

**UGANDAN SCIENTISTS, SCANDINAVIAN  
COLLABORATIONS, AND THE CULTURAL ECONOMY  
OF SCIENCE**

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**ABSTRACT** Money and cultural economies of science are imbued with multiple meanings for actors involved in international scientific research and research training collaborations in Uganda. This article uses economic anthropology to explore some of the tensions and misunderstandings that arise from Ugandan-Scandinavian partnerships in science. Using ethnographic examples drawn from the experiences of Ugandan scientists and their Scandinavian counterparts, the article describes how the positions and actions of Ugandan scientists produce different, and at times contradictory meanings, for themselves, their kin, local colleagues, and Scandinavian counterparts. Compassion for a grieving sibling, a gift to a charity fundraiser, the extraction of personal savings from an international research project, and the strategic construction of a countryside home are just a few examples of actions and relations that shape actors' understandings of Ugandan-Scandinavian scientific collaborations. The article finds that pre-existing tensions in scientific collaborations resulting from dependency upon foreign donors for research and research training funding are further exacerbated by foreign actors' partial understandings of the meanings and moralities of scientific work in Uganda. The article concludes that greater recognition of the patterns of cultural economy that make money and labor in science meaningful are necessary for mitigating mistrust and misunderstanding across South-North scientific collaborations.

**KEYWORDS** Cultural economy, economic anthropology, scientific collaborations, research training, Scandinavia, Uganda.

## **Introduction**

The practice of science in developing countries is strongly influenced by funding and research priorities that originate in the wealthiest countries and regions (Velho, 2006). Uganda is not an exception in this respect. Money for Ugandan research and research training almost entirely originates from international donors (UNCST, 2013), with the United Kingdom, the USA, and the Scandinavian countries making important contributions (UNCST, 2012). Meanwhile, the Ugandan government's contributions to science are at best sufficient to cover the costs of staff salaries and a minimum level of infrastructure maintenance, leaving very little national funding to support research.

Given that economic relationships are integral to the practice of science in Uganda (Crane, 2013) as elsewhere (Okwaro & Geissler, 2015; Zink 2013), it is surprising that so few studies draw specifically from economic anthropology to describe and explain the meanings of money and material resources in scientific research and research training. Towards addressing this gap, I apply an analytical approach that combines cultural economy (Halperin, 1994) and elements of actor-network theory (Latour, 2005) to contemporary Ugandan-Scandinavian collaborations in science.

Cultural economy has roots in the generic model of economy proposed by Karl Polanyi in the 1950s whereby the “substantive meaning of economic derives from man’s [sic] dependence for his living upon nature and his [sic] fellows. It refers to the interchange with his [sic] natural and social environment” (Polanyi, 1957, p 243). Polanyi recognized markets as an important pattern of economic organization mediating the interplay of social/material elements, but also broadened our understanding of economy to include other patterns for producing, moving, storing and consuming resources across time and space. These other patterns of economic organization, be they reciprocal, redistributive or householding, can be identified independently of and alongside with markets (Halperin, 1994). Through its recognition of diverse modes of economic organization, cultural economy encourages more robust and contextualized explanations of the meaning and value of scientific labor in and amongst Ugandan institutions than do neoclassical theories of economy, for example. In the cases discussed below, reciprocal

and redistributive patterns of economic organization coexist with market patterns amongst Ugandan scientists, their kin, and foreign counterparts. One finds that these are sustained by alternative, and sometimes competing, social rules, moralities, and practices, and that they facilitate forms of agency amongst Ugandan scientists that can circumvent or resist the influence of foreign donors.

Actor-network theory makes a twofold contribution to this article's analysis of the cultural economy of science in Uganda. Firstly, actor-network theory offers a model whereby actors and their networks are engaged in interactive and coproductive relations. This contrasts with Polanyi's model that emphasizes economic actors as embedded in specific institutionalized economic contexts (Callon, 1998, p.9). Secondly, actor-network theory creates analytical space for incorporating the agencies of non-human actors, or "actants" (Latour, 2005), into the explanation of science economies. I find that this relaxation of the presumed hierarchical relationship between economic agent and economic pattern, together with the inclusion of grounded observations of the material actants that also constitute economic assemblages, facilitates the realization of Itty Abraham's ambition for a postcolonial science studies that "leaves open the possibility of seeing multi-directional influences and channels simultaneously" (Abraham, 2006, p 217).

For the socially and geographically mobile Ugandan scientists with Scandinavian connections that are the primary subject of this paper, there is no single and hegemonic economic frame within which their scientific labors can be understood (Slater, 2002). "No place dominates enough to be global and no place is self-contained enough to be local" (Latour, 2005, p 204). Rather, from situated positions within actor-networks (Latour, 2004) that connect local spaces from across the globe, Ugandan scientists make meaning of their work and material obligations via entangled, and often misaligned, emic frames for understanding economy. These frames include kinship systems, labor contracts, Scandinavian work ethics, and collegial egalitarianisms. Not only brokers at the intersection of multiple actor-networks, Ugandan scientists occupy borderlands (Prasad & Anderson, 2017) where different patterns of economy intermingle and become entwined. It is in this context that Ugandan scientists exert their own agency to

achieve the social reproduction of themselves, their kin, and colleagues (Narotzky & Besnier, 2014), as well as scientific outcomes that lie closer to their own research priorities (Zink, 2016; Okwaro & Geissler, 2015). It is also in this context where meanings of money diverge.

I have collected the empirical material that underpins this article during qualitative anthropological research carried out amongst scientists working in fields related to biomedicine, agriculture and natural resource management in Uganda during the course of my five visits to Uganda between 2013-2016 with a total duration of 13 weeks, as well as during other encounters with Ugandan scientists and their partners in Europe, South Africa and via the Internet. One or more semi-structured individual interviews were carried out with 50 different Ugandan scientists at various stages of their careers. These were complemented with a larger number of informal discussions, participant observations at research institutes, universities and other sites of scientific work, and 57 completed questionnaire surveys. While this article focuses on salaries, cultural economies and Scandinavian collaborations in Uganda, my project in its entirety addresses Ugandan, Ghanaian and Zimbabwean scientists' experiences of the internationalization of higher education and research collaborations with foreign partners, particularly in fields related to human health or agriculture. The examples highlighted in this article are drawn from this sample, and selected to highlight the experiences of Ugandan scientists with experience of research training in Scandinavia and research collaborations with Scandinavian scientists and donors.

Drawing from these sources, I will describe and analyse the overlapping and sometimes contradictory meanings of money and other resources from the situated perspectives of Ugandan scientists themselves, and to a lesser extent from lay publics in Uganda, and Scandinavian partners in research. These will be illustrated with a number of specific ethnographic examples pertaining to the value and meaning of scientific salaries, obligations to kin and colleagues, the giving of charity and gifts, and salary 'top-up' payments from foreign donors, as well as scientists' home construction projects and scientific workshops in hotels. I argue that economic anthropology, and cultural economy in particular, offers a valuable analytical

position from which to observe and explain the persistence of mistrust and misunderstanding amongst partners in research and research capacity building that takes place across national and continental borders.

### **Overpaid and Underpaid: Ugandan scientists and their salaries**

Payments to scientists for scientific and scholarly work are contingent and contentious in Uganda. This is the situation from the perspective of the lay public, as well as from the perspective of public officials, international donors, and Ugandan scientists themselves. Just as the purchasing power of a Ugandan scientist's salary varies from the capital city of Kampala to the western town of Fort Portal or the former colonial metropole of London, so too do the meanings of salaries change from the situated position of one individual to another (Parry & Bloch, 1989). From the perspective of Ugandan scientists themselves, scientific salaries are usually too small. From the perspective of many Scandinavian donors, Ugandan scientists are paid enough. Meanwhile, researchers are highly paid in comparison to most other Ugandans.

The contentious meanings of money in Ugandan science and higher education were nowhere more evident than the campus of Uganda's leading public institution of higher education and research, Makerere University, during late 2016. On October 17<sup>th</sup> I had spent an afternoon teaching Masters and PhD students in the College of Agriculture and Environmental Studies. The atmosphere on the campus at the time was calm, and in class we discussed strategies for designing students' thesis research projects. Two weeks later that classroom and all others were empty while riot police and students battled back and forth across the campus. At the root of the conflict were the salaries of university lecturers.

Makerere lecturers went on strike to protest the government's failure to honor its contractual obligations to pay salary "top-ups" to its staff. Top-ups are allowances and payments for work that is additional to the normal teaching load, and might include fuel and housing benefits as well as payments for teaching evening or weekend courses. Students subsequently went on strike to protest the absence of lecturers

in the classroom, and a day of violent clashes between students and riot police ensued. On November 1<sup>st</sup>, Uganda's President Museveni issued a decree closing the university indefinitely. University buildings were locked, and on-campus student residents were evicted from their rooms (Mufumba, 2016). The consequences of what would become a two month closure of Uganda's leading university were far-reaching and sometimes unexpected. For example, public services were crippled at one of Uganda's most important hospitals and its subsidiary health centers when the university post-graduate students who normally carry much of the daily workload did not come to work (Namagembe, 2016).

Sympathy for the situation of the academic staff amongst students and the public at large was mixed given the broader consequences of the strike, and given that faculty salaries had nearly doubled during recent years while the salaries of other public servants had remained stagnant (Mwenda, 2016). In 2015, a senior lecturer at a public university such as Makerere could earn approximately 5 million Ugandan shillings (USD 1,400) per month before additional salary top-ups. Meanwhile, a primary school teacher's monthly salary was closer to USD 200 and a police officer might earn little more than USD 100 each month.

Amongst scientists there are also wide gaps in earnings. A senior scientist at one of the country's national research institutions normally earns half that of a senior lecturer at a public university like Makerere, despite sharing similar backgrounds and oftentimes being partners on the same projects. Meanwhile, lecturers or scientists that do not have PhDs, or who are enrolled in a PhD programme, earn much less. While less advanced in their scientific rank, it is common for this latter group to already be in their 30s or 40s, married, with children, and having a full-time workload in teaching, medical practice and/or research at their institution.

Over the course of our discussions during four years, Isaac<sup>1</sup>, a professor and natural scientist at a public university, often regretted that the low salaries of researchers like himself were an obstacle to the conduct of serious scientific research in Uganda. He compared his own workdays to those of his former

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1 Pseudonyms are used throughout the paper.

PhD supervisors (and now partners) when he himself studied in Scandinavia. He recalled Scandinavian scientists then and now as enjoying salaries that permitted them to focus and devote extensive amounts of unbroken time to their scientific work. By comparison, his own days were fractured by competing social, professional and economic demands.

It was thus something of a surprise to me when Isaac expressed sympathy for accusations in newspapers and by the lay public in Uganda that scientists on strike were being greedy, saying the criticism was “about how overpaid university lecturers and professors are in Uganda” and agreeing that this was “a valid point”. He continued to explain himself using the example of the discrepancy between his own salary and that of primary school teachers. The ease with which Isaac pivoted from describing himself as underpaid to overpaid is a consequence of the multiple actor-networks in which he finds himself simultaneously engaged. His shifting explanations of the meanings attached to a scientist’s salary are logical in a context where local and global networks of social relations are entangled, and where multiple patterns and scales of economic organization coexist in the same time and the same place.

### **Survival amongst kin and colleagues**

What Polanyi (1957) describes as an interchange with social and natural environments, and what Narotzky and Besnier (2014) describe as making a living, Robert, a successful Ugandan epidemiologist working in global public health, describes as survival. Speaking with me in his office in Kampala during May of 2014, he urged, “*Survive* is the word that you must take from Uganda. Survive. I am surviving. I have survived.” Coming from Robert, who is salaried as a lecturer, has a PhD from a Scandinavian research university, and is a key partner on a number of ongoing research projects with Scandinavian colleagues, it is surprising to hear him speak of his own existence in terms of precariousness or survival. Obviously, the survival he spoke of was not a matter of putting food on his own dinner table and a roof over his own head. Rather, it was a survival that included support to a range of people in his social and scientific networks, contributing to the reproduction of their and his own material and social wellbeing, and maintaining a scientific career that felt important and relevant to the existing health challenges in his country.

Robert's desire to survive and even succeed is partly what motivates him to engage with public opinion, government bureaucracy and philanthropy. These engagements in turn often have implications for his own personal economy, as well as his sense of well-being and perceptions of inequity across the Ugandan and Scandinavian sites of his scientific work. The morning before a meeting with Robert in 2014 I found an article by him in one of Uganda's main daily newspapers where he critiqued the national health care system and urged the government to make a number of additional investments. Our talk itself was an interruption in his last minute push to finalize a research grant proposal with a looming deadline, and following our talk he invited me to a workshop with officials from the Ministry of Health where they would discuss possible policy changes for improving the situation in the country's hospitals and clinics. Amidst these competing engagements, Robert explained that his personal life had appeared in his own empirical data when a sibling's infant child passed away during delivery at the hospital a couple of weeks earlier. Such experiences are common in African contexts where poverty and poor infrastructure are much more closely intertwined with the personal lives of medical doctors and scientists than is normally the case in wealthier countries where class and privilege offers further distance from the risk of infant mortality (Wendland, 2010).

Sitting together, we talked about the feelings of loss and the difficulty of offering comfort in such moment of intense personal and family crisis. We also discussed the regular occurrence of such tragedies in Uganda compared to their exceptionality in Scandinavia. Robert, who has maintained significant personal and professional networks in Scandinavia since completing his PhD, expressed his deep frustration at the fundamental differences in the conditions for life and for making a living between Scandinavia and Uganda. These differences were fundamentally jarring to him given the close proximity of Uganda and Scandinavia in his own life history, and his continuing presence in both via physical travel as well as Internet communication technologies.

In 2015 I would meet Robert again at an elaborate fundraising event attended by medical scientists, NGO representatives, parliamentarians and many others. The event



was hosted at an international hotel in Kampala and organized by a local lecturer who was attempting to raise money for the purchase of basic equipment for a regional health center where he also carried out research. I sat with the organizer as we awaited the arrival of guests who were caught in an exceptional traffic jam after a late-afternoon downpour. He explained that beyond facilitating the purchase of needed materials, the event was an opportunity for individuals to demonstrate their own leadership and commitment to health research and health care reform for an audience that included political and scientific leaders, as well as key members of the community where the health center was located. The dinner fee of 20,000 Ugandan shillings (about 6 US dollars) was relatively modest, but I watched the organizer, Robert and many others raise their hand to publicly commit part of, and in some cases many times, their monthly salaries to the charity fund.

In the day-to-day challenges faced by Ugandan scientists', like their fellow civil servants (Whyte 2015), there is great overlap between the personal and professional, as well as the biological and infrastructural. Looking exhausted from across his desk, Robert explained to me that one result is that

You end up actually not so happy with yourself, not so happy with your country, not so happy with your family. You end up being pulled left, right and center. You might not be as productive and do as much good work as you should. [...] I find [us] highly trained researchers on the run.

Robert's case is one illustration of a common situation for scientists in Uganda. The "environment" for their scientific work is crisscrossed by multiple moralities and patterns of economy that impose conflicting demands upon their work to achieve a state of survival that includes the material, social and scientific reproduction of themselves and their close kin and colleagues.

### **Managing economic obligations and aspirations**

The cultural economy in Uganda is such that when an individual achieves a position in society commanding some material resources, then the individual is also expected to be a benefactor who can assist extended family members and other relations with school fees, healthcare costs, contributions to

funerals, and gifts to the newly married. As a Ugandan who has achieved a doctoral degree, often including international travel and training, one has joined an elite group of less than half of 0.01% of the general population. This achievement and the real and perceived resources it puts in the hands of the PhD holder has important implications for their own life expectations, for aspirations for their children, as well as the expectations of and obligations to an array of kin.

Uganda is a state where there is limited public funding for a social safety net, and nearly all state services carry a cost to the individuals who seek them out. Hospital visits remain costly even after user fees for public health services were abolished in 2001, and in the case of complicated or expensive health problems the economic consequences for families can be catastrophic (Nabyonga et al., 2013). Meanwhile, although public primary and secondary schooling is formally free of charge, there remains significant costs associated with sending children to them for their education (Chapman et al., 2010). Public schooling is unlikely to prepare students with the resources necessary to enter university education later in life (Post, 2016; Nishimura et al., 2008). On the other hand, a private school that is more likely to provide the academic support necessary for a student to eventually enter the university is likely to require the payment of school fees ranging upwards to USD 700 per student per year (Tumwebaze, 2012).

Samuel, a medical researcher who completed his PhD in 2016, explained to me that “You have to pay for everything in Uganda. When you get sick, you pay. When somebody in your extended family gets sick, you pay. People make demands all the time because you are one of the few people that have ‘broken through’.” Samuel is not alone in fielding continuous requests for money and support from close and distant kin. Where the state provides no social and economic safety net, persons with resources are constantly fulfilling, negotiating or warding off demands from others who have fallen on harder times.

In this situation, an economic strategy available to researchers is to limit one’s ability to service social obligations by rapidly converting cash to property or materials that are less amenable to redistribution via dispersed kin networks. This was one of the strategies behind the house-building activities of Paul,

a well-established medical doctor with a PhD from abroad, and his wife, a health researcher with a PhD from Scandinavia. They began a real estate career when Paul was abroad by saving part of his stipend to make modest investments in land in Uganda. By the time I began to know the family in 2013 they were the owners of a house in an upper-middle class neighborhood of Kampala, had several small buildings near different university campuses where they rented rooms to students, and had several plots of land in the countryside. With respect to the latter, Paul had long dreamed of building a house in the “village” where they could eventually retire and survive off their savings and a few hectares of mixed crops.

By 2016, the house was becoming a reality. While still unfinished, it had a roof and an enclosure, and it was surrounded by fields of *matooke* bananas, cassava, beans and papaya. On a clear blue-sky day in October we inspected the progress of the ongoing work to sculpt a garden landscape with a rusty rented bulldozer operated by an owner hired from Kampala. Paul explained that owning property and building in Uganda requires significant personal investments of time. One’s own physical presence at the sites is a prerequisite for construction and maintenance work. Sitting together with me on the unfinished veranda with a packed lunch of chicken and rice and warm lager beer, Paul’s eyes sparkled as he pointed out the new additions to the property. He verbally painted a picture for me of the day when his mother, his family and a number of colleagues would arrive through the compound gate to the housewarming party that he would host when the building was complete in a couple years’ time.

Ownership of a house in the countryside, something that is rather common amongst well-established scientists in Scandinavian, appeared luxurious in a village otherwise populated by worn one or two room tin-roofed homes, mostly lacking electricity, along rutted dirt roads that are only passable by foot or four-wheel drive vehicle when it rains. Paul recognized this, but the logic behind his investment was not only focused on achieving status and affluence. It was also a long term economic planning to secure a comfortable subsistence for his immediate family after his retirement from work at the hospital and his private practice, and in the absence of a reliable pension and state-sponsored social safety net. Furthermore,

it was a conscious methodology to convert liquid wealth to land and agricultural capital that could not be easily claimed by extended kin experiencing an acute crisis that cash might mediate, or requests from colleagues for larger contributions to philanthropic fundraisers, funerals, or weddings.

For Paul and Ruth, buying land and building houses was a cultural, economic and infrastructural methodology for storing economic resources (Halperin, 1994), while simultaneously buffering them from the multiple entanglements of colleagues and more distant kin. Their economic success was not simply a matter of securing property and a steady income. It was also a matter of surviving and renegotiating their existing social entanglements and obligations, to make space for future aspirations, hopes and ambitions (Narotzky & Besnier, 2014).

### **Scandinavian cultural economies in Uganda**

Scandinavian understandings of science economies, when exported to a Ugandan context by Scandinavian donors and partners, do not simply overrun locally constituted cultural economies. Rather, they add complexity, often in contradictory and sometimes inflammatory ways, to already intricately entangled contexts for scientific practices. One result is that, despite Scandinavian ambitions to facilitate a decolonization of science in developing countries through partnership and collaboration, they continue to reproduce neo-colonial relationships through misunderstandings economy that undermine the social and material foundations for achieving more equitable and transparent scientific partnerships (see Okwaro & Geissler, 2015). This process is illustrated by the multiple meanings of income supplements, private house-building projects, and hotel workshops within Scandinavian-Ugandan scientific collaborations.

### ***Buying time or giving gifts? Positioned experiences of scientific income supplements***

Sitting with a Scandinavian development aid professional discussing Scandinavian investments in research training in Uganda, I brought up the issue of offering income supplements for Ugandan researchers enrolled in Scandinavian/Ugandan PhD programs while they are in Uganda, as well as for their Ugandan supervisors. The development aid professional responded that

“Our resources are for education... if people think their salaries are too low and would like to have higher salaries... well who doesn't?” My interviewee then raised a number of other arguments against offering top-ups or salary supplements to Ugandan partners. These included: that the people in question are already receiving contractually stipulated salaries and stipends from their Ugandan institutions to carry out research and supervision; that a practice of topping up salaries would contribute to the creation of additional hierarchies and elite groupings amongst PhD students and supervisors in Uganda; and that researchers are already collecting illicit income (otherwise known as “sitting allowances”) in brown envelopes in return for their participation in meetings that are the “internal work of the university.”

Scandinavian sensitivities to salary top-ups may be related to culturally specific perceptions of the constitution of gifts and the obligations that they create. Making reference to Scandinavian society in particular, Marcel Mauss (1990, p 1–3) observed some 100 years ago that gift giving is a social and moral act loaded with meaning and obligation. In Swedish culture, for example, a gift given to an acquaintance creates *skuld* (debt) that can undermine a relationship if the gift is not reciprocated during a relatively short time frame. In the context of Scandinavian research training and research collaborations, a top-up looks much like a gift. However, a salary top-up to an individual who is already obligated via existing contractual instruments to carry out an activity (research or research supervision, in this case), would introduce a gift relation into an economic exchange that is already regulated, from the Scandinavian perspective, as a (labor) market exchange within the institutional bounds of the Ugandan state.

For my Scandinavian interviewee, this raises immediate concerns that such a gift relationship would corrupt the established contract between the public servant and the Ugandan state. As such, a gift relationship between a foreign government and a Ugandan scientist cannot be safely grafted onto a preexisting market transaction for scientific labor between Ugandan scientists and a Ugandan state institution, without also jeopardizing cherished Scandinavian donor principles of transparency, equity and solidarity.

Whereas scientists at public institutions in Uganda are civil servants, and the formal contracts governing scientists' work designate research as an activity for which they are remunerated with a government salary, in practice these same scientists understand their obligations differently when research is sponsored by foreign funders. The availability of foreign funding to buy materials and support services for research does not create additional time for the scientist to carry out research unless the funding can also be used to supplement his or her salary. In the absence of a salary supplement, the scientist has difficulty to justify putting significant amounts of time and energy into the research project at the expense of their other income earning activities and social obligations, both within and outside their public institution. Foreign partners that are unaware of the norms and organization of Ugandan science economies can experience frustration when their Ugandan counterparts are not producing results at the pace and level of quality that was designated in the project document. Ugandan scientists can simultaneously perceive that foreign partners, from their positions of relative social and material comfort, are detached from the day-to-day realities and struggles associated with working and surviving as a scientist in Uganda.

Joseph, a medical scientist who spent several years in Scandinavia explained to me that scientists in Uganda “worry about what they are earning because most of the time it is not enough to see them through their expenditures for the month.” In contrast, in Scandinavia schooling and health care are supplied by the state, welfare benefits are available to those that cannot work, state pensions are usually sufficient for a dignified, if not a luxurious, retirement, and scientists take paid family vacations. There, Joseph observed, “everyone gets about enough to see them through their expenditures for the month so that keeps them committed to what they are doing.” Charles, a leading scientist in Ugandan medical research, was more pointed in his critique of Scandinavian donors:

[They] cannot keep telling me that because [we] have this salary from government [we] will not receive anything extra. Is the salary in Stockholm enough for you to survive on? To provide for your family and to save? [...] To use the argument that because you are salaried here in government or in the university [they] will not top you up is using a broken or lame argument.

At the heart of these conflicting views is the outsider's confusion regarding the local status and legitimacy of formal versus informal rules governing scientific labor in Uganda. Moreover, in some cases, foreign partners with limited local experience are simply oblivious to the patterns of economy that characterize scientific work. For Ugandan scientists, the unwritten rules and moral obligations that stem from the social and material context of everyday life compete with and curtail the power of formal civil servant contracts to govern their scientific work. From a Scandinavian perspective, scientific labor takes place in a labor market where the formal, written rules are the rules that have legitimacy. Added to this confusion are conflicting understandings of the meaning of a salary supplement. While the Scandinavian working at the embassy understands the supplement as a gift that can potentially corrupt Ugandan institutions, for Ugandan scientist a supplement is a payment for scientific labor in a cultural economy that is simultaneously local and global, material and social.

***Infrastructural actants and their interpreters: houses and hotels***

Material actants can assume an important role in determining the scope and duration of international research and research training collaborations (Latour 2005). Scientific equipment and technologies are obvious examples of such vital actants, but less obvious infrastructures located beyond the laboratory and beyond the intuitive limits of the scientific field can also have determinacy for scientific collaborations. Amongst Ugandan-Scandinavian scientific collaborations, for example, one finds that private houses and hotels enter the universe of partnership both as multi-voiced speakers for specific constellations of economic relations, and as buffers to social and economic claims advanced by other human actors.

Ruth and Paul's countryside house (mentioned above) sheltered some of their savings from the claims of kin and colleagues, but in other instances such infrastructures worked against the interests of my research subjects. For Elijah and his colleagues in Kampala, a house-building project undermined their negotiations for a larger living allowance from the Scandinavian PhD programme in which they were enrolled. In the midst of negotiations, the Scandinavian partner visited Uganda and learned that one PhD student was away from the

office to oversee issues related to the building of a house. Elijah explained that

When [Ingrid] came from [Scandinavia], she went to my colleague's place. My colleague phoned [Ingrid] to say that she was busy building. Ingrid's impression was that it was Ingrid's money that my colleague was using [to build]. So Ingrid thought that the stipend was quite comfortable to live with. [Ingrid] really embarrassed my colleague saying that 'ahh, you are so comfortable. You are building.'

The renegotiation of the terms of the contract failed to produce any changes in the Ugandan scientists' stipends. From Elijah's perspective, the emergence of his colleague's house building project and the Scandinavian partner's interpretation of this as a sign of the generosity of the current terms of the contract were to blame. The material existence of a house construction and its incorporation into the existing Scandinavian-Ugandan research and research training collaboration introduced a new friction into an already uncomfortable actor-network. To the Scandinavian partner the house indicated the generosity of the PhD students' stipends. However, from the Ugandan perspective its emergence as an agent in the negotiations was only possible due to Ingrid's ignorance of local conditions and cultural economies. Or, in Elijah's words: "This showed me that these guys are disconnected from the life that we live here."

Hotels are another material infrastructure that are understood differently by different audiences, and thereby introduce friction into multinational research assemblages. For some Scandinavian donors it is difficult to justify why a meeting or workshop should take place at a private hotel, sometimes some distance from the home institutions of the scientists, instead of in one of the meeting rooms of the home institution. This is particularly poignant when Scandinavian and other development aid has been used to construct buildings on university and research institute campuses. Scandinavian partners are also conscious of the per diem and travel allowance envelopes collected by Ugandan scientists when they attend off-campus meetings.

Ugandan scientists experience the skepticism of Scandinavian partners as a suspicion of corruption based upon



a misunderstanding of local conditions. For Ugandan scientists, meetings in hotels are a strategy for creating time to concentrate on a particular task. By placing the workspace in a location where sheer distance and traffic congestion can be enrolled as an agent that wards off competing demands from one's boss, one's employees and students, as well as one's family and one's private business partners, a physical and temporal space is created where participants can concentrate upon the matters at hand. Here, the brown envelopes bearing small amounts of cash that change hands are understood from the researcher's perspective as legitimate contributions that offset some of the monetary and social costs associated with being away from the workplace, the family, and one's other income-generating enterprises.

### **Conclusions**

Ugandan scientists are often frustrated by what they perceive as Scandinavian partners' misreading of the meaning of salary top-ups, brown envelopes containing cash, workshops in hotels, and house building projects. In some circumstances, these are overcome through long-term collaborative relationships where counterparts acquire a greater depth of understanding of the cultural economies of science in Uganda (Zink, 2016). Oftentimes, however, overseas partners have limited experience of science in Uganda. In these cases, Ugandan scientists seek ways to discreetly solve the contradiction without creating friction. Patience, an agricultural scientist, explained that

The only way to make ends meet is a salary top-up and to get engaged in research. If you have to go to the field you can get a per diem, but you don't use it all in the field. You save a little bit to cover domestic expenses. That is how we really operate. A lot of these Nordic grants, they are difficult. They are difficult to get, and colleagues put a lot of effort into them but do not get enough out.

Patience's candid description offers an example of how Ugandan researchers are able, to a limited extent, to circumvent the taboos of Scandinavian cultural economies by moving per diem money intended for offsetting fieldwork costs into a private household economy. It also illustrates the continuing challenges to establish trust and transparency within international research collaborations.

As subjects of anthropological inquiry, Ugandan scientists reveal the continued existence of (sometimes painful) incompatibilities and inconsistencies amongst the enacted cultural economies that assemble Uganda, Scandinavia, and the scattered scientific infrastructures that dot the hills of Kampala and Entebbe. Moreover, despite the vast geographic distances that frequently separate collaborating actors in science, they are nevertheless frequently thrust into close proximity through their participation in economic, social and moral engagements that link Uganda and Scandinavia. The application of a cultural economy approach together with actor-network theory makes visible the overlapping and sometimes incompatible logics and frameworks for understanding economy that foster frictions and misunderstandings both at home and in international scientific research collaborations. These are illustrated by the contradictory meanings and physical conflicts spawned by research salaries and “top-ups” to local scientists. For some Scandinavian donors the latter introduces a third party’s gift (Mauss, 1990) that is morally questionable into a legitimate domestic labor contract. For Ugandan researchers, these are inadequate but nonetheless desirable compensations for their time and labor in an otherwise disfigured and inequitable post-colonial scientific economy that exceeds national boundaries. All the while, broad swathes of the Ugandan public wonder how a scientist earning fifteen times the salary of a police officer can be considered overpaid.

The actor-networks that compose scientific collaborations and enact cultural economies are further shaped by the agencies of the materials from which they are composed. Beyond the materiality of laboratories and scientific technology, Elijah, Paul and Ruth’s stories illustrate how scientists’ private homes can become key actants shaping cultural economies engaging both kin and scientific collaborators. In other instances, local scientists’ hotel-based workshops mobilize buildings and Cartesian space to create opportunities for concentrated scientific labor. Simultaneously these actions raise concerns of corruption amongst some Scandinavian sponsors. These practices, as they are linked to scientific labor, create opportunities as well as tensions amongst scientists, foreign partners, and local publics. They also illustrate the coproductivity of science with other social projects such as kinship (Jasanoff, 2004).

The findings offered here do not point to an easy solution for resolving the frictions and misunderstandings inherent to international research collaborations in developing countries, be they Scandinavian or otherwise. Nevertheless, the prospects for further decolonizing research and research training would be greater should donors explicitly employ models for understanding science economies that recognize and are critically reflective of the multiple meanings, moralities and patterns of economic activity. Such a model may seem risky and unwieldy to foreign actors that are more comfortable accounting for investments in science and science training with log frame summaries and other easily compared quantitative devices. However, continued failure to recognize simultaneous presence of Ugandan scientists and their scientific practices in multiple social and geographic contexts also erodes the conditions for equitable collaborations, and the pursuit scientific knowledge and technology goals that respond to Ugandan priorities.

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