

STS in “Africa”: Extended Narrative

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Scholars working on Science and Technology in Africa have worked on a wide range of projects related to cultural astronomy (Holbrook; Segla); innovation and entrepreneurship (Wahome; Mavhunga; Avle; Densmore; Odumosu; Mwenda; Burrell); hardware “hacking” (Coban; Mboa Nkoudou); data (Biruk; Tichenor; Bezuidenhout); genomics (Okeke; Pollock); intellectual property (Foster; Osseo-Asare); urbanism (Adelusi-Adeluyi); health, healing and medicine (Livingston; Meek; Langwick; Pollock; Tantchou; Hamdy; Benton; Osseo-Asare); capital (Peterson; Breckridge); capacity (Tousignant; Okeke); energy (Osseo-Asare; Hecht); environment (Rarieya; Green; Solomon); imperialism (Tilley); scholarly mobility and infrastructures (Bernard; Auerbach; Okonkwo; Lachenal; Mwangola); humanitarianism and “development” (Peterson; Bernal; Biruk; Burrell; Benton); new media (Opeibi; Bernal; Avle); biometrics (Vally; Breckridge); race and gender (Pollock; Benton; Twagira; Okonkwo).

Within this diverse set of topics, I find my own project most closely located alongside those working on data, capacity, and humanitarianism. That said, the “field” context of my project as well as [my previous work prior to the doctoral program](#) put me in close touch with the innovation and entrepreneurship in Africa work. My broader interests in open data and digital humanities also put me in conversation with those working on (digital) scholarly infrastructures. As detailed in [this workflow](#), I selected a [subset](#) within a [broader list of works](#) to query in more depth. I used my annotations of these works (organized under [each analytic question](#)) to respond to the analytic questions which structured my inquiry. I believe this approach enabled me to develop both the breadth and depth expected of this exercise.

I structure the insights gained from this process in two parts, first are broader reflections and insights that may not necessarily fit under the questions posed but are important to include nonetheless. Second, I use the analytic structure to organize my initial insights from the literature that pertain to my project. This text can also be found as the “abstract” within each of the sub-essays in the document. More elaborated “summaries” can be found within each of the sub-essays.

“Doing Good” - Science and Humanitarianism in Africa

Narratives about science in the service of “helping” Africa are not new. Medical anthropologists and critical humanitarian scholars have shed light on the politics and practices of volunteering in Africa (e.g. Ruth Prince’s work “[Volunteer Economies: The Politics and Ethics of Voluntary Labour in Africa](#)”; and [extensive work by Geissler](#); Liisa Malkki’s “[The Need to Help](#)”). The rich body of overlapping work by medical anthropologists looking at transnational scientific collaboration and partnership in the field of global health also provides an important point of inspiration and comparison to the discourse and work emerging from and about technology in Kenya. Building on questions posed by [Crane](#), [Peterson and Folayan](#), [Biruk](#), [Tichenor](#), [Tousignant](#), [Geissler](#) and others enables me to think about the emerging discourse of “ethics” growing in popularity in the field of technology development beyond traditional “benefits” and “harms” and instead with a focus on inclusion and exclusion including questions about who can legitimately speak “for Africa.”

Work by scholars like [Breckenridge](#) and [Vally](#) on the biometric state offers a different, complementary perspective on my project, highlighting the importance of paying attention to questions of the state and centralization of state power and surveillance. Even if in practice, state capacity is not in place for this, the *worry* of this kind of state surveillance and intrusion of personal privacy is important in shaping how Nairobians may be thinking about sharing data. My own experience working with a tech company in Nairobi found that Kenyans avoided sharing their geo-

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locations for fear of being tracked by the government (*publication forthcoming*). This included turning phones off or switching to airplane mode when not in use. Holding this work together with [Coban](#) (and other work by Marchant, Weiss, [Wahome](#), de la Chaux) on tech entrepreneurship in Kenya and work on the social lives of data ([Biruk](#), [Bezuidenhout](#), [Tichenor](#)) will help me to shed light on how the double bind of opening up data sets for the purposes of enacting social good and justice operates uneasily with the possibilities of commercial exploitation, decontextualization, appropriation, and use in state surveillance.

I have developed my own approach to data collection in part to [move away from narratives of deficit](#) that are heavily part of the existing discourse about Africa. I am keen to work together with interlocutors to shake out the *other* issues that emerge when the [existence of “African” data](#) and its generation and sharing are taken as a given. I also move away from a focus on “global” circulations of data (esp. use of “global” Western data being consumed by African users) to looking at the data that is *generated* in/from Africa (by Africans and non-Africans alike). This grounds my project in multiple fieldsites within Nairobi, although I will necessarily also be accounting for the ways in which the data generated and used travels across multiple scales.

There are ongoing questions about the ethical responsibilities of building repositories for scholarly sources and resources about Africa in Africa. [Osseo-Asare](#) noted cultures of secrecy both amongst scientists and healers that she encountered and company archives that she was unable to access, leading her to rely largely on oral histories. Hecht similarly faced [“secretive institutions that actively sought to keep their records from public view”](#) noting that she therefore interviewed workers, managers, and technical experts to discern patterns and narratives invisible in the written record. However, Hecht was eventually able to also gain access to unpublished, “uncatalogued, disorganized collections located on industrial sites, buried in dusty closets” and her lack of preservation of these sources made her the subject of strong critique by [van Sittert \(2013\)](#) (in Hecht’s own words) [“for not single-handedly preserving the archive myself,”](#) which she insinuates is outside of her responsibilities as an individual researcher. This raises a very important question for my research as to what the boundaries and levels of responsibilities of researchers are in terms of technical infrastructures, including the preservation and management of our sources and data. [Van Sittert](#) (who works on developing digital archives) seems to hold a different view of the responsibilities of researchers questioning [“...why the failure to systematically work or digitize a condemned African mine archive to which the author was given unrestricted access is of no consequence.”](#)

Future Elaborations

Additional work that I plan to query in future elaborations of this work will touch more directly on the open data movement, especially as it has been developed in/for Africa. The [formal movement](#) has not yet been an extensive object of study of social scientists (other than a recent 2018 special issue on [“Open Data and Africa”](#)). There is also a notable gap in the type of [data available on public portals](#); ethnographic or qualitative data is largely missing. As part of growing awareness about the challenges inhibiting the sharing of qualitative data, [Mannheimer et al. \(2018\)](#) noted that data repositories and academic libraries are key partners to address the unique challenges of qualitative data sharing. [Tsai et al. \(2016\)](#) are also contributing to a growing conversation about the promises and pitfalls of qualitative data sharing. I expect to read this growing body of literature next.

Notable Threads

Throughout the sub-essays, several common threads reemerge: first, the notion of science for societal benefit. [Tilley](#) pointed out that data work in Africa even in the 1930s was justified as helping development and to “solve African problems” which rings hollow in the context of

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[extensive research fatigue of Malawian participants](#) (Biruk 2018) who are nonetheless expected to understand their role as [“voluntary, altruistic and towards the collective good”](#) (while researchers earn money, status, and accolades for the work).

Second, contention over categories of naming and how to identify the situated nature of knowledge while simultaneously describing how knowledge travels globally (but also often unevenly). How to describe holders of particular knowledges without defaulting to “stable” identity categories? Lines of similitude and difference are made invisible when we label half the world as “global South” and half of the world “global North.” I believe the STS in Africa community is well-poised to problematize and explore alternatives to the sedimented binary discourse about “global North” and “global South” (see for example, this [latest call for papers](#)) which shape the design and implementation of standardized tech solutions for diverse communities around the world. I continue to mull over how to grapple with these open questions in my own project and am interested in learning from Green’s [relational ontology \(2012\)](#) and Fortun’s enunciatory communities (2001) and other existing strong examples of complex multi-scalar analyses of data that scholars like [Tichenor](#) and [Biruk](#) offer.

Finally, of note and growing importance is deep and explicit discussion about the scope of responsibility for qualitative researchers with relation to the development of a robust and nuanced qualitative data commons. Given cultures of secrecy and protection of data and information, what responsibility do researchers have for protecting, developing, and maintaining scholarly source material including interview and other qualitative datasets? Further, [\(how\) do intersectional identities align \(or not\) with moral duties and ethical responsibilities?](#)

The following section below provides a brief initial response to the annotation questions I pursued. This text can also be found as the “abstract” within each of the sub-essays in the document. Clicking the title will take you directly to the sub-essay which includes greater elaboration of these abstracts including a sampling of the “raw” annotations I made.

[DISCURSIVE RISKS: What are the analyst’s epistemic assumptions of “Africa”?](#)

A highly established, ossified binary discourse noted, both in common public discourse and still in circulation even amongst STS scholars who [recognized its problematics](#) was that of “global North” - “global South.” Many of the scholars used the two interrelated terms to describe funding and partnership dynamics ([Okeke 2011](#); [Crane 2011](#); [Coban 2018](#)). Within her text, Pollock (2014) recognized the problematics of the bifurcation between global South-North but noted that [“Africa” is an actor’s category and marks inequalities that cannot be ignored](#). Scholars are also still working through their own assumptions how distinct epistemologies align with “local” and “global” scales ([Pollock 2014](#); [Crane 2011](#)). Some scholars suggested that “local knowledge” in fact comes to exist - and to gain value - because of global projects ([Biruk 2018](#); [Coban 2018](#); [Tilley 2011](#)). Analysis of [data infrastructures was largely absent](#). Despite discussions about the politics of global funding, global race politics do not feature in most of this work and analyses of sexuality (exceptions being for example [Adia Benton](#) and Tousignant (2018) who discuss the [racialization of expertise](#); and [Laura Ann Twagira](#)’s focus on gender).

[DEUTERO: How is this analyst denoting and worrying about “Africa”?](#)

Within the annotated set, STS scholars working with diverse epistemic communities in “Africa” have indicated concerns with how transnational scientific partnerships and agreements are reproducing colonial power dynamics ([Crane 2010](#); [Coban 2018](#)) and how to move beyond oversimplified ([Tichenor 2017](#); [Bezuidenhout 2017](#)), deficit models ([Wenzel and Tousignant, 2016](#)) towards more agential ways ([Mavhunga 2014](#)) to decolonizing the production of scientific

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knowledge ([Foster 2017](#), [Wahome 2018](#)) and thinking about Africa's contribution to the world (and global theory) ([Breckenridge 2015, 2018](#); [Tousignant 2018](#)).

META: What discourses does the analyst consider/leverage to characterize/theorize science and technology in Africa?

Within the annotated set, STS scholars draw on a range of discourses to characterize science and technology in Africa. These include scholarly discussions engaging with postcolonial studies (with scholars like Mudimbe and the Comaroffs cited heavily) ([Tilley 2011](#); [Pollock 2014](#); [Mavhunga 2014](#)); critical data studies and the sociology of quantification ([Biruk 2018](#); [Bezuidenhout 2017](#)); anthropological work on infrastructures ([von Schnitzler 2013](#); [Tousignant 2018](#)); STS theories of the boundaries of knowledge ([Crane 2010](#)); and feminist theories of performativity ([Tichenor 2017](#); [Coban 2018](#)).

Several discursive themes recur throughout the annotated set: the dominance and reliance on non-African funding within African science and technology ([Tousignant and Geissler 2016](#); [Tousignant 2018](#); [Crane 2010](#); [Coban 2018](#); [Tichenor 2017](#)); different ways of theorizing African "capacity" ([Mavhunga 2014](#); [Geissler and Tousignant 2016](#); [Bezuidenhout et al. 2017](#)); and discussions of "Africanizing" science and who benefits from science and tech ([Tousignant 2018](#); [Coban 2018](#)).

MACRO: (How) are economic and legal infrastructures said to shape science and technology in Africa?

Analyses of the economic and legal infrastructures figure heavily in STS scholarship situated in African contexts, especially by those who rely on historical sources. Specific economic and legal infrastructures mentioned include university Institutional Review Board ethics protocols ([Biruk 2018](#)); development funding regimes that build and reify "global North" and "global South" inequalities ([Biruk 2018](#); [Crane 2010](#); [Coban 2018](#); [Bezuidenhout 2017](#); [Geissler and Tousignant 2016](#)); colonial histories ([Tilley 2011](#); [Osseo-Asare 2014](#); [Foster 2017](#); [Breckenridge 2014](#)); economic competitiveness ([Tilley 2011](#)) as well as claims to citizenship ([von Schnitzler 2013](#)); Bretton Woods structural adjustment programs and the emergence of a neoliberal knowledge economy ([Green 2012](#); [Pollock 2014](#); [Okeke 2011](#)); and intellectual property law ([Foster 2017](#); [Pollock 2014](#); [Osseo-Asare 2014](#)) (and its [overemphasis on individualist](#) notions of authorship).

MICRO: What did the analyst choose to describe as "science" and/or "data" in Africa?

Even within just the annotated set, STS scholarship in/on/about the continent spans a wide range of contexts and epistemic communities of scientists (for more on the diversity of projects, see [this exhibit](#)). While some scholars working on science and tech in Africa continue to study "elites" working in labs (e.g. [Pollock 2014](#)), others are explicit about their move to study those making science outside of the laboratory environment (e.g. [Biruk 2018](#)). [Mavhunga](#) studies things that "[few would consider technological](#)," while [Tilley](#) conducted a [historical inquiry of studies about British colonial Africa](#). Other "sciences" studied included: African medicinal plant knowledges ([Osseo-Asare 2014](#)) and [negotiations over their intellectual property](#) ([Foster 2017](#)); "[big science](#)" ([Okeke 2016](#)) and [diagnostic science in African hospital laboratories](#) ([Okeke 2011](#)); [transnational collaboration in HIV medicine](#) in Uganda and the US ([Crane 2010](#)); the [science of biometric identification](#) and registration systems ([Breckenridge 2014](#)); pre-paid electricity and water devices in South African townships ([Von Schnitzler 2013](#)); and the [socio-material practices of prototyping, making and innovating within engineering and hardware projects](#) in Nairobi's makerspaces ([Coban 2018](#)). An emergent body of work looks at the performance and production of data in African contexts ([Biruk 2018](#); [Tichenor 2017](#); [Bezuidenhout et al. 2017](#)).

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NANO: (How) is “Africa” invoked when the author discusses data (as a place with unique demands or responsibilities, for example)?

“Africa” is invoked by scholars working on science and technology as a site with unique responsibilities with regards to data and research practices. Long standing debates about the relationship between “indigenous knowledge” and “science” continue to animate the study of science and technology on the continent and appear to be a particularly strong area of focus for STS scholars working in South African contexts (see for example [Foster 2017](#), [Osseo-Asare 2014](#), [Pollock 2014](#), [Green 2012](#), [von Schnitzler 2013](#), and [Hecht - van Sittert 2013](#) exchange). [Green’s work](#) should be an important reference point for scholars grappling with the identity politics of knowledge. Discourse about “[Made in Africa, for Africa](#)” and “[Africanness](#)” has been noted as a claim for a particularly distinct local expertise ([Coban 2018](#); [Crane 2010, 2013](#); [von Schnitzler 2013](#)). Ethical questions about the the responsibilities of researchers to [reduce/minimize research fatigue](#), allow for [informed refusal](#), and enact an [ethics/politics of reciprocity and accountability](#) are discussed. Open questions persist about the responsibilities of researchers in developing infrastructures towards [protecting, sharing, and maintaining scholarly qualitative source materials](#).

TECHNO: (How) does the analyst account for the data practices and responsibilities of the people and organizations studied?

The studies explicitly looking at data practices ([Tichenor 2017](#); [Biruk 2018](#); [Bezuidenhout 2017](#)) had strong accounting for the data practices of their interlocutors, describing for example, a process of “rough approximations” which involved “filling out” the approximate diagnostic data performed by nurses, physicians, and laboratory technicians to produce a representation of malaria in Senegal ([Tichenor 2017](#)) and a misalignment of categories of data leading to desires for generating “our own data” ([Tousignant 2018](#)). Scholars had different perspectives on the travels of data noting the importance of location ([Crane 2010](#); [Hountondji 1990](#)) but also the difficulty (impossibility?) of disaggregating co-constructed knowledges ([Tilley 2011](#); [Osseo-Asare 2015](#)). Few of the studies explicitly employed a technical analysis of the underlying infrastructures (other than some mention by [Tilley 2010](#) and [Foster 2017](#)). [Von Schnitzler \(2013\)](#) argued that technology itself was a political terrain for the negotiation of moral-political questions about limits, entitlements and obligations of citizenship in South Africa.

DATA: (How) does the analyst account for their own data practices and responsibilities?

Most of the STS work in Africa does not grapple directly with questions of data ([Biruk 2018](#), [Tichenor 2017](#) and [Bezuidenhout 2017](#) are a few exceptions). Even of those that study data practices, I did not find examples of scholars who have published their own qualitative data in digital or reusable formats amongst the annotated set (some scholars have published small excerpts from their data, e.g. [photographs](#) or [block quotes from interview data](#), or the [survey instruments of those studied](#)). The most common practice was reflection on methods used to collect data for the project (e.g. [Foster 2017](#); [Coban 2018](#)). Many also discussed the unique demands and responsibilities of “science” to address societal challenges, especially challenges faced in African contexts (e.g. [Okeke 2011](#); [Pollock 2014](#)). Citing specific interviews in endnotes (i.e. linking narrative to a particular interview) was also done by more than one scholar within the annotated set ([Foster 2017](#); [Biruk 2018](#)) but does not yet seem to have become a mainstream practice.

ECO: What material constraints are said to undergird science and technology work in Africa?

While used more infrequently within analyses of science and tech in Africa, notable factors mentioned included flooding ([Tichenor 2017](#)), plant growth (or lack thereof) ([Foster 2017](#)), the decay and remains of industry ([Pollock 2014](#)) and labs ([Tousignant 2018](#)). Notably, time was

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mentioned both for its scarcity ([Crane 2010](#); [Bezuidenhout 2017](#)) and structuring of the day (shared time zones across geographic zones) ([Pollock 2014](#)).

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