

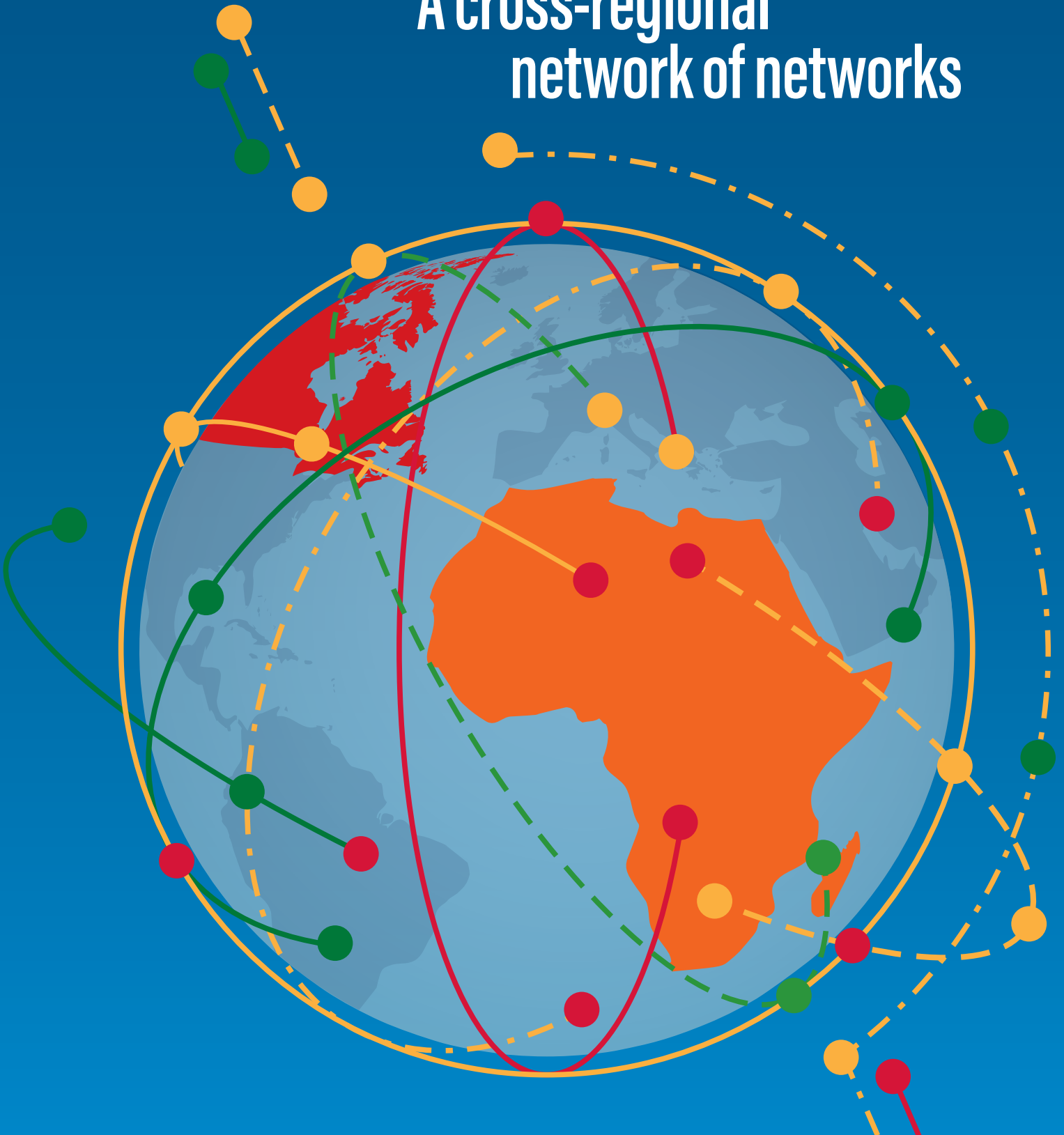


# openAIR

AFRICAN INNOVATION RESEARCH

## 2022 Annual Report

### A cross-regional network of networks



Open AIR is a network comprising researchers from Africa, Canada and beyond who are interested in open innovation, collaborative initiatives, scaling, inclusion, and policy impact.

Our purpose is to develop better understanding of African innovation contexts, better policies, and better practice.

The plan for 2023 and beyond is to focus on seizing windows of opportunity for fostering:

- improved African participation in policy processes influencing regulation of knowledge for innovation
- improved African national utilisation of limits and flexibilities provided in existing regulatory instruments
- alternative, openness-oriented models of innovation that can operate outside regulatory constraints

We are conducting research aligned to nine themes, comprising five clusters and four lenses:

- Clusters: high technology hubs; informal innovation; traditional knowledge and Indigenous entrepreneurs; innovation metrics; and laws and policies
- Lenses: economic integration, international law, and trade policy; gender equality and empowerment of women and girls; artificial intelligence (AI); and the maker movement

Analysis of the results of these studies will be used to produce reports, research publications, improved theoretical models, and policy briefs and guidelines.


Concurrently we are representing Africa as consultants in our various areas of expertise and have representation at inter-governmental organisations, relevant government bodies, and others, as well as in academic circles.

We also have a proactive online presence, with our website (including open access downloadable information) and lively social media.

And we offer Fellowships for university students at all levels, to participate in our work, and to travel for the purpose of conducting research in new environments.

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*How can open collaborative innovation help knowledge-based businesses scale up and seize the new opportunities of a global knowledge economy?*

*Which knowledge governance policies will best ensure that the social and economic benefits of innovation are shared inclusively?*





## About Open AIR

Open AIR is a unique collaborative network of researchers spread across more than 20 African countries, Canada, and other parts of the world. Since 2015, Open AIR researchers have focused on **two overarching questions**:

- *How can open collaborative innovation help knowledge-based businesses scale up and seize the new opportunities of a global knowledge economy?*
- *Which knowledge governance policies will best ensure that the social and economic benefits of innovation are shared inclusively?*

Open AIR's primary goal has been to uncover new insights about the balance between control over, and access to, knowledge. We aim to solve a problem at the heart of intellectual property (IP) and innovation policy: how to reconcile tensions between appropriation and access, between excluding and sharing, and between competing and collaborating. In pursuit of this goal and this aim, Open AIR has explored and documented the ways in which African innovators and knowledge-based enterprises are able to capitalise on open collaborative approaches to innovation and knowledge governance.

Open AIR has developed, and embedded itself in, an extensive international community of practice composed of entities and individuals sharing Open AIR's focus on fostering open collaborative innovation and inclusive knowledge governance. Going forward, this community of practice, which is a network of networks, allows for mutually beneficial research and policy engagement partnerships, and for intensive global dissemination of our research findings. Through its community of practice, Open AIR is fostering greater recognition of the innovation and knowledge governance modalities present in African settings, of Africa's role in the global knowledge economy, and of the need for African interests and perspectives to be mainstreamed in forums where global and continental norms are negotiated.

*Open AIR's primary goal has been to uncover new insights about the balance between control over, and access to, knowledge.*

# Governance, Management, Thought Leadership, and Funding

## Steering Committee and Hub Institutions

Open AIR's governance is provided by its Steering Committee, composed of leading academics at its **six hub institutions**:

- Access to Knowledge for Development Center (A2K4D), School of Business, The American University in Cairo (AUC)
- Nigerian Institute of Advanced Legal Studies (NIALS), Lagos
- Centre for Intellectual Property and Information Technology Law (CIPIT), Strathmore University, Nairobi
- Intellectual Property (IP Unit), Faculty of Law, University of Cape Town (UCT)
- College of Business and Economics, University of Johannesburg (UJ)
- Centre for Law, Technology and Society (CLTS), Faculty of Law, University of Ottawa (uOttawa)

The Steering Committee provides guidance to project management on expenditure; on planning, monitoring, evaluation and learning (PMEL); on priorities for research and knowledge mobilisation; on alignment of research ethics protocols across the hubs; and on appointment of members of the New and Emerging Researchers (NERG) group. The Steering Committee members also participate in research; supervision of Master's, PhD and Post-Doctoral students in the NERG programme; and knowledge mobilisation through conference and seminar presentations, blogs, and publications (books, book chapters, journal articles, reports, working papers, policy briefs).

## Management and Administration

Project management and administration are led by Open AIR managers **Victoria Schorr** at the uOttawa hub and **Nan Warner** at the UCT hub, with financial administration support from **Phyllis Webb** and devolution of responsibility to other hubs for the management and administration of certain research and NERG support monies. Open AIR's PMEL framework is grounded in its Theory of Change (see pages 20–21).



Nigerian Institute of Advanced Legal Studies



**Strathmore University**

*Centre for Intellectual Property and Information Technology Law*



**ip unit**  
UNIVERSITY OF CAPE TOWN  
INTELLECTUAL PROPERTY UNIT

**SARCHI**  
TRANSFORMATIVE  
INNOVATION, AIR  
AND SUSTAINABLE  
DEVELOPMENT



uOttawa

CENTRE DE RECHERCHE EN  
**droit, technologie  
et société**  
CENTRE FOR  
**Law, Technology  
and Society**



## Thought Leadership

Open AIR thought leadership continues to be strong, and is led by our Steering Committee members based at the institutional hubs.



Steering Committee member Prof. **Chidi Oguamanam**, of the uOttawa Centre for Law, Technology and Society (CLTS), holds the University Research Chair in Sustainable Bio-Innovation, Indigenous Knowledge Systems and Global Knowledge Governance—and remains one of the foremost legal authorities in these domains. In addition to his numerous scholarly outputs, Oguamanam continues to participate as a legal expert in the work of WIPO's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC).



The other Steering Committee member at the uOttawa hub at the CLTS, Prof. **Jeremy de Beer**, is a globally recognised authority on intellectual property, technology innovation, and international trade and development. In addition to his influential scholarly outputs, de Beer continues to contribute to non-academic forums—in Canada to the Supreme Court of Canada and Parliamentarians in the Senate and House of Commons, and internationally at UN and other intergovernmental forums.



Steering Committee member Prof. **Caroline Ncube** at UCT holds the SARChI Research Chair in Intellectual Property, Innovation and Development (funded by South Africa's Department of Science and Innovation and the National Research Foundation). The work of this Chair is influential in both scholarly and policy circles. Ncube participates in, among other forums, the work of the WIPO Standing Committee on Copyright and Related Rights (SCCR) and, with particular urgency in 2022, AU negotiations on the AfCFTA IP Protocol.



The other Steering Committee member at UCT, Dr. **Tobias Schonwetter**, is Director of the university's IP Unit and of the UCT iNtaka Centre for Law & Technology. Schonwetter is a prominent participant in African and South African policy engagement processes. In particular, Schonwetter has made numerous inputs into South Africa's protracted Copyright Act amendment process. Also notable is the IP Unit's Memorandum of Understanding with the African Regional Intellectual Property Organisation (ARIPO), the Harare-based intergovernmental body with 20 Member States in Anglophone and Lusophone Africa.



The Steering Committee member at the University of Johannesburg, in its College of Business and Economics, is Prof. **Erika Kraemer-Mbula**, who holds the SARChI Research Chair in Transformative Innovation, the 4th Industrial Revolution and Sustainable Development. Kraemer-Mbula is an internationally renowned authority, and widely published, on African innovation systems, with an extensive network of contacts at South African, African, and global levels. Among other things, Kraemer-Mbula connects Open AIR into the broad Globelics (Global Network for Economics of Learning, Innovation, and Competence Building Systems) network of influential collaborators, and her SARChI Research Chair's trilateral structure includes the African Centre for Technology Studies (ACTS) in Nairobi and the Science Policy Research Unit (SPRU) at Sussex University in the UK.



At Open AIR's East Africa hub at Strathmore University in Nairobi, Steering Committee member Dr. **Melissa Omino** directs the Centre for Intellectual Property and Information Technology Law (CIPIT). Omino brings specific expertise on IP and access to medicines (which was the focus of her PhD research), as well as on issues of digital copyright, AI, and related information technology matters. Among other things, Omino oversees the work of CIPIT's Data Governance Centre, represents CIPIT in the Digital Trade Alliance, and has done extensive research into the negotiations, ongoing since 2020, towards a US-Kenya free trade agreement.



Steering Committee member Prof. **Nagla Rizk** is Founder and Director of the Access to Knowledge for Development Center (A2K4D) in the School of Business at The American University in Cairo (AUC). Rizk is an influential voice, and is widely published, on numerous economic and innovation matters at the global, Egyptian, and Middle East and North Africa (MENA) levels. A2K4D serves as the MENA or Egypt hub in numerous projects and networks, including, most recently, taking on the role of the MENA hub in the A+ Alliance's Fair Hubs Network, which is focused on combating algorithmic bias in AI deployments. As well as this recent focus on AI, Rizk is a thought leader on Egyptian innovation metrics, and—through A2K4D's participation in the international Fairwork project—on labour standards in the gig economy.

*We aim to solve a problem at the heart of intellectual property and innovation policy: how to reconcile tensions between appropriation and access, between excluding and sharing, and between competing and collaborating.*

# Key Funding Partners

Open AIR's long track record of successful implementations has allowed it to continue to attract funding support. Our current **key funding partners** are:

- Social Sciences and Humanities Research Council of Canada (SSHRC)
- International Development Research Centre (IDRC)
- Universities Canada Queen Elizabeth Scholars - Advanced Scholars (QES-AS) programme



Conseil de recherches  
en sciences humaines  
du Canada

Social Sciences and  
Humanities Research  
Council of Canada

Canada



IDRC · CRDI

International Development Research Centre  
Centre de recherches pour le développement international

Canada

QUEEN  
ELIZABETH  
Scholars

In addition, substantial **co-funding** was brought into the project through the hub institutions and through individual researchers and their home institutions. For example, the UCT hub is a consortium member, on behalf of Open AIR, in the EU-funded African European Maker Innovation Ecosystem (mAKE) project, which is helping to fund Open AIR's work in the maker movement research area. Such co-funding enlarges the scope of the research in which Open AIR is involved and helps to build the stature of the hubs as leading research institutions within their own countries and globally.

MAKE



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 101016858.

*How can open collaborative innovation help scale the impacts of next-generation technologies to promote gender equality, youth employment, and other aspects of inclusion?*



# Evolution of Research and Engagement Agenda

Open AIR's research and engagement foci have, for more than a decade, retained a consistent core focus on matters of open collaborative innovation, but with this core focus guided by thematic considerations that have undergone several refinements. A key moment of thematic refinement was the 2013 publication of Open AIR's foresight research findings, in the report entitled *Knowledge and Innovation in Africa: Scenarios for the Future*.<sup>1</sup> The detailed, plausible scenarios in this report allowed us to develop **five research clusters**:

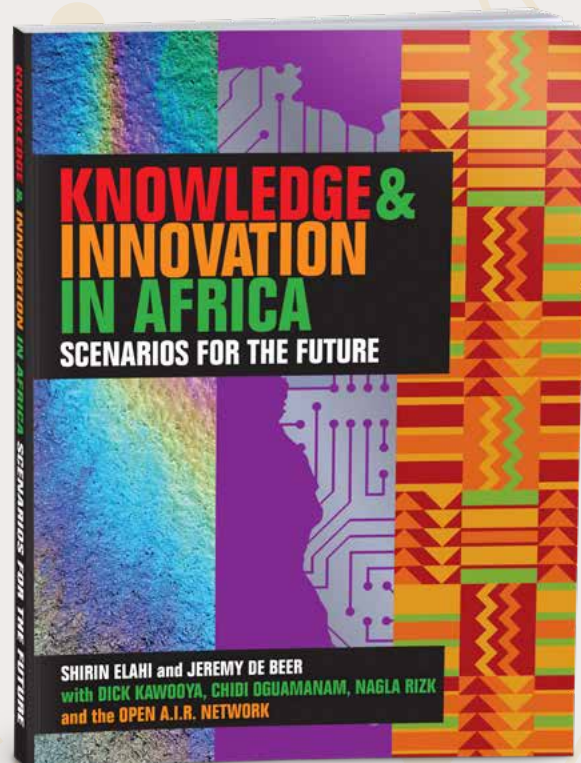
- **High Technology Hubs**
- **Informal Innovation**
- **Traditional Knowledge and Indigenous Entrepreneurs**
- **Innovation Metrics**
- **Laws and Policies**

Five years later (in 2018), based on research findings emerging from the five clusters and on emerging trends in African and global innovation landscape, **an additional research question** emerged (to complement the two original questions as presented on page 5 of this report):

*How can open collaborative innovation help scale the impacts of next-generation technologies to promote gender equality, youth employment, and other aspects of inclusion?*

Engagement with this additional question spawned development of **four research lenses** to be explored in concert with the five aforementioned clusters:

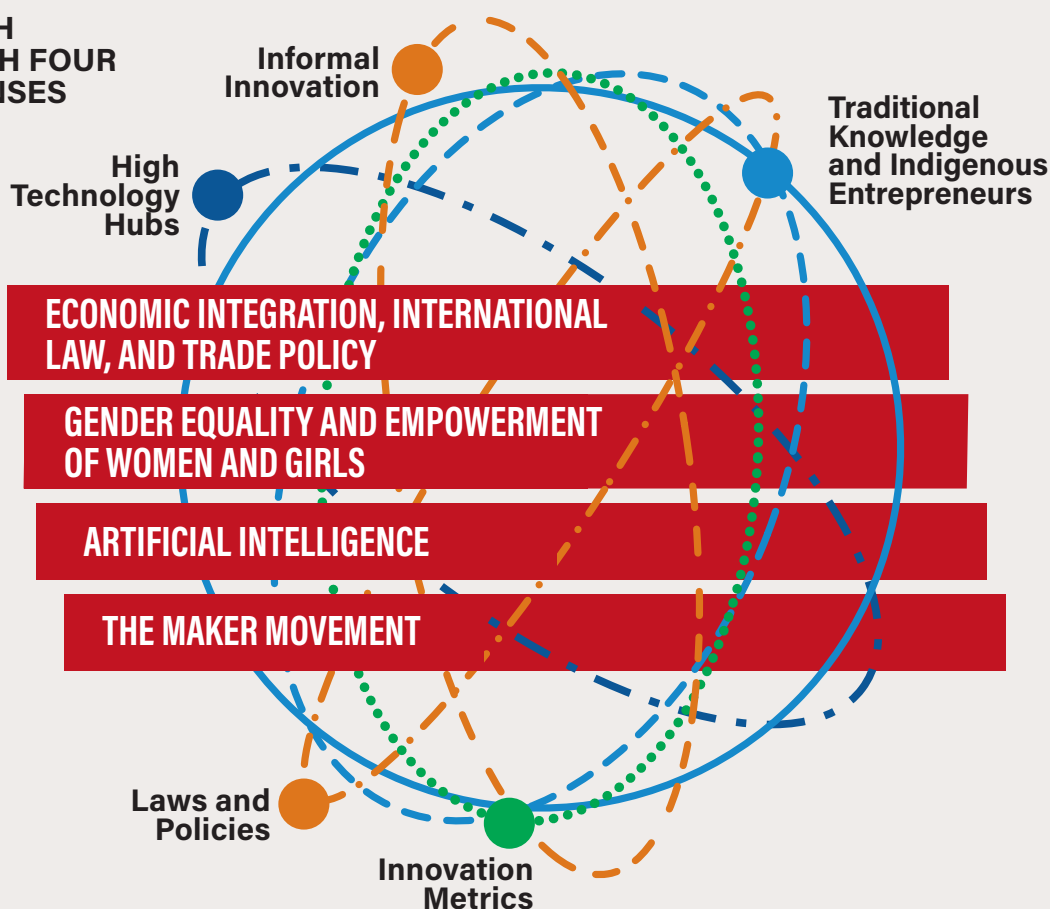
- **Economic Integration, International Law, and Trade Policy**
- **Gender Equality and Empowerment of Women and Girls**
- **Artificial Intelligence (AI)**
- **The Maker Movement**



<sup>1</sup> Open AIR. (2013). *Knowledge and Innovation in Africa: Scenarios for the Future*. <https://bit.ly/3JolHFx>

# Research and Engagement Themes

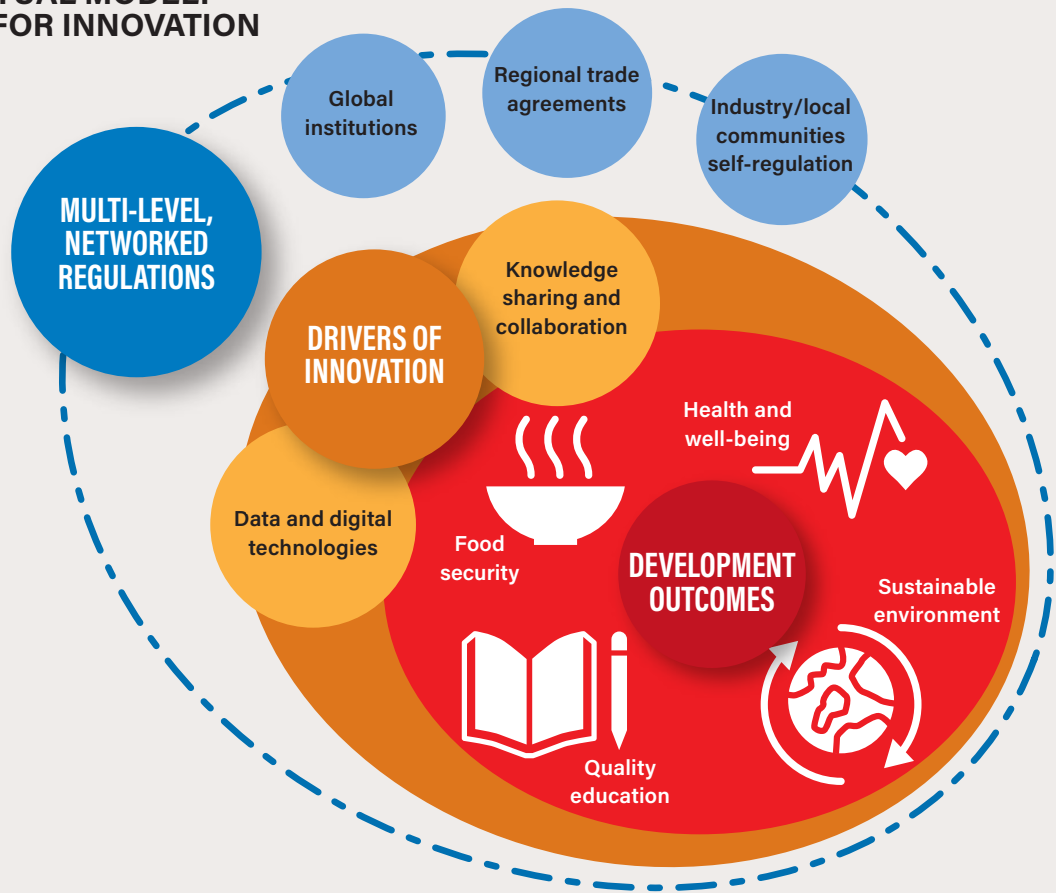
FIVE RESEARCH CLUSTERS WITH FOUR RESEARCH LENSES



Another important refinement of the Open AIR research foci occurred in 2022. With funding from the IDRC, Open AIR Steering Committee members undertook an extensive **scoping study** on matters of innovation regulation in relation to health/vaccines; data and technology governance; and trade/environment. The outcome of the study was the report *Regulation for Innovation: Conceptualising a Development Research Agenda for Inclusive and Sustainable Economies in Lower-Income Countries*.<sup>2</sup> Among the key elements of that report is the **conceptual model** that it proposes for understanding and exploring “Regulation for Innovation”.

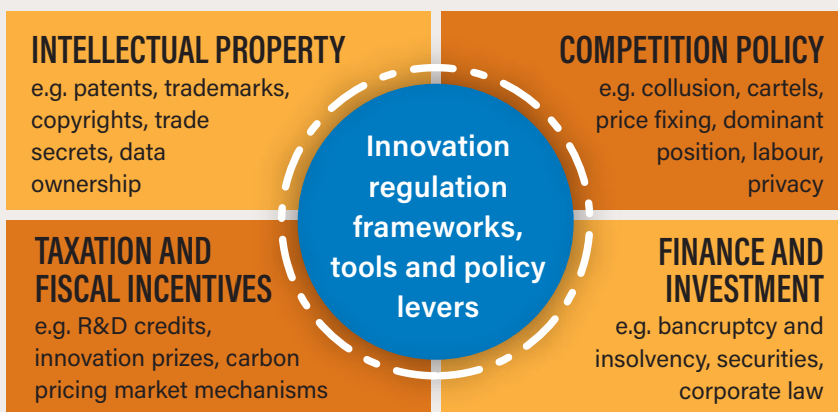
<sup>2</sup> de Beer, J., Ncube, C. B., Oguamanam, C., Rizk, N., & Schonwetter, T. (2022). *Regulation for Innovation: Conceptualising a Development Research Agenda for Inclusive and Sustainable Economies in Lower-Income Countries*. Open AIR.

## NEW CONCEPTUAL MODEL: REGULATION FOR INNOVATION



As seen above, the base level (“development outcomes”) of the model is grounded in regulation in support of UN Sustainable Development Goal (SDG)-related development outcomes such as health and well-being, food security, a sustainable environment, and quality education. This complex base layer of regulation is being formulated at the global, regional, and local levels (“multi-level, networked regulations”). Between the base-layer regulations and the development outcomes are “drivers of innovation”, with two of the key drivers being: knowledge sharing and collaboration; and data and digital technologies.

## INNOVATION REGULATION FRAMEWORKS, TOOLS, AND POLICY LEVERS



The 2022 scoping study report also provides a **matrix** that sets out the frameworks, tools, and policy levers impacting innovation regulation, in four quadrants: intellectual property; competition policy; taxation and fiscal incentives; and finance and investment.

# 2023 and Beyond

Open AIR's planned activities for 2023 and beyond, grounded in the conceptual model and matrix presented in the 2022 scoping study report, will fall within a set of **focus areas** (see figure below) grouped together under the overarching theme of "Regulation for Innovation Supporting Sustainable Development Goals"

## FOCUS AREAS, 2023 AND BEYOND



The plan for 2023 and beyond is to focus on seizing windows of opportunity for fostering:

1. **improved African participation in the multi-level processes** influencing development and refinement of the instruments that regulate knowledge for innovation;
2. **improved African national utilisation of** limits and flexibilities provided in **existing regulatory instruments**, through policy-legal-regulatory reform measures; and
3. **alternative, openness-oriented models of innovation** that can operate outside certain prevailing regulatory constraints.

To give but one example of the new research and engagement agenda to commence in 2023:

*At the African continental level, we will focus on implementation and extension of protocols to the African Continental Free Trade Area (AfCFTA), a high-ambition agreement setting digital trade, investment, and other rules of the knowledge economy with the aim of lifting millions of people in 54 African countries out of extreme poverty through boosting income in Africa by USD450 billion.<sup>3</sup> Through the work of Open AIR, Canadians will be able to bilaterally and cross-regionally engage in and support this endeavour.*

The work from 2023 onwards will build upon Open AIR researchers' work in the nine research thematic areas outlined earlier, on pages 13–14 (the five clusters and four lenses):

- **Clusters:** high technology hubs; informal innovation; traditional knowledge and Indigenous entrepreneurs; innovation metrics; laws and policies
- **Lenses:** economic integration, international law, and trade policy; gender equality and empowerment of women and girls; artificial intelligence (AI); the maker movement

<sup>3</sup> African Union (AU). (n.d.). African Continental Free Trade Area (AfCFTA). <https://au-afcfta.org>

# Research Methods

Most of Open AIR's research to date has consisted of:

- situational analysis via interconnected, empirical case studies
- theory-building, including grounded theory-building
- policy design and testing
- elements of action research

The **case studies** address research questions at the situational level, i.e., where the units of analysis are not micro or macro, but are instead located at the intersection of actors and forces that shape innovation situations. This approach enables our researchers to engage with mixed methods within the various sub-studies, for example, literature reviews, internet-based data mining, social network analysis, key informant interviews, and surveys.

Open AIR's **theory-building** work has taken many forms, with conceptual models developed through:

- scoping reviews (drawing on literature and engagement with experts);
- grounded theory-building, in which new conceptual models are based on the network's on-the-ground research observations, e.g., as published in the Open AIR book *Innovation & Intellectual Property: Collaborative Dynamics in Africa*;<sup>4</sup>
- fusions of literature review and grounded theory-building, e.g., the scaling research that resulted in Open AIR's 2020 *Scaling Innovation* report;<sup>5</sup> and
- in the case of the research that generated Open AIR's 2013 *Scenarios for the Future* report,<sup>6</sup> a fusion of scoping review, grounded-theory building, and foresight data collection.

The **policy design and testing** have consisted of using empirical case study evidence and theoretical frameworks to inform the development and design of recommendations to different countries' policymakers and influential stakeholders.

Some of Open AIR's research, e.g. with South African maker communities, has included **action research** elements, whereby the research process deliberately blurs the distinction between researcher and research subject, allowing the development of findings to be a collaborative process. As part of the new research and engagement strategy for 2023 and beyond (as summarised above), Open AIR will be intensifying and adapting its action research efforts. This action research will focus on collaborative knowledge co-creation between Open AIR researchers and the key actors in policy-legal-regulatory processes impacting regulation of innovation at global and African continental levels.

4 de Beer, J., Armstrong, C., Oguamanam, C., Schonwetter, T., (Eds.). (2014). *Innovation & Intellectual Property: Collaborative Dynamics in Africa*. UCT Press, with UCT IP Unit and GIZ. <https://bit.ly/3yEtIXK>

5 Open AIR. (2020). *Scaling Innovation: How Open Collaborative Models Help Scale Africa's Knowledge-Based Enterprises*. <https://bit.ly/ScalingInnovation2020>

6 Open AIR. (2013). *Knowledge and Innovation in Africa: Scenarios for the Future*. <https://bit.ly/3JolHFx>

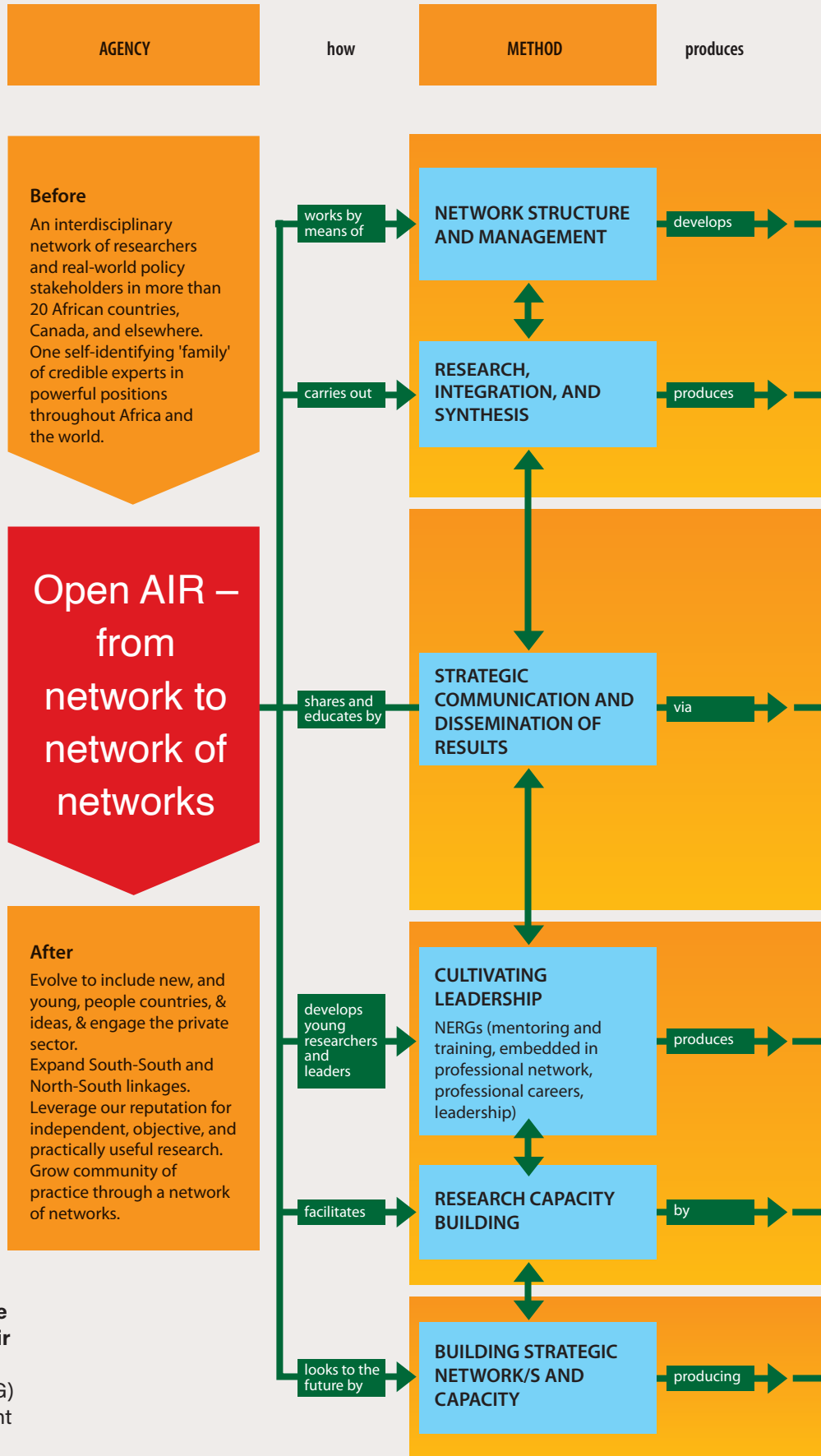




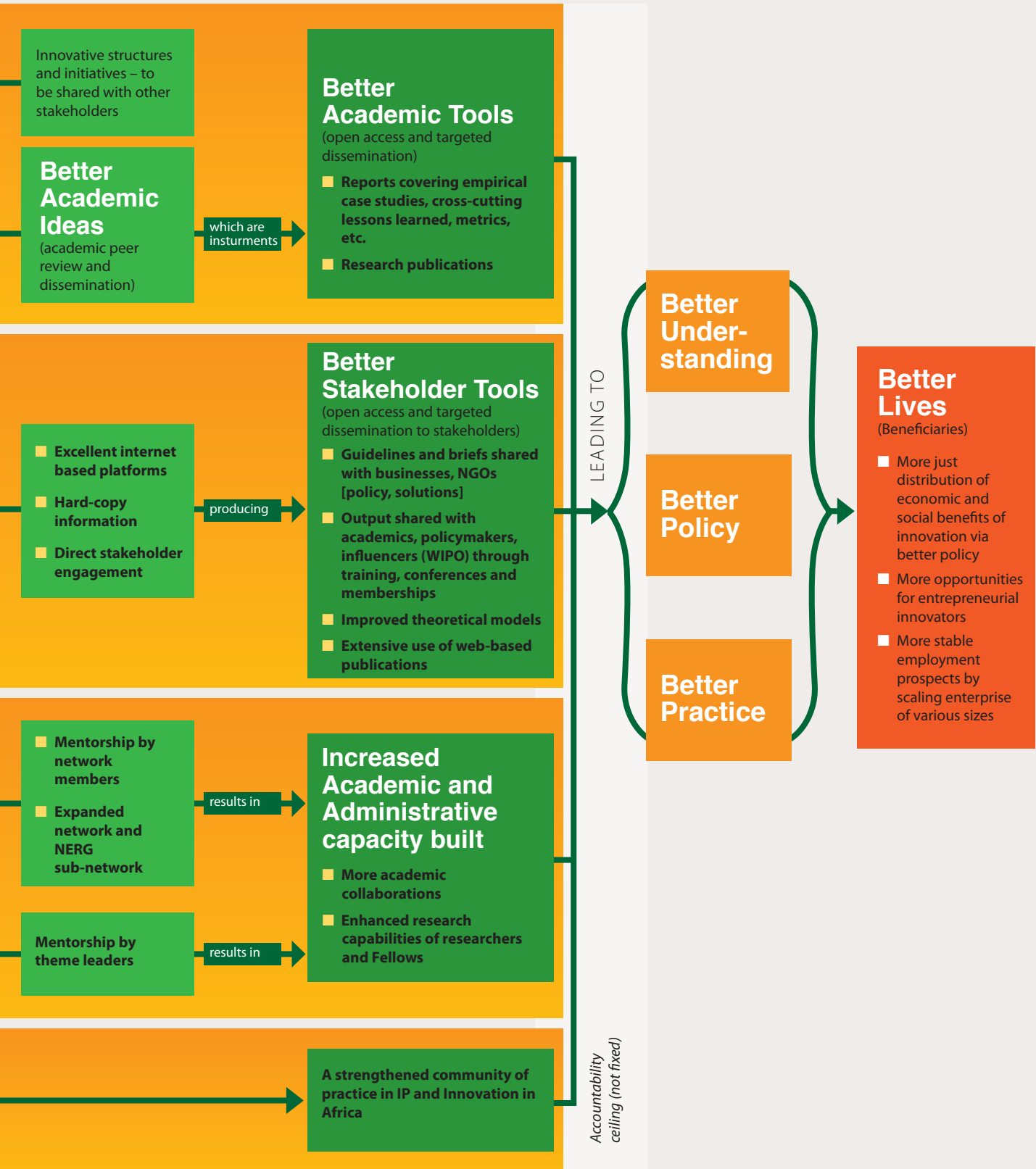
# Theory of Change

Open AIR's Theory of Change, as illustrated in the figure to the right, is supported by a five-point strategy for mobilising research insights into practical outcomes:

- 1. Leveraging our social capital and connections to key decision-makers.** For example, through our reputation and networks, we are able to connect with key decision-makers in international organisations, national governments, and leading scholarly and activist associations.
- 2. Engaging stakeholders early and often in the research process to ensure relevance.** In addition to using action research, we endeavour to engage, after data collection, with the subjects and beneficiaries of our research.
- 3. Open-access publishing of research outputs.** In addition to numerous (largely open-access) books, book chapters, journal articles, conference papers, and reports, we publish Open AIR Working Papers, briefing notes, briefing papers, and blogs. We endeavour to publish, where possible, not only in English but also in French—and, in some cases, in Arabic and Swahili.
- 4. Amplifying our influence online and traditional channels.** Our website has become an increasingly key vehicle for disseminating research activities and results; our social media presence continues to grow (and create interest in our work); and our thought leaders contribute items to traditional media outlets.
- 5. Empowering new scholars to share insights and build capacity for their future endeavours.** Our New and Emerging Researchers Group (NERG) is thriving, with more than 130 current and alumni members.







## New and Emerging Researchers Group (NERG)



Esther Ekong

A major achievement of the Open AIR network has been our ability to continue to attract promising new scholars and to mentor them to become future leaders. The New and Emerging Researchers Group (NERG), designed to build the capacity of current and future young researchers in Africa and Canada, is composed of undergraduates, graduate students, PhD students, postdocs, and other research associates. More than 130 NERGs have passed through the programme since its inception. Our NERG Fellows are located across the project's different hubs, and are engaged with Open AIR research at various levels. NERG Fellows receive training and mentoring to develop their talents and to allow them to build lasting international and interdisciplinary relationships. This, in turn, positions them for immediate jobs and long-term career opportunities upon becoming NERG Alumni. NERG members are encouraged and supported to conduct their own original research, under the direction and mentorship of Steering Committee members and other collaborators, and they receive authorial credits on numerous publications.



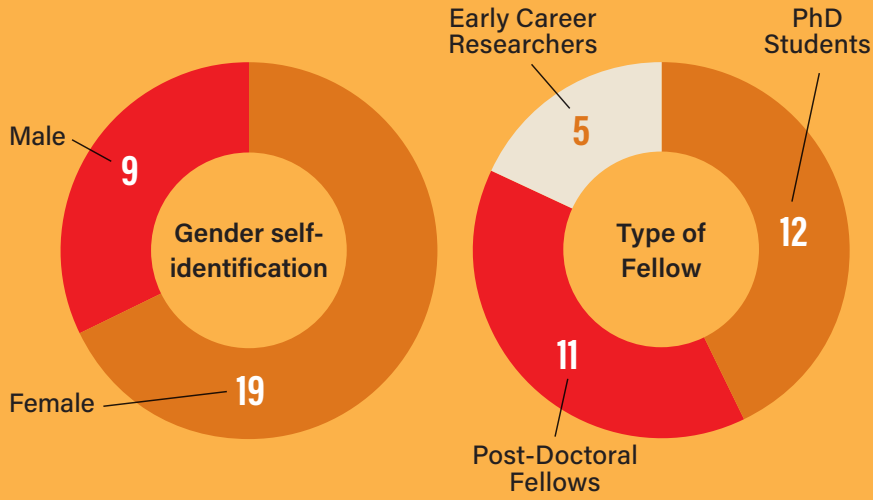
Caroline Wanjiru Muchiri

Open AIR's continued funding support from the Universities Canada Queen Elizabeth Scholars - Advanced Scholars (QES-AS) programme, which commenced in 2016, has allowed us to surpass our initial goals for NERG numbers and NERG research and outputs.

As part of regular rotation of leadership of Open AIR's NERG, **Caroline Wanjiru Muchiri** has taken over from **Esther Ekong** as the NERG leader and representative on the Steering Committee.

With the QES-AS funding, Open AIR has been able to host NERGs at several Open AIR hubs (and to allow them to move between hubs), thus generating strong collegial bonds between emerging researchers from numerous African countries and Canada. QES-AS Fellows must also participate in research data collection at a non-academic site as part of their Fellowships, which provides crucial fieldwork experience for NERGs and expands Open AIR's network of networks. The most recent tranche of funding from QES-AS requires a focus on West African scholars, and this development will, among other things, contribute greatly to Open AIR's growing presence in Francophone Africa.

**THE 28 QES-AS FELLOWS SINCE 2016**



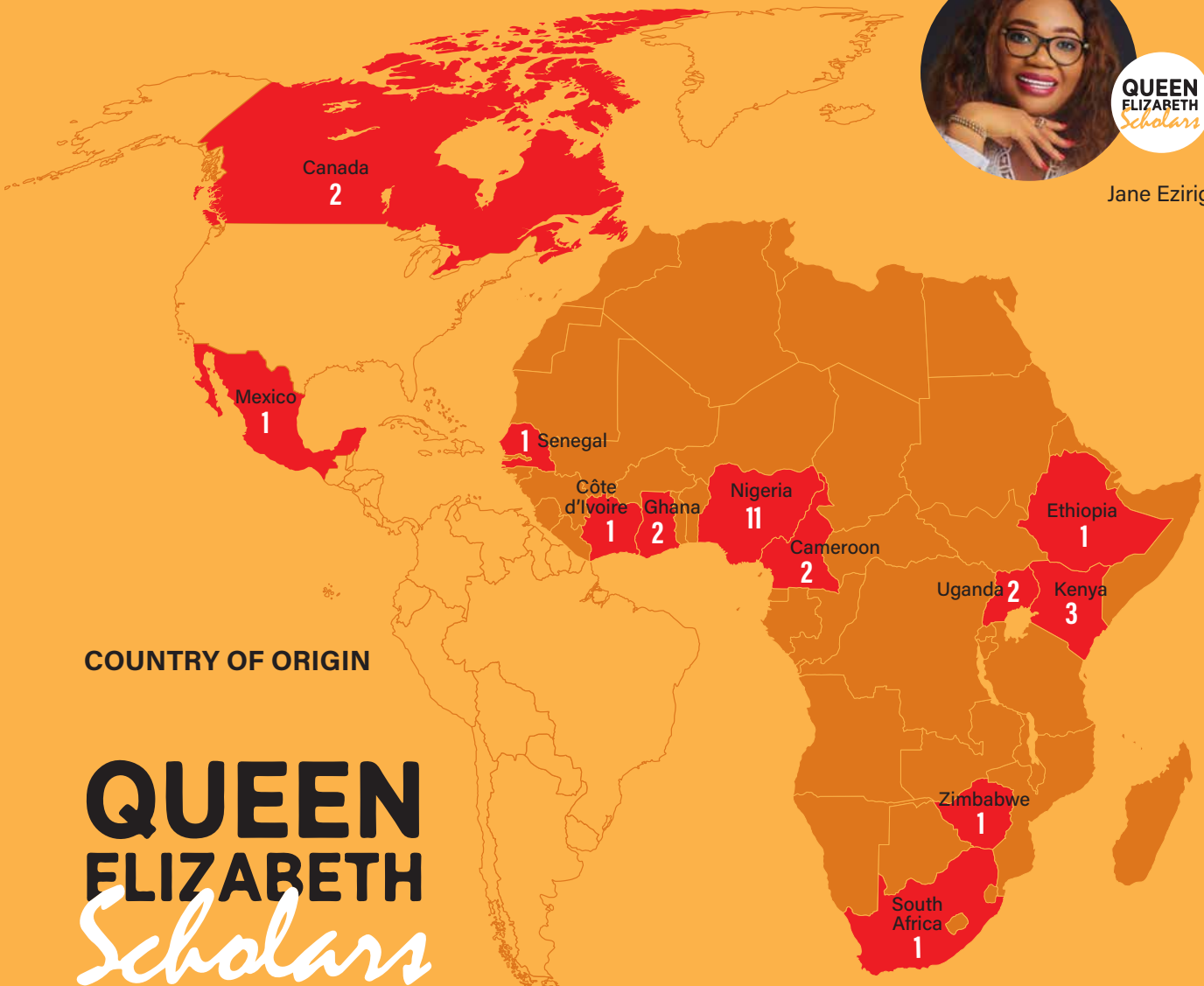
*The two newest Post-Doctoral Fellows:*



Yvonne Ndelle



Jane Ezirigwe

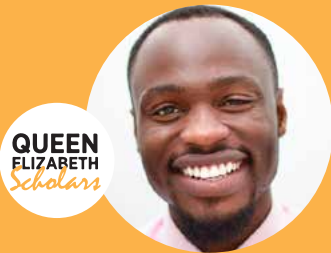


**QUEEN  
ELIZABETH**  
*Scholars*

The period 2021-22 has seen NERGs and NERG Alumni continue to make their mark.



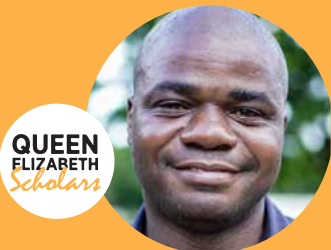
**Olayinka Oluwakemi Adeniyi**, who was studying at one of our South African hubs, did her QES-AS Fellowship at Open AIR's Kenya hub, including securing a placement with the African Trade Policy Centre as part of her QES Fellowship.



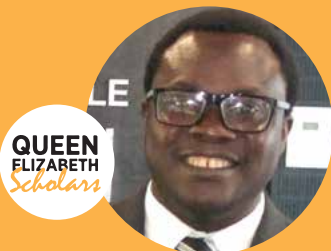
QES Alumnus **Jake Okechukwu Effoduh** participated in an African Union (AU) expert panel on AI in 2021, which led to him playing a role in supporting the drafting of an AI resolution for the African Commission on Human and Peoples' Rights, which is an organ of the African Union. Effoduh also published a Paradigm Initiative Policy Brief on AI in Nigeria.



Alumnus **Sileshi Bedasie Hirko** studied at Harvard, having been admitted with a scholarship award. Hirko was already an award-winner while still a QES-AS Fellow at uOttawa, winning a Civil Society Scholars Award (CSSA) grant from the Open Society Foundations. In 2022, Hirko published a book on copyright, higher education, and sustainable human development.



QES-AS NERG Alumnus **Thomas Hervé Mboa Nkoudou** was featured in a *Nature* article on leadership by early-career scientists, and the makerspace he founded in Cameroon, called Mboalab, hosted the 2022 Africa Open Science Hardware (AfricaOSH) Summit.



QES-AS NERG Alumnus **Desmond Osaretin Oriakhogba** published two books during 2021-22: one on Nigerian IP law the other on copyright collective management in Africa.



QES-AS Alumnus **Chijioko Ifeoma Okorie** published a book on music copyright law and policy in Africa.

## NERG ALUMNI: WHERE ARE THEY NOW?



### ELIAMANI LALTAIKA

In July 2021, Eliamani Laltaika was appointed to the High Court of Tanzania. His research in 2012, as an Open AIR NERG, looked into open-access publishing, protection of traditional knowledge, and access and benefit sharing in relation to African genetic resources. He then became a Lecturer in the School of Business Studies and Humanities at the Nelson Mandela African Institute of Science and Technology (NM-AIST) in Arusha, before being appointed to the High Court.



### ESTHER NGOM

Cameroonian national Esther Ngom, who served her NERG Fellowship at the University of Cape Town, now runs the Yii SCP law firm that she founded in the Cameroonian capital Yaoundé. This firm advises clients on a wide range of IP matters, with a specialisation in access and benefit-sharing (ABS) in relation to Cameroonian genetic resources. Ngom participated in the drafting of the 2021 ABS agreement signed between Swiss perfume company Firmenich and a local Indigenous community for the exploitation of two local plants. Ngom also participated in the drafting of Cameroon's ABS law, adopted in 2021.



### ALEXANDRA MOGYOROS

NERG Alumnus Alexandra Mogyoros, a Canadian national, has held research positions and fellowships at the universities of Toronto, Ottawa, Edinburgh, Cape Town, and Oxford. She clerked for Justice Thomas Cromwell and Justice Malcolm Rowe at the Supreme Court of Canada, and articulated and practised law in a litigation boutique in Toronto. Mogyoros is currently an Assistant Professor of Law at Toronto Metropolitan University, where she teaches property law and legal theory.



# Research Activities and Findings

## High Technology Hubs

Africa's tech hubs provide opportunities for local entrepreneurship, innovation, social change, and economic growth. They also provide entrepreneurs with the opportunity for partnerships with external partners. By providing capacity-building services, access to networks, and access to financing, hubs are innovation enablers that respond to gaps between innovators and the market, frequently leading to the scaling of innovations. Within the innovation ecosystem, the majority of tech hubs in Africa are located in cities. Cities provide easier access to the necessary services and infrastructure for setting up businesses, access to government services, and access to a wide variety of professional services, including qualified people to hire as a business grows.

Recent Open AIR outputs in this thematic area include Lucienne Abrahams' study of innovation and scaling practices by three South African hubs and their hosted start-ups; Chris Armstrong and Jeremy de Beer's article on the scaling practices of African enterprises, including scaling through participation in tech hubs; and South African NERG Kgotso Ditshego Magoro's blog on the rural tech hub developed in South Africa by the Mamaila Tribal Authority.



Mireille Wondia



Lucienne Abrahams (2021)  
***Innovation and Scaling by Tech Hubs and Their Hosted Startups: Three South African Cases***  
Online at: <https://bit.ly/3JteN3i>



Chris Armstrong and Jeremy de Beer (2021)  
***A Taxonomy to Understand Scaling of Innovation by African Enterprises***  
Online at: <https://doi.org/10.23962/10539/31370>



Kgotso Ditshego Magoro (2022)  
***Digital Mandhwane: Enabling Inclusive Digital Transformation in Rural South Africa***  
Online at: <https://bit.ly/3ZC0aA9>



Mireille Yeo Wondia (2021)  
***Access to Sustainable and Inclusive Energy through Pay-As-You-Go Solar Technologies in Sub-Saharan Africa***  
Online at: <https://bit.ly/423WzMX>



Centre for Intellectual Property and Information Technology Law (CIPIT) (2021)  
***Simplified Data Protection Impact Assessment for Small Organisations***  
Online at: <http://bit.ly/3ZCV1YR>



Caroline B. Ncube and Isaac Rutenberg (2021)  
***"Intellectual Property and Fourth Industrial Revolution Technologies"*** in Z. Mazibuko & E. Kraemer-Mbula (eds.) *Leap 4.0: African Perspectives on the Fourth Industrial Revolution*  
Online at: <https://bit.ly/3LwgFd9>

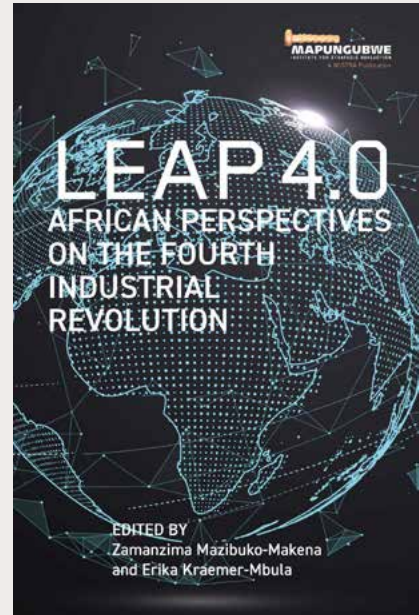
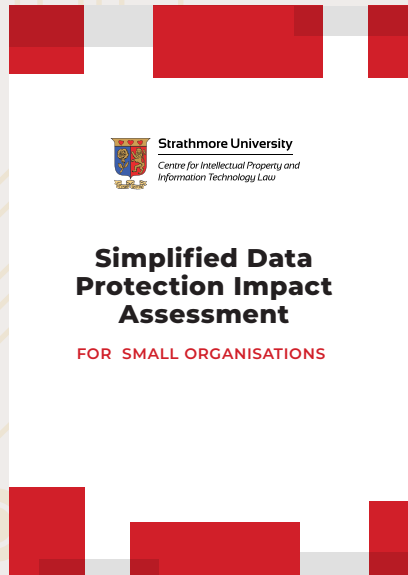


Photo: <https://nstf.org.za/>

Dr. Lucienne Abrahams, Director of the LINK Centre, University of Witwatersrand, Johannesburg, speaking at the National Science and Technology Forum



# Informal Innovation

There is now widespread recognition that, in the vast majority of Sub-Saharan African countries, the informal economy is central to the provision of innovative products and services that cater for the needs of unserved markets and provide livelihoods. This recognition has opened up space for policy practical deliberations regarding the tools and supports that could be put in place to foster sustainable growth and innovation by African informal-sector innovators and their micro-, small- and medium-sized enterprises (MSMEs). Policymakers need easily communicated facts that can be used to inform and justify bold policy and programme designs, including policy experimentation.

Recent Open AIR outputs in this thematic area include Erika Kraemer-Mbula's presentation on "Understanding Innovation in the African Informal Economy" to a seminar convened by University College London's Institute for Innovation and Public Purpose (IIPP), and an article by Elvis Avenyo and Kraemer-Mbula on their research into differences in innovative behaviour between female- and male-owned enterprises. In that article, Avenyo and Kraemer-Mbula explain, among other things, their finding that while female-owned businesses tended to be less likely than male-owned ones to introduce product innovations, the female-owned enterprises tended to be more successful in selling innovative products.







Elvis Avenyo



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Erika Kraemer-Mbula (2021)  
**Understanding Innovation in the African Informal Economy**  
Online at: <https://bit.ly/3FhsSym>



Elvis Korku Avenyo and Erika Kraemer-Mbula (2021)  
**Innovation and the Performance of Informal Enterprises in Developing Countries: A Gender Perspective**  
Online at: <https://doi.org/10.1108/ijge-11-2020-0174>



Bertha Vallejo, with co-authors (2021)  
**Strengthening the Knowledge Base to Face the Impacts of Climate Change on Water Resources in Africa: A Social Innovation Perspective**  
Online at: <https://doi.org/10.1016/j.envsci.2020.09.026>



Erika Kraemer-Mbula (2022)  
**Innovation Trends in Africa**  
Online at: <https://bit.ly/42d5R9C>



Ahou Rachel Koumi (2021)  
**Innovation ouverte en contexte académique à Abidjan, Côte d'Ivoire**  
Online at: <https://bit.ly/3TasG9U>



Chukwuka Okwuosa, Nailah Ramsomair and Chidi Oguamanam (2021)  
**COVID-19 Digital Health Innovations: The African Context**  
Online at: <https://bit.ly/3ytPh7D>



Chris Armstrong and Jeremy de Beer (2021)  
**A Taxonomy to Understand Scaling of Innovation by African Enterprises**  
Online at: <https://doi.org/10.23962/10539/31370>



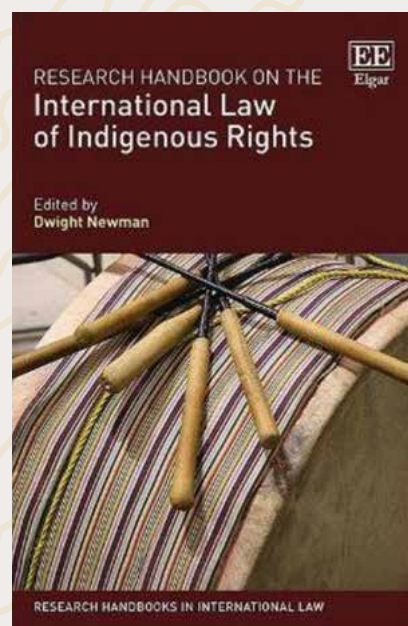
Chris Armstrong and Erika Kraemer-Mbula (2022)  
**Value Creation and Socioeconomic Inclusion in South African Maker Communities**  
Online at: <https://doi.org/10.23962/ajic.i29.14245>

# Traditional Knowledge and Indigenous Entrepreneurs

Open AIR interrogates traditional and Indigenous knowledge (TK/IK) matters on numerous levels. Empirical studies probe the operations of institutions and structures—of varying levels of formality—within TK/IK-holder communities. Open AIR also seeks to interrogate international norm-setting on TK/IK at the World Intellectual Property Organisation (WIPO); access and benefit-sharing modalities between the private sector and TK/IK-holders; and interfaces between TK/IK and African national education systems.

Open AIR's Chidi Oguamanam is a long-standing participant in the work of WIPO's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC). This work took on added urgency in 2022 with WIPO's decision to convene a full Diplomatic Conference on Genetic Resources and Associated Traditional Knowledge in 2024. At African national level, Open AIR's Esther Ngom participated in the drafting of Cameroon's ABS law (adopted in 2021) and in the development of a 2021 ABS agreement, between a Swiss perfume company and Cameroonian TK/IK-holders, for exploitation of the genetic resources in two plants.

Other Open AIR researchers have also had several publications in this research thematic area. An article by Chika Ezeanya-Esiobu, Chidi Oguamanam, and Vedaste Ndungutse set out the findings from their study, in Rwanda, of the interface between animal health TK/IK and the teaching of veterinary medicine in the country's technical and vocational education and training (TVET) institutions. They found that TK/IK on the treatment of animals is absent from the TVET curriculum and almost entirely absent from the teaching provided by instructors. Teshager Dagne published an article based on his research into African farm data, drawing attention to the power imbalance between the global companies extracting agricultural data and the local communities from which the data emerges. Oguamanam published a book chapter focused on the ABS implications of the manipulation of genetic resources through synthetic biology and digital sequence information (DSI) technologies.





Chidi Oguamanam (2022)  
**"Indigenous Peoples Rights in Equitable Benefit-Sharing over Genetic Resources: Digital Sequence Information (DSI) and a New Technological Landscape"**  
 in D. Newman (ed.) *Research Handbook on the International Law of Indigenous Rights*  
 Online at: <https://doi.org/10.4337/9781788115797.00030>



Chidi Oguamanam (2022)  
**WIPO-IGC 45: Bold and Strategic Moves Toward TK and TCE Text(s)**  
 Online at: <https://bit.ly/3l6X8VY>



Chidi Oguamanam (2022)  
**WIPO-IGC 43: Logjam over Two Genetic Resources Texts**  
 Online at: <https://bit.ly/3YC0Cgl>



Chika Ezeanya-Esiobu, Chidi Oguamanam and Vedaste Ndungutse (2021)  
**Indigenous Knowledge and Vocational Education: Marginalisation of Traditional Medicinal Treatments in Rwandan TVET Animal Health Courses**  
 Online at: <https://doi.org/10.23962/10539/31372>



Teshager W. Dagne (2021)  
**Embracing the Data Revolution for Development: A Data Justice Framework for Farm Data in the Context of African Indigenous Farmers**  
 Online at: <https://ssrn.com/abstract=3857393>



Angela Yeboah-Appiah (2021)  
**Providing an Equitable Framework for Safeguarding Intangible Cultural Heritage: Women in the Kente Weaving Industry in Ghana**  
 Online at: <https://bit.ly/3YCrEEr>



Chidi Oguamanam (2021)  
**"From Science, Technology and Innovation to Fourth Industrial Revolution Strategies in Africa: The Case for Indigenous Knowledge Systems"** in Z. Mazibuko & E. Kraemer-Mbula (eds.) *Leap 4.0: African Perspectives on the Fourth Industrial Revolution*  
 Online at: <https://bit.ly/3LwgFd9>



Angela Yeboah-Appiah

**The Journal of Law, Social Justice & Global Development**

**Embracing the Data Revolution for Development: A Data Justice Framework for Farm Data in the Context of African Indigenous Farmers**  
 Tesh W. Dagne

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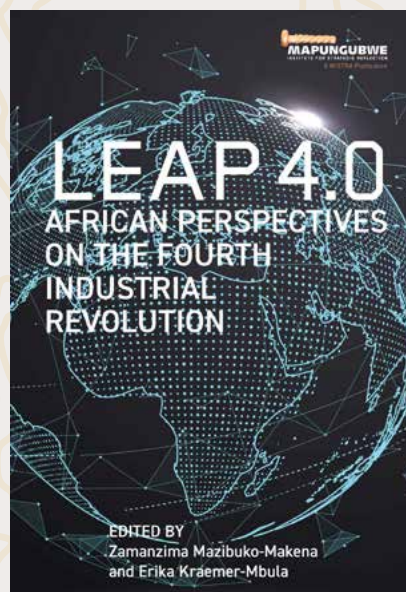
**Article Information**  
 Issue: 25: 2020: General Issue  
 This article was published on: 10 May 2021  
 Keywords: digitalisation, agriculture in Africa, data revolution, digital agriculture, farming.  
 Journal ISSN: 1467-0617 Article DOI: 10.31373/JGD.2019.2929.

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**Abstract**  
 This article examines the challenges that the digitalisation of agriculture in Africa brings with respect to ownership and control of data from the perspective of African indigenous farmers as data originators. It discusses the phenomena of the data revolution and digital agriculture in Africa, mapping out the ecosystem of digital agriculture by identifying general trends, key players, types and features of digitalisation driven by the capabilities of mobile and network infrastructure as well as by higher-level digitalisation supported by data infrastructures capability. By situating farm data as a constitutive element of traditional knowledge of agriculture production that is subjected to 'datafication', the article outlines the challenges of access to data and of unequal utilisation of data as having an impact on development imperatives that necessitate better control of data flows. It proposes data justice as a conceptual framework for an Africa-wide governance of farm data in which the challenges on access to data and unfairness in its utilisation are addressed in a manner consistent with the continent's aspirations for intra-regional relations.

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<https://www.jlsgd.org/issue/>



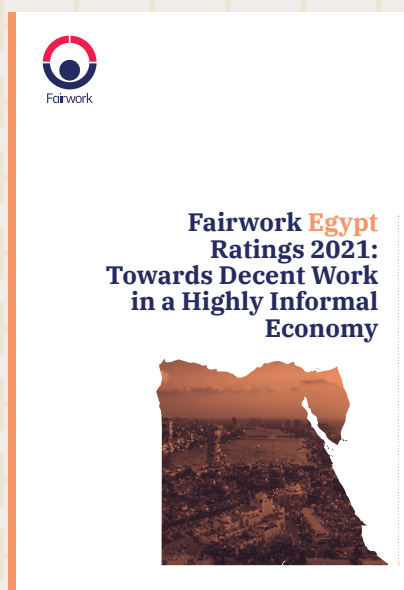


## Innovation Metrics

Open AIR's innovation metrics research team is based at our Egypt hub, the Access to Knowledge for Development Centre (A2K4D) at The American University in Cairo (AUC). Based on a review of Open AIR case study findings, the team determined that African MSMEs' innovation is largely driven by three core modalities: collaboration, human capital development, and knowledge governance.

These modalities, present across African enterprises at varying levels of formality, are currently under-measured by conventional global innovation metrics such as the Global Innovation Index (GII). Thus, these three elements form the pillars of Open AIR's Innovation Activity Index (IAI), which is a proposed addition to current measures used in crafting innovation metrics. Open AIR has identified sub-indicators for the three pillars, and a glossary of terms along a spectrum from formal to semi-formal to informal activities—resulting in an African Alternative Innovation Measurement Survey (AAIMS) instrument. In 2022, three Open AIR hub teams, at AUC, the University of Johannesburg (UJ), and Strathmore University in Nairobi, collected qualitative and quantitative AAIMS data that are to be used to further refine the IAI tool and to generate comparative findings across Egypt, Kenya, and South Africa.

Open AIR's Egypt hub, A2K4D in the AUC School of Business, hosted the launch of the Global Innovation Index 2021, and two Open AIR hubs—at the AUC School of Business and the UJ College of Business and Economics—have been selected to represent their respective countries in the GII Academic Network. As an extension of its work on innovation metrics, A2K4D is the Egypt lead for the international Fairwork project, which is investigating working conditions in the gig economy sectors of ride-hailing, courier delivery, tutoring, and home services. A2K4D and its Fairwork partners published the first Fairwork Egypt report.





Access to Knowledge for Development Center (A2K4D), with GII partners (2021)

**Global Innovation Index 2021: Insights into Innovation in Egypt**

Online at: <http://bit.ly/3LfgFhw>



Erika Kraemer-Mbula (2021)  
**Understanding Innovation in the African Informal Economy**

Online at: <http://bit.ly/3FhsSym>



Access to Knowledge for Development Center (A2K4D), with Fairwork partners (2021)

**Report Launch: Fairwork Egypt 2021 Ratings**

Online at: <https://bit.ly/3Fj0EmI>



Access to Knowledge for Development Center (A2K4D), with Fairwork partners (2021)

**Fairwork Egypt Ratings 2021: Towards Decent Work in a Highly Informal Economy**

Online at: <http://bit.ly/3mULi8>

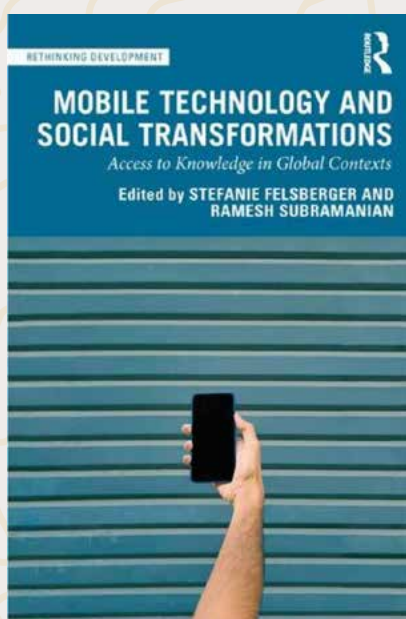
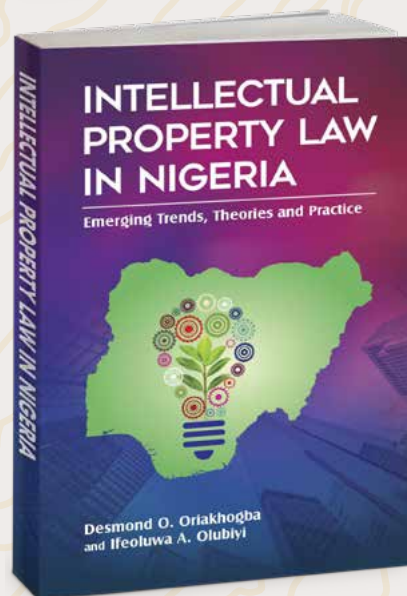
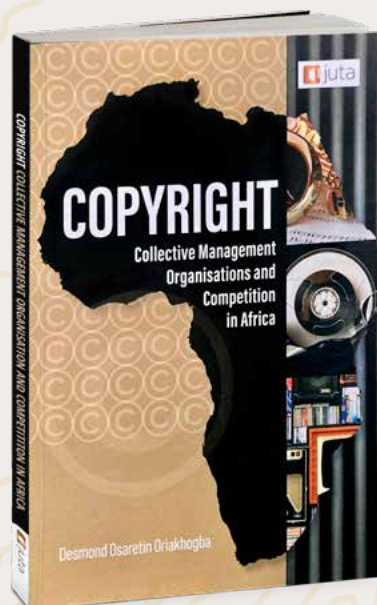




## Laws and Policies

Open AIR researchers are active in data collection and writing on numerous legal and policy matters, including matters in the fields of trade and intellectual property; science, technology and innovation (STI); open data and open science; and the sharing economy.

At the University Cape Town (UCT) hub, Caroline Ncube provided written inputs to the South African Parliamentary Portfolio Committee on Trade and Industry in respect of domestic copyright law provisions necessary for South Africa to adhere to the WIPO Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled (Marrakesh VIP Treaty). Ncube also contributed to a position paper providing guidance to the AU on STI in support of the continent’s realisation of the UN SDGs and the AU’s Agenda 2063. Also at the UCT hub, Desmond Osaretin Oriakhogba authored a book on copyright collective in Africa, and co-authored a volume on Nigerian IP law. At the Egypt hub, Nagla Rizk authored a book chapter providing “An A2K Perspective on Ride-Sharing Legislation”. At the Canada hub, Jeremy de Beer and Chidi Oguamanam were lead authors of a 2022 Global Open Data for Agriculture and Nutrition (GODAN) study that produced a strategic framework for governance of data linked to food and agriculture.





Caroline B. Ncube (2021)  
**Comments to the Portfolio Committee on Trade & Industry on the Alignment of s19D CAB to the Marrakesh Treaty**  
 Online at: <https://bit.ly/3yt3zVZ>



Caroline B. Ncube, with co-authors (2021)  
**Draft Positioning Paper: Thematic Track 2: Science, Technology and Innovation**  
 Online at: <https://bit.ly/420lmjV>



Desmond Osaretin Oriakhogba (2021)  
**Copyright, Collective Management Organisations and Competition in Africa**  
 Online at: <https://bit.ly/3mLrihy>



Desmond Osaretin Oriakhogba and Ifeoluwa A. Olubiyi (2021)  
**Intellectual Property Law in Nigeria: Emerging Trends, Theories and Practice**  
 Online at: <https://bit.ly/3FBVCSH>



Nagla Rizk (2021)  
**"Egypt and the Case of Uber: An A2K Perspective on Ride-Sharing Legislation"** in S. Felsberger & R. Subramanian (eds.) *Mobile Technology and Social Transformations: Access to Knowledge in Global Contexts*  
 Online at: <https://doi.org/10.4324/9781003089575>



Jeremy de Beer, Chidi Oguamanam and Éliane Ubalijoro (2022)  
**Ownership, Control, and Governance of the Benefits of Data for Food and Agriculture: A Conceptual Analysis and Strategic Framework for Governance**  
 Online at: <https://doi.org/10.5281/zenodo.7054790>



Erika Kraemer-Mbula, Gussai Sheikheldin and Rungano Karimanzira (2021)  
**"Southern Africa"** in S. Schneegans, T. Straza & J. Lewis (eds.) *UNESCO Science Report 2021: The Race Against Time for Smarter Development*  
 Online at: <http://bit.ly/3mHB2JT>



Charlene Tsitsi Musiza (2021)  
**Multilateral Matters #9: The Marrakesh Treaty and the Accessible Books Consortium: What Lessons for Successful Intellectual Property Multilateralism?**  
 Online at: <https://bit.ly/3ZXmzYt>



Isaac Rutenberg (2021)  
**A Critical Review of Intellectual Property Rights in the Kenyan Tea Sector**  
 Online at: <https://doi.org/10.1093/jiplp/jpab055>

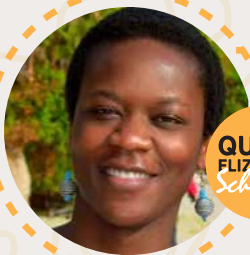


Oluseye Jegede and Caroline B. Ncube (2021)  
**Science, Technology, Innovation Management for Industrial Development in South Africa: Implications for the Fourth Industrial Revolution**  
 Online at: <https://bit.ly/3ZSFSSE>



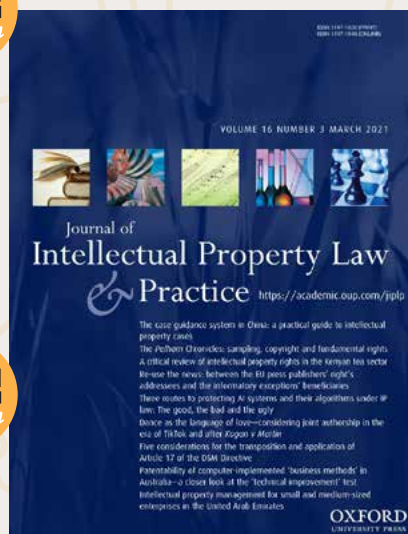
Desmond Oriakhogba

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Charlene Musiza

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# Economic Integration, International Law, and Trade Policy

In this thematic area, the African Continental Free Trade Area, for which implementation began in 2019, continues to be a key area of focus for Open AIR research and writing. Open AIR researchers produced written outputs touching on, among other things, the AfCFTA Intellectual Property Protocol; Nigeria's priorities in respect of the AfCFTA IP Protocol; and multi-territorial copyright licensing in the context of AfCFTA. At the level of international trade, several Open AIR authors engaged with matters linked to access to medicines in the context of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement).



Caroline B. Ncube (2022)  
***Intellectual Property and the African Continental Free Trade Area: Lessons and Recommendations for the IP Protocol***  
Online at: <https://bit.ly/3LffiiS>



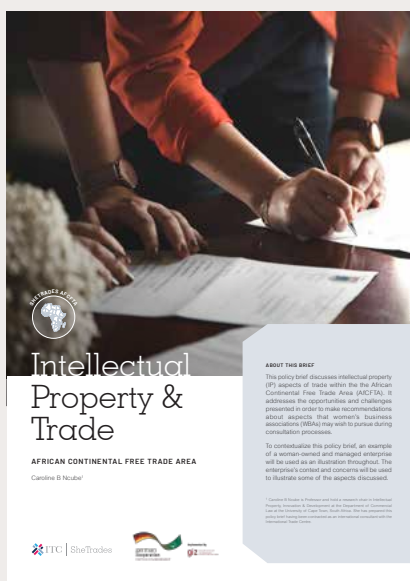
Caroline B. Ncube (2021)  
***Intellectual Property & Trade: African Continental Free Trade Area***  
Online at: <https://bit.ly/3mGV5rN>



Adebambo Adewopo, Desmond Osaretin Oriakhogba and Chijioko Ifeoma Okorie (2022)  
***Negotiating the Intellectual Property Protocol under the Agreement Establishing the African Continental Free Trade Area: Priorities and Opportunities for Nigeria***  
Online at: <https://doi.org/10.1515/ldr-2021-0064>



Desmond Osaretin Oriakhogba and Chijioko Ifeoma Okorie (2021)  
***Multi-Territorial Digital Copyright Licensing within the AfCFTA: Considerations for Appropriate Guiding Principles***  
Online at: <https://doi.org/10.2139/ssrn.3968374>







Philda Maiga (2021)  
**Positioning Women Entrepreneurs to Harness IP for AfCFTA Gains**  
Online at: <https://bit.ly/3mKddRL>



Philda Maiga (2021)  
**From Africa to the World: Unlocking Barriers for Women to Trade**  
Online at: <http://bit.ly/3ys67UD>



Melissa Omino and Joanna Kahumbu (2022)  
**Left on Our Own: COVID-19, TRIPS-Plus Free Trade Agreements, and the Doha Declaration on TRIPS and Public Health**  
Online at: <https://bit.ly/3Jv9HU0>



Gaëlle Groux and Jeremy de Beer (2021)  
**"Canada: Access to Medicine in High-Income Countries" in S. Ragavan & A. Vanni (eds.) Intellectual Property Law and Access to Medicines: TRIPS Agreement, Health, and Pharmaceuticals**  
Online at: <https://doi.org/10.4324/9781003176602-13>



Caroline B. Ncube (2021)  
**"South Africa's Three Decades of Access to Medicine Discourse: Blight or Benefit" in S. Ragavan & A. Vanni (eds.) Intellectual Property Law and Access to Medicines: TRIPS Agreement, Health, and Pharmaceuticals**  
Online at: <https://doi.org/10.4324/9781003176602-15>



Abdelhamid Benhmade (2021)  
**Le Big Pharma a-t-il raison de freiner des quatre fers ?**  
Online at: <http://bit.ly/3Zv4pO1>



Fernando dos Santos, Caroline B. Ncube and Marisella Ouma (2022)  
**Intellectual Property Framework Responses to Health Emergencies - Options for Africa**  
Online at: <https://doi.org/10.17159/sajs.2022/12775>



Abdelhamid Benhmade (2022)  
**Pourquoi la nouvelle proposition sur l'accès aux vaccins est-elle insuffisante ?**  
Online at: <https://bit.ly/3mMxl0c>



Bertha Vallejo and Tadesse Getachew Mekonnen (2021)  
**Foreign Direct Investment (FDI) and Learning in Ethiopia's Textile and Garment Sector**  
Online at: <http://bit.ly/3J5jrTH>

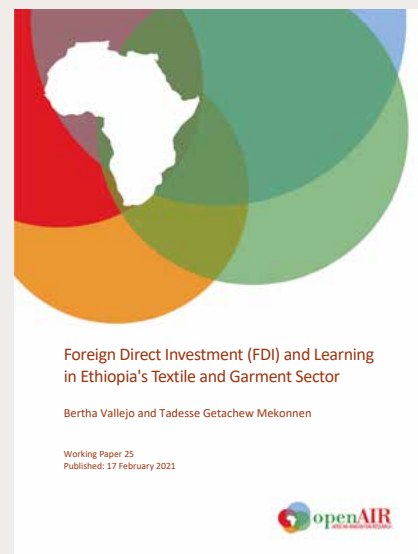
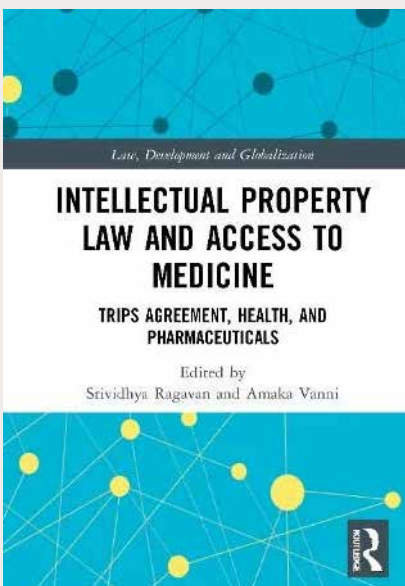


Philda Maiga



Bertha Vallejo

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# Gender Equality and Empowerment of Women and Girls

This research theme continues to yield groundbreaking research and writing outputs by Open AIR researchers. Key outputs have included: the “Incubating Feminist AI” webinar, convened by Open AIR’s Egypt hub, A2K4D, as part of the A+ Alliance’s F



Access to Knowledge for Development Center (A2K4D) (2022)  
***Incubating Feminist AI: MENA f***  
Online at: <https://bit.ly/3Jq2nrP>



Esther Ekong (2021)  
***Coalescing Intellectual Property Incentives, Gender Inclusiveness and Environmental Sustainability for Female Traditional Healers in Nigeria***  
Online at: <https://doi.org/10.1080/20421338.2021.1889758>



Elvis Korku Avenyo and Erika Kraemer-Mbula (2021)  
***Innovation and the Performance of Informal Enterprises in Developing Countries: A Gender Perspective***  
Online at: <https://doi.org/10.1108/ijge-11-2020-0174>



Angela Yeboah-Appiah (2021)  
***Providing an Equitable Framework for Safeguarding Intangible Cultural Heritage: Women in the Kente Weaving Industry in Ghana***  
Online at: <http://bit.ly/3YCrEEr>



Pamela Mreji (2022)  
***Opportunities for Women in Transformative Innovation and 4IR in Africa***  
Online at: <https://bit.ly/3T66NIA>



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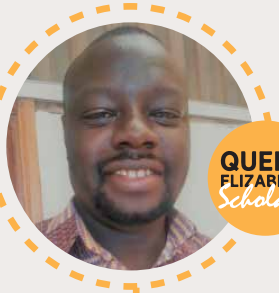


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Pamela Mreji

Aboubacry Kane

Dominique Diouf



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Aboubacry Kane and Dominique Diouf (2021)

***Quelle est la place de la femme dans l'écosystème digital au Sénégal ?***

Online at: <http://bit.ly/3Le4Mlo>



Jeremy de Beer, Laura Foster, Chidi Oguamanam, Katie Szilagyi and Angeline Wairegi (2021)

***Smart Farming and Governing AI in East Africa: Taking Gendered Relations and Vegetal Beings into Account***

Online at: <http://bit.ly/3T8vNiv>



Philda Maiga (2021)

***Positioning Women Entrepreneurs to Harness IP for AfCFTA Gains***

Online at: <https://bit.ly/3mKddRL>



Esther Ekong (2021)

***Trickles and Spouts: Translating Research on Intellectual Properties to Women's Entrepreneurship***

Online at: <https://bit.ly/3FgDY6u>



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Philda Maiga





## Artificial Intelligence (AI)

Open AIR's work on AI topics is focused on ensuring strong representation of African perspectives and on fostering ethical and equitable AI. It is our conviction that regulatory frameworks for the use of AI technologies should be transparent, innovative, ethical, and inclusive of Global Southern and African imperatives. In addition to the need for strong African participation in global AI norm-setting, African innovators must be central actors in the development of AI technologies and initiatives deployed on the continent.



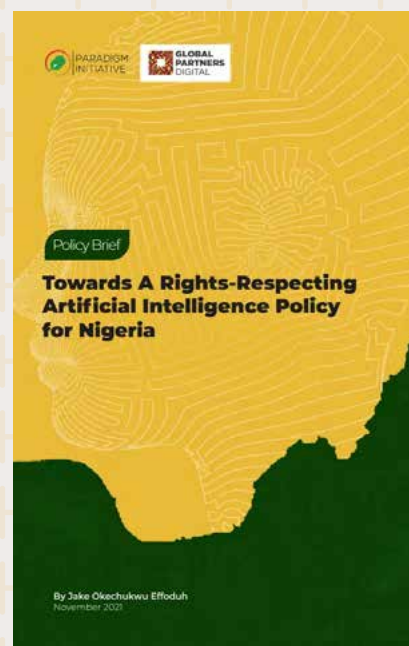
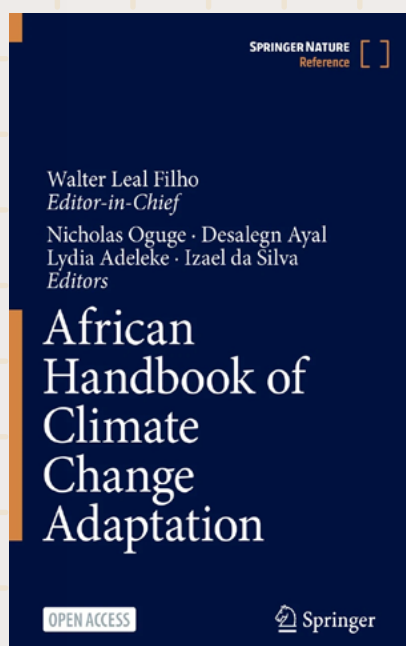
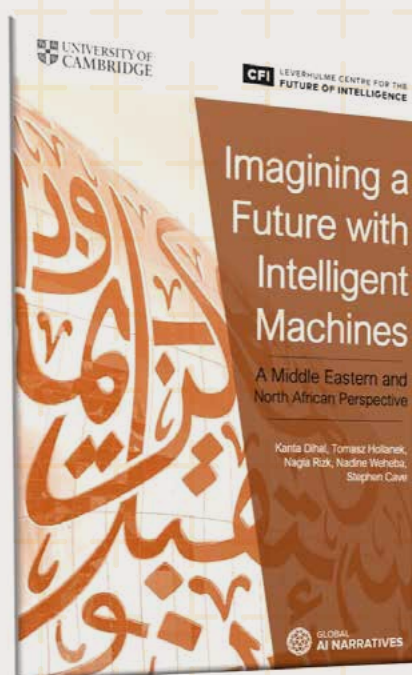
Isaac Rutenberg, Arthur Gwagwa and Melissa Omino (2021)  
**"Use and Impact of Artificial Intelligence on Climate Change Adaptation in Africa"** in W. L. Filho, N. Oguge, D. Ayal, L. Adeleke & I. da Silva (eds.) *African Handbook of Climate Change Adaptation*  
Online at: [https://doi.org/10.1007/978-3-030-45106-6\\_80](https://doi.org/10.1007/978-3-030-45106-6_80)



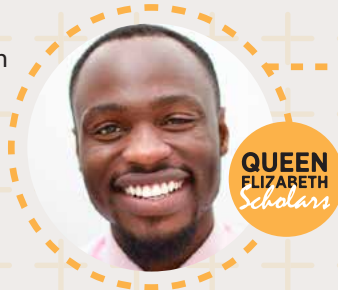
Nagla Rizk and Nadine Weheba, with co-authors (2021)  
**Imagining a Future with Intelligent Machines: A Middle Eastern and North African Perspective**  
Online at: <http://bit.ly/3IZMpUY>



Access to Knowledge for Development Center (A2K4D) (2022)  
**Incubating Feminist AI: MENA f&a+i>r Hub's First Network Meeting**  
Online at: <https://bit.ly/3Jq2nrP>



Jake Effoduh



Jake Okechukwu Effoduh (2021)  
***Towards A Rights-Respecting Artificial Intelligence Policy for Nigeria***

Online at: <https://bit.ly/3LjKzRL>



Jeremy de Beer, Laura Foster, Chidi Oguamanam, Katie Szilagyi and Angeline Wairegi (2021)

***Smart Farming and Governing AI in East Africa: Taking Gendered Relations and Vegetal Beings into Account***

Online at: <http://bit.ly/3T8vNiv>



Sileshi Hirko (2022)  
***Harnessing AI and Big Data for Development in Africa: The Prospects and Challenges of the IP System***

Online at: <https://bit.ly/3ZCuRp1>



Angeline Wairegi, Melissa Omimo and Isaac Rutenberg (2021)  
***AI in Africa: Framing AI through an African Lens***

Online at: <https://doi-org.proxy.bib.uottawa.ca/10.4000/ctd.4775>



Florence Ogonjo, Joseph Theuri Gitonga, Angeline Wairegi and Isaac Rutenberg (2021)

***Utilizing AI to Improve Efficiency of the Environment and Land Court in the Kenyan Judiciary***

Online at: <https://bit.ly/3Jb5e7C>



Desmond Osaretin Oriakhogba (2021)

***What If DABUS Came to Africa? Visiting AI Inventorship and Ownership of Patent from the Nigerian Perspective***

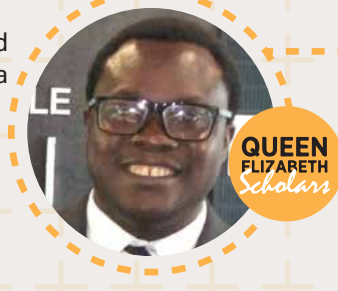
Online at: <http://bit.ly/3Zv2CZj>



Sileshi Hirko



Desmond Oriakhogba



# The Maker Movement

Open AIR has been researching and engaging with African maker communities since 2016. These communities are not mere research subjects; they are also collaborators in our research. Open AIR sees the maker movement as a key manifestation of, and potential future driver for, open, collaborative innovation and livelihood development in Africa. In 2021, Open AIR's Chris Armstrong participated in the virtual Africa Makerspace Gathering convened by the Africa Makerspace Network (AMN), in which Open AIR is a core partner member. Armstrong also presented virtually to the "Remaking the Maker Movement" hosted in Australia by the Queensland University of Technology's (QUT's) Faculty of Business and Law.

In February 2022, Open AIR joined a large consortium of African and European partners in the launch of a three-year, EU-funded project entitled African European Maker Innovation Ecosystem (mAKE), which is supporting the work of, and interactions between, hardware-focused digital innovation hubs (DIHs) and makerspaces in Africa and Europe. Later in 2022, Mboalab, a leading African hub/makerspace established by Open AIR's Thomas Hervé Mboa Nkoudou in the Cameroonian capital Yaoundé, hosted the 2022 Africa Open Science Hardware (AfricaOSH) Summit. Also in 2022, Armstrong presented to the AMN's virtual June 2022 Study Week Program, served on the judging panel for the AMN's Africa Makerspace Excellence Awards, and participated in-person in the AMN's 2022 Africa Makerspace Gathering in Cape Town in November. Following that AMN gathering, Open AIR's University of Cape Town hub hosted a two-day mAKE project consortium meeting, with coordination by Open AIR's UCT Project Manager Nan Warner.

Key publication outputs under this research theme include: a book chapter by Mboa Nkoudou on sustainable development via African fab labs (fabrication laboratories); a journal article by Mboa Nkoudou that also reflected on the work of African fab labs; and a journal article by Armstrong and Open AIR colleague Erika Kraemer-Mbula on value creation and socioeconomic inclusion by South African maker communities.



Thomas Hervé Mboa Nkoudou (2022)  
**"High-Stake Conditions to Catalyse Local Sustainable Development through Fablabs in Africa"**  
in P. Régnier, D. Frey, S. Pierre, K. Varghese & P. Wild (eds.) *Handbook of Innovation & Appropriate Technologies for International Development*  
Online at: <https://doi.org/10.4337/9781800887824.00023>



Thomas Hervé Mboa Nkoudou (2021)  
**Stratégies de résistance à la technocolonialité: Apprendre des fablabs d'Afrique**  
Online at: <http://bit.ly/429rjw6>



Chris Armstrong (2022)  
**Launch of African European Maker Innovation Ecosystem (mAKE) Project**  
Online at: <http://bit.ly/42a6Szd>



Thomas Hervé Mboa Nkoudou and Mboalab (2022)  
**Africa Open Science Hardware (AfricaOSH) Summit 2022, Yaoundé, Cameroon**  
Online at: <http://bit.ly/42g3VNI>

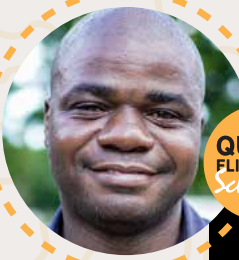


Chris Armstrong and Erika Kraemer-Mbula (2022)  
**Value Creation and Socioeconomic Inclusion in South African Maker Communities**  
Online at: <https://doi.org/10.23962/ajic.i29.14245>

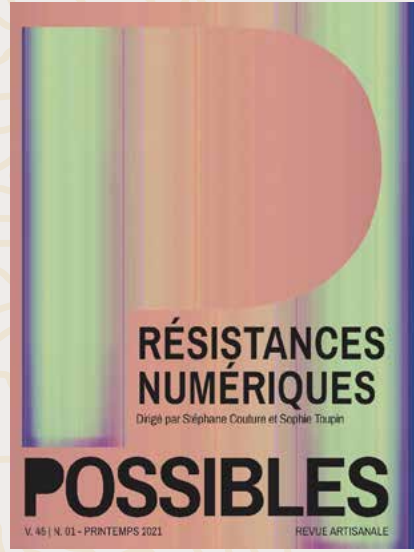


Africa Makerspace Network (AMN) (2022)  
**Study Week Program: Promoting the Growth of Digital Innovation Hubs**  
Online at: <http://bit.ly/3JEBrvX>





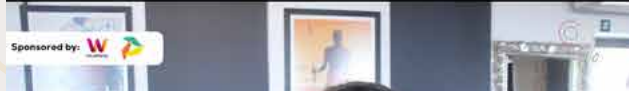
Thomas Mboa Nkoudou



Africa Makerspace Network (AMN) (2022)  
**Highlights from the Africa Makerspace Gathering Day 1**  
Online at: <https://www.youtube.com/watch?v=kelqHEsJ-rU>



Chris Armstrong (2021)  
**Institutionalisation and Informal Innovation in South African Maker Communities**  
Online at: <https://bit.ly/404Z2EZ>



# Knowledge Mobilisation



**Policy  
Engagement**

**Thought  
Leadership**  
(see pages 8-9)

**Recognition &  
Awards**

**Publications**

**Website &  
Social Media**





Photo: WIPO, Emmanuel Berrod



## Policy Engagement

As seen in the preceding sections of this report, Open AIR researchers continue to develop, submit, and publish inputs on numerous policy matters at the international, African continental, and African national levels, including matters under consideration at:

- WIPO IGC
- the WTO TRIPS Council
- AU entities implementing AfCFTA
- African national level





## Recognition and Awards



Open AIR's **Thomas Hervé Mboa Nkoudou** was featured in a *Nature* article entitled "How Junior Scientists can Land a Seat at the Leadership Table".



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Open AIR's **Esther Ekong** and **Dianah Byaruhanga Ajuna** both received uOttawa awards for their work. Ekong received the 2021–2022 Special Merit Scholarship and Byaruhanga Ajuna received the 2021 CLTS Impact Award.



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Social Sciences and  
Humanities Research  
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In November 2022, **Open AIR** was named as a finalist for the Canadian SSHRC Impact Awards in the Partnership Award category. In the words of SSHRC President Ted Hewitt:

*The Impact Awards finalists embody the very best ideas and research about people, human thought and behaviour, culture and society, and more. They help us understand and improve the world around us, today and into the future. Each year, all of us at SSHRC look forward to learning who the jury has selected to be part of this select group of outstanding students and researchers, and this year is no exception. Congratulations to you all!*

7 [https://www.sshrc-crsh.gc.ca/news\\_room-salle\\_de\\_presse/latest\\_news-nouvelles\\_recentes/2022/2022-impact-award-finalists-eng.aspx](https://www.sshrc-crsh.gc.ca/news_room-salle_de_presse/latest_news-nouvelles_recentes/2022/2022-impact-award-finalists-eng.aspx)

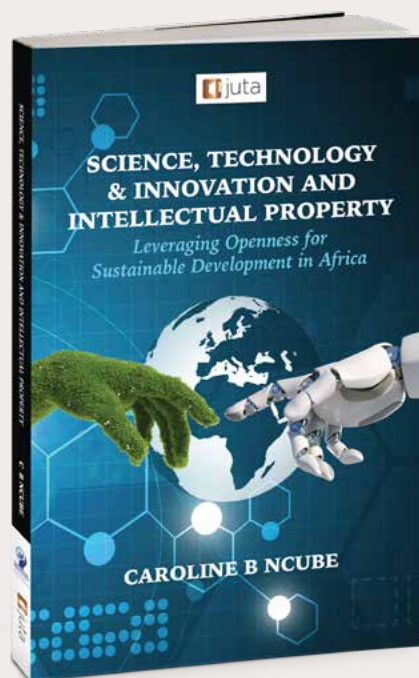
*“The Impact Awards finalists embody the very best ideas and research about people, human thought and behaviour, culture and society, and more. They help us understand and improve the world around us, today and into the future.”*

*– Ted Hewitt, SSHRC President*

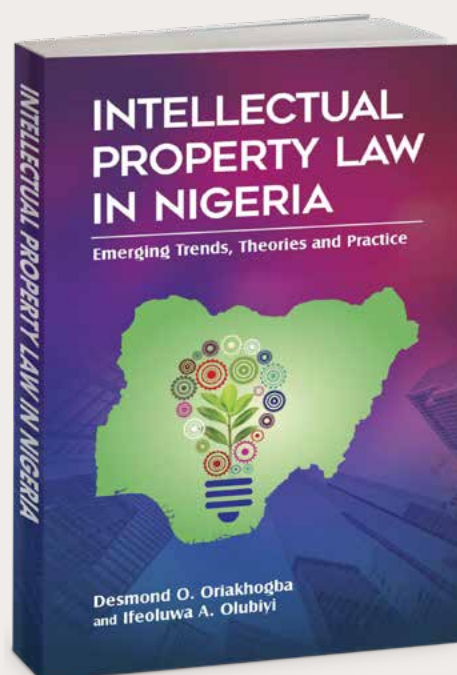


# Publications

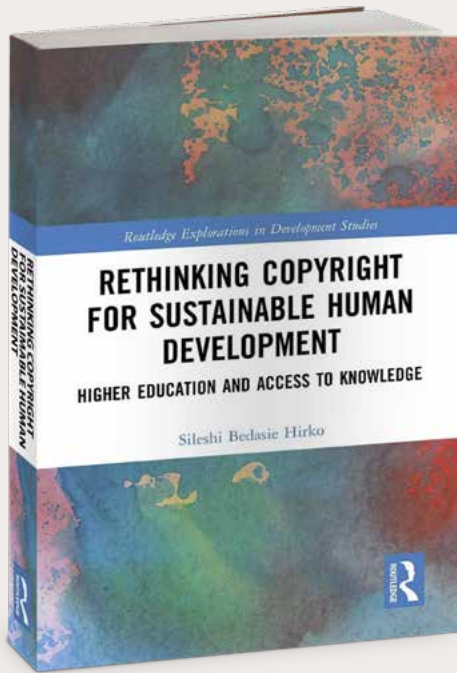
In addition to the large number of journal articles, papers, reports, and blog posts featured earlier in this report, Open AIR researchers have also published numerous books and book chapters.



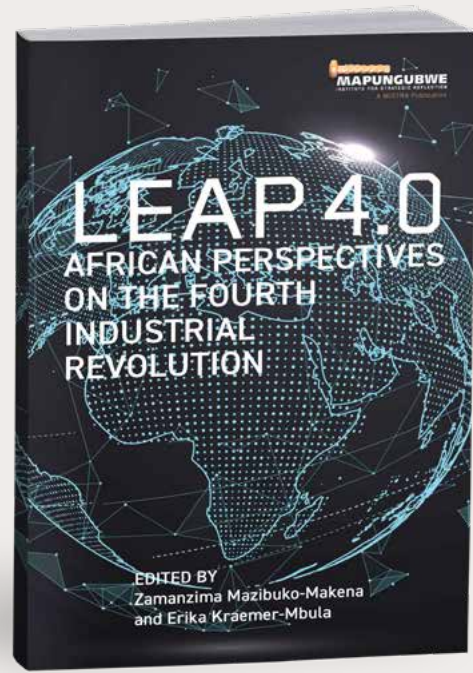
Caroline B. Ncube (2021)  
***Science, Technology & Innovation and Intellectual Property: Leveraging Openness for Sustainable Development in Africa***  
Online at: <https://doi.org/10.15641/1-48513-776-4>



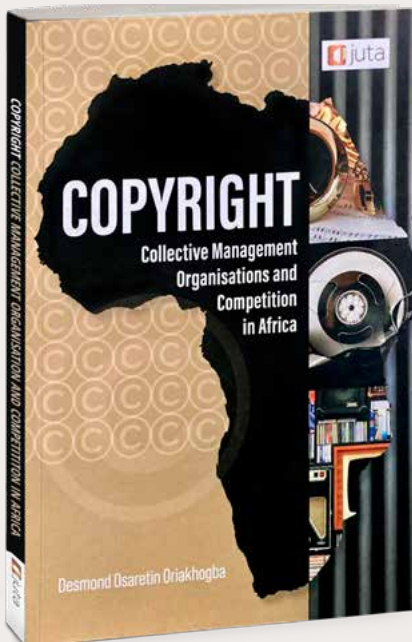
Desmond Osaretin Oriakhogba and Ifeoluwa A. Olubiya (2021)  
***Intellectual Property Law in Nigeria: Emerging Trends, Theories and Practice***  
Online at: <https://bit.ly/3FBVCSH>



Sileshi Bedasie Hirko (2021)  
***Rethinking Copyright for Sustainable Human Development: Higher Education and Access to Knowledge***  
 Online at: <https://doi.org/10.4324/9781003214298>



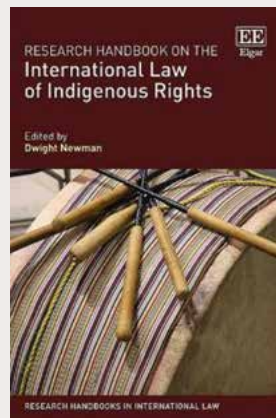
Zamanzima Mazibuko-Makena and Erika Kraemer-Mbula (eds.) (2021)  
***Leap 4.0: African Perspectives on the Fourth Industrial Revolution***  
 Online at: <https://bit.ly/3LwgFd9>



Desmond Osaretin Oriakhogba (2021)  
***Copyright, Collective Management Organisations and Competition in Africa***  
 Online at: <https://bit.ly/3yzh3zu>



## Book Chapters



Chidi Oguamanam (2022)  
**"Indigenous Peoples Rights in Equitable Benefit-Sharing over Genetic Resources: Digital Sequence Information (DSI) and a New Technological Landscape"** in D. Newman (ed.) Research Handbook on the International Law of Indigenous Rights  
Online at: <https://doi.org/10.4337/9781788115797.00030>



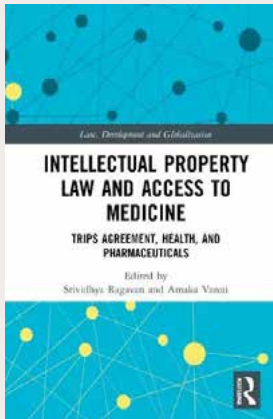
Isaac Rutenberg, Arthur Gwagwa and Melissa Omino (2021)  
**"Use and Impact of Artificial Intelligence on Climate Change Adaptation in Africa"** in W. L. Filho, N. Oguge, D. Ayal, L. Adeleke & I. da Silva (eds.) African Handbook of Climate Change Adaptation  
Online at: [https://doi.org/10.1007/978-3-030-45106-6\\_80](https://doi.org/10.1007/978-3-030-45106-6_80)



Nagla Rizk (2021)  
**"Egypt and the Case of Uber: An A2K perspective on Ride-Sharing Legislation"** in S. Felsberger & R. Subramanian (eds.) Mobile Technology and Social Transformations: Access to Knowledge in Global Contexts  
Online at: <https://doi.org/10.4324/9781003089575>

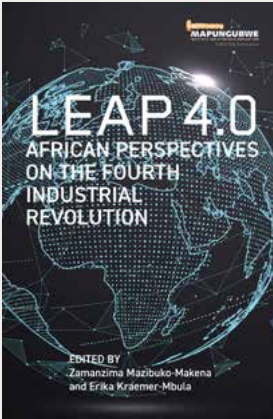


Thomas Hervé Mboa Nkoudou (2022)  
**"High-Stake Conditions to Catalyse Local Sustainable Development through Fablabs in Africa"**  
 in P. Régnier, D. Frey, S. Pierre, K. Varghese & P. Wild (eds.) *Handbook of Innovation & Appropriate Technologies for International Development*  
 Online at: <https://doi.org/10.4337/9781800887824.00023>



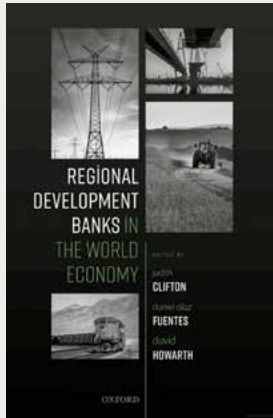
Caroline B. Ncube (2021)  
**"South Africa's Three Decades of Access to Medicine Discourse: Blight or Benefit"** in S. Ragavan & A. Vanni (eds.) *Intellectual Property Law and Access to Medicines: TRIPS Agreement, Health, and Pharmaceuticals*  
 Online at: <https://doi.org/10.4324/9781003176602-15>

Gaëlle Groux and Jeremy de Beer (2021)  
**"Canada: Access to Medicine in High-Income Countries"**  
 in S. Ragavan & A. Vanni (eds.) *Intellectual Property Law and Access to Medicines: TRIPS Agreement, Health, and Pharmaceuticals*  
 Online at: <https://doi.org/10.4324/9781003176602-13>



Chidi Oguamanam (2021)  
**"From Science, Technology and Innovation to Fourth Industrial Revolution Strategies in Africa: The Case for Indigenous Knowledge Systems"** in Z. Mazibuko & E. Kraemer-Mbula (eds.) *Leap 4.0: African Perspectives on the Fourth Industrial Revolution*  
 Online at: <https://bit.ly/3LwgFd9>

Caroline B. Ncube and Isaac Rutenberg (2021)  
**"Intellectual Property and Fourth Industrial Revolution Technologies"** in Z. Mazibuko & E. Kraemer-Mbula (eds.) *Leap 4.0: African Perspectives on the Fourth Industrial Revolution*  
 Online at: <https://bit.ly/3LwgFd9>



Erika Kraemer-Mbula (2021)  
**"The African Development Bank: 'African solutions to African problems'?"** in J. Clifton, D. Díaz Fuentes & D. Howarth (eds.) *Regional Development Banks in the World Economy*  
 Online at: <https://doi.org/10.1093/oso/9780198861089.003.0003>

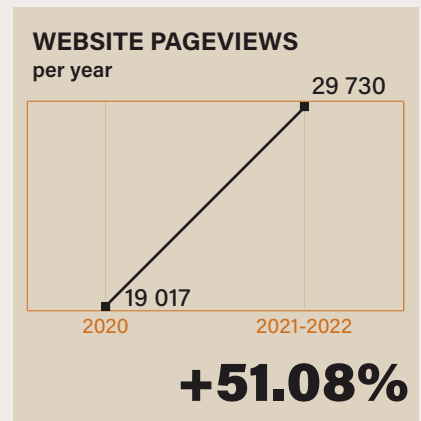
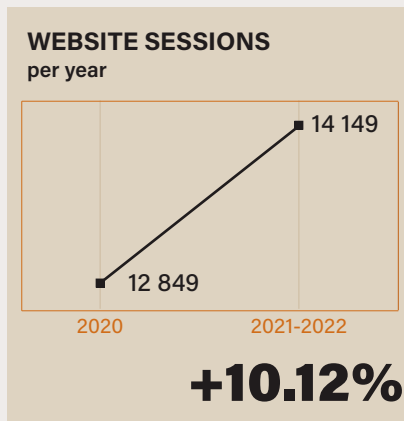
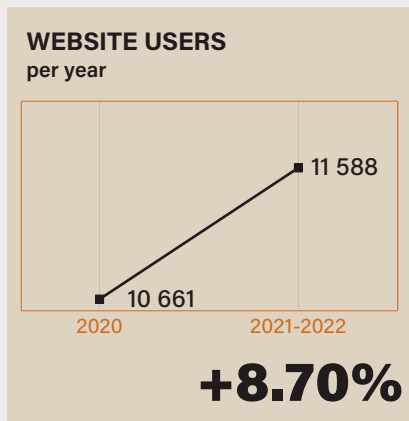




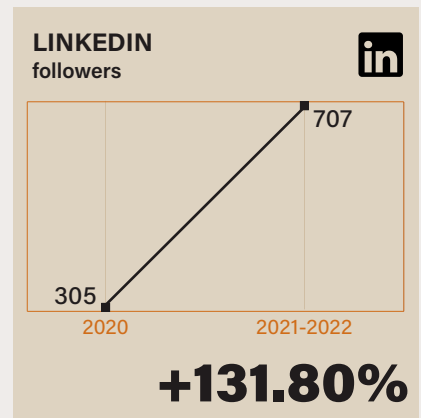
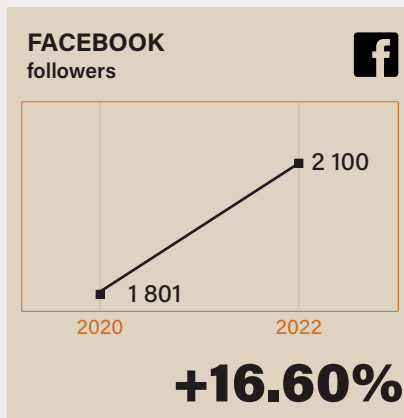
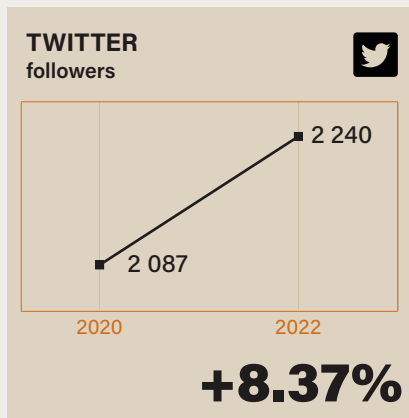
# Website and Social Media

Open AIR's website and social media channels continue to flourish. We have seen a steady increase in the areas below:

## WEBSITE



## SOCIAL MEDIA



# Network Hubs

## NORTH AFRICA



Access to Knowledge for Development Center (A2K4D)  
The American University in Cairo  
Cairo, Egypt  
cairo@openair.africa

## WEST AFRICA



**Nigerian Institute of  
Advanced Legal Studies**

Nigerian Institute of Advanced Legal Studies (NIALS)  
Lagos, Nigeria  
lagos@openair.africa

## EAST AFRICA



**Strathmore University**

*Centre for Intellectual Property and  
Information Technology Law*

Centre for Intellectual Property and Information  
Technology Law (CIPIT)  
Strathmore University  
Nairobi, Kenya  
nairobi@openair.africa

## SOUTHERN AFRICA



Intellectual Property (IP Unit)  
Faculty of Law  
University of Cape Town  
Cape Town, South Africa  
capetown@openair.africa

**SARChI**  
TRANSFORMATIVE  
INNOVATION, 4IR  
AND SUSTAINABLE  
DEVELOPMENT



College of Business and Economics  
University of Johannesburg  
Johannesburg, South Africa  
gauteng@openair.africa

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Faculty of Law, University of Ottawa  
Ottawa, Canada  
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