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Perceptions of Rwanda’s research environment in the context of digitalization: reflections on deficit discourses

Pamela Abbott ¹[0000-0002-4680-0754] and Andrew Cox ¹ [0000-0002-2587-245X]

¹ University of Sheffield, Sheffield, S1 4DP, United Kingdom
(p.y.abbott, a.m.cox)@sheffield.ac.uk

Abstract. Digitalization of research processes, like those related to open science, for example, has had mixed outcomes for the visibility of African scholarship. One reason for this may be that ICT-based interventions aimed at improving African research systems presume a country deficit model, that is, a view that Africa’s research environment is inherently under-resourced, and failing. Our study set out to explore, through a collaborative rich picture exercise, how research practices are viewed in Rwanda in the light of digitalization by a mixed group of global North and South information specialists. Through an in-depth qualitative inductive analysis of the participants’ accounts, we uncovered not only a dominant discourse of “deficit”, but also an underlying but hidden counter-narrative of resistance to this. We extrapolate how this view could be seen as having the potential for more optimistic outcomes in promoting a more inclusive African research paradigm. We then suggest a research agenda to explore the potential for the digitalization of research processes to provide a means of enabling a dialogue between Western and indigenous forms of knowledge.

Keywords: African Research Systems, Digitalization, Deficit Discourses.

1 Introduction

There is a persistent discourse around African research that labels it as sub-standard (Arowosegbe, 2016). Within this discourse, African scholars are often considered invisible through not participating in global research networks (ibid.). An oft-quoted statistic is that authors from sub-Saharan Africa produce less than 1% of the world’s research outputs (e.g. Fonn et al. 2018). Research about Africa that does become known is often co-authored by scholars from the global North, with the role of the African researcher being relegated to data collection or other secondary tasks (Tijssen, 2007). This has led to critiques of global North researchers in collaborative research projects based in Africa as being ‘extractive’ and exploitative (Bai, 2018).

The digitalization and globalization of research and scholarship has had mixed outcomes for the visibility of African scholarship. For example, open access/open science programs have been initiated to make African scholarship more visible (McKay, 2011), but their success is dubious, since openness may expose African scholarship to further exploitation and/or inequalities that mirror or amplify existing digital divides (Schöpfel & Herb, 2018). Projects such as Research4Life, funded by international aid agencies,

have been set up to enable African scholars access at no, or lower costs, to up-to-date research from the global North. These may, however, be seen as creating a ‘market’ for global North scholarship and playing into the already North-dominated scholarly publishing system, creating a new form of dependency in a digital economy of knowledge production and dissemination (Chan, 2018). Other foreign-aid funded projects aimed at digitally ‘strengthening’ Africa’s research infrastructures (e.g. the EU-sponsored AfricaConnect initiative¹ or Canada’s IDRC ICT4D program²) and research systems (e.g. SIDA in Rwanda³) seem to make only short-term impacts on what appears to be an intransigent problem (Malapela, 2017).

It seems that many of these interventionist programs are based on a country deficit model, i.e. a view that Africa’s research systems are inherently under-resourced, and failing (Gwynn, 2019). Yet this discourse seems to echo the view of development as modernization (Escobar, 2012), assuming that there is a common path of development for all countries and ignoring more positive alternatives that would reflect the local needs and strengths of the country. Our study set out to explore how people in one such country saw the status of research there and whether alternative models could be uncovered.

The paper reports on our own attempts in the Information School, University of Sheffield, UK, to start a research collaboration with Rwandan higher learning institution (HLI) librarians and a pan-African information specialist training organization supporting capacity-building efforts in a range of African countries, including Rwanda. Led by our own ethos to engage in participatory and inclusive research, we employed a group discussion method using rich pictures (Checkland & Scholes, 1990) to help frame participants’ understandings of the research situation in Rwanda. We found that even though the findings revealed underlying patterns of subordination of African research and persistence of the perception of ‘failure’ as described above, there was an alternative thread that gave a voice to a counter-discourse that is often absent in these debates. What is promising about this counter-narrative is its linkages with other alternative literatures that offer a more optimistic view of research and scholarship in African contexts, some of which also enroll digital technologies in complementary ways (e.g. Piron et al., 2016).

The aim of the paper is to explore discourses around Rwanda’s research environment in the context of ongoing digitalization of research processes through the vehicle of an incipient North-South research collaboration. The following research question is thus raised: *What practical issues/challenges can be found in participants’ accounts of doing research in Rwanda?*

The following section reviews the literature that presents African research and scholarship as a discourse of deficiency. We then present the methodology of our research study followed by in-depth accounts of the findings. We discuss those findings in the

¹ This initiative provides ongoing support for research and education networking in sub-Saharan Africa (see: <https://www.africaconnect.eu/Pages/Home.aspx>)

² The IDRC’s ICT4D programme initiated a series of infrastructure connectivity programmes aimed at improving access to digital services in several African regions (Elder et al., 2013)

³ The Swedish government sponsored programmes to strengthen the main research institution in Rwanda (University of Rwanda) including emphasising the role of ICTs (Tvedten et al., 2017)

light of the dominant ‘deficit’ discourse while also presenting the counter-discourse for comparison, after which we offer a medium for pursuing a research agenda on this topic. We conclude on this point while also acknowledging the limitations of the study.

2 Literature Review

We take a broad interpretation of the term ‘digitalization’ in this paper to refer to the processes by which social norms and structures are increasingly influenced by the use of digital technologies (Brennen & Kreiss, 2016). In the practices of academic research and scholarship, digitalization can manifest itself as the application of digital technologies and processes to any aspect of these practices, e.g., publication of research outputs, or the underlying bases that enable them, e.g. research infrastructures. One good example of the potential transformative effect of digitalization on research processes is the development of open science, a movement towards more collaborative engagement in knowledge creation and dissemination, underpinned to a great extent by digital technologies (Fecher & Friesike, 2014). It has sometimes been positioned as a beneficial development for African scholarship by elevating its status (Raju et al., 2015).

Literature on the paucity or presumptive ‘failure’ of research from sub-Saharan Africa, though, tends to present it from a “country deficit” perspective. This places center-stage a web of in-country issues that are assumed to create research environments that are inimical to the smooth functioning of the research process (Ngongalah et al., 2018). This perspective emphasizes what the country lacks and how it can “catch up” to more developed country research contexts, which we refer to as a ‘deficit’ discourse in this paper, where deficit denotes lack or failure in comparison to the contexts of those generating the discourse (Aikman et al., 2016). It does so, however, without necessarily positioning these issues within broader systems of imbalance such as the inequalities created by the international scholarly communication system (Chan, 2018). Rather, it focuses on the way that a weaker in-country environment for research makes it more difficult to perform research on par with external scholars. In development contexts such discourses can be enduring and help to reproduce the very conditions which they describe, through so-called discursive practices, sustained by regimes of knowledge and power (Escobar, 2012). Below we highlight how these discourses present countries’ research environments as a problem to be ‘fixed’. Research environments (also referred to as systems) encompass the institutions, infrastructures, processes and other contextual factors that provide support for in-country knowledge creation and dissemination (GDN, 2017).

2.1 The Country Deficit Perspective Explained

The country deficit perspective portrays the State’s commitment and investment in research in Africa as weak. According to Fonn et al. (2018), investment in education including Higher Education was a priority immediately after independence; however, since the 1980s, African governments reduced spending on higher education and re-

search, in favor of primary and secondary education. This trend was reinforced by economic policies imposed via the IMF and World Bank. More recently, the World Bank has recognized the need to create local knowledge economies in Africa (Fonn et al., 2018; Collins and Rhoads, 2010), thus resulting in a slight increase in the subcontinent's contribution to research output (Fonn et al., 2018). In comparison to more advanced economies, however, the level of government investment in research remains low, below 0.5% of GDP (Beaudry et al. 2018). Where research policies exist, they tend to mimic those of the global North, ignoring local conditions (Boshoff, 2009). This may be influenced by the fact that North-South interventionist programs meant to improve research systems in the global South tend to employ models of performing research from the global North (e.g. UNESCO. 2009). Universities seem unable to prioritize research, following instead a strategy of massification, which is evidenced by increased growth in student numbers, with accompanying pressures on academic workloads (Beaudry et al. 2018).

This extensive focus on teaching precludes much inspiration for research as a career (Ngongalah et al., 2018). The country deficit perspective also highlights lack of funding, of equipment and of support and mentoring as key barriers for young scholars (Beaudry et al. 2018). Teaching in research methods is deemed to be lacking (Ngongalah et al., 2018) and a lack of influence of research on policy further reduces the motivation to undertake research. These societies are also portrayed as lacking free self-expression, which could be interpreted as a precondition for scholarly debate. The low rewards for research and lack of a research environment are implicated in the "brain drain", with many talented individuals being drawn to migrate (Ondari-Okemwa, 2007). The number of scholars moving away from Africa could have been as much as 30% in the 1980s and 90s (Beaudry et al. 2018).

Another important issue in the country deficit model is basic infrastructure. There are fundamental problems in terms of reliable electricity supply, computer ownership, internet access and bandwidth (e.g. Malapela, 2017). Even within universities, which are relatively well resourced, facilities are not comparable to those in the Global North. In addition to the international digital divides, there are significant differences in access to resources and skills between institutions, between subject areas of study and geographically within countries (Gwynn, 2019). Women are under-represented in scholarly output (Gwynn, 2019). While considerable investment is being made in internet infrastructure and digital skills (Nwagwu, 2013), African infrastructure consistently lags behind that taken for granted in the Global North.

From the perspective of access to scholarly content, low investment in research as a whole is reflected in a failure to license access to relevant literature. Digitalization does not necessarily provide a solution either, e.g., with open access, scholars often lack the bandwidth or digital and information literacy skills to access content. A country deficit view also prevails regarding the provision of digital infrastructure for open access repositories, which are deemed weakly developed in Africa due to lack of funding, awareness and support from senior management and poor technical infrastructure (Dlamini and Snyman, 2017). African institutions have also struggled to fund and retain the expertise to run open access systems effectively (e.g. Christian, 2008). These problems are not unique to Africa, but they are often portrayed as barriers causing Africa to lag

significantly behind the global North. The consensus is that, fundamentally, the relatively weak research environment in Africa makes it hard for scholars there to benefit from digitalization efforts in the research process.

In the same vein, scholarly publishing within Africa itself is also seen to be weak due to lack of sustainable business models or funding. African authors are reluctant to publish in local journals because the journals lack prestige; indeed African institutions tend to require publication in “international journals” with impact factors. Local publications are effectively invisible since they are not effectively indexed within the scholarly communication systems (Chan, 2018). Language is also particularly a barrier for scholars from Sub-Saharan Africa; there are many local languages, but few are used for research publication (Ondari-Okemwa, 2007). In the realm of the sharing of research data, Bezuidenhout et al. (2017) identify a large number of barriers in low-resourced research environments. The whole infrastructure for data sharing is seen to be disadvantageous, however, researchers may also not profit from sharing their data for fear of being scooped. Some deficit issues raised are the cost of hardware and software, slow internet speeds and lack of technical support.

2.2 Global South Research Systems

The country deficit perspective is also apparent in the growing literature on the assessment of research environments in countries of the global South. Such literature seems to be predicated on the need to replicate similar systems evidencing the link between science and policy as exists in the global North (GDN, 2017). A perceived wide and growing research capacity deficit between so-called ‘developed’ and ‘developing’ countries is prompting efforts to establish underlying causes (Mouton & Waast, 2009; GDN, 2017). A number of tools, techniques and frameworks have been devised to undertake these assessments, but they tend to be based on conceptualizations of research systems as they may work in advanced economies (GDN, 2017; Gaillard, 2010; UNESCO, 2009). There is a recognition that such models may not be entirely congruent with the research environments in low-resource contexts: “...*developed research systems – such as those that exist in advanced countries – broadly present different issues from developing ones, especially when it comes to the question of change... The main difference between developed and developing research systems is that, with the former, all or most constitutive elements of a highly productive, international grade research environment are active and effective, while with the latter, some elements are more active and others are either inchoate or non-existent*” (Idrissa, 2016, p. 3).

These incongruences result in an inability to collect enough reliable data on indicators thought relevant to measuring the performance of the research environment (Gaillard, 2010; Mouton & Waast, 2009), thus leading to efforts to capture other forms of data that are more processual and qualitative (Gaillard, 2010). There is also a question as to whether a ‘system’ is the best way to describe what is actually occurring in research environments in lower-resourced contexts: “*It is even debatable whether one can talk of a science ‘system’ in many of these countries, as they do not exhibit typical systemic characteristics... Rather, the image of an ‘assemblage’ of fragile, somewhat*

disconnected and constantly under-resourced institutions is perhaps a more apt metaphor to describe the science arrangements in some of these countries, particularly in many countries of sub-Saharan Africa” (Mouton & Waast, 2009, p. 167).

Although these assessments attempt to capture a view of the social and political contexts in which these research systems operate, their tendency to try to find one-size-fits-all indicators and to compare across countries means that only a superficial analysis can be made. Additionally, such comparative models undoubtedly reinforce the rhetoric of deficiency and dysfunction at play in ‘developing country’ research environments and the message that they need ‘rescuing’ or ‘fixing’. In turn, this discourse then also falls into the realm of “development as modernization” and encourages a culture of dependency, especially on foreign knowledge regimes (Andrews & Okpanachi, 2012). ICT4D literature has already critiqued modernization views of technology-based innovation in the global South and promoted the importance of embeddedness in the local context for a more meaningful engagement with local actors (Avgerou, 2010). We take a similar view with regard to the development of research systems in Africa, especially in the light of digitalization, which has often been shown to amplify divides and inequalities, rather than ameliorate them (Toyama, 2011). We also align with the spirit of counter-narratives to development as modernization, which take a more context-sensitive approach to improving life conditions in low-resourced settings (Escobar, 2012).

3 Methodology

Qualitative data for this paper were collected as part of a project to initiate engagement with the higher learning institution (HLI) librarian community in Rwanda. We (2 University of Sheffield, Information School researchers) contacted 4 librarians from 3 HLIs in Rwanda: University of Rwanda (2 participants), University of Lay Adventists of Kigali (1 participant) and Ruhengeri Institute of Higher Education (1 participant). All were directors of their respective libraries. Prior to travelling to Sheffield, we co-developed a questionnaire which they used to conduct informal enquiries in their institutions. These enquires, together with their own experience as service providers, gave the librarians a broad understanding of their research environment. Our participants also included a representative of Information Training and Outreach Centre for Africa (ITOCA), an NGO targeting capacity-building in information skills for a range of library and information specialists across Africa. ITOCA’s knowledge of regional contextual issues around research practice would also inform the data collection. Three of the four invited librarians, the ITOCA representative and the two Information School researchers participated in the weeklong workshop.

We conducted daily group interviews involving the participants. Altogether, we collected around 12 hours of recorded material over the weeklong period supplemented by 6 “rich pictures”, 10 flipcharts representing discussions and 30 A4 pages of notes. The focus of this paper is on the rich picture collaborative group exercise (similar to Walker et al., 2014) which took place on Day 2 of the weeklong engagement workshop. For this exercise, all participants were asked to prepare a ‘picture’ of the challenges/issues of doing research in Rwanda. Each participant then presented their rich picture for the

benefit of the group and then led a discussion about it. Each presentation and discussion session was recorded and documented, while the flipcharts representing the rich pictures were collected, stored and scanned for later reference. For analysis purposes, each rich picture, its discussion notes and recording were treated as a separate case. Separate in-depth inductive analyses of the cases were done to draw out themes across all of the cases and relate them back to the research question. Table 1 presents the data that were analyzed for each case.

Table 1. Rich Picture Data Collected.

ID	Title of Rich Picture	Participant [CODE]
RP1	Challenge: Availability of Content	Rwandan Librarian 1 [RL1]
RP2	Challenges: Lack of Motivation Fees & Money to be used in research activities	Rwandan Librarian 2 [RL2]
RP3	Researchers' Skills Development	Rwandan Librarian 3 [RL3]
RP4	Publishing in low-resource environment	ITOCA Representative [IR]
RP5	Global South Collaborations	Information School Researcher 1 [ISR1]
RP6	Research across two continents	Information School Researcher 2 [ISR2]

Reflecting on our method after the workshop, we began to ask whether framing the rich picture exercise around “issues and challenges” might itself have been influenced by the country deficit discourse. We sought for ways to reassess this as a starting point. We were inspired as a result, to consider how far within the participants’ accounts there was evidence for an alternative counter-narrative framing of research practice.

4 Results: Key Points from the Rich Picture Cases

Synopsis of RP1. The main topic of this rich picture was about the (lack of) availability of, and access to, relevant content in many aspects of the Rwandan research environment. The issue was presented from the viewpoint of a Rwandan HLI librarian and their perceptions of the challenges to a Rwandan researcher working in this environment. Presented in a very factual/literal manner, some key issues raised were:

- High costs of subscription to international content;
- Lack of access to locally produced Rwandan content;
- Comparably greater proportional availability of international to local content;
- Low incidence of Rwandan researchers publishing in open access repositories;
- Poor maintenance of these open publishing infrastructures in Rwandan HLIs.

Related to the issue of relevant content was that of impediments to implementing local Rwandan research outcomes due mainly to language barriers. The research outputs are generally produced in English, while policymakers may not be literate enough in that language to be able to convert these findings into implementable outcomes. This leads

to what the RL1 referred to as an “information divide”, where the results of locally-produced research are rendered inaccessible to the potential beneficiaries.

“...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]

Synopsis of RP2. The main topic of this rich picture was about the financial constraints facing the Rwandan researcher when conducting research locally. The issue was presented from the viewpoint of a Rwandan researcher undertaking field or laboratory-based research. In a very pragmatic way, RL2 proposed “fees” as a key issue to enable (motivate) a local researcher to conduct research and publish the results. The various types of “fees” were broken down into components roughly matching various stages of the research process. The overall implication was that without the availability of “fees” at these various stages, no research was possible.

The discussion revealed that financial constraints both at the level of the HLI (insufficient budgets to fund research) and at the individual level (low salaries) contributed to the need for research funding to subsidize researchers’ incomes and those of the many people dependent on the ancillary jobs at each stage of the research process. As RL2 put it, it is a matter of supporting livelihoods:

“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]

Without these incentives, researchers are likely to seek top-ups to their income by taking on consultancies or extra teaching at other institutions. When funded, they also need to be mindful of financially supporting the “pecking order” of research assistants as mentioned above.

Synopsis of RP3. RP3 was mainly about the lack of a reading and writing culture to support researchers in building up their skills in order to publish their research. This was presented from the perspective of a Rwandan HLI librarian’s view of a Rwandan researcher. Like RL1, the key points were presented in a factual/literal manner underpinned by a sort of logical portrayal of the successful pathway to this end: resources/content → search skills → reading → writing → publishing.

RL3 noted 2 key barriers to achieving the above goals: institutional weakness in supporting training and availability and access to content; and the traditional oral society, which RL3 believes is hampering the development of a reading culture:

“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]

Rwandan culture and the oral tradition continued to be a major thread of the discussion on this rich picture topic, with other key points being made such as: the large extended families in which researchers are embedded and to which they must contribute financially; the coded messages used to transmit knowledge from generation to generation in traditional Rwandan oral culture; the crowded family homes in which there is no room for reading quietly; and the ineffectiveness of the library as an institution, e.g., in:

“When it comes to libraries like the national library, you realize that they exist by name [in name only] but [are] not working properly. Public libraries, also, they have created recently, again are not working properly. So materials on Rwanda, they are there but not well organized.” [RL1 in RP3 discussion]

Synopsis of RP4. This rich picture was presented from a dual point of view, first, from the perspective of the researcher from a low-resourced setting, such as Rwanda, and second, from the perspective of the NGO that is implementing the research project in that low-resourced setting. This rich picture was presented in the form of a force-field analysis with incentives to do research (publish) on one side of the flipchart and barriers against it on the other side. In general, the forces constraining the ‘publish’ goal were stacked up against the incentive forces and the situation was presented as a challenging “terrain” for a “survival”-oriented type of researcher who has learnt to negotiate this challenging environment.

From the NGO’s perspective, the main challenge was to provide a bridging role between the local research environment and the external funding agencies. In this regard, IR raised the issue of the powerlessness of local actors to advance their own research agendas:

“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]

Synopsis of RP5. RP5 was about building global North-South collaborations and was presented from the point of view of a global North researcher. The rich picture was organized in the form of a mind map with the key phrase “Global South Collaborations” in the center and other concepts linked to it around the flipchart. It thus gave the impression of presenting a complex, holistic picture of the situation of doing research in the Rwandan context.

In the presentation and discussion of this rich picture, there were many points critiquing the above, especially, the motivations for ODA (development-focused) funding by the UK government and the pressures to do more and more (potentially extractive) research in the global South:

“The other thing that they are pushing now in GCRF [Global Challenges Research 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]

Synopsis of RP6. The last rich picture analyzed was that of the differences between the research contexts of the global North (UK) and the global South (Rwanda). The perspective here was also that of a global North researcher and presented a dichotomous view of the two research contexts, attempting to depict:

- Cultural issues (language and contexts) – e.g. plurilingualism vs. monolingualism, diversity vs. homogeneity
- Organizational decision-making – hierarchical vs. flat
- Level of economic development – low-tech, agriculture-based vs. highly-industrialized, information-rich
- Environmental sustainability – high level, low level
- Connectivity – low-level vs. high-level of technology infrastructure

A key point raised in this rich picture concerned the overwhelming power wielded by the resource-rich global North, with its historically dominant position based on an imperialist past, which still exerts neo-colonial influences in the global South. A key enforcer of this power differential in the research context is the imperative to write and publish in English, which, as noted by previous rich pictures, is a key weakness in Rwandan cultural traditions. This position is expressed candidly in the following:

"I think you're being sucked into a system; you are at the margin of a system that we are at the center 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 world-wide culture." [ISR2]

5 Discussion

5.1 Rich Picture Discussions as Deficit Discourses

All six rich picture accounts collected in the workshop, in their own way, shared an explicit deficit view of Rwanda; they all made assumptions that a global North model of research was appropriate to Rwanda and that by this standard their system had failed. Reflecting on our own research practice, we realized, however, that we (a) influenced the co-development of the informal questionnaire by assuming challenges *would* be found and (b) influenced the topics of the rich picture discussions by explicitly asking for their perceptions of these challenges, i.e., *seeded* the challenge idea. Thus, it is hardly surprising that various 'deficit' viewpoints surfaced as described below.

Knowledge and Content Deficit: RL1 bemoaned the failure of the library infrastructure to provide scholars access to the content they needed. There were not enough funds

to buy content. Local publishing was weak. The open access infrastructure was poor. For this participant, the basic knowledge infrastructure that academic librarians are tasked with creating barely existed.

Financial Deficit: RL2 perceived Rwanda's deficit in research in terms of poverty; the accumulating costs of research make it impossible for most scholars to afford to do it. This participant's vision of Rwanda is simply as a poor country.

Skills Deficit: RL3 mourned Rwandan scholars' lack of skills in finding content, in reading, in writing in English and in getting published. Fundamentally there was no reading and writing culture because the society's norms were still rooted in orality. His picture of Rwandan researchers was a view of them lacking in skills.

Research Infrastructure Deficit: Bringing these points together into an overview, IR articulated a dilemma of researchers being trapped between the standards of global North scholarship (to gain funding and to publish for tenure) and the range of deficits in the research infrastructure which effectively prevented them succeeding: teaching load, lack of local funding, competition for international funding and misdirected funder research priorities. The whole research infrastructure is condemned as in deficit.

Sustainability Deficit: While ISR1 and ISR2 focused more on the context for international collaboration, both also expressed a sense of deficit. ISR1's account focused on creating a house of collaboration, but revealed a lack of confidence in the UK infrastructure to truly support equal and ethical international research partnerships.

Power Deficit: ISR2's account expressed a sense of a huge gap of understanding between contexts overlaid by a historical and continuing power differential. Rwanda suffers from a power deficit. The deep roots of the deficit in Rwandan research are revealed.

Participants in the workshop had thus effectively reproduced the dominant country deficit discourse as discussed in the literature review, shaped in part by how we had framed the grounds of debate. The *Financial Deficit*, *Sustainability Deficit* and *Power Deficit* views aligned to the first point of the country deficit model as summarized in the literature review, namely, that concerning inadequate investment in higher education and subsequent dependency on foreign aid (Collins and Rhoads, 2010). The *Knowledge and Content Deficit* and *Skills Deficit* views aligned with the second point concerning lack of institutional and suprainstitutional support (Ngongalah et al., 2018). Finally, the *Research Infrastructure Deficit* views aligned to the third point concerning inadequate support for research infrastructures (Gwynn, 2019).

5.2 Alternatives to the Deficit Discourse

Having recognized during the analysis process that we had ourselves set up the discussion premised on deficit, it seemed appropriate to actively search analytically for counter-narratives. We argue that in the participants' statements and the discussion around the points within the group we can glimpse the outline of a form of resistance to a neo-colonial model of research.

Thus, RL2's account hinted at the figure of the potential researcher simply refusing to do research when it did not provide them with a living for a "good life". It appeared that the needs of the extended family that depended on the researcher were valued more

than a research career. Thus, fundamental household structures are pictured as preventing the penetration of global North values around research. Although presented as a deficit, it also points to the basis for a refusal to participate in neo-colonial globalization.

Similarly, while RL3 damned the lack of a reading and writing culture, what was simultaneously revealed was the survival of indigenous oral culture. At the most fundamental level the extended household seemed to prevent the creation of quiet spaces for private reading. The “barriers” of language begin also to seem like a form of protection. Scholars struggled to express themselves for publication in English, seemingly translating their thoughts to English from French, after first having had to translate them from their indigenous tongue, Kinyarwanda, to French. Presented as a barrier to the writing of English these layers could also be read as the insulation of indigenous ways of knowing behind a barrier of language. IR, for example, talked eloquently about how his earliest memories, related to values and morals, are strongly associated with his first language.

During the discussion of RL1’s rich picture, it also emerged that because research results are published in English, a language 90% of Rwandans do not read, communities are increasingly reluctant to participate in new research. They are tired of researchers helicoptering in to collect data but never returning to share the results and benefits of their research. This resonated with IR’s point that external funders failed to base their funding on in-country need. We can hear echoes here of Tuhiwahi Smith’s (2012: 1) shocking statement that research is a dirty word for indigenous people, “inextricably linked to European colonialism and imperialism”. Thus, resistance to doing research for the global North publishing behemoth spreads beyond scholars to the subjects of research too.

ISR2’s account for all its sense of dualism at least made clear the gap of context and daily life between the contexts as a potential for rich alternative voices. While this casts doubt on international collaboration as a vehicle for research, it also acknowledges profound ignorance of “the other” and articulates a desire to hear different ways of thinking surviving at the global “periphery”. While ISR1 felt skepticism about the infrastructure to support true participatory research with Rwanda, she did have a clear vision of what this would look like, if only by virtue of the difficulties of creating it.

Thus, our analysis uncovers elements of resistance to the global North model of research as defined by successfully publishing in an “international” English language journal. While we do not directly see anything of the indigenous knowledge infrastructure or what indigenous research might look like, we do see how shallowly the neo-colonial model has penetrated.

Thus, there are hints of resistance to the influences of globalization buried within our data. We would argue that a continuing subjection of endogenous knowledge is apparent in the explicit references to a deficit discourse (Nyamnjoh, 2012). Nyamnjoh has traced the deprecation of African knowledge within Africa itself to the violence of colonialization, and argued that it is a form of epistemicide. Endogenous ways of knowing were seen under colonial rule as other, inferior and primitive and reflecting the continuing power of neo-colonialism, African education retains “epistemological xen-

ophilia and knowledge dependency” Nyamnjoh (2012: 143) suggests. African institutions continue to place their scholars in a publish or perish dilemma, where they conduct research at great disadvantage compared to those in the global North. Scholars try to make sense of local problems through the global North’s knowledge system, rather than develop their own theory (Andrews and Okpanachi, 2012). Much of our data reflects the continuing power of these assumptions, cf. Escobar’s (2012) discursive practices.

In this context, evidence of resistance can be seen as a positive starting point for research infrastructures which are a hybrid of African epistemologies and global North science. For example, research subject resistance to extractive research is a positive driver to reconsider the best ways of doing research and publishing the results appropriate to the local context. Revaluing oral ways of knowing would empower local researchers and create potential for new knowledge alliances with scientists working in modes usual in the global North (e.g., Puri, 2007). Such optimism has resonances in some work around open science. Mboa Nkoudou (2016) and Piron et al. (2016) see positive prospects in a version of open science for Africa, though one understood in rather different ways from how the term is used in the global North, which has tended to reinforce the hegemony of the existing scholarly publishing system (Okune, et al. 2016). In this manifestation, open science would give more emphasis to publishing in local languages and emphasizing public involvement in science. In a similar vein, OCSDNet (2017) propose a manifesto for an inclusive and sustainable form of open science where African ways of knowing gain recognition.

6 Conclusion and Study Implications

The paper explores how “development as modernization” assumptions can take root in thinking about African research, in the form of the country deficit perspective. We find this discourse prevalent in both literature about African research and research evaluation. We also find it deeply embedded in attitudes in the field. Both participants and the researchers themselves began the current study by taking a deficit model for granted. Nevertheless, applying a reflexive turn, we argue that the data generated in our discussions does contain evidence for a counter-narrative which hints at points of resistance to adopting models of research built purely from those of the global North. It points to the potential existence of a resource in orality and indigenous ways of knowing insulated from globalization and neo-colonialism. Regarding theory, this study demonstrates the need to challenge pervasive deficit models in relation to research in the global South and to search for counter narratives that unlock positive opportunities for hybrid approaches sensitive to local contexts, and which can harness digital technologies. In so doing, we may avoid the pitfalls of digitalization being responsible for amplifying ‘deficit’ discursive practices. Regarding practical implications, a potential follow-on to this work could be bringing together stakeholders both local to, and external from, the research contexts who embody different epistemological positions and engaging them in a rich dialogue to better inform policy that is sensitive to local needs.

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