5.2(f) and 21.3(e).

[161] SADC *Summary of the SADC Revised Regional Indicative Strategic Development Plan 2015–2020,* Gaborone, Botswana (2017) at 1 and 5.

[162] Ibid.

[163] SADC (2017) supra at 9.

[164] Southern Africa Today '40th SADC Summit approves Vision 2050' 1, 7–8 October 29, 2020, https://www.sardc.net/en/southern-africa-today/40th-sadc-summit-approves-vision-2050/; J Ngwawi 'Vision 2050 and RISDP 2020–30 … Compass for SADC strategic direction' December 29, 2019 https://www.sardc.net/en/southern-african-news-features/vision-2050-and-risdp-2020-30-compass-for-sadc-strategic-direction-2/.

[165] Art 2 SADC Protocol on STI.

[166] Art 2(p) SADC Protocol on STI.

[167] Art 2(h) SADC Protocol on STI.

[168] Art 2(m) SADC Protocol on STI.

[169] Art 5.1 SADC Protocol on STI.

[170] Art 8 SADC Protocol on STI. These are currently under development as a call for experts was issued in 2019.

4.5 National STI policies

A consideration of national STI policies can take one of two forms, namely (1) it may be descriptive by merely setting out what exists or (2) it may be normative and evaluate the policies. This section will do both, paying attention to the challenges that states face in policymaking and implementation. There have been several developmental agencies' initiatives to map and evaluate national STI policies in Africa in the last five years, including (in chronological order):

i UNCTAD's Technology Innovation Reports published in 2012, 2015 and 2018,[171] as well as its country STI policy reviews conducted under its framework for reviews.[172] In Africa, these have been completed for Uganda,[173] Ethiopia,[174] Rwanda,[175] Ghana,[176] Lesotho,[177] Mauritania[178] and Angola;[179]
ii UNESCO's 2015 Science Report;[180]
iii ECA et al's 2016 ARIA VII Report;[181]
iv the African Capacity Building Foundation (ACBF)'s 2017 Africa Capacity Report;[182]
v the African Academies of Science (AAS)'s 2018 Report;[183]
vi ECA's 2018 STI Country profiles, mentioned in section 4.2.4 above; and

[171] UNCTAD *Technology and Innovation Report 2012: Innovation, Technology and South-South Collaboration* (UNCTAD/TIR/2012) at 61–62, https://unctad.org/system/files/official-document/tir2012_en.pdf; UNCTAD *Technology and Innovation Report 2015: Fostering Innovation Policies for Industrial Development* (UNCTAD/TIR/2015) at 55–89 discussing Tanzania, Ethiopia, https://unctad.org/system/files/official-document/tir2015_en.pdf; UNCTAD (2018) supra.

[172] UNCTAD A Framework for Science, Technology and Innovation Policy Reviews — Harnessing Innovation for Sustainable Development (UNCTAD/DTL/STICT/2019/4), https://unctad.org/system/files/official-document/dtlstict2019d4_en.pdf.

[173] UNCTAD Science, Technology and Innovation Policy Review: Uganda UNCTAD/DTL/STICT/2020/4 — 16 Oct 2020, https://unctad.org/system/files/official-document/dtlstict2020d4_en.pdf.

[174] Science, Technology and Innovation Policy Review of Ethiopia UNCTAD/DTL/STICT/2020/3 — 11 Mar 2020, https://unctad.org/system/files/official-document/dtlstict2020d3_en.pdf.

[175] UNCTAD Science, Technology and Innovation Policy Review: Rwanda UNCTAD/DTL/STICT/2017/8 — 24 Oct 2017, https://unctad.org/system/files/official-document/dtlstict2017d8_en.pdf.

[176] UNCTAD Science, Technology & Innovation Policy Review: Ghana UNCTAD/DTL/STICT/2009/8 — 21 Nov 2011, https://unctad.org/node/14463.

[177] UNCTAD Science, Technology & Innovation Policy Review: Lesotho — An Implementation Strategy UNCTAD/DTL/STICT/2009/7 — 31 Jul 2010, https://unctad.org/node/14464.

[178] UNCTAD Science, Technology & Innovation Policy Review: Mauritania UNCTAD/DTL/STICT/2009/6 — 31 Jul 2010, https://unctad.org/node/14465.

[179] UNCTAD Science, Technology & Innovation Policy Review: Angola UNCTAD/SDTE/STICT/2008/1 — 31 Aug 2008, https://unctad.org/node/14461.

[180] UNESCO Science Report: Towards 2030 (UNESCO 2015), https://unesdoc.unesco.org/ark:/48223/pf0000235406.

[181] ECA, AU & AfDB (2016) supra.

[182] ACBF (2017) supra.

[183] African Academy of Science (AAS) *Africa Beyond 2030. Leveraging Knowledge and Innovation to Secure Sustainable Development Goals (AAS 2018),* http://otrasvoceseneducacion.org/wpcontent/uploads/2018/03/africa-beyond-2030-1.pdf.

vii UNESCO's Global Observatory of STI Policy instruments (GO-SPIN), which was formally launched in November 2018.[184] The platform also presents a content analysis of the STI policy for nine African countries, namely Botswana, Ethiopia, Ghana, Malawi, Mozambique, Nigeria, Rwanda, Uganda and Zimbabwe.[185] Finally, GO-SPIN is also able to generate and publish country profiles,[186] if requested by a state to do so. As of 2020, it has published eight country profiles, including for Rwanda,[187] Malawi,[188] Zimbabwe[189] and Botswana.[190]

UNESCO has had several projects on STI policymaking initiatives which collectively have covered Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Central African Republic, Côte d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, eSwatini, Gabon, Gambia, Malawi, Mozambique, Namibia, Niger, Republic of the Congo, Senegal, Sudan, Togo, Burundi, Zambia and Zimbabwe, a total of 23 states.[191] One of these projects used the GO-SPIN methodology to analyse and map national STI landscapes and propose appropriate policy positions.

Scholars and experts have also undertaken in-depth analysis of national STI policies, from the perspective of individual states[192] and, of particular interest to this book, from a regional perspective.[193] Some evaluations are couched in capacity building and training settings. For instance, the Design and Evaluation of

[184] UNESCO 'Global Observatory of Science, Technology and Innovation Policy Instruments (GO-SPIN)', https://en.unesco.org/go-spin.

[185] https://gospin.unesco.org/frontend/analytical-content/init.php.

[186] See https://en.unesco.org/go-spin/country-profiles.

[187] GA Lemarchand & A Tash *Mapping Research and Innovation in the Republic of Rwanda* (UNESCO 2015).

[188] GA Lemarchand & S Schneegans *Mapping Research and Innovation in the Republic of Malawi* (UNESCO 2014).

[189] GA Lemarchand & S Schneegans *Mapping Research and Innovation in the Republic of Zimbabwe* (UNESCO 2014).

[190] GA Lemarchand & S Schneegans *Mapping Research and Innovation in the Republic of Botswana* (UNESCO 2013).

[191] UNESCO 'Development of STI policy instruments in Africa 2014 Project', http://www.unesco.org/new/en/natural-sciences/science-technology/sti-policy/africa/development-of-sti-policy-instruments-in-africa/; UNESCO 'Capacity-Building in Science, Technology and Innovation Policy in Africa', http://www.unesco.org/new/en/natural-sciences/science-technology/sti-policy/africa/capacity-building-in-sti-policy-in-africa/; UNESCO *Science, Technology & Innovation Policy Initiative: Responding to the Needs of Africa* (2009), https://unesdoc.unesco.org/ark:/48223/pf0000161058; UNESCO-AECID 'Best practices in STI in Africa', http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Best_practices_in_STI_Africa_EN.pdf.

[192] Eg, AH Vicentia 'Higher Education and the National System of Research and Innovation: The Case of the Republic Of Benin' (2019) 5(9) *International Journal of Social Science and Economics Invention* 119–128, https://doi.org/10.23958/ijssei/vol05-i09/154; Sibanda (2019) supra.

[193] Eg, JA Forson 'Innovation Financing and Public Policy Dilemmas in the Economic Community of West African States (ECOWAS)' (2017) 12(1) *MPRA* 1, https://mpra.ub.uni-muenchen.de/102432/; A Gutowski, NM Hassan, T Knedlik, CM Ngo Tong & K Wohlmuth (eds) *African Development Perspectives Yearbook 2019: Science, Technology and Innovation Policies for Inclusive Growth in Africa — Human Skills Development and Country Cases* (2020); RA Alabi, A Gutowski, NM Hassan, T Knedlik, SSM Nour & K Wohlmuth (eds) *African Development Perspectives Yearbook 2018: Science, Technology and Innovation Policies for Inclusive Growth in Africa — General Issues and Country Cases* (2018).

Innovation Policies (DEIP) workshop series presented by United Nations University (UNU-MERIT) and the African Observatory of Science, Technology and Innovation (AOSTI) enable experts to critically assess STI policies with relevant national stakeholders in various regions. To date, two DEIP workshops for AU member states have been held. The first, in 2014, catered for EAC, COMESA and SADC member states.[194] The second, in 2017, catered for West African states.[195] A third workshop was held in 2018, not for states but for members of the AUC.[196]

From the above accounts, and other sources, a composite picture was built of the national STI policies that have been adopted or are under formulation on the African continent. These are tabulated below per region of the AU. Many of these policies have been reviewed and where that is the case, this is indicated in the review column on the right. This chapter does not seek to replicate these reviews, because it is not possible in a work of this nature since a thorough review process involves detailed examination of the policy, data collection and NSI stakeholder consultations. Therefore, the chapter relies on the completed reviews listed above and draws themes from them which will then inform the recommendations made in Chapter Six. The table intentionally excludes related legislation, STI institutions and funding as these have been canvassed in ECA's 2016 review.[197] This section only seeks to illustrate the spread of STI policies across the African continent, hence it lists only these. It is understood that there may be policies that are not expressly labelled 'STI policy' that have a bearing on the NSI. These are generally not listed here because the exercise is to identify composite STI policies.

Table 7: National STI policies (by region)

State	STI Policy [--- under formulation * no policy]	Review
Central Africa [9 states]		
Burundi	National Policy on Scientific Research and Technological Innovation, 2011	
--- UNESCO project	Central African Republic, Congo, DR Congo, Equatorial Guinea, Gabon	
*	Cameroon, Chad, São Tomé and Príncipe	→

[194] M Iizuka, P Mawoko & F Gault 'Innovation for Development in Southern & Eastern Africa: Challenges for Promoting ST&I Policy' *UNU Policy Brief No. 1* (2015).

[195] M Iizuka, A Konté, P Mawoko, E Calza & F Gault 'Innovation for Development in West Africa: Challenges for Promoting ST&I Policy' *UNU Policy Brief No. 3* (2018).

[196] United Nations University 'Design and Evaluation of Innovation Policies (DEIP), with the African Union Commission in Morocco', https://www.merit.unu.edu/events/event-abstract/?id=1822&speaker=.

[197] ECA (2016) supra at 87–8.

State	STI Policy [--- under formulation * no policy]	Review
Eastern Africa [14 states]		
Ethiopia	STI Policy, 2012; Start-up Strategy, 2018 (known as the '2222 plan')	ECA 2016; UNESCO GO-SPIN, UNCTAD 2020
Kenya	National STI Policy A Policy Framework For STI[198]	ECA 2016
Madagascar	--- (has a National Research Policy)	
Mauritius	National Innovation Framework 2018–2030[199]	
Rwanda	National STI Policy 2020[200]	ECA 2016; UNESCO GO-SPIN, UNCTAD 2020
Seychelles	National Policy and Strategy for Research Technology and Innovation 2017	
Sudan	STI Policy 2017	African Development Perspectives Yearbook (ADPY) 2018
Tanzania	STI Policy Reform	UNCTAD 2015; ECA 2016
Uganda	National STI Policy 2009, National STI Plan (NSTP) 2012/2013 – 2017/2018, STI Sector Development Plan 2019/2020–2024/2025	ECA 2016; UNESCO GO-SPIN, UNCTAD 2020
*	Comoros, Djibouti, Eritrea, Somalia, South Sudan	
Northern Africa [7 states]		
Egypt	National Strategy for STI (2030)[201]	ADPY 2019
Libya	National Strategy for STI 2014	
Mauritania	--- (in progress)	
Morocco	--- 'Moroccan Innovation Strategy'	
Tunisia	---	ADPY 2019
*	Algeria, Sahrawi Republic	→

[198] https://www.education.go.ke/index.php/downloads/file/323-a-policy-framework-for-science-technology-and-innovation.

[199] http://www.sustainablesids.org/wp-content/uploads/2018/10/Mauritius-National-Innovation-Framework.pdf.

[200] https://ncst.gov.rw/sites/default/files/documents/official/STI_POLICY_2020.pdf.

[201] http://www.crci.sci.eg/wp-content/uploads/2019/12/National-Strategy-for-Science-Technology-and-Innovation-2030.pdf.

State	STI Policy [--- under formulation * no policy]	Review
Southern Africa [9 states]		
Angola	National Policy for STI 2011	ECA 2016
Botswana	National Policy on Research, STI 2011 & implementation plan 2012	UNESCO 2015; ECA 2016; UNESCO GO-SPIN
eSwatini	National Science and Technology Policy, 2006–2011	
Lesotho		ECA 2016
Malawi	ST Policy 1991 revised 2002	UNESCO GO-SPIN
Mozambique	STI Policy 2002	UNESCO GO-SPIN
Namibia	--- UNESCO STI project	
South Africa	White Paper on STI 2019	ECA 2016
Zambia	National Science and Technology Policy 1996[202]	ECA 2016
Zimbabwe	Second Science and Technology Policy 2012[203]	ECA 2016; UNESCO GO-SPIN
Western Africa [16 states]		
Benin	National Policy for Scientific Research and Innovation in the Republic of Benin and its 2025 Strategic Plan (under formulation)[204] in progress – UNESCO	Vicentia 2019
Burkina Faso	National Policy for Scientific and Technical Research, 2012; National Strategy to Popularize Technologies, Inventions and Innovations, 2012.	UNESCO 2015
Gambia	National STI Policy 2013–2022	ECA 2016
Ghana	STI Policy 2017–2020	ECA 2016, UNESCO GO-SPIN, UNCTAD
Niger	Draft national policy on STI[205]	
--- UNESCO STI project		
Nigeria	National STI Policy 2012	ADPY 2018; ECA 2016; UNESCO GO-SPIN →

[202] http://nstc.org.zm/wp-content/uploads/2020/08/National-Science-and-Technology-Policy-2.pdf.
[203] https://www.healthresearchweb.org/files/Zimbawesciencetechpolicydocumentnew.pdf.
[204] Vicentia (2019) supra at 120.
[205] Communique Du Conseil Des Ministres Du Vendredi 10 Juillet 2020, https://www.presidence.ne/conseils-des-ministres/2020/7/10/zef2pm594x9v69950g44z9sed4toqc.

State	STI Policy [--- under formulation * no policy]	Review
Sierra Leone	National Innovation & Digital Strategy (2019–2029)[206]	
Togo	National STI Policy 2014	
*	Guinea-Bissau, Liberia, Mali	
--- UNESCO Project	Cabo Verde, Côte d'Ivoire, Guinea, Senegal	

Source: Author[206]

4.5.1 Evaluation of STI policies

Scholars considering STI policies usually do so from the vantage point of whether they meet their stated objectives. Similarly, development agencies' capacity building programmes focus on this aspect. There are several challenges to the use of STI policies to add to an enabling environment for innovation, five of which will be highlighted here. First, one of the main challenges that states face in policymaking is the inadequacy of evidence to inform policy.[207] Second, implementation capacity is compromised by inadequate 'critical technical skills and resources to promote R&D, improve higher education, and foster growth' which is partially attributable to low GERD, which has not reached the 1% target aspired to by African states.[208] This, coupled with reliance on external funding and dependence on raw materials, means that most African economies lack the diversity and resilience to generate revenue to increase internal funding and investment in capacity enhancement.[209] Consequently, some reviews of states with these limitations assert that their NSI continues to be disadvantaged by 'poor infrastructure, small pool of researchers, low patronage of science and engineering programs, weak intellectual property frameworks, and minimal scientific output relative to the rest of the world'.[210] Whilst there may be some truth in this, the characterisation of IP systems as 'weak' and then attributing the inadequacy of the NSI to this, is overstated. Indeed, as noted by UNCTAD:

> There are important areas of tension between intellectual property protection and the realization of the potential of frontier technologies in areas such as agriculture, health and energy, suggesting that an exclusive focus on strengthening intellectual property protection may be inappropriate. The principle of policy space for flexibility and inclusiveness is

[206] www.dsti.gov.sl.

[207] W Siyanbola, A Adeyeye, O Olaopa & O Hassan 'Science, technology and innovation indicators in policy-making: the Nigerian experience' (2016) 15 *Palgrave Commun* 2, 16015 1–9, https://doi.org/10.1057/palcomms.2016.15.

[208] ACBF (2017) supra at 5.

[209] Ibid.

[210] ACBF (2017) supra at 6.

fundamental, to allow intellectual property regimes to be geared to each country's needs and capacities, through an appropriate balance between the granting of exclusive rights and the promotion of follow-on innovation by competitors.[211]

4.6 Conclusion

The above discussion shows that the African continent has made concerted efforts to harness STI for development through STISA-2024 and related strategies. A robust monitoring system has been set up that aligns continental mechanisms (the STI Forum and the African Regional Forum on Sustainable Development) with the global STI Forum on the HLPF convened annually by the ESC. The continental meeting serves to build consensus so that coherent key messages are taken forward to the global meetings. The relationship between IP and STI is not linear and has some inherent tensions, as noted above in section 4.5.1. However, setting the two firmly within a developmental agenda implementation and monitoring structure serves to clarify priorities for African states.

[211] UNCTAD STI Report (2018) supra at xv.

Chapter 5

LEVERAGING OPENNESS TO MEET THE CHALLENGES OF OUR TIME

5.1 Introduction

Chapter One laid out African and global development agendas. This chapter returns to this aspect by detailing the role of IP in the agendas (in section 5.2). Section 5.3 reprises IP in trade contexts, as already shown by its inclusion in the TRIPs Agreement, discussed in Chapter Two, and in plurilateral and bilateral agreements discussed in Chapter Three. Section 5.4 defines the openness paradigm and why an open approach would be beneficial to Africa's developmental and trade aspirations as articulated in Agenda 2063 and its flagship project, the AfCFTA. Section 5.5 then outlines some African openness initiatives, with emphasis on open science and the African Open Science Platform. Following this, section 5.6 considers openness in relation to access to medicines, a priority area for the African continent for a considerable period of time whose importance has been underscored by the COVID-19 pandemic. Section 5.7 concludes.

5.2 IP, SDGs and Agenda 2063

As a way to contextualise the rest of the chapter's discussion of IP and openness, it is important to begin by expressly linking IP with sustainable development goals as articulated in the SDGs and Agenda 2063, which have been reprised in section 1.5 above. Inclusive and equitable development are major themes in IP generally, with much focus on the creation of IP frameworks that enable and support innovation in all sectors, including marginalised constituencies such as the informal sector, women and indigenous peoples and local communities (IPLC).[1]

Out of its recognition of the significance of IP to sustainable development, WIPO has been reporting annually on its contribution to the implementation of the SDGs.[2] Nine years prior to this, WIPO introduced its Development Agenda in

[1] De Beer et al (2020) supra; De Beer et al (2013) supra.

[2] WIPO Committee on Development and IP (CDIP), Report on WIPO's Contribution to the Implementation of the Sustainable Development Goals and its Associated Targets, Twenty-Third Session Geneva, May 18 to 22, 2020 CDIP/25/6, https://www.wipo.int/edocs/mdocs/mdocs/en/cdip_25/cdip_25_6.pdf.

2007.[3] This agenda has been under implementation since its adoption with a focus on projects in these six clusters: (a) Technical Assistance and Capacity Building; (b) Norm-setting, Flexibilities, Public Policy and Public Domain; (c) Technology Transfer, Information and Communication Technologies (ICT) and Access to Knowledge; (d) Assessment, Evaluation and Impact Studies; (e) Institutional Matters including Mandate and Governance and (f) Other Issues.[4] Many projects have been undertaken under WIPO DA including IP policies for African states.[5]

A useful way of explaining the linkages between IP, innovation and sustainable development is to cluster the explanation around the five Ps (people, prosperity, planet, peace and partnerships). IP considerations are most relevant to the first three, which are discussed in turn below.

5.2.1 People

Beginning with the SDGs pertaining to people (1–6 and 10), the relevance of IP to SDG 1: no poverty is seen in the possibility that the IP protection of certain works may hinder further innovation through the creation of patent thickets and thus preclude income generating innovative activities. The converse is also true, and an appropriately nuanced IP framework would enable and enhance income generating innovative activities.

Regarding SDG 2: zero hunger, the IP protection of plant varieties, processes and products used in both subsistence and commercial agriculture impacts the yield of plant and animal food sources, thereby directly impacting hunger levels. This IP protection has to be considered within the light of Agenda 2063's goal to modernise agriculture for increased productivity and production. The protection of new varieties of plants has emerged as a controversial aspect, as has the protection of TK. The protection of TK is relevant here to the extent that it applies in an agricultural context, for example as know-how pertaining to farming practices. This aspect will be discussed in subsequent sections.

The IP protection of pharmaceutical compositions and medical devices has the most obvious relation to SDG 3: good health and well-being and Agenda 2063's goal to have a continent of healthy and well-nourished citizens. This is because access to medicines is a critical component of the right to health. In the context of the continent's disease burden, a pertinent twofold question to ask is: 'How are IP regimes impacting access to medicines and medical equipment in Africa?

[3] WIPO Decision of the 2007 General Assembly, https://www.wipo.int/edocs/mdocs/govbody/en/wo_ga_34/wo_ga_34_16.pdf; Report of the Provisional Committee on Proposals Related to a WIPO Development Agenda (PCDA) A/43/13 REV. September 17, 2007 para 5, https://www.wipo.int/edocs/mdocs/govbody/en/a_43/a_43_13_rev.pdf. Generally, see J de Beer (ed) *Implementing the World Intellectual Property Organization's Development Agenda* (2009).

[4] WIPO 'Development Agenda: 45 Recommendations', https://www.wipo.int/export/sites/www/ip-development/en/agenda/recommendations.pdf.

[5] WIPO 'Development Agenda Project DA_10_05, https://www.wipo.int/meetings/en/details.jsp?meeting_id=25442; Ncube *Intellectual Property Policy* (2016) supra at 47–50.

What are Africa's policy choices?'[6] The answer to these questions will be explored in subsequent sections, mainly in the context of the TRIPS Agreement and the proposal for an art 73 waiver discussed in section 5.5.1 below.

The connection between IP, SDG 4: quality education and Agenda 2063's goal for well-educated citizens and a skills revolution underpinned by STI primarily hinges on copyright protection of learning materials. These educational goals are also related to Agenda 2063's goal to create a continent of engaged and empowered youth and children. Copyright considerations in the educational context are commonly labelled as access to knowledge matters.

SDG 5 and Agenda 2063 goal 17 relate to gender equality in all spheres of life. The connection between IP and gender equality is multi-faceted and applies to adults, youth and children. Therefore Agenda 2063's goal for engaged and empowered youth and children is also relevant in this context. Gendered analyses of IP frameworks highlight that women are generally under-represented in the IPR system, particularly with regard to IPR registrations.[7] This gender gap is not unique to Africa and exists globally as evidenced by several studies.[8] This scholarship considers gender disparity, application of IP doctrines to gendered and sexualised subject matter and gendered IP doctrines. Studies on female inventors and authors in South Africa highlight the same focal concerns. For example, a recent study has demonstrated that the IP system has a tendency to disempower women, 'especially rural African women crafters whose works, [are] created in collaborative communities'.[9] Similar concerns have been voiced in relation to women in high-tech sectors, such as artificial intelligence.[10] SDG 6 is common to the people and planet categories and will be discussed under the planet category below in section 5.2.3.

5.2.2 Prosperity

The SDGs grouped together under prosperity are 7 (affordable and clean energy), 8 (decent work and economic growth), 9 (industry, innovation and infrastructure),

[6] CB Ncube 'Patents, pharmaceuticals and medical equipment' presentation, Colloquium on COVID-19 and the African Continental Free Trade Agreement (AfCFTA): How the AfCFTA could stimulate an inclusive and developmental post-COVID-19 economic revival' (25 May 2020), https://webcms.uct.ac.za/sites/default/files/image_tool/images/524/Downloads/AfCFTA%20Webinar%202020.pdf.

[7] J de Beer, K Degendorfer, M Ellis & A Gaffen 'Open AIR Briefing Note – Integrating Gender Perspectives into African Innovation Research' (2017) 2, https://openair.africa/wp-content/uploads/2018/11/Briefing-Note-Gender-2017-09-21.pdf.

[8] Eg, see J Heikkilä 'IPR gender gaps: a first look at utility model, design right and trademark filings' (2018) 118 *Scientometrics* 869, https://doi.org/10.1007/s11192-018-2979-0; KW Swanson 'Intellectual Property and Gender: Reflections on Accomplishments and Methodology' (2016) 24(1) *American University Journal of Gender, Social Policy & the Law* 175.

[9] DO Oriakhogba 'Empowering Rural Women Crafters in KwaZulu-Natal: The Dynamics of Intellectual Property, Traditional Cultural Expressions, Innovation and Social Entrepreneurship' (2020) 137 *South African Law Journal* 145 at 146.

[10] A Thirukesan 'The absence of gender analysis in AI and its implications for Africa: with perspectives from WomENG' (1 December 2019), https://openair.africa/the-absence-of-gender-analysis-in-ai-and-its-implications-for-africa-with-perspectives-from-womeng/.

10 (reduced inequalities) and 11 (sustainable cities and communities). They correspond closely to the following Agenda 2063 goals: a high standard of living, quality of life and well-being for all African citizens; transformed economies, world class infrastructure and an Africa that takes full responsibility for financing her development goals. IP is relevant to these goals in several ways including as a facilitator of the growth of knowledge through public knowledge, as an economic incentive to spur R&D and as a system for balancing competing stakeholder interests.[11] In its own estimation, WIPO considers its mission to be most closely relevant to SDG 9 and it seeks to contribute by 'lead[ing] the development of a balanced and effective international intellectual property (IP) system that enables innovation and creativity for the benefit of all'.[12] This assertion is contested and there is a considerable body of scholarship arguing that the standards set at WIPO have not been appropriately balanced for the benefit of all stakeholders.[13]

5.2.3 Planet

The planet related SDGs clean water and sanitation (SDG 6), responsible consumption and production (SDG 12), climate action (SDG 13), life below water (SDG 14) and life on land (SDG 15) are articulated as Agenda 2063's goal of creating environmentally sustainable and climate resilient economies and communities. IP's relevance to this cluster of development goals arises out of regulation and protection of innovation. IP protects most of the necessary technologies and relevant knowledge. Much has been written about these aspects, as highlighted in Chapter Four's discussion of the relationship between IP and technology transfer. In a bid to open up innovation in these areas for the benefit of developing countries and LDCs, WIPO created a platform known as WIPOGreen—The Marketplace for Sustainable Technology, which allows sharing of information and other collaboration between 'technology providers, technology seekers and other stakeholders such as corporations, academic and research institutions, intergovernmental organizations, and small and medium-sized enterprises (SMEs)'.[14]

5.3 IP in a trade context

IP in its various forms may apply to goods and services that are the subject of trade. It is relevant to trade because it is a non-tariff measure. Non-tariff measures are

[11] WIPO *Innovation Driving Human Progress: WIPO and the Sustainable Development Goals* (2019), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1061.pdf.

[12] WIPO CDIP supra at 2.

[13] N Syam 'Mainstreaming or Dilution: Intellectual Property and Development in WIPO' (2019) *South Centre Research Paper 95*, https://www.southcentre.int/wp-content/uploads/2019/07/RP95_Mainstreaming-or-Dilution-Intellectual-Property-and-Development-in-WIPO_EN.pdf; P Drahos 'Developing Countries and International Intellectual Property Standard Setting' (2005) 5(5) *Journal of World Intellectual Property* 765; SF Musungu 'Rethinking Innovation, Development and Intellectual Property in the UN: WIPO and Beyond' (2005) *TRIPS Issues Papers 5,* https://quno.org/sites/default/files/resources/Rethinking%2BIP%2B-%2BWIPO%2Band%2BBeyond.pdf.

[14] WIPOGreen 'The Marketplace for Sustainable Technology', https://www3.wipo.int/wipogreen/en/.

defined as 'policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both'.[15] Non-tariff measures are classified into technical and non-technical measures and then into chapters. IP is classified as a non-technical measure, assigned to Chapter N. These chapters are tabulated below to graphically place IP within its trade context.

Table 8: Classification of non-tariff measures by chapter

Imports	Technical measures	A	Sanitary and phytosanitary measures
		B	Technical barriers to trade
		C	Pre-shipment inspection and other formalities
	Non-technical measures	D	Contingent trade-protective measures
		E	Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade
		F	Price control measures, including additional taxes and charges
		G	Finance measures
		H	Measures affecting competition
		I	Trade-related investment measures
		J	Distribution restrictions
		K	Restrictions on post-sales services
		L	Subsidies and other forms of support
		M	Government procurement restrictions
		N	Intellectual property
		O	Rules of origin
	Exports	P	Export related measures

Source: UNCTAD 2019 International Classification of Non-Tariff Measures UNCTAD/DITC/TAB/2019/5 vii

IPRs are granted in terms of national laws and the rights are limited to national territories. If a business is trading across borders, it has to obtain IPRs in all its trade territories. This then makes agreement on IP minimum standards a trade imperative, in order to provide certainty to cross-border traders and those from other territories who wish to trade in a specific jurisdiction. Hence the conclusion of the TRIPS Agreement under the auspices of the WTO and the treatment of IP in trade agreements. Similarly, IP is of great significance for African RECs[16] and the overall continental regional integration agenda. Preceding sections have detailed

[15] UNCTAD *Non-tariff Measures: Evidence from Selected Developing Countries and Future Research Agenda* (2010) 99, https://unctad.org/system/files/official-document/ditctab20093_en.pdf.

[16] Eg, see Nkomo (2014) supra at 324.

relevant multilateral agreements (in section 2.2), plurilateral and bilateral trade agreements (in sections 3.2–3.4) and RECs' IP instruments (in section 3.6). Section 4.3 highlighted the inclusion of IP in STISA-2024 and this will be consolidated in Chapter Six's discussion of IP within the AfCFTA.

The inclusion of IP in trade agreements is often justified in terms of its relationship with investment and economic development.[17] It is important to note that this is a controversial and unsettled proposition.[18] On the one hand, there are arguments that a strong IP framework would lead to economic growth.[19] On the other hand, it has been demonstrated that the relationship between strong IP protection and economic growth is not supported by incontrovertible evidence.[20] In particular, today's developed economies had minimal IP protection to encourage innovation and growth in the earlier stages of their economic development.[21] Therefore, in LDCs, more than 60% of which are located in Africa, strong IP protection does not necessarily spur technological innovation because innovative capacity in these states is not primarily or solely reliant on IP protection.[22] The forum-shifting of IP from the WTO to the international investment regime has been lamented as a further foreclosure of the flexibility and policy space secured in the TRIPS

[17] D Kyrkilis & S Koboti 'Intellectual Property Rights as Determinant of Foreign Direct Investment Entry Mode: The Case of Greece' (2015) 19 *Procedia Economics and Finance* 3; P Nunnenkamp & J Spatz 'Intellectual property rights and foreign direct investment: A disaggregated analysis' (2004) 140 *Review of World Economics* 393; KE Maskus 'Intellectual Property Rights and Economic Development' (2000) 32(3) *Case Western Reserve Journal of International Law* 471; RE Evenson 'Intellectual Property Rights and Economic Development, by Keith Maskus' (2001) 33(2) *Case Western Reserve Journal of International Law* 187; KE Maskus 'Intellectual Property Rights and Foreign Direct Investment' (2000) *Centre for International Economic Studies Policy Discussion Paper 0022,* https://www.iatp.org/sites/default/files/Intellectual_Property_Rights_and_Foreign_Direc.htm; K Idris *Intellectual Property: A Power Tool for Economic Growth* (2003), https://www.wipo.int/edocs/pubdocs/en/intproperty/888/wipo_pub_888.pdf; D Kaplan 'Intellectual Property Rights and Innovation in South Africa: A Framework' in D Kaplan *The Economics of Intellectual Property in South Africa (*2009) at 1.

[18] Generally, see C Geiger (ed) *Research Handbook on Intellectual Property and Investment Law* (2020).

[19] Idris (2003) supra; Maskus 'IP Rights and Economic Development' (2000), 'IP Rights and Foreign Direct Investment' (2000) & (2003) supra; KMLA Lybecker 'The Economic Case for Strong Protection for Intellectual Property' (2 May 2014), https://www.ipwatchdog.com/2014/05/02/the-economic-case-for-strong-protection-for-intellectual-property/id=49376/.

[20] Baker, Jayadev & Stiglitz (2017) supra; C Correa & X Seuba (eds) *Intellectual Property and Development: Understanding the Interfaces* (2019); R Gold, J Morin, & E Shadeed 'Does intellectual property lead to economic growth? Insights from a novel IP dataset' (2019) 13 *Regulation and Governance* 107; B Maister et al *Harnessing Intellectual Property Rights for Development Objectives: The Double Role of IPRs in the Context of Facilitating MDGs Nos. 1 and 6*. (2011); WIPO *The Economics of Intellectual Property in South Africa* (2009).

[21] LJ Gibbons 'Do as I Say (Not as I Did): Putative Intellectual Property Lessons for Emerging Economies from the Not So Long Past of the Developed Nations' (2011) *SMU Law Review* 923; D Vaver *Intellectual Property Rights: Critical Concepts in Law* (2006); G Dutfield *Intellectual Property Rights and the Life Science Industries: A Twentieth Century History* (2003); RL Ostergard *The Development Dilemma: The Political Economy of Intellectual Property Rights in the International System (Law And Society)* (2003); HJ Chang 'Kicking Away the Ladder: An Unofficial History of Capitalism, Especially in Britain and the United States' (2002) 45(5) *Challenge* 63.

[22] JT Gathii 'Strength in Intellectual Property Protection and Foreign Direct Investment Flows in Least Developed Countries' (2016) 44 *Georgia Journal of International and Comparative Law* 499 at 501–502.

Agreement for private arbitration processes.[23] It is clear that within the African continent, and indeed globally, there is consensus that IP should be harnessed to enhance sustainable development and support trade.

5.4 The openness paradigm

Many concepts and systems have been described as 'open', to the extent that one can say there is an emerging concept of 'openness' reflected in scholarship and practice by innovators and entrepreneurs.[24] Establishing whether a system is open or not requires a consideration of several factors, including 'the degree to which people are free, or even empowered, to universally access a system and to participate, collaborate and share within that system'.[25]

The four dimensions of openness are (i) ideological, (ii) legal, (iii) technical and (iv) operational.[26] Ideological openness is related to the 'beliefs [principles and arguments] about the purpose and value of openness'[27] which underpin this book's arguments about collaborative innovation[28] and several states' efforts to establish a more inclusive NSI.[29] The ideological underpinnings of openness and IP scholarship include (i) social justice imperatives,[30] (ii) sustainable development, (iii) human development, (iv) philosophical approaches and (v) human rights. Legal openness refers to the mechanisms used to enable and support access, participation, collaboration and sharing of works that are the subject of IPRs. These are primarily (i) limitations and exceptions or other flexibilities and (ii) voluntary licensing. The first option has been discussed in detail in Chapter Two in sections 2.3.1 (copyright limitations and exceptions) and 2.8.1 (patent flexibilities). The second option cannot be relied upon by states to meet public interest objectives, and states need to use their legislative and policymaking powers to ensure openness, appropriate access, participation and collaboration in keeping with the public interest and other related imperatives.

Technical openness relates to technical aspects, for instance formats and standards. In the context of open data, its quality, availability, dataset formats and

[23] JT Gathii & C Ho 'Regime Shifting of IP Lawmaking and Enforcement from the WTO to the International Investment Regime' (2007) 18 *Minnesota Journal of Law, Science & Technology* 427.

[24] CB Ncube 'Intellectual Property and Openness' in I Calboli and ML Montagnan (eds) *The Handbook of Intellectual Property Research* (forthcoming). This section is adapted from that chapter.

[25] De Beer et al 'Innovation, Intellectual Property and Development Narratives in Africa' in De Beer et al (eds) (2013) supra at 8.

[26] T King, C Hodgkinson-Williams, M Willmers & S Walji 'Dimensions of open research: critical reflections on openness in the ROER4D project' (2016) 8(2) *Open Praxis* 81 at 83.

[27] King et al (2016) supra at 83.

[28] MA Peters and P Roberts *The Virtues of Openness: Education, Science, and Scholarship in the Digital Age* (2012) at 1–2.

[29] DST (2018) supra at 22.

[30] E.g. Sunder (2012) supra; A Chander & M Sunder, *Is Nozick Kicking Rawls's Ass? Intellectual Property and Social Justice* (2007) 40 *U.C. Davis L. Rev*. 563.

metadata standards are important.[31] Operational openness pertains to surrounding practices such as transparency and collaboration supported by frequent and clear communication about goals, questions, progress and the dissemination of products or outputs.[32] The key attributes of openness that emerge from the above four dimensions are accessibility, responsiveness and creativity. These domains and attributes are easily identifiable in the definitions of concepts that are characterised as open, some of which are listed in the table below. These concepts and their usage are very diverse and differ between disciplines, for instance examination of open innovation unearths much complexity.[33] Where possible, the table uses definitions from national policy instruments to demonstrate their understanding and use by policymakers, rather than by scholars.

Table 9: Definitions of some 'opens'

	Definition
Open access	'digital, online, free of charge, and free of most copyright and licensing restrictions'[34]
Open data	'Data that can be used by anyone without technical or legal restrictions. The use encompasses both access and reuse.'[35]
Open collaborative innovation	'fundamental change in the socio-economic systems that facilitate innovation'[36]
Open innovation	'The basic premise of open innovation is to introduce more actors into the innovation process so that knowledge can circulate more freely and be transformed into products and services that create new markets, fostering a stronger culture of entrepreneurship and encouraging firms to use external and internal ideas, and internal and external paths to market, as they look to advance their technologies.'[37] →

[31] J Berends, W Carrara, H Vollers, T Fechner & M Kleemann *Analytical Report 5: Barriers in Working With Open Data, European Data Portal* (March 2017) at 18, https://www.europeandataportal.eu/sites/default/files/edp_analytical_report_n5_-_barriers_in_open_data.pdf; M Beno, K Figl, J Umbrich & A Polleres 'Perception of Key Barriers in Using and Publishing Open Data' (2017) 9(2) *JeDEM* 134 at 145.

[32] King et al (2016) supra at 87.

[33] J de Beer 'Intellectual Property and "Open" Innovation: A Synthesis of Concepts' in Calboli and Montagnani (forthcoming) supra.

[34] P Suber *Open Access* (2012) at 4.

[35] OECD Making Open Science a Reality, OECD Science, Technology and Industry Policy Papers, No. 25, (OECD Publishing 2015) at 55, https://doi.org/10.1787/5jrs2f963zs1-en.

[36] J de Beer *Open Innovation Policy Frameworks: Intellectual Property, Competition, Investment & Other Market Governance Issues* (2015).

[37] DST (2018) at vii.

Open research	'the process of conducting and sharing research in which a selection of research proposals, work-process documents, literature reviews, methodologies, research instruments, analytical frameworks, findings and/or data are intentionally shared on publically-accessible platforms in order for others to freely access, use, modify, and share them subject to measures that preserve ethical practice and legal provenance'[38]
Open science	'the idea that knowledge from across different domains should be openly shared as early as it is practical in the research process ... proposes to expand access to and participation in the processes and outputs of the entire research life cycle … [and] an expanded range of actors, including "citizens," could take part in the knowledge production process, from agenda setting to research design, and from the dissemination and uptake of research to subsequent policy influence'[39]
Open source software	'computer software that is made freely available for anyone to modify or redistribute, provided that the source code of the software is made freely available to others.'[40]

In most of the above, openness is secured by voluntary licensing, such as using creative commons licenses for literary works, the GNU General Public License (GNU GPL or GPL) for software or patent pools for pharmaceuticals. That is to say, a product, process, work or a resource that is protected by IP is licensed by the right-holder for use in various contexts under stipulated conditions. This is an important point to make to dispel the oft-held misconception that openness is antithetical to IPRs. The opposite is true, because in order for one to be able to openly license a resource for use, one must have IPRs in that resource. It is also important to state that some resources are openly or freely available because they are not protected by IPRs and are therefore in the public domain. Either way, the significant point is that openness hinges on the absence (where the resource is in the public domain) or licensing of IPRs (where it is protected).

Open approaches are supportive of developmental efforts because they enable collaboration which ought to render more efficient and more robust solutions to whatever challenge confronts society, institutions or persons. For example, an open letter was signed by more than 140 world leaders ahead of the health ministers' World Health Assembly meeting held on 18 May 2020 calling for an open people's vaccine for COVID-19.[41]

[38] CA Hodgkinson-Williams & T King 'Researching OER in the open: Developments in the ROER4D project' (2015) at 5.

[39] L Chan 'Situating Openness: Whose Open Science?' in L Chan et al (eds) *Contextualizing Openness: Situating Open Science* (2019) at 4.

[40] J Speres 'The Enforceability of Open Source Software Licences: Licences Be Granted Non-Contractually?' (2009) 21 *South African Mercantile Law Journal* 174 at 175.

[41] UNAIDS 'Press Release: World leaders unite in call for a people's vaccine against COVID-19', 14 May 2020, https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2020/may/20200514_covid19-vaccine.

Another example is that, in resource-constrained contexts, access to educational resources may be hindered by costs affiliated to IPR protected resources which are sold at a premium, therefore access to free resources is preferable. This is the argument for open access and open educational resources in developing countries. This argument has been solidified by the need to switch to emergency remote teaching during the COVID-19 pandemic, which forced the closure of educational institutions at all levels. This meant access to hard copy books in libraries was severely hindered and there was greater reliance on electronic resources, which in disadvantaged contexts could only be accessed as open educational resources (OER). Even well-resourced institutions, such as universities, required additional licensing concessions and arrangements to facilitate access and relied on OER to a greater extent than previously.[42] From the perspective of researchers and academics, open access permits better dissemination of research findings, which results in benefits for society.[43]

5.5 African instruments and initiatives on openness

There are several AU instruments that advance open approaches to STI in the pursuit of sustainable development. For instance, STISA-2024 states that 'a multi-disciplinary and multi-sectoral approach to *Collaborative Open Innovation* and Entrepreneurship is essential to achieving the Knowledge Economy and sustainable socio-economic development across Africa'[44] (emphasis added). It then continues to relate this to 'education and research, private and public sector stakeholders' in the 'co-creation, adaptation and commercialisation of research and innovation outputs'.[45] Evidently what the authors had in mind was open education, open research, open science and open innovation.

Many initiatives on the continent facilitate and support these opens. For example, the African Academy of Science hosts an open research platform for African scientists to publish their work in a system that provides peer review and extensive dissemination.[46] Further, UNESCO has compiled a list of open access initiatives across the continent.[47] OER initiatives are closely aligned to open access projects

[42] CB Ncube 'The musings of a copyright scholar working in South Africa: is Copyright Law supportive of emergency remote teaching?' 13 May 2020, *Afronomics Law*, https://www.afronomicslaw.org/2020/05/13/the-musings-of-a-copyright-scholar-working-in-south-africa-is-copyright-law-supportive-of-emergency-remote-teaching/.

[43] L Czerniewicz & S Goodier 'Open access in South Africa: A case study and reflections' (2014) 110(9–10) *South African Journal of Science* 1–9, https://dx.doi.org/10.1590/sajs.2014/20140111; DM Matheka et al 'Open access: academic publishing and its implications for knowledge equity in Kenya' (2014) 10 *Globalization and Health* 26, DOI:10.1186/1744-8603-10-26; L Abrahams, M Burke, E Gray & A Rens *The Southern African Regional Universities Association (SARUA) Study Series: Opening Access to Knowledge in Southern African Universities (*2008).

[44] AU (2014) supra at 31.

[45] Ibid.

[46] AAS Open Research, https://aasopenresearch.org/.

[47] UNESCO 'Global Open Access Portal – Africa', http://www.unesco.org/new/en/communication-and-information/portals-and-platforms/goap/access-by-region/africa/.

and are usually embedded in them. However, there are distinct projects that focus only on OER.[48] Another example is the move to create the Africa Open Innovation Platform, which commenced with the extension of South Africa's Innovation Bridge[49] to SADC states at the African STI Forum 2020.[50] This platform presents innovations classified by SDGs, technical fields and institutions with functionalities for seeking funding. The EU-Africa Ubora Open Innovation Infrastructure which provides a collaborative platform for biomedical engineering is another example.[51]

Open Science initiatives are slowly gaining traction, with several examples spread throughout the continent.[52] One example is the African Open Science Platform (AOSP) which was in its pilot phase from 2017–2019. At the end of the pilot, a landscape study and frameworks were submitted.[53] The pilot was sponsored by South Africa's Department of Science (DSI) and administered by the National Research Foundation (NRF) and the Academy of Science of South Africa (ASSAf) with several partners including the International Science Council (ISC) and its Committee on Data (CODATA).[54] From 2020, the project is in the implementation phase with a project office located in South Africa.[55]

Globally, UNESCO is leading a consultative process with a view to adopting a recommendation on open science by November 2021 which will be 'a standard-setting instrument' following a decision of its General Conference at its 40th Session.[56] Consultations on this have been held with Africa's ministers of education, science and technology at a forum held in December 2019. At that forum, it was noted that the AU's vision is that 'open science could be a game changer for achieving the Sustainable Development Goals, particularly in Africa' and the AOSP is an AU

[48] Eg, OER Africa, https://www.oerafrica.org/about-us.

[49] Innovation Bridge, https://www.innovationbridge.info/ibportal/innovations.

[50] Presentation of the Innovation Bridge, by CSIR-South Africa, African STI Forum 2020, Victoria Falls, 24 February 2020.

[51] P Makabore 'Presentation of the EU-Africa Ubora Open Innovation Infrastructure', *African STI Forum* (2020).

[52] J Mwelwa, G Boulton, JM Wafula & C Loucoubar 'Developing Open Science in Africa: Barriers, Solutions and Opportunities' (2020) 19(1) *Data Science Journal* 31, DOI: http://doi.org/10.5334/dsj-2020-031; J Chisenga 'Open Science in Africa: For What and Whose Mandate?' (2018), https://www.scecsal.org/publications/papers2018/010_chisenga_2018.pdf.

[53] AOSP *The Future of Science and Science for the Future: Vision and Strategy for the African Open Science Platform*, 12 December 2018, DOI 10.5281/zenodo.2222417; AOSP 'Closing of the Pilot AOSP Project – October 2019', http://africanopenscience.org.za/?p=1174; I Smith 'The African Open Science Platform (AOSP): Fostering a Culture of Open Data within African National Systems of Innovation' (2019); H Soodyall & I Smith 'OASP: Pilot Study and Landscape Findings', *AOSP Delivery Phase Planning Workshop* (2019); ASSAf 'AOSP – Landscape Study' (2019).

[54] AOSP 'NRF South Africa to host the AOSP Project Office' 29 April 2020, http://africanopenscience.org.za/?p=1191.

[55] Ibid.

[56] P Oti-boateng 'Towards a UNESCO Recommendation on Open Science: Building a Global Consensus on Open Science' at 10 African STI Forum 2020, Victoria Falls, 24 February 2020.

project that gives life to this aspiration.[57] It is animated by a vision, founded on Agenda 2063 and STISA-2024,

> for African scientists to be at the cutting edge of contemporary, data-intensive science as a fundamental resource for a modern society; to be innovative global exponents and advocates of Open Science; and [to be] leaders in addressing African and Global Challenges.[58]

This was endorsed by the Ministerial Session of the 3rd Ordinary Session of the AU STC-EST which declared that they 'support and promote open science initiatives at the national, regional and continental levels to increase access to scientific information, data, knowledge and networks and to bring science closer to society'.[59]

Discussions on this UNESCO consultation continued at a round table panel at the African STI Forum 2020, where consensus was that open science is beneficial to the continent's efforts to leverage STI for sustainable development.[60] Indeed, the continent has begun important work on the AOSP. Some of the recommendations proffered to UNESCO were the following:

1.1 A partnership with the AOSP;
1.2 Expansion of ASSAf's 2018 landscape assessment;
1.3 The coordination (with the AOSP) of African initiatives on open access, open notebooks and open review.[61]

African educational and research institutions, parliaments, researchers and other stakeholders have repeatedly made calls for open approaches, including in the

1 Dakar declaration on Open Science in Africa (2016);[62]
2 Dakar Declaration on Open Access in Africa and the Global South (2016);[63]
3 Cape Town Open Education Declaration: Unlocking the promise of open educational resources (2007);[64] and the

[57] AU Department of Human Resources, Science & Technology Specialized Technical Committee on Education, Science and Technology STC-EST III, 12 December 2019, Forum on Open Science for Africa at 3.

[58] Ibid.

[59] Report of Ministerial Session of the 3rd Ordinary Session of the AU Specialised Technical Committee on Education, Science and Technology, 13 December 2019, Addis Ababa, at 9.

[60] M Qhobela 'Inputs (from Africa) to UNESCO' *African STI Forum 2020, Victoria Falls* (24 February 2020).

[61] Qhobela (2020) supra at 18.

[62] The Dakar Declaration on Open Science in Africa adopted by the participants at the Sci-GaIA Workshop on "Promoting Open Science in Africa", the 2nd TANDEM Workshop and the WACREN Conference 2016, all held in Dakar in March 2016, http://www.sci-gaia.eu/dakar-declaration/, institutional signatories listed at http://www.sci-gaia.eu/institutional-signatures/.

[63] Dakar Declaration on Open Access in Africa and the Global South. Adopted in Dakar, Senegal, on Friday, April 1, 2016, https://wiki.lib.sun.ac.za/images/5/50/Dakar-declaration-2016.pdf.

[64] Cape Town Open Education 'Declaration: Unlocking the promise of open educational resources', adopted 5 September 2007, https://www.capetowndeclaration.org/read-the-declaration. Signatories include 'learners, educators, trainers, authors, schools, colleges, universities, publishers, unions, professional societies, policymakers, governments, foundations and … open education initiatives around the world'.

4 Kigali Declaration on the Development of an Equitable Information Society in Africa 2009.[65]

This demonstrates that national and continental initiatives have support and ought to be meaningfully implemented.

5.6 Openness, patents and access to medicines

The right to health finds protection in the Universal Declaration of Human Rights (UDHR),[66] which has attained the binding status of customary international law,[67] the International Covenant on Economic, Social and Cultural Rights (ICESCR)[68] and other significant human rights instruments, including the African Charter on Human and Peoples' Rights.[69] The relationship between IP and human rights is the subject of a substantial body of literature, including Helfer and Austin's seminal text *Human Rights and Intellectual Property: Mapping the Global Interface* which maps the main threads of scholarship into three main groups, namely (1) historical, (2) human rights lens' evaluation of state use of available policy space or flexibilities and (3) using human rights arguments to motivate expanding or

[65] Kigali Declaration on the Development of an Equitable Information Society in Africa 2009. Adopted at the Development of an Equitable Information Society: The Role of African Parliaments; international conference, Kigali, Rwanda, 4–5 March 2009. Signed by representatives of the Parliaments of Algeria, Angola, Botswana, Burkina Faso (PAP), Burundi, Chad, Comoros, Congo-Brazzaville, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Ethiopia, Gambia, Ghana, Kenya, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sierra Leone, Sudan, eSwatini, Tanzania, Togo, Uganda and the Pan African Parliament, East African Legislative Assembly, ECOWAS and SADC Parliamentary Forum.

[66] Art 25 of the UDHR provides: 'Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services.'

[67] BS Chimni 'Customary International Law: A Third World Perspective' (2018) 112(1) *American Journal of International Law* 1, DOI:10.1017/ajil.2018.12; G Ooms & R Hammonds 'Global constitutionalism, responsibility to protect, and extra-territorial obligations to realize the right to health: time to overcome the double standard (once again)' (2014) 13 *International Journal for Equity in Health* 68, DOI:10.1186/s12939-014-0068-4.

[68] Art 12 of the ICESCR provides for the right to health as follows:
'The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health. The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for:
The reduction of the stillbirth-rate and of infant mortality and for the healthy development of the child;
The improvement of all aspects of environmental and industrial hygiene;
The prevention, treatment and control of epidemic, endemic, occupational and other diseases;
The creation of conditions which would assure to all medical service and medical attention in the event of sickness.' Also see UN Committee on Economic, Social and Cultural Rights General Comment No. 14 2000.

[69] Adopted 27 June 1981, OAU Doc. CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), entered into force 21 October 1986. Art 16 provides '1. Every individual shall have the right to enjoy the best attainable state of physical and mental health. 2. States parties to the present Charter shall take the necessary measures to protect the health of their people and to ensure that they receive medical attention when they are sick.'

diminishing intellectual property rules.[70] A detailed explanation of the scholarship on the right to health is beyond the scope of this section, and readers are pointed to comprehensive studies,[71] some of which are listed in Velasquez et al's annotated bibliography.[72] This bibliography lists summaries and comments on human rights and access to medicines scholarship by region (Africa, Asia and Oceania, Europe, the Americas and the Middle East). It also provides information about key role players in the normative space, including civil society, international organisations with mandates that include intellectual property, discussion groups and relevant resolutions on health and intellectual property.

The right to health cannot fully be realised without access to medicines and the requisite diagnostic and therapeutic medical equipment. Its realisation is an integral part of the SDGs and Agenda 2063. For example, IP protection of pharmaceutical compositions and medical devices impacts the realisation of SDG 3: good health and well-being and Agenda 2063's goal to have a continent of healthy and well-nourished citizens.

Medicines and diagnostic and therapeutic medical equipment are protected by IPRs such as patents for pharmaceutical compositions and medical equipment and trade secret protection. The time and cost investment required for drug development justifies the use of IPRs to secure a return on investment. Estimates of the actual monetary costs vary, with estimates in 2011 pegging the amount at $1.3 billion[73] and at 1.86 billion in 2013.[74] However, such protection needs to be calibrated to serve the public interest, hence the TRIPS patent-related flexibilities set out in Chapter Two. Africa's perennial developmental challenges include a considerable disease burden, comprising both communicable and chronic non-communicable diseases (NCDs).[75] Some communicable diseases such as HIV/AIDs and tuberculosis and neglected tropical diseases (NTDs), including guinea-worm disease, Buruli ulcer

[70] LR Helfer & GW Austin *Human Rights and Intellectual Property: Mapping the Global Interface* (2011) at 506–510.

[71] B Coriat & L Orsenigo 'IPRs, Public Health and the Pharmaceutical Industry: Issues in the Post-2005 TRIPS Agenda' in Cimoli et al (2014) supra; African Scholars for Knowledge Justice (ASKJustice) project, http://askjustice.org/.

[72] G Velásquez, CM Correa & VH Pinto Ido *Intellectual Property, Human Rights and Access to Medicines: A Selected and Annotated Bibliography* 3ed (2020).

[73] MP Pugatch 'Patent Pools and Collaborative Initiatives: Assessing the Efficacy of Alternatives to IP in the Development of New Pharmaceutical Drugs, Especially for Neglected Diseases – An Empirical Analysis' (2011) 2(4) *European Journal of Risk Regulation* 566.

[74] JA DiMasi, HG Grabowski & RW Hansen 'Innovation in the pharmaceutical industry: New estimates of R&D costs' (2016) 47 *Journal of Health Economics* 20.

[75] WHO Regional Office for Africa *The Health of the People: What Works – the African Regional Health Report 2014* (2014) at 7–9; A de-Graft Aikins, N Unwin & C Agyemang et al 'Tackling Africa's chronic disease burden: from the local to the global' (2010) 6 *Global Health* article 5, https://doi.org/10.1186/1744-8603-6-5.

and human African trypanosomiasis,[76] are very prevalent.[77] For instance, a study of Francophone Africa covering the period 1990–2017 found that the region has a 'high burden of communicable and neonatal diseases'. [78] Similarly, the incidence of NCDs is alarmingly high. Examples include Mozambique's high levels of diabetes and hypertension,[79] Tanzania's challenge of type 2 diabetes mellitus[80] and Ghana and Cameroon's responses to diabetes, hypertension and stroke.[81] Diabetes is widespread across the continent and its costs take a huge toll on national economies.[82]

While there are strong current calls for openness in the context of the COVID-19 pandemic,[83] similar calls have been made in the past to meet the crises caused by Ebola[84] and neglected diseases. For example, Rutschman's proposal for 'a dormant license, agreed upon in the pre-outbreak period, that would become active once a public health emergency is declared' to reduce or eliminate 'transactional IP inefficiencies during the early stages of an outbreak and [help] get vaccines to the market more efficiently to save lives'.[85] Some open collaborative initiatives have been established to enhance generic competition and to enhance innovation for drug development for neglected diseases.[86]

5.6.1 IPRs, the COVID-19 pandemic and the proposal for a TRIPS waiver

The TRIPs Agreement's health related flexibilities remain a topical and important issue. Patentability criteria are largely set in the TRIPs Agreement but there is some

[76] WHO (2014) supra at 69.

[77] PJ Hotez & A Kamath 'Neglected tropical diseases in sub-saharan Africa: review of their prevalence, distribution, and disease burden' (2009) 3(8) *PLoS Neglected Tropical Diseases* e412, DOI:10.1371/journal.pntd.0000412.

[78] C El Bcheraoui et al 'Burden of disease in francophone Africa, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017' (2020) *The Lancet Global Health, DOI*:10.1016/S2214-109X(20)30024-3.

[79] C Silva-Matos & D Beran 'Non-communicable diseases in Mozambique: risk factors, burden, response and outcomes to date' (2012) 8 *Global Health* 37, https://doi.org/10.1186/1744-8603-8-37.

[80] M Kolling, K Winkley & M von Deden '"For someone who's rich, it's not a problem": Insights from Tanzania on diabetes health-seeking and medical pluralism among Dar es Salaam's urban poor' (2010) 6 *Global Health* 8, https://doi.org/10.1186/1744-8603-6-8.

[81] A de-Graft Aikins, P Boynton & LL Atanga 'Developing effective chronic disease interventions in Africa: insights from Ghana and Cameroon' (2010) 6 *Global Health* 6, https://doi.org/10.1186/1744-8603-6-6.

[82] Silva-Matos & Beran (2012) supra.

[83] Eg, see Health Policy Watch WHO 'Costa Rica & Chile Announce Official Launch of COVID-19 Intellectual Property Pool', May 15, 2020, https://healthpolicy-watch.org/who-costa-rica-announce-official-launch-of-covid-19-intellectual-property-pool/; UNAIDS 'Uniting behind a people's vaccine against COVID-19', May 14, 2020. https://www.unaids.org/en/resources/presscentre/featurestories/2020/may/20200514_covid19-vaccine-open-letter.

[84] C Oguamanam & N Ramsoomair 'COVID-19: In the Shadow of Ebola, the Patent War to Come and a Forgotten Africa' May 31, 2020, https://openair.africa/covid-19-in-the-shadow-of-ebola-the-patent-war-to-come-and-a-forgotten-africa/; A Attaran & JW Nickerson 'Is Canada patent deal obstructing Ebola vaccine development? (2014) *The Lancet* 384 (9958), e61.

[85] AS Rutschman 'IP Preparedness for Outbreak Diseases' (2018) 65(5) *UCLA Law Review* 1200.

[86] Pugatch (2011) supra.

policy space regarding their meaning and several flexibilities that can be used to support and enable access to medicines as explained in Chapter Two. However, many countries in African states have not fully leveraged these. For example, some do not have compulsory licensing provisions that would enable the production of pharmaceuticals and medical equipment, which would be critical as efficacious medicine and vaccines are developed, produced and patented. Similarly, others have compulsory licensing provisions but have never used them. Accordingly, it is important to enact compulsory licensing provisions and to implement them for public or all-sector use of COVID-19 pharmaceuticals and medical equipment.

Another important area is the efficacy of the amendment to the TRIPs Agreement,[87] which has been again highlighted by the COVID-19 pandemic, which requires a comprehensive health responsive that includes diagnostics, a vaccine and treatment/management medication. Further, it is apparent that those countries that had opted out of this important flexibility need to avail themselves of it.[88]

It is important to note that while this section has limited its focus on patents, other IP rights are implicated in COVID-19 health responses. This is because copyright, designs and the protection of undisclosed information are also relevant to the protection of pharmaceutical compositions and medical devices needed in the prevention (now that a vaccine has been found), diagnosis and treatment of COVID-19. Consequently, South Africa and India tabled a proposal for a TRIPS waiver, co-sponsored by eSwatini and Kenya, tabled at the 15–16 October 2020 TRIPS Council meeting addressed all IPRs.[89] The proposal requested a halt or a temporary cessation of the

> implementation, application and enforcement of sections 1 [copyright and related rights], 4 [industrial designs], 5 [patents] and 7 [undisclosed information] of Part II of the TRIPS Agreement in relation to prevention, containment or treatment of COVID-19.[90]

The matter was debated at the council with arguments made for and against the proposal, and South Africa then requested that the matter be kept open for discussion for a period not exceeding 90 days, ending 31 December 2020.[91] Resolution was not

[87] CM Correa 'Will the Amendment to the TRIPS Agreement Enhance Access to Medicines' (2019) *South Centre Policy Brief No. 57*.

[88] KEI Online 'Open letter asking 37 WTO Members to declare themselves eligible to import medicines manufactured under compulsory license in another country, under 31bis of TRIPS Agreement' 27 April 2020, https://www.keionline.org/32707.

[89] WTO 'TRIPS Council Waiver from certain provisions of the TRIPS Agreement for the prevention, containment and treatment of COVID-19', Communication from India and South Africa, 2 October 2020 IP/C/W/669 and Corrigendum 6 October 2020 IP/C/W/669/Corr.1.

[90] WTO (2020) supra at para 12.

[91] South Centre (2020) supra; KEI Online 'WTO TRIPS Council (October 2020): European Union dismisses concerns that IPRs are a barrier to COVID-19 medicines and technologies' 20 October 2020, https://www.keionline.org/34275; KEI Online 'WTO TRIPS Council (October 2020): South Africa issues clarion call urging support for TRIPS waiver proposal' 16 October 2020, https://www.keionline.org/34235, 21 October 2020.

reached and the matter remains open until March 2021.[92] In the meantime, efforts continue to find comprehensive health solutions using both proprietary (closed) and open approaches. The following section gives examples of these approaches in Africa.

5.6.2 Examples: Proprietary and open approaches to PPEs, ventilators

Several projects to develop open-source ventilators commenced soon after the onset of the COVID-19 pandemic.[93] The AU High Level Panel on Emerging Technologies (APET) authored a White Paper in August 2020 that called for open approaches to sourcing medicines and medical devices required to meet the COVID-19 pandemic.[94] It cited examples of ongoing work such as:

1.a The School of Public Health, Makerere University's collaboration with the local Kiira Motors Corporation and the Ministry of STI within the Resilient Africa Network project in the development of open design low-cost ventilators;[95]
1.b The South African Medical Research Council (SAMRC) and the Technology Innovation Agency's call for the production of locally manufactured PCR reagents and test kits for use on open PCR testing platforms[96] which resulted in several initiatives;
1.c A team at the University of Cape Town's development of Covi-ID32 a contact tracing open-source platform for African contexts which have limited smartphone penetration.[97]

Several other open projects have been mounted on the African continent and some were showcased at ECA's Innovation & Investment Forum's Innovation Challenge in June 2020, which called for entries in:[98]

i. Affordable rapid testing;
ii. Enhanced medical devices and personal protection gear design and fabrication;
iii. Alternative tools for efficient and effective contact tracing and isolation;
iv. Development and production of potential drugs and vaccines in Africa.

168 entries were received, from which 29 were shortlisted to showcase their work at the Forum,[99] and seven winners were selected.[100] The following table sets out

[92] WTO 'Members to continue discussion on proposal for temporary IP waiver in response to COVID-19', https://www.wto.org/english/news_e/news20_e/trip_10dec20_e.htm.

[93] JM Pearce 'A review of open source ventilators for COVID-19 and future pandemics' (2020) 9 *F1000Research* 218, https://doi.org/10.12688/f1000research.22942.2.

[94] AUDA-NEPAD *White Paper: Harnessing Innovation and Emerging Technologies to Address the Impact of COVID-19 in Africa* (2020) at 19.

[95] AUDA-NEPAD (2020) supra at 10, citing Bulamu Ventilator, http://www.kiiramotors.com/bulamu-ventilator/.

[96] Ibid; Strategic Health Innovation Partnerships & the Technology Innovation Agency 'Request for Applications (RFA): Diagnostics for COVID-19' SAMRC-RFA-SHIP-01-2020, 13 May 2020, https://www.samrc.ac.za/sites/default/files/attachments/2020-05-13/COVID-Diagnostics-RFA-SHIP.pdf.

[97] Ibid.

[98] ECA 'Showcasing Investment Ready Rapid and Point-of-Care Testing Innovations', https://www.uneca.org/aiif-covid-19-ic-fr/pages/africa-innovation-and-investment-forum-2020-covid-19-innovation-challenge.

[99] ECA 'Programme of Work', https://www.uneca.org/sites/default/files/images/Science_Tech/pow_covid-19_aiif_2020-updated_17-6-2020.pdf.

[100] ECA 'Winning entries', https://www.uneca.org/aiif2020.

some examples and notes where the entry adopted an open approach to IP and innovation.

Table 10: PPE, medical devices and contract tracing entries, ECA Innovation & Investment Forum Innovation Challenge 2020

Entrant	Entry	Type	IP/OPEN
Medical Devices			
Shona McDonald, South Africa *winner*	OggieAir personal respirator	Prototypes ready	Open: Based on University of Southampton's PeRSo,[101] prototype design which is an open specification under the CC BY 4.0 licence
Prof Sudesh Sivarasu, South Africa	OpenAIRE ventilator: solution tailored for COVID-19[102] UCT personal respirator for healthcare professionals treating COVID-19 (PeRSo)	Prototype	Collaboration: with clinicians at Groote Schuur Hospital & the CSIR Open: PeRSo is based on Southampton's prototype
Personal Protection Equipment (PPE)			
Dr Gerrie J Booysen, Central University of Technology, South Africa	PPE Mask with a reusable filter	Prototype	no patent, copyright protected
Prof Sudesh Sivarasu, University of Cape Town, South Africa	UCT ViZAR, UCT multipurpose sterile testing stations – UBUNTU Booth,[103] reusable N95-equivalent masks/PPEs PPE Earsaver mask supports	Prototype	UCT ViZAR openly licensed[104] no patent, open design

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[101] P Elkington et al 'A Personal Respirator Specification for Health-care Workers Treating COVID-19 (perso)' (2020). DOI:10.31224/osf.io/rvcs3.; also see Public Policy Southampton 'PeRSo Developing World (PeRSo-DW)', https://www.southampton.ac.uk/publicpolicy/support-for-policymakers/policy-projects/perso-dw.page.

[102] Faculty of Health Sciences UCT 'COVID-19 Research Summary', http://www.health.uct.ac.za/fhs-covid-19-research-table.

[103] N Davids 'Ubuntu Booth prioritises frontline healthcare workers' (5 August 2020), https://www.news.uct.ac.za/article/-2020-08-05-ubuntu-booth-prioritises-frontline-healthcare-workers.

[104] UCT Research Contracts and Innovation 'Disposable Transparent Face Visor PPE', http://www.rci.uct.ac.za/rcips/innovation_achievements/products/UCTVizar.

Contact Tracing			
Eniola Ishola, Kings Embedded Solutions Limited, Nigeria	Iresponse: AI-powered, contact tracer, self-checker	Working demonstration	IPR owned by company[105]
Magdalena Johanna Grobler, North West University (NWU) South Africa "winner"	Tjop-tjop; mobile app health data collection for COVID-19	Under development	IPR owned by NWU[106]

Source: Compiled by author, based on attendance at entrants' presentations & Innovation Forum supporting documentation

The above examples show open innovation in the PPE and medical devices category and a proprietary approach to the contact tracing apps. The PeRSO prototype from the University of Southampton has been customised for many local contexts in collaboration with the originator team. Further support is provided for adaption in LDCs.

5.7 Conclusion

The preceding sections have shown how the AU and its member states have adopted open approaches to both innovation and IP in the furtherance of sustainable development. Major initiatives in this regard are the AOSP and the consensus position taken at the sixth African Regional Forum in 2020 that the continent supports the development of a UNESCO recommendation on open science.

[105] Iresponse, https://iresponse.com.ng/, indicates copyright protection.
[106] Tjoptjop 'Terms and Conditions', https://tjop-tjop.com/Terms.html.

Chapter 6

CONTINENTAL IP INSTRUMENTS AND INSTITUTIONS

6.1 Introduction

This concluding chapter weaves all the previous chapters' arguments together by discussing the continental IP framework, specifically with regard to the institutional reform and policy rejuvenation that would come from the operationalisation of PAIPO and the conclusion of the AfCFTA IP Protocol. These continental developments ought to be aligned with the global and African development agendas set out in Chapter One and within the precepts of the international, regional and national IP frameworks set out in Chapters Two and Three. Further, they have to support efforts to use STI to achieve sustainable development aims as discussed in Chapter Four and enable states to leverage openness as explained in Chapter Five.

6.2 Continental IP institutions and instruments

So far, the AU has not been very active in the domain of IP. It passed a Continental Strategy on GIs in 2017[1] and a Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources in 2000.[2] Neither of these instruments has binding force. The main reason for this 'hands off' approach thus far could have been a recognition of the activities of ARIPO, OAPI and the RECs. The following subsections consider PAIPO and IP in the AfCFTA since they are the most recent institutional and regulatory developments.

6.2.1 PAIPO

The AU's activities in the IP domain seem to be gathering momentum within the context of Agenda 2063 as evidenced by the adoption of the PAIPO Statute.[3] The AU resolved to create PAIPO in 2007,[4] adopted the PAIPO statute in 2016 and

[1] Second Ordinary Session of the Specialised Technical Committee (STC) on Agriculture, Rural Development, Water and Environment (Ministers' Session) in October 2017 (AU, 2017 STC2/ARDWE/MIN).

[2] African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources, 2000.

[3] Statute of the Pan-African IP Organisation (PAIPO Statute), adopted 31 January 2016.

[4] AU Assembly Decision on the Establishment of PAIPO, Assembly of the African Union Eighth Ordinary Session 29–30 January 2007, Addis Ababa, Ethiopia, Assembly/AU/Dec.138 (VIII) para 2.

STISA-2024 has expressly acknowledged PAIPO as falling under the mandate and goals of Agenda 2063. Specifically, it was described as being established to:

> implement AU policy in the field of Intellectual property. It will ensure dissemination of patent information, provide technical and financial support to invention and innovation and promote protection and exploitation of research results.[5]

The preamble addresses institutional and policy matters in the context of 'cultural and socio-economic development'. It acknowledges the existing IP institutions on the continent by noting the 'crucial role' of national IP offices and the autonomy of ARIPO and OAPI, which it recognises as 'building blocks' for PAIPO. The first aspect, relating to national IP offices, is uncontroversial. It notes the need to strengthen the capacity of IP institutions. The second aspect, relating ARIPO and OAPI, is thought provoking. It is unclear how they would constitute building blocks for PAIPO and what the ultimate vision is. Is it to merge all three into one organisation or to proceed in some form of parallelism that has the three functioning within clearly delineated spheres? The latter option would be more appropriate as the regional IP organisations are entrenched, and they have clear mandates and systems in place. It is also the preferred approach of the regional IP organisations.[6] There have also been discussions of the harmonisation of the two regional IP organisations, as indicated in section 2.6 above.

In keeping with Agenda 2063's alignment of IP and development, the preamble of the PAIPO Statute recognises the role PAIPO could play as 'an efficient continental IP organisation' in the promotion of the 'cultural and socio-economic development of Africa'. It continues by referencing 'international human rights and international agreements on sustainable development and the protection of indigenous knowledge'. Finally, it cites both the SDGs and Agenda 2063.

Institutionally PAIPO is a specialised agency of the AU.[7] Its mandate is to (a) 'be responsible for IP and other emerging issues related to IP in Africa'; (b) 'promote effective use of the IP system as a tool for economic, cultural, social and technological development of the continent'; and (c) 'set IP standards that reflect the needs of the AU, its member states and RECs, ARIPO and OAPI'.[8] In this context IP systems are defined as 'tools and other legal and administrative measure that assist in the use of IP and the application of IP rights for the socio-economic development of Africa'.[9] Article 4 then lists 18 functions which include harmonisation[10] and strengthening the regional IP organisations,[11] collective management organisations[12] and the human, financial and technical capacity of member states to realise the benefits

[5] AU (2014) supra at 36.

[6] CB Ncube 'PAIPO: ARIPO and OAPI speak', 15 April 2014, http://afro-ip.blogspot.com/2014/04/paipo-aripo-and-oapi-speak.html.

[7] Art 2 PAIPO Statute.

[8] Art 3 PAIPO Statute.

[9] Art 1 PAIPO Statute.

[10] Art 4 paras (a), (b) and (l) PAIPO Statute.

[11] Art 4 para (f) PAIPO Statute.

[12] Art 4 para (g) PAIPO Statute.

of the IP system.[13] Interestingly one of the functions is 'to take deliberate measures to promote the protection and exploitation of IP rights within the Member States, including conclusion of bilateral and multilateral agreements'.[14] This is a worrying stance to take, in view of the comments above on the use of such agreements to advance TRIPS-plus provisions. Several functions relate to policy and norm-setting including at the international level where PAIPO is expected to facilitate the formation of African common positions.[15] It is noteworthy that PAIPO does not have an IPRs registration function which ensures that the regional IP organisations and national IP offices will continue to fulfil this function.

The organs of PAIPO consist of (1) a conference of state parties that will meet every three years,[16] (2) a council of ministers comprised of the ministers responsible for IP in the party states,[17] (3) a secretariat[18] headed by a Director General[19] and (4) a board of appeal.[20] Fifteen ratifications are required for the statute to enter into force.[21] The statute has so far been signed by only six states[22] and has not yet entered into force, although it has already been settled that its headquarters will be located in Morocco.[23] The creation of a continental IP organisation has been debated since the 1990s[24] and the discussions continue unabated. They centre on whether a continental organisation would be appropriate, considering existing institutions and available resources,[25] and what the competence of such an organisation would be[26] given the existence of ARIPO and OAPI.

The five-year implementation report on STISA-2024, published in 2019, notes the slow rate of progress in operationalisation of PAIPO and the 'consequent lack of

[13] Art 4 para (o) PAIPO Statute.
[14] Art 4 para (h) PAIPO Statute.
[15] Art 4 paras (d), (e), (j), (n) and (q) PAIPO Statute.
[16] Art 10 PAIPO Statute.
[17] Art 11 PAIPO Statute.
[18] Art 13 PAIPO Statute.
[19] Art 12 PAIPO Statute.
[20] Art 14 PAIPO Statute.
[21] Art 24(1) PAIPO Statute.
[22] Chad signed 1 January 2018, Comoros 29 January 2018, Ghana 4 July 2017, Guinea 13 December 2018, Sierra Leone 14 July 2016 and Tunisia 19 June 2019. See list of signatory states – AU 'Statute of the Pan African Intellectual Property Organization (PAIPO), https://au.int/en/node/32549.
[23] Art 8 of the PAIPO Statute; Assembly of the Union Twenty-Third Ordinary Session 26–27 June 2014 Malabo, Equatorial Guinea Assembly/AU/ /Dec.517-545(XXIII) Assembly/AU/ /Decl.1-4(XXIII) Assembly/AU/ /Res.1(XXIII) Decision on Pan-African Intellectual Property Organization (PAIPO) – Doc. EX/CL/839(XXV).
[24] Dean 'Part 1' (1994) supra; Dean 'Part 2' (1994) supra.
[25] CB Ncube & E Laltaika 'A new intellectual property organisation for Africa?' (2013) 8(2) *Journal of Intellectual Property Law and Practice* 114; B Baker 'Proposed Pan-African IP Organization a Terrible Idea' 28 September 2012, http://infojustice.org/archives/27392?doing_wp_cron=1349607009.5964870452880859375000; K Egbuonu 'Pan-African Intellectual Property Organisation (PAIPO)' 8 October 2012, http://afro-ip.blogspot.co.uk/2012/10/a-review-of-african-official-ip_8.html; D Kawooya & A Abdel-Latif 'A new course for the Pan African Intellectual Property Organisation is urgently needed' (18 October 2012), www.change.org/p/a-new-course-for-the-pan-african-intellectual-property-organization-is-urgently-needed.
[26] Adewopo (2003) supra; Mupangavanhu (2015) supra; Mupangavanhu (2014) supra.

activity in the critical area of intellectual property management and technology transfer'.[27] This is not necessarily a disadvantageous position because without clarity on the symbiosis between the ARIPO, OAPI and PAIPO, it would be imprudent to proceed. It could be that, in practice, instruments of co-operation will need to be concluded between the RECs, the regional IP organisations and PAIPO on how they work together so that their spheres of operation and collaboration are clear. Such instruments would be concluded under art 16 of the statute that reads: 'The PAIPO shall establish and maintain working relationships with any international, regional or national institutions that may assist PAIPO to achieve its objectives.' Further, the RECs and regional IP organisations may be invited to attend any meetings of any PAIPO organ as observers.[28] This would ensure an opportunity for direct and immediate input into PAIPO activities.

6.2.2 The AfCFTA IP Protocol

This section discusses the IP Protocol. To provide context, it gives a brief overview of the AfCFTA. As noted in Chapter One, the operational phase of the AfCFTA was launched in July 2019 and implementation was postponed to 2021. The AfCFTA is headquartered in Accra, Ghana where its Secretariat is hosted. The administrative structures of the organisation are the Assembly, the Council of Ministers, the Committee of Senior Trade Officials and the Secretariat, headed by a Director-General.[29] As indicated in Chapter One, eight RECs are the building blocks of the AfCFTA, hence the detailed discussion of their IP frameworks in Chapter Three, as they will coalesce into the continental framework.

Article 4 of the AfCFTA Agreement provides that its objectives are to:

> (a) progressively eliminate tariffs and non-tariff barriers to trade in goods; (b) progressively liberalise trade in services; (c) cooperate on investment, intellectual property rights and competition policy; (d) cooperate on all trade-related areas; (e) cooperate on customs matters and the implementation of trade facilitation measures; (f) establish a mechanism for the settlement of disputes concerning their rights and obligations; and (g) establish and maintain an institutional framework for the implementation and administration of the AfCFTA.

Its principles include 'variable geometry; flexibility and special and differential treatment; transparency and disclosure of information; preservation of the acquis; Most-Favoured-Nation (MFN) Treatment; National Treatment and reciprocity'.[30] The principle of variable geometry is a flexible approach that enables regional trade partners to implement the terms of a trade agreements at different times to suit their unique contexts and capabilities. Gathii identifies these three main characteristics of the flexibility it affords trade partners:

[27] Third Ordinary Session for the Specialized Technical Committee on Education, Science and Technology (STC-EST) 10th to 12th December 2019, Addis Ababa, Ethiopia *Contextualising STISA-2024: Africa's STI Implementation Report 2014 – 2019* HRST/STC EST/EXP (III) 1.5 para 10.

[28] Art 15 of the PAIPO Statute.

[29] Art 9 of the AfCFTA Agreement.

[30] Art 5(c)–(i) of the AfCFTA Agreement.

(i) policy flexibility and autonomy to pursue, at slower paces, time-tabled trade commitments and harmonization objectives;
(ii) mechanisms to minimize distributional losses by creating opportunities such as compensation for losses arising from implementation of region-wide liberalization commitments and policies aimed at the equitable distribution of the institutions, and organizations of regional integration to avoid concentration in any one member; and
(iii) preferences in industrial allocation among members in an RTA, and preferences in the allocation of credit and investments from regional banks.[31]

The scope of the Agreement is trade in goods, trade in services, investment, IPRs and competition policy.[32]

The AfCFTA Agreement is a complex document, consisting of Protocols, Annexes and Appendices, which 'upon adoption, form an integral part' of the Agreement.[33] They 'shall form part of the single undertaking, subject to entry into force'. The negotiation of protocols was divided into phases with the Protocols on Trade in Goods, Trade in Services and Settlement of Disputes in phase one. As at August 2020 several aspects of phase one were still being negotiated. These are tariff concessions, rules of origin for goods and schedules of specific commitments for services.[34] IP, investment and competition policy were scheduled for phase two,[35] which will now continue through virtual means due to the travel and gathering restrictions imposed as a result of the COVID-19 pandemic. As indicated in Chapter One, this is ongoing work. The 33rd Ordinary Session of the Assembly of the AU held in February 2020 decided to introduce a third phase to address e-commerce.[36] More recently, the second and third phases have been merged and the e-commerce protocol will be negotiated alongside the protocols on IP, investment and competition.[37] The following sub-section now turns to the substantive and procedural aspects, which are of prime importance in negotiating the IP Protocol.

6.2.2.1 Substantive aspects in the IP Protocol

The first step in scoping possible substantive aspects that could be addressed in the IP Protocol is to survey the existing IP regulatory framework and the extent to which AU members have adopted this framework. There is already an extensive and well-entrenched legal framework for IP international, regional and national levels as set out in Chapters Two and Three above. However, as indicated above, the international framework sets minimum standards and creates policy space

[31] JT Gathii 'African Regional Trade Agreements as Flexible Legal Regimes' (2009) 35 *North Carolina Journal of International Law & Commercial Regulation* 571.

[32] Art 6 AfCFTA Agreement.

[33] Art 8(1) AfCFTA Agreement.

[34] Tralac *The AfCFTA: A Tralac guide* 7ed (August 2020) at 4.

[35] Art 7 AfCFTA Agreement.

[36] Decision on the African Continental Free Trade Area (AfCFTA) Doc. Assembly/AU/4(XXXIII) 33rd Ordinary Session of the Assembly of the Union, 9–10 February 2020, Addis Ababa, Ethiopia Assembly/AU/Dec.751(XXXIII).

[37] Tralac (2020) supra at 2.

for states to craft appropriate national standards that meet their developmental contexts and aspirations. This means that African states could address matters of specific relevance to them in the IP Protocol, bearing in mind binding international minimum standards. It is also important to recall that Algeria, Ethiopia, Equatorial Guinea, Comoros, Libya, São Tomé and Príncipe, Somalia, Sudan and South Sudan are not yet WTO member states, so they are not bound by the TRIPS Agreement. Although they are in the process of ratification, this is a lengthy process that takes many years. Further, some of these AU member states are also not members of the IP agreements listed in Table 4 above, meaning that the IP Protocol negotiating states will not be starting from the same minimum standards framework. In this regard, it would be useful to add a provision to the protocol to the effect that all member states will subscribe to the TRIPS minimum standards. The SADC member states have already followed this route through art 24 of the SADC Protocol on Trade that provides that member states shall 'adopt policies and implement measures within the Community for the protection of Intellectual Property Rights, in accordance with the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)'.

The MFN principle in art 4(d) of the TRIPS Agreement exempts regional preferential trade agreements established before the agreement came into force. These trade agreements are notified to the WTO and trigger the obligation to 'immediately and unconditionally' extend 'any advantage, favour, privilege or immunity granted by a member to the nationals of any other country' to WTO member states. The gist of the MFN principle is that WTO member states must 'treat nationals of all other members on an equivalent basis in relation to intellectual property protection'.[38] The AfCFTA is not exempted under this provision, as it was concluded after the TRIPS Agreement came into force. Therefore, AU member states who are also WTO member states would have to extend any preferences granted to AfCFTA member states under the IP Protocol to WTO member states.

IP Protocol negotiating states would also have to consider the impact of bilateral agreements in terms of which some member states may now be bound to TRIPS-plus standards as set out above. Similarly, some instruments of the regional IP organisations have narrowed the available policy space, for example by foregoing LDC transition periods. The implications of this are that any positions taken in the IP Protocol to leverage policy space will not be available to all member states. At this juncture, it is important to reiterate that one of PAIPO's functions relates to the conclusion of bilateral and multilateral agreements, therefore had it been operationalised prior to the negotiation of the IP Protocol, PAIPO organs would have been expected to participate in these negotiations, such as the ongoing US-Kenya FTA negotiations.

Considering Agenda 2063, the objectives of the AfCFTA Agreement and the position taken by the RECs, the objectives of the IP Protocol ought to include

[38] UNCTAD and ICTSD UNCTAD-ICTSD Resource Book on TRIPS and Development (2005) 63, https://unctad.org/system/files/official-document/ictsd2005d1_en.pdf.

furtherance of the Agenda 2063 aspirations and goals identified in Chapter One as being impacted by IP, ie supporting regional integration, for instance, through a regional IPR exhaustion regime that fosters a regional market; enhancing IP policy coherence on the continent; and providing guidance on the appropriate use of policy space and the creation of common approaches to multilateral negotiations.[39]

Further, as indicated in Chapter Three, it would be worthwhile to pursue the agenda set in the COMESA-EAC-SADC Tripartite. These are issues that are of particular significance to African states and the priorities they have set. To recap, these issues are the protection of IPRs, promoting a balanced IP protection system, promoting cultural industries and using flexibilities under international treaties.[40]

There are also very specific recommendations that can be made with regard to specific IPRs.[41]

6.2.2.2 Procedural aspects

The IP protocol will be negotiated in accordance with the principles that underpinned the negotiation of the AfCFTA Agreement and the other protocols. This section seeks to highlight learnings from the negotiation of other IP agreements which have been distilled into the Max Planck Principles for IP Provisions in Bilateral and Regional Agreements, and how they may be adapted for an African context.[42] Specifically, extensive national stakeholder consultations are required, accompanied by the requisite transparency and disclosure of information under art 5(d) of the AfCFTA Agreement. In other parts of the world, IP negotiations have been marred by lack of transparency, failure to consult widely and inclusively, seeking to forum-shift negotiations from established bodies, overlooking or concealing implications for fundamental rights such as privacy and freedom of expression and rushing processes, thereby foreclosing the possibility of carefully considered positions.[43]

6.3 Conclusion

This book has discussed national, regional and continental IP instruments, with an emphasis on the regional and continental levels, with a view to presenting the state of IP on the continent. These instruments are tabulated below.

[39] ECA, AU, AfDB & UNCTAD (2019) supra at 26; CB Ncube, T Schonwetter, J de Beer & C Oguamanam 'A principled approach to intellectual property rights and innovation in the African Continental Free Trade Agreement' in Luke & Macleod (2019) supra 177 at 180.

[40] Art 9 of the COMESA-EAC-SADC Tripartite FTA Agreement.

[41] Ncube et al (2019) supra at 185–6.

[42] Ncube et al (2019) supra at 177.

[43] Ncube et al (2019) supra at 182–3.

Table 11: African IP instruments

AU level	AfCFTA IP Protocol – phase 2 AfCFTA negotiations Continental Strategy on Geographical Indications 2018–2023 PAIPO Statute, 2006 Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources, 2000
Regional IP Organisations	ARIPO Guidelines to Audiovisual Contracts, 2020 Model Law on Copyright and Related Rights, 2019 African Agenda on Copyright and Related Rights, 2017 Policy Framework on Access and Benefit Sharing Arising from the Use of Genetic Resources in the ARIPO Member States, 2016 Guidelines for the Domestication of the Marrakesh Treaty, 2016 Arusha Protocol for the Protection of New Varieties of Plants, 2015 Swakopmund Protocol for the Protection of Traditional Knowledge and Folklore, 2010 Banjul Protocol for the Protection of Trade Marks, 1993 Harare Protocol for the Protection of Patents, Industrial Designs and Utility Models, 1982 OAPI Bangui Agreement of 1977 (revised in 2015, revised text came into force in Nov 2020)* includes annexes on patents (Annex I); utility models (Annex II); trademarks and service marks (Annex III); industrial designs (Annex IV); trade names (Annex V); geographical indications (Annex VI); literary and artistic property (Annex VII); protection against unfair competition (Annex VIII); layout-designs (topographies) of integrated circuits (Annex IX); plant variety protection (Annex X).
Regional Economic Communities	COMESA Regional Policy on IP rights and Cultural Industries Regional IP Policy on the Utilization of Public Health-Related WTO-TRIPS Flexibilities and the Approximation of National IP Legislation EAC draft IP Policy, 2018 ECOWAS Development of a Harmonized TRIPS Policy for Adoption by ECOWAS Member States that Employ TRIPS Flexibilities to Improve Access to Medicines in the Region, 2012 Guidelines for Implementation of TRIPS Flexibilities in National Legislation to Improve Access to Medicines in the West African Region, 2012 SADC draft Regional Framework and Guidelines on IPR, 2018 COMESA-EAC-SADC Tripartite FTA – phase 2: intellectual property (on-going)
National	National legislation and institutions

Source: Author

Regarding the continental, regional and national level instruments tabulated above, the African continental level is the least developed. However, as shown above, the

AU is moving swiftly to create new institutions, namely PAIPO and the AfCFTA Committee on IP that will be created under the IP Protocol. These developments present an opportunity for the continent to consolidate its IP framework and create high-level platforms for the development of cohesive African positions on IP matters. However, the infrastructure has to be frugal and not add to the burden of already stretched resources. That is to say, duplication of functions must be avoided, and the existing and new institutions need to co-ordinate their activities to best effect. For instance, one of the first tasks of the new structures should be to collate the significant norm-setting and consensus-building work that has been done by the RECs and regional IP organisations, in order to begin at the stage they have reached, rather than attempt to start from scratch. This book's careful collation of this work is intended to contribute to this effort. Further binding obligations taken on at the global level should also be foregrounded.

The placement of both PAIPO and the AfCFTA IP Protocol very firmly within Agenda 2063 underscores the importance of IP to the pursuit of sustainable development. The emphasis of the linkages between IP and STI as well as trade in Chapters Four and Five is intended to scaffold consideration of IP at all regulatory levels. In addition, the benefit of open approaches and the continental commitment to take this up at global level should also be kept in mind. The sum total of these considerations is that any calibration of existing or new IP statutory provisions needs to be conceived of with the development agenda in mind, so that laws meet lived realities and are context specific. For example, if most innovation is incremental or grassroots in nature, utility models ought to be provided for in national laws. Or if a significant portion of the economy relies on TK-based entrepreneurship, such as handicraft manufacture, appropriate means of protection are required. The point has already been made that *sui generis* protection is more suitable for TK and TCEs. Finally, while most jurisdictions focus on their domestic sphere, it is hoped that this book's surfacing of regional and continental positions will enable AU member states to nuance their national IP frameworks with a broader perspective which is required by the AfCFTA's vision for enhanced intra-African trade.

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