

Developing Resilient Research Ecosystems When Resources Are Scarce: The Role Of Repositories

LIBSENSE-AAU webinar

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Structure of the talk

- Outlining the Problem Context
- Researching the Problem Theoretically
- Practical Solutions through Action Research in LIBSENSE

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Introducing the Problem Context

Science Papers Published 2016

TABLE 3
Scientific Production (World Share of Scientific Publications) in Developing Countries

Areas/Countries	World share (%) of scientific publications		
	2001	2006	Evolution 2006/2001
Asia (excluding Japan)	9.4	14.8	+87
China	3.6	7.0	+96
ASEAN	0.7	1.0	+42
Latin America (including Mexico)	2.6	3.2	+46.4
Brazil	1.2	1.6	+35
Africa	1.2	1.2	0
North Africa	0.5	0.5	+11
South Africa	0.4	0.4	-9
Near and Middle East (excluding Israel)	0.5	0.8	+90
Total Developing Countries	13.7	20.0	

“Following a long period of relative stagnation, Africa’s share of world publication output more than doubled since 2003 to reach 3% today. This is a notable but contrasted progress.” (Gaillard & Mouton, 2022, p. 319)

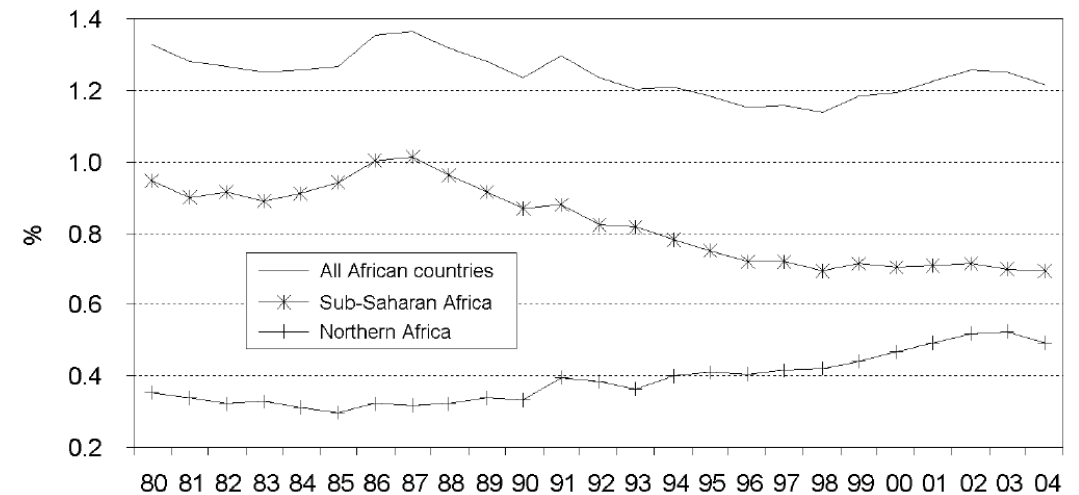
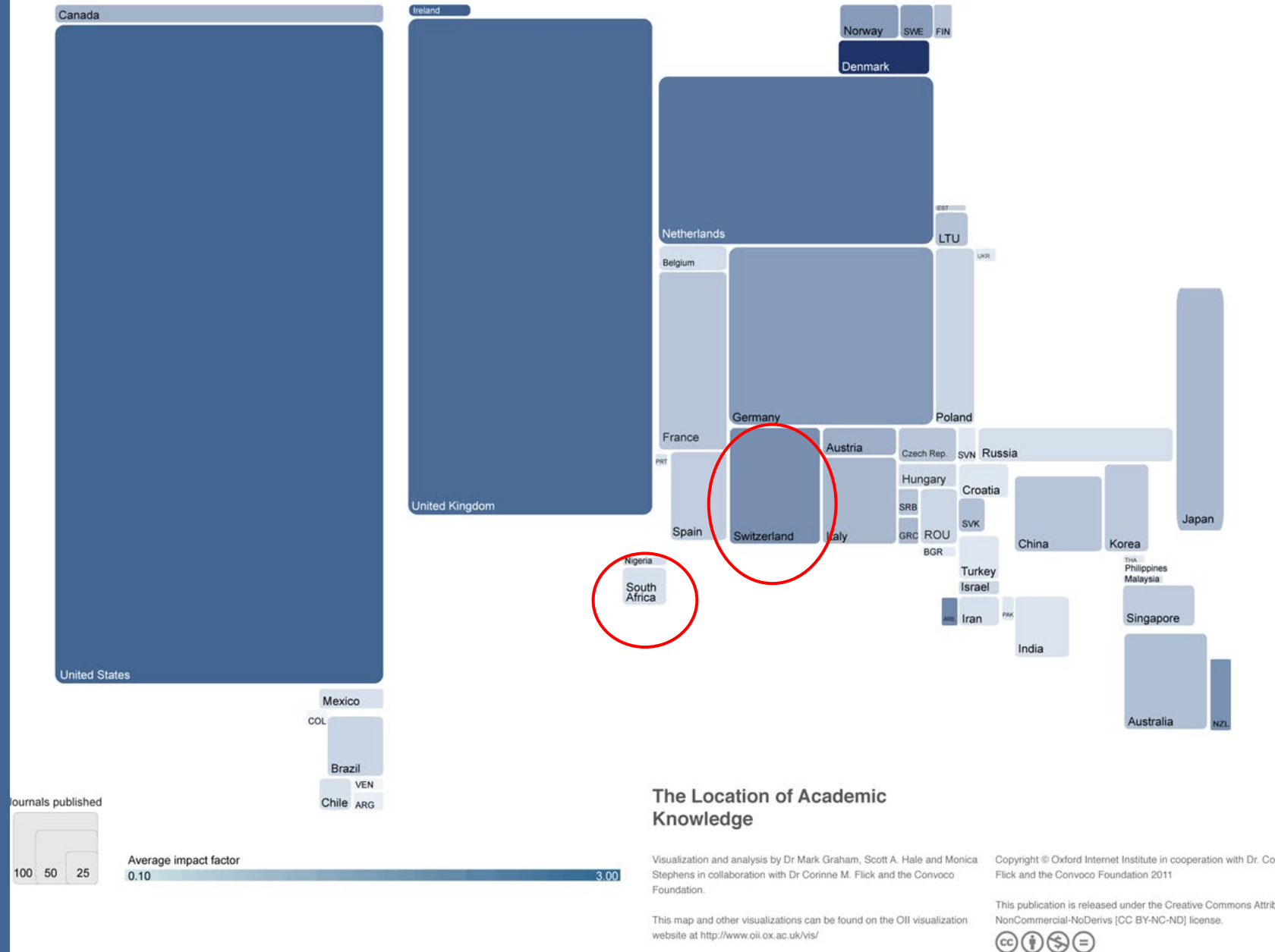


Figure 1. Trends in African research article output in the international journal literature (1980–2004): % of worldwide publication output in the international peer-reviewed journal literature. Source: CWTS/Thomson Science Citation Index database (edition 2005, excluding the Arts and Humanities Citation Index). *Reproduced from (Tijssen, 2007)*

“Africa’s long-term publication output trends indicate that its contribution to global knowledge production has slipped slightly during the 1990s. Sub-Saharan Africa has fallen behind quite dramatically; from a 1% share in 1987 to 0.7% in 1996, with no sign of recovery (Figure 1). Africa has lost 11% of its share in global science since its peak in 1987; Sub-Saharan science has lost almost a third (31%)”. (Tijssen, 2007, p. 307)



This map reveals a staggering amount of inequality in the geography of the production of academic knowledge. The United States and the United Kingdom publish more indexed journals than the rest of the world combined. One of the starkest contrasts is that Switzerland is represented at more than three times the size of the entire continent of Africa.

Extracted from research done at the OII on the Location of Academic Knowledge:
<https://geography.oii.ox.ac.uk/the-location-of-academic-knowledge/>

Critically Analysing the Problem Context

The problem has potentially 3 components:

- **Visibility:**

- the problem may be due to a lack of discoverability in mainstream research output databases such as Web of Science and Scopus, i.e., African research outputs are less likely to appear in these databases, but they are the ones on which scientometric research is being undertaken

- **Accessibility:**

- (1) the research is being published in venues which require subscriptions or on which barriers have been placed to access the research, i.e., the research sits behind paywalls of international journals and are not accessible to the communities it is meant to serve or educate
- (2) the research is being published open access in predatory journals not indexed in mainstream databases and not considered reputable
- (3) the research is being published open access in institutional repositories which are poorly configured thus making them non-discoverable

- **Productivity:**

- The problem may be due to a dysfunctional or low-resourced research ecosystem, i.e. lack of resources, infrastructure and institutional capacity to support research, thus leading to poor quality or no output

The problem is complex with both systemic and structural contours:

- **Systemically**, African scholars may struggle to engage successfully with all aspects of the research lifecycle due to a multitude of issues, e.g. lack of accessibility to mainstream research databases due to funding shortfalls or institutional pressures to 'publish or perish' but a lack of requisite support for their research activities (Abbott & Cox, 2020; Cox & Abbott, 2021)
- **Structurally**, persistent 'deficit discourses' and social justice inequities linked to knowledge hegemonies and power imbalances between global North and global South research practice may continue to disadvantage African scholars in comparison to their global North colleagues, leading e.g. to extractive or exploitative research collaborations (Abbott, 2024; Abbott & Cox, 2020; Abbott, 2025)

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Studying the Problem Using the Rwandan HEI Context

Studying Rwandan Research Challenges

- A chain of logic?
 - African scholarship is not visible; research outputs are not accessible
 - Open science is a movement that can address inequities in how science works
 - Open science may be able to address the invisibility of African scholarship
- An exploratory study...
 - Exploring Rwandan librarians' experiential knowledge of the research process in their country
 - Mapping their discussions to a framework centred on the 'research lifecycle'
 - Why the 'research lifecycle'?
 - One way of looking at the production and dissemination of academic knowledge from a country's research environment
 - Open science seen as 'opening up' aspects of the 'research lifecycle' --- ICT enabling new ways of doing research that enable collaboration, sharing of data and outputs, free access to published outputs

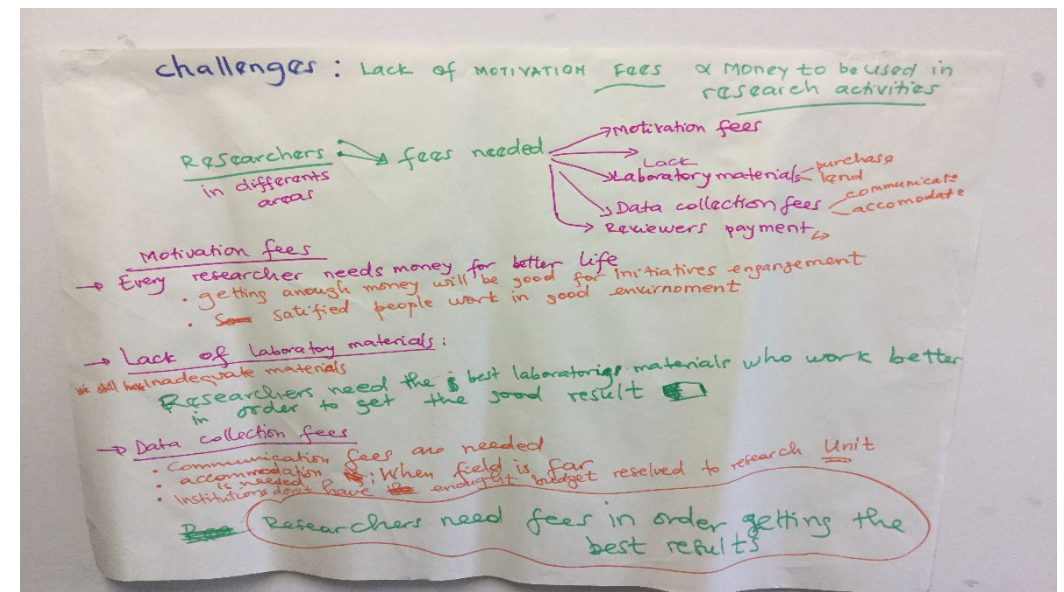
OS & the Inequity of Research & Scholarship in Africa – 3 perspectives

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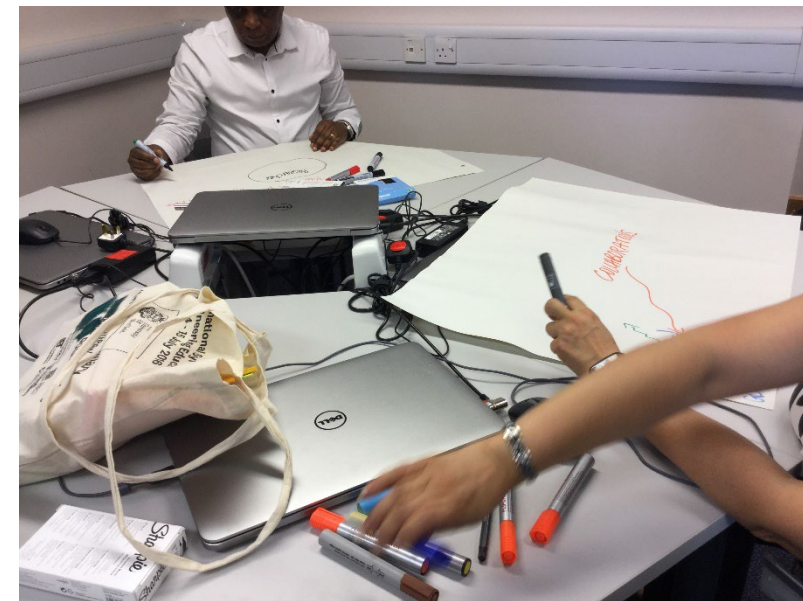
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- Inequalities in the Scholarly Communication System
 - Powerful scholarly communication system dominated by global North industry leaders who effectively exclude African scholars through high costs, setting global research agendas and operating closed networks of knowledge production
 - Open science could reduce this inequity, however, as with other digital divides, it tends to exacerbate existing inequalities and could open scholars to exploitation due to infrastructural advantages of global North scholars
 - Deficits in the In-Country Research Environment
 - A web of in-country issues assumed to render the country deficient in resources and infrastructure to support a workable research environment
 - In this view open science initiatives are also under-invested and under-resourced, i.e. ineffective to engender change
 - Cognitive Injustices
 - Domination and erasure of local knowledge through power structures in play since colonisation and enduring within current economic and political systems
 - Open science can bring change but not within these dominant power structures

Our Study

- **Research Question:** What practical issues/challenges can be found in participants' accounts of doing research in Rwanda?
- **Approach:** Rich Picture collaborative exercise as part of a participatory week-long engagement workshop
- **Participants:** Senior librarians, NGO Information Specialists (Rwanda/South Africa), Information Studies researchers (UK)
- **Analysis:** Separate in-depth inductive analyses of each Rich Picture 'case'
- **A reflexive review of the analysis:**
 - Acknowledging that our own assumptions may have influenced the process
 - Committing to drawing out counter-narratives different to a 'deficit' discourse



Sample Rich Picture -Challenges: Lack of Motivation Fees & Money to be used in research activities (Rwandan Librarian viewpoint)



Preparing the Rich Pictures

Findings - 1

Research Lifecycle	Idea generation		Data coll. & analysis	Dissemination of results		
Themes	Motivation	Access to literature		Local publication	Publication in international journals	Open access
Researcher position	Publish or perish model Limited funding for research, mostly from external funders, disconnected from local agendas Teaching loads			International journal publication needed for promotion	High rejection rates Predatory publishers	Lack of incentives for open access
Costs	Lack of financial motive to do research Doing extra teaching is easier than doing research	High cost of access to literature content	Lab costs Data collection costs – paying participants' travel or fees		Publication costs: reviewing costs, APCs (notwithstanding discounts)	
National and institutional support infrastructure		Poor technical infrastructure: electricity, computer ownership, bandwidth, software and IT support ICT support staff leave quickly when they have been trained Hard to work from home because of network cost Librarians low status				No robust access infrastructure Lack of sustainable infrastructure
Skills		Lack of reading habits Lack of search skills Low English skills			Low English skills Lack of academic writing skills Lack of understanding of publishing process	Little understanding of IPR in context
Access		Lack of local content High cost of subscriptions			Rwanda has graduated out of Research4Life	

- All aspects of the 'research lifecycle' affected at some level
- The most affected aspects were 'Access to Literature' and 'Publication in International Journals'
- All aspects expressed as weaknesses of the research environment
- Issues raised were strongly related to in-country deficits
- From this perspective, open science unlikely to help, but would rather amplify the existing problems

Findings - 2 : 6 Deficit Perspectives

Deficit Viewpoints from the Rich Picture Discussions	Key Illustrative Quotes
Knowledge and Content Deficit	“...when it comes to the population, they are out of what’s going [on], they don’t have anything of what’s going on, so it’s like..., it seems that the project talks about them and is intended to solve their problem even, but at the end of the day... they are also absent as audience ” [RL1]
Financial Deficit	“Every researcher needs money for a better life... better life means everyone needs money, money from funders so when you get money, you do everything but when you are hungry you can stay at home [laughing in background] for better life” [RL2]
Skills Deficit	“ So the oral tradition, I think, is another burden on the academician. To spend time reading, reading is time-consuming and sometimes for some literature, it requires concentration. So, there are many things which cause ... in their home, in their houses, there is no other room because there are many people there, you can’t read” [RL3]
Research Infrastructure Deficit	“External funders drive the research agenda. So the research agenda is not yours. You are going to write that agenda according to what the [external] researcher is willing to fund, so you tell them what they want to hear and therefore then you will be accepted and you are likely to get some funding. So it’s not to address the local challenges as such. It’s to address what the funder wants to hear” [IR]
Sustainability Deficit	“The other thing that they are pushing now in GCRF [Global Challenges Re-search Fund] is they want to spend the money in even lower resource countries. This is a good thing for Rwanda, really, but again that is pushing you as a researcher now to go into countries which are so very different in their contexts from where you come from, that it’s going to be so hard for you to understand what the problems and the issues are there. And they don’t give you time to understand this.” [ISR1]
Power Deficit	“ I think you’re being sucked into a system; you are at the margin of a system that we are at the centre of. We’ve got the privilege of writing in our own language. I’m the editor of a journal. I can get my things published relatively easily, but we’re thinking of the people on the other side. They can’t even write in their own language. There’s something very wrong about that. And it’s also creating this uniform worldwide culture.” [ISR2]

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How Open Science practices can address the research problem

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- **Productivity:**
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Open science is perceived to be able to address all three issues:

- To improve **accessibility** and **visibility** through open publishing platforms and open research infrastructures that create alternative discoverable channels for the dissemination of research outputs, e.g. green open access, open journals etc.
- To improve **productivity** by enabling collaborative research practices, data sharing, co-production of research outputs, and ways of incentivising researchers that do not depend on high impact factors and journal rankings

Research Infrastructures

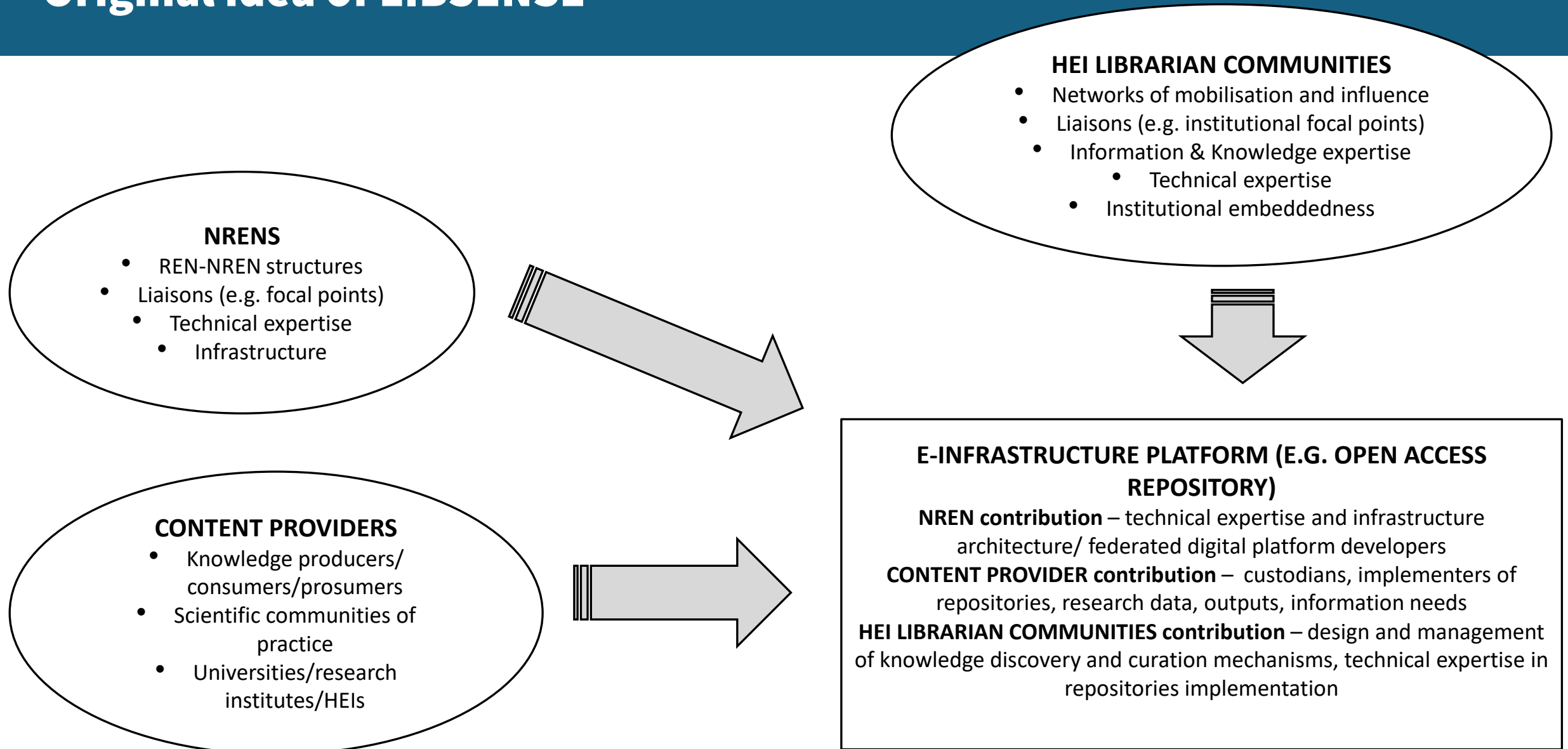
- A key part of the delivery of open science is **research infrastructures**
- According to (European Commission, 2024) research infrastructures are “**facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields**”.
- These include:
 - “major equipment or sets of instruments
 - knowledge-related facilities such as collections, archives or scientific data infrastructures
 - computing systems
 - communication networks”
- But infrastructural resources can introduce their own inequalities because of (a) global digital divides and (b) incorporation of systemic injustices in their construction/deployment



Introducing the LIBSENSE Project

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- **Library Support for EMBEDDING NREN Services and e-Infrastructure**
 - Formally launched in 2017
 - Co-founded by four partners – 3 NGOs and 1 HEI :
 - West and Central African Research and Education Network (**WACREN**) [Lead Partner]
 - Electronic Information for Libraries (**EIFL**)
 - Confederation of Open Access Repositories (**COAR**)
 - The University of Sheffield (**UoS**) **Information School**
 - “...a [WACREN](#)-initiated, community-driven, pan-African programme aimed at building a community of practice for open science and progressing the adoption of open science policies, services and infrastructures in Africa” (*From the [LIBSENSE Website](#)*).

Original idea of LIBSENSE



How LIBSENSE builds resilience

- Through three strategic pillars:
 - **Policy work:** refers to planned, ongoing or completed work around developing guidelines, strategies, roadmaps and other similar structured proposals that enable changes to the research environment oriented around the LIBSENSE vision of an African-centred way of implementing open science practices.
 - **Capacity building:** refers to activities aimed at improving knowledge, changing behaviour or instilling skills related to open science concepts and practices within the community through targeted meetings, workshops, training sessions and similar interventions.
 - **Infrastructure support:** refers to provision of hardware, software, technological tools, protocols, standards and other technical instruments to enable the deployment of suitable technologies and platforms to support services and applications for research and education across participating institutions.
- Applied to strategic Open Science Interventions

Example – Open Access Repositories

- Resilience built through partnerships, and applying the strategic framework:
 - Partners: COAR, NII Japan, CERN/InvenioRDM
 - Policy: TETfund linkages, National OA council coordination
 - Capacity: OAR regional workshops, skills profiles development, webinar series
 - Infrastructure: BAOBAB (regional), RUMBU (national) | MOUs: NII Japan, La Referencia
- Building on-campus open science communities of practice through ECR leadership

What institutions can do

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- The LIBSENSE project fosters ***networks of action*** through its capacity-building efforts, enrolment of experts/key stakeholders, partnerships and collaborations and community-building
 - At the institutional level, adopting a similar approach can help spread open science practices where they prove to be workable
 - **Policy work** – setting out the standards on which the repositories will work and reward mechanisms for their use/alignment with national policies
 - **Capacity building** – training and awareness raising of the benefits of using repositories
 - **Infrastructure support** – involving the skilled personnel in building and maintaining the requisite infrastructure

References

- Abbott, P. Y. (2025). Infrastructuring in a Socially Just Way: Lessons Learnt from a Grassroots Open Science Initiative in Africa. In A. Mfengu & R. Raju (Eds.), *Advancing Social Justice Through Curriculum Realignment*. UCT Libraries. <https://doi.org/10.15641/978.0.7992.2561.7>
- Abbott, P. (2024). A Social Justice Analysis of an African Open Science Initiative. In W. Chigona, S. Kabanda, & L. F. Seymour (Eds.), *Implications of Information and Digital Technologies for Development* (pp. 385–399). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-66982-8_27
- Abbott, P., & Cox, A. (2020). Perceptions of Rwanda's Research Environment in the Context of Digitalization: Reflections on Deficit Discourses. In R. K. Bandi, R. C. R., S. Klein, S. Madon, & E. Monteiro (Eds.), *The Future of Digital Work: The Challenge of Inequality* (pp. 50–64). Springer International Publishing. https://doi.org/10.1007/978-3-030-64697-4_6
- Cox, A., & Abbott, P. (2021). Librarians' perceptions of the challenges for researchers in Rwanda and the potential of open scholarship. *Libri*. <https://eprints.whiterose.ac.uk/164115/>
- Gaillard, J. (2010). Measuring Research and Development in Developing Countries: Main Characteristics and Implications for the Frascati Manual. *Science, Technology and Society*. (Sage India: New Delhi, India). <https://doi.org/10.1177/097172180901500104>
- Gaillard, J., & Mouton, J. (2022). The State of Science, Technology and Innovation in Africa: Trends, Progress and Limitations. *Science, Technology and Society*, 27(3), 318–326. <https://doi.org/10.1177/09717218221078548>
- Tijssen, R. (2007). Africa's contribution to the worldwide research literature: New analytical perspectives, trends, and performance indicators. *Scientometrics*, 71(2), 303–327. <https://doi.org/10.1007/s11192-007-1658-3>

