The future sits in places: Electricity, value, and infrastructural triage in Tanzania

Kristin D. Phillips

Department of Anthropology, Emory University, Atlanta, GA 30322, USA
Corresponding author: Kristin D. Phillips; e-mail: kdphill@emory.edu

This article explores the shifting landscapes of light, labor, and value produced by the politics of electrification in Tanzania. Through engaging the anthropologies of infrastructure and electricity, it asks, how do people understand the relationship between electricity and value in the landscapes that sustain them? A brief outline of the history of electrification in Tanzania highlights its role in the production of place, and analysis of fieldwork with residents, leaders, and energy advocates between 2017 and 2020 reveals contemporary understandings of the relationship between electricity, value, and place. The article then chronicles recent government efforts to dramatically expand access to electricity, outlines the processes of selective grid expansion, and describes how people experience and understand its effects. I construct a theory of infrastructural triage to conceptualize the process of assigning degrees of urgency, priority, and value for developing infrastructure in particular spaces and for particular people and highlight its role in newly configuring the landscapes and timescapes in which people live and experience their everyday lives. In the process of enhancing the productivity and labor of some people but not others, electricity facilitates, obstructs, and marks flows of value across landscapes.

Keywords Electricity; Infrastructure; Energy; Landscape; Tanzania; Value

> Places possess a marked capacity for triggering acts of self-reflection, inspiring thoughts about who one presently is, or memories of who one used to be, or musings on who one might become. (Basso 1996, 107)

Since the turn of the millennium, substantial policy attention has turned to the energy inequalities that divide people across the globe. While megaprojects aiming to exponentially boost national energy supplies have tended to dominate media reports, international policies like the United Nations' Electricity for All program have also drawn attention to the less glamorous goal of electrification for the 1.2 billion people in the world who remain unconnected. In Tanzania, like in many postcolonial contexts where electricity development has historically privileged industry, big agriculture, and elite households, 62% of the total population (and 75% of the rural population) lives without connection to electricity (United Republic of Tanzania 2020). These mainly rural and peri-urban populations rely instead on biomass (charcoal, firewood, or animal dung), kerosene, and, increasingly, renewable energy technologies.

Historian Kate Showers (2011, 207) has referred to this uneven terrain of electricity access in many African contexts as "widely separated islands of Neo-European technological modernity [connected] over the heads of excluded African majorities." Indeed, in Tanzania, the national electricity grid often passes directly by villages to reach sites of industry and extraction (van der Straeten 2014). Where it does reach villages, connections are often to schools, shops, and other places of business, versus the domestic spaces of home, where the labor of poor people and women tends to be focused. It is important to note that unelectrified villages are *not* filled with people who have never seen or used electricity before. They *are* filled with people who have regularly traveled great distances and spent considerable time and money each week to meet essential electricity needs that they cannot meet in other ways. In Tanzania, electricity is often to be found "elsewhere"—in the city or a village here or there. It is often a

Figure 1 What about your promises? Cartoon by Daniel Mzena. From https://twitter.com/dannimzena1/status/715050765811859457.

destination to which one must travel, a chore to undertake, or an event to plan. For some, it is a pastime, an activity to be planned and anticipated. Young men may vanish from farming or afternoon chores to electrified places to play pool, listen to music, and drink a cold soda. Young women trek to electric mills in neighboring villages that not only liberate them from the backbreaking work of grinding grain but also allow them to socialize along the way. Electricity in Tanzania is intimately bound up with place, time, and sociality.

A cartoon from the Tanzanian daily *Mwananchi* highlights popular perceptions of the relationship between electricity, place, and value (Figure 1). It shows two village women joining forces to lower a girl into a water hole to draw water. One asks, "My child, is there even really a sign/smell of water?" Incongruously, grid electricity wires and a "clean safe water" pipeline pass next to the village but offer nothing to it, save a warning on the power lines that the wires are "dangerous." The village in the distance, marked by the wafting wood fire smoke that rises from it, remains unconnected to national infrastructures of power and water. These fuels of life and livelihood pass by with prominence and importance, traveling on to other landscapes of value. The cartoonist voices a question presumably from these women to the government: "What about your promises?"

The cartoon is a stylized account of a prevailing reality. In Tanzania, central hydropower sites send electricity via high-voltage transmission lines past innumerable unelectrified villages to Dar es Salaam, where it is sent back out through the national grid (van der Straeten 2014). The cartoon depicts how space molds the production of infrastructure and, in turn, how infrastructures imbue landscapes with value through direct impacts on labor and livelihood. In some places, people labor solely with the body, while in others, the outcomes of manual labor may be multiplied by the enhanced potentiality of electricity. Women—it is suggested—are disproportionately burdened by this disparity. The village landscape hosts developments (power columns and pipelines) that benefit outsiders, yet these seem to present only dangers or inconveniences. Pipes and wires are spectacles of modernity, suggesting the possibility of a healthier, more prosperous, less laborious future. The cartoon depicts disillusionment and even insult, a sense of the government's having rewarded good faith and political support with neglect and even betrayal. As Harvey, Jensen, and Morita (2017, 8, original emphasis) note, "rather than unmitigated *public* goods, different infrastructures turn out only to be good for some people some of the time."

In this article, I explore how people understand the relationship between electricity and value in the landscapes that sustain them. My fieldwork with residents, leaders, and energy advocates between 2017 and 2020 as well as ethnographic work in Tanzania since 2003 reveals the history and contemporary understandings of the relationship between electricity, value, and place. Through chronicling recent efforts to expand access to electricity and detailing

the processes of selective grid expansion, I craft a theory of *infrastructural triage* to conceptualize the process of assigning degrees of urgency, priority, and value for developing infrastructure in particular spaces and for particular people. This triage newly configures the landscapes and timescapes in which people live and experience their everyday lives. In the process of enhancing the productivity and labor of some people but not others, electricity facilitates, obstructs, and marks flows of value across landscapes.

Infrastructure, value, and place: Insights for the anthropology of electricity

Scholars working at the juncture of anthropology, the history of science, geography, and urban studies have increasingly drawn on the concept of infrastructure to theorize how constructed networks of goods, meanings, people, and capital structure and distribute value across space and time (Anand, Gupta, and Appel 2018; Harvey, Jensen, and Morita 2017; Hetherington 2019; Larkin 2013; Simone 2012). Studies of electricity, for example, have highlighted the profound effects of electric lighting on the configuration of daily life. These include its particular role in producing the norms and forms of families: the extension of domestic work and the school day and the expansion of markets for entertainment and social connection via radio, television, telephone, and internet connection (Gupta 2015; Nye 1990; Winther 2008; cf. Wilhite 2013). With a few notable exceptions, however (Dean 2020; Winther 2008), the anthropological study of electricity on the African continent has been most fruitful in the study of urban spaces (de Boeck 2011; Degani 2017a; Mains 2012, 2019; Simone 2004), where sharp inequalities invite analysis of the study of differential provisioning. But while it is clear why urban geographers and urban anthropologists have chosen to focus so much on city infrastructure and built environments, it is less clear why anthropologists of infrastructure and electricity have paid so little attention to rural ones.

Attention to economically peripheral geographies is particularly important for the ethnographic scholarship on energy transition that explores key energy questions facing the world at the height of anthropogenic climate change (cf. Boyer 2019; Degani, Chalfin, and Cross 2020; Günel 2019; Howe 2019). Built infrastructures tend to cluster and interweave, and many large-scale proposals for energy transition tend to assume an existing foundation of energy, education, housing, regulation, waste management, and transport infrastructures.[1] Planning new energy futures requires not simply studying people and places that networks reach and serve but also understanding the challenges where they do not, or where they do so indirectly, peripherally, or tangentially (see also Cross 2017).

I approach the study of electricity in such peripheries through theorizing its *value*, a concept that has driven anthropological research for well over a century (Graeber 2001; Gregory 1997; Weiss 1996, 2016; Werner and Bell 2003). In studying the value of electricity—as a commodity, a political project, a tool of self-making, even increasingly a right—I start from Clyde Kluckhohn's (1951, 395) classic definition of value as "conception[s] … of the desirable," that is, ideas about what people are thought to want in a given social field. The value of electricity in rural Tanzania not only encompasses calculations of perceived utility (as neoclassical economists would have it) or invested labor (as Marx might suggest) but also reflects meanings derived from the actions that constitute electricity's politics, production, use, spatialization, and spectacle.

This approach to value follows Nancy Munn's (1992) landmark study of value transformation in Papua New Guinea. For Munn, the lived world—including the kula exchange ring that has long fueled anthropological theorizing—is constructed by *action*, not things. She theorizes value as meanings derived from people's expectations of engaging in particular kinds of acts. Munn (1992, 9, original emphasis) argues that in Gawa,

> value may be characterized in terms of differential levels of *spatiotemporal transformation*—more specifically, in terms of an act's relative capacity to extend or expand … *intersubjective space time*—a space time of self-other relationships formed in and through acts and practices.

In Munn's theory of value, certain acts are anticipated to produce changes in the scale of intersubjective spacetime. For Munn, *potency* is the value of the spacetime extended or constricted through particular actions and is constituted *spatially* by connections between persons and places; *temporally* through acts of "remembering"; and *materially* by the qualities, conditions, potentialities, and constraints associated with the act. But the temporal construction of value is not only in relation to the *past*, through remembering, but in relation to the *future*, through anticipation. Understanding the value of electricity requires attending to the diverse ways people anticipate the spatial, temporal, and material effects of acting with, acting proximate to, and acting without electricity. That is, it requires attending not only to what it is like to have electricity but to what it is like *not to have* electricity or to be merely *proximate to* electricity, cast into even darker shadows by the immediacy of others' electric light.

Infrastructures like electricity are important sites for studying contestation, negotiation, and communication about the value of different places and the people and lifeways they embed. Anand, Gupta, and Appel (2018, 1) characterize infrastructure networks as essentially political: they are

> a terrain of power and contestation: To whom will resources be distributed and from whom will they be withdrawn? What will be public goods and what will be private commodities, and for whom? Which communities will be provisioned with resources for social and physical reproduction and which will not? Which communities will have to fight for the infrastructures necessary for physical and social reproduction?

Taken as historical artifacts, infrastructures offer what Anand, Gupta, and Appel (2018, 3) call "archaeologies of differential provisioning," and we can read infrastructures as evidence of outcomes of classifications, contestations, and assertions of value. Electricity not only generates and channels value that will produce future differentiations through the augmentation and enhancement of labor but also congeals and indexes valuations of people, labor, and place at a particular moment in time—a process I call *infrastructural triage*.

The term *triage* (derived from the French word *trier*—"to pick or cull") generally refers to categories and procedures for establishing priorities for treatment in medical settings (Redfield 2013), such as the seriousness of illness or injury, salvageability, or the greatest good for the greatest number. Such criteria privilege medical and philosophical categories over social ones like status or familiarity with the caregiver. Redfield observes that in contexts of abundance, triage is about primacy of treatment and assumes all will eventually receive care. In contexts of relative scarcity, however, it must be understood that triaging can imply *whether* one receives care. Thus, triage presumes an "imperative to choose" and, through explicit valuations of some criteria over others, "discriminates in the name of bodily egalitarianism" (Redfield 2013, 169). This notion of triage provides an apt metaphor for tracing the processes of selection, prioritization, and discrimination in the name of egalitarianism that, I show, have structured and legitimated the distribution of infrastructure investment—and specifically in electricity—in Tanzania. Put simply, electrical wiring and power poles land in direct relation to valuations, and these inscribe the landscape with goods, services, and meaning.

It is such triaged landscapes, in part, that *constitute* people, shaping who they are and what they do and feel (Tilley and Cameron-Daum 2017). Landscapes are not "a blank slate for conceptual or imaginative thought but a material form … that, through differential experience, is constitutive of different identities" (Tilley and Cameron-Daum 2017, 5). In his now-classic ethnography *Wisdom Sits in Places*, Basso (1996) referred to this co-constitution of people and place as *interanimation*. He wrote, "As places animate the ideas and feelings of persons who attend to them, these same ideas and feelings animate the places on which attention has been bestowed" (Basso 1996, 55). Senses of place are "the ways in which citizens of the earth constitute their landscapes, and take themselves to be connected to them" (Basso 1996, 54). In this relationship between people and place, Basso (1996, 56) argues, places speak to us, but (citing Sartre) express only what we enable them to say: places "provide points from which to look out on life, to grasp one's position in the order of things. … Their disembodied voices … are

merely those of people speaking silently to themselves … and on numerous occasions … of people speaking to each other." This notion of interanimation resonates with Munn's (1992, 11) argument that actions and value are "intersubjective"—that is, agents are not only producing the world through their acts but "producing themselves or aspects of themselves in the same process." My approach thus tacks between Basso's interanimation and Munn's intersubjectivity to explore the co-constitution of people, infrastructures, and places and the things and ideas we use to engage them. This research proposes the centrality of electricity—specifically, power lines, power poles, and the shifts in mobility, exchange, agency, and selfhood they prompt—to the construction and experience of value and place.

Reflections on method, site, and place

Alongside a decade and a half of research in a still unelectrified village in rural Singida in central Tanzania (Phillips 2009, 2010, 2018, 2020), I began conducting research on electrification and energy in Meru District outside the north central Tanzanian city of Arusha in 2017. Whereas my village research in Singida had offered me insights into the topography of electrification, labor, and mobility across relatively ethnically homogenous and largely kin-based settlements in the economic margins of Tanzania, peri-urban Meru offered different opportunities for inquiry. Specifically, it presented a field in which to investigate constructions of place and understandings of electricity in sites of greater economic diversity, geographic centrality, and relatively recent rural settlement—where authority is driven more by narratives of primacy than by autochthony; where experiences of landscape are tightly coupled with the political economy and competition for land; and where diverse histories, languages, and cultural heritages interact, interweave, and jostle for position.

The data for this article emerge primarily from research conducted between 2017 and 2020 in the foothills and plains south of Mount Meru and east of Arusha City (pop: 400,000) in Meru District (pop: 268,000 in 2012). Particular insight was gleaned from household and village leader interviews conducted in June and July 2019 in two rural villages of Kikwe Ward, Meru District. Kikwe Ward owes much of its settlement to its proximity to Arusha, which began in the British colonial period as a small military outpost squeezed among the resident Meru farming and Arusha pastoralist populations of Mount Meru and grew into a larger township with a considerable European settler population that forcibly displaced local residents. Other groups also streamed to its economic opportunities: Swahili and Asian traders from the coast and migrants from throughout northern and central Tanganyika drawn by its opportunities to meet taxation mandates through wage labor in industry and plantation farming. Today, Arusha is the third largest city in Tanzania, and since 1995, it has served as the site of the Rwanda genocide tribunals and the heart of international tourism to Mount Kilimanjaro and nearby wildlife parks. Arusha's economic diversity deeply conditions supply and demand in the city and, specifically, the political and economic circumstances of those seeking to live on subsistence-level incomes.

Kikwe Ward lies south of the Arusha-Moshi Road, which divides Kikwe from the base of Mount Meru. The land that constitutes Kikwe remained largely unsettled until the 1960s, when Meru people from the mountain descended onto the plains in search of more farmland and settlers "from outside" (i.e., other regions) migrated to the area for day labor opportunities at a nearby sugarcane factory. The rurality and lack of basic infrastructures for water and electricity in Kikwe Ward's four villages belie the cosmopolitanism of its residents today, who represent a broad mix of Tanzania's 110 ethnic language groups: Pare, Chagga, Sandawe, Rangi, Meru, Iramba, and Arusha, to name a few. Some residents have been around for generations longer than others, a status often marked by the centrality of their land to the economic heart of the villages. Homes are made of locally fired bricks with either thatched or sheet metal roofs (Figure 2) or "modern" cement brick houses with metal roofs. Residents farm and herd small livestock like goats and sheep, and some keep milk cows. Some men and women also sell their skills as masons, teachers, millers, shopkeepers, tailors, housekeepers, cooks, builders, and workers in the villages, at the neighboring Nelson Mandela

Figure 2 Unelectrified household in Meru. Photograph by the author.

African Institution of Science and Technology (a master's degree– and doctoral degree–granting institution), or in nearby settlements lining the Moshi-Arusha Road.

Geographer Yi-Fu Tuan ([1977] 2001) suggests three ways of accessing understandings of place: intimate knowledge (in the way that we know our home), navigation (in the way that a long-term resident can find their way in a place), and conceptual knowledge (as a geographer or anthropologist studies and produces abstractions of a place). The research that constitutes this article consists of the intimate knowledge acquired through living and working in dialogue with others in Meru in June and July 2019 as well as additional research visits to Arusha and Meru in 2017, 2018, and 2020.[2] This included twenty semistructured household interviews as well as twenty-one interviews with government officials, engineers, scholars, and advocates working on issues of energy and electrification in Meru, Arusha, and Dar es Salaam.[3] It is also informed by the navigational knowledge acquired through walking and talking in Kikwe villages with knowledgeable insiders, asking directions to meet my basic needs, traversing hamlets etched with irrigation channels, and walking along power lines and past them to the most peripheral homes. Finally, it derives historical depth and conceptual foundations from reading and discussing Tanzanian policy documents, Meru-based dissertations, historical sources, and expatriate archives. It is through this processual triad of lived experience, dialogical wayfinding, and engaging and producing abstractions that I render this particular Meru space as a place that holds meaning for many.

Valuing like a state: Rural electrification in historical perspective

How did the terrain of differential provisioning emerge in Tanzania? The first electricity applications arrived in colonial Tanganyika in 1908, just thirty years after Thomas Edison brought electric light to Manhattan. But the initial grid in Tanzania aimed only to power the colonial administration, railway workshops, extractive industries, plantation agriculture, and the residences of Europeans and some Asians. "Africans" in colonial Tanganyika, van der Straeten (2014, 275) notes, "were not considered eligible as customers nor thought to be able to pay for electricity." At independence in 1961, Tanganyika was producing a mere 50 megawatts (MWs) of electricity (low even for other sub-Saharan African countries at the time);[4] a few isolated grids had been built in the larger cities; and a low-voltage hydropower grid provided electricity to sisal plantations in the north.

In 1964, mainland Tanganyika united with island Zanzibar to form the contemporary nation-state of Tanzania. Under the banner of his vision for Tanzanian socialism (Ujamaa), President Julius K. Nyerere proposed electricity

as a key incentive to motivate rural people to participate in nation building through "villagization." Villagization aimed to render rural populations more legible and more productive by concentrating widely dispersed rural people into (still rural) centers to facilitate the delivery of important services like electricity, health care, and education (Schneider 2014; Scott 1998). Although the aspiration for this infrastructure succeeded in incentivizing people to relocate during villagization (and in rationalizing their forcible relocation when it did not), the provision of electricity did not turn out to be one of its outcomes. The big dam era under Nyerere did significantly increase hydropower production to 430 MWs, but electricity remained inaccessible to most Tanzanians. Nevertheless, electricity today remains a highly potent political technology in Tanzania with deeply spatial connotations, economic ramifications, and historical significance.

Tanzania's national electric grid continues to rely primarily on seasonally variable hydropower and, to a lesser degree, petroleum. Even in the nation's capital, electricity supply has been marked by frequent blackouts and unreliable access. Until only recently, the Tanzanian government has directed its electricity policies toward increasing the reliability of electricity for industry, business, and privileged urban residential areas, rather than toward a substantial expansion of the national grid. This strategy left nonelite urban residents, wealthy rural households, and the vast majority of the country's population that lives below the poverty level all struggling to meet individually their diverse energy needs.[5] Moreover, national electricity policy and expansion in Tanzania have been severely incapacitated by decades of mismanagement, during which the parastatal agency charged with electricity production and distribution—the Tanzania National Electric Supply Company (TANESCO)—has found itself bound to excessively overpriced power production agreements (Cooksey 2017; Degani 2017b).[6] In the context of such challenges, grid expansion to rural areas has, until only recently, remained low on the list of national electricity priorities.

But the 2010 discovery of significant offshore natural gas reserves in southern Tanzania has set in motion a seismic shift in the landscape of energy and electricity policy. Through its regional power-sharing agreements, the government now plans Tanzania to be a net *exporter* of electricity in East Africa, even as three-quarters of Tanzanians remain entirely unconnected, prompting backlash and popular demands (Phillips 2014) and threatening the ruling party's precarious but tenacious hold on Tanzanian electoral politics since independence in 1961. The production of a flurry of energy and electrification policies has been the result, to the extent that in 2015, Tanzanian politics blogger Ben Taylor questioned if the 2015 presidential election debates "might be summed up in a single issue": electricity.[7] Following these elections, the late President Magufuli, known widely as "the bulldozer" for his aggressive politics, ushered in an era of ambitious electricity policy as part of his plans to make Tanzania a middle-income country by 2025.[8]

The landscape of electricity provision is changing with an influx of government resources for rural electrification through the Rural Energy Agency (REA). Most Tanzanians differentiate between TANESCO electricity and REA electricity, and this distinction appears in much of the commentary that follows. TANESCO was founded in 1931, and it generates, purchases, transmits, and sells electricity. Since 1975, the government has been the sole shareholder of TANESCO, and the power sector in Tanzania is vertically integrated, that is, run by a national utility that owns the power plants and transmission and distribution lines and delivers electricity services. Until 2008, it even held a monopoly as the only entity that could legally produce energy. Today, TANESCO remains the main company that owns and operates downstream power sector infrastructure and remains the single buyer of electricity in Tanzania, meaning that if you produce your own energy, you may only sell it to TANESCO.

A TANESCO connection requires paying the per-meter extension fee, plus a connection fee and the cost of the meter, so grid extension has always been directly tied to the politics of place. TANESCO grid expansion has tended to follow the money but has rendered even wealthier households that lie distant from the main power lines unable to connect. In response to these electric politics of place, the REA was established under the Ministry of Energy in 2007 to provide an alternate pathway for electrification with distinct funding and pricing to promote

electrification in rural areas, which were otherwise considered "uneconomic" (electrification's triage equivalent to medically "unsalvageable"). REA has funding from the Tanzanian government as well as other partners like the World Bank and the Swedish government. REA has opened up the opportunity for electrification in rural areas with its more accessible connection fees and lower tariffs.

But REA electrification has never promised universal electricity coverage, though it is often referenced as though it does. Tanzania's 2014 National Electrification Program Prospectus laid out the government's bold (but qualified) plans for rural electrification through four successive phases between 2013 and 2022. Through spatial analysis, the government ranked villages for priority for electrification based on their "socioeconomic development potential." In total, about 12,248 settlements (i.e., villages) were evaluated and assigned an index using three criteria—education, health and social welfare, and local economy. The top 10% of settlements (totaling 1,192) according to this index were named "Development Centres," and those that were not already electrified (totaling 693) were initially prioritized for electrification. Four phases of electrification were then planned: Phase I would extend the megavolt backbone line to an initial fifteen hundred settlements; Phase II would electrify settlements within ten kilometers of the backbone line; Phase III would electrify settlements within forty kilometers of the (now extended) backbone line with feeder lines; and Phase IV would connect settlements within ten kilometers of the feeder lines constructed in Phase III. In all, the policy would add 5,526 settlements to the grid, boosting the percentage of electrified settlements from 19.5% to 64%.

The principles of this infrastructural triage by the Tanzanian government center on the much-debated neoliberal values of economic productivity and efficiency. It classifies economic spaces according to their likelihood of multiplying investment, with the implication that such an approach will hold direct benefits for the few but indirect benefits for the many. It is important to note that regardless of the focus on productive consumers of electricity, even this limited government investment in grid expansion comes as a huge net outlay and falls into the category of "social spending," not a profit-oriented investment. In any case, the spatial logic of subsequent phases proceeds from the initial classification of these promising hubs, with electrical lines increasingly extended into nearby lower-order settlements. As Bowker and Star (1999, 3) have noted, "the material force of categories appears always and instantly." From some perspectives (particularly from the private renewable energy industry), this triage might be considered essentially predatory (in the context of rural electrification in the United States, such lines were called "snake lines") because the most lucrative potential business is picked off by the government, an outcome that generally forecloses the opportunity to privately develop markets on an area basis (Cooke, cited in Nye 1990, 303). This mode of triaging potential electricity consumers renders it difficult to imagine that those left out now will ever be connected.

Regardless, the program has by all accounts been widely successful at extending power lines to connect more settlements (Figure 3). And power poles, like many infrastructures, have become spectacles (Dalakoglou 2010) and even fetishes (Namba 2016) of state efficacy and power in the highly charged multiparty politics of Tanzania. In early 2020, the government daily newspaper the *Daily News* reported that Tanzania's minister of energy had claimed the country's achievement of electricity access for over 70% of the population (*Tanzania Daily News* 2020). But it is critical to note the difference between what the government counts as "access to electricity" and the actual electricity connection to which most Tanzanians aspire. Electricity *access* is counted as grid connection to any part of a settlement, usually the school, the clinic, and households of key businesses or political figures. Electricity *connection* is connection to the main household dwelling (United Republic of Tanzania 2017, 2020). Even today, after the first two waves of rural electrification, less than 25% of rural households are connected. In what follows, I offer insight into the process of selective grid expansion, rural Tanzanians' experiences of it, their aspirations for electricity, and its ongoing impacts on the production of place and people.

Figure 3 Power poles in recently electrified village in Meru. Photograph by the author.

Power, poles, and place: Electricity and infrastructural triage in Meru District

"People call this area 'the end of the village.' We like to say that it's 'the beginning' of it." Lukas delivered this comment in 2019 with a wry edge. We were seated outside, his toddler son on his lap, in his modest homestead courtyard (interview, July 1, 2019, Kikwe Ward). Lukas was the appointed livestock officer of this Meru District village. Having moved to the growing village only in the last five years, he and his wife had been allocated a plot of land on the village outskirts. His compound, though small, stood cluttered with the markings of sure ambition: the brick outline of a larger house that he would complete as he was able to pay to fire more bricks, a fluttering of chickens that he bred to sell meat and eggs, a couple small solar panels that supported lights and a bit of phone charging, and a fenced courtyard that kept chickens in and strangers out. Lukas was referring to the electric grid, newly extended into this village, but still far from his own homestead. He elaborated, "We have no electricity. REA is not coming." Lukas and his neighbor Thomas stood out from the interviews I was conducting in the four-village ward for their flat acceptance that the electric grid would never reach their own households.

Lukas and his wife's basic energy needs, living as they do without electricity, are limited but urgent. They need access to a gas- or electricity-powered mill to grind their maize. They need cooking fuel (firewood or charcoal) for the two meals a day of *ugali* (maize meal porridge), bananas, beans, and meat that they cook. And they need kerosene or solar panels for lighting at night. Additionally, Lukas's work as the village livestock officer requires that he be reached quickly, and so he needs to charge his phone. Lukas emphasized how much a lack of electricity affects his time, labor, and finances. The cattle vaccinations central to his work require refrigeration, and so most days he must travel to the next large town, Tengeru, by minibus to pick up the vaccinations he needs for the day's work, and he pays for that transportation out of his own meager salary. Beyond basic needs, Lukas aspires to own a television and an electrically charged radio.

REA brought electricity to Lukas's village in 2016. To get electricity, residents within thirty meters of planned power poles were permitted to come to the village office and submit a request form with a meter deposit of 27,000 shillings (less than US$12)—a marked discount compared with the 350,000 shilling (US$150) deposit usually required for a TANESCO meter deposit. Although REA promised connections to everyone who paid the fee, in the end, it only connected half: thirty households in total. Officials explained that the number of *nguzo* (power

columns) they had been promised had not arrived. Affected residents noted also that power poles planned in some parts of the village had been reallocated to other parts.

Mzee Matayo and his wife, Katarina, represent one of the fortunate households to benefit from REA electrification. Matayo is retired from teaching at a nearby government high school. Their house is of a "modern" construction, with painted cement walls, a solid metal roof, and cushioned wood living room furniture. With electricity, they power lights, a DVD player, phone charging, a refrigerator, and a radio. Prior to electrification, the family used solar panels for basic energy needs, and they continue to keep them on hand for when electricity cuts out. Despite its inconsistency, Mzee Matayo prefers grid electricity because it is cheap and powerful energy. It requires no specialized appliances and does not face the same capacity issues as solar (such as being unable to run a refrigerator). Mzee Matayo is quietly apologetic about his electrification success, indirectly acknowledging the tensions of the uneven electricity landscape and noting his attempts to distribute the benefits of electrification by charging his neighbors' phones: "We help each other. But it would have been better if everyone had gotten [electricity]" (*Tunasaidiana. Lakini ingefaa kama kila mtu angepata*) (interview, June 26, 2019, Kikwe Ward).

Jonathan, the elected (and volunteer) head of a village hamlet with whom I spent the afternoon in one village, narrowly missed having his home electrified. He is a trained mason who makes a living in construction. He shares his neat, modern brick house with his wife and three children, and they deploy three small solar panels to light the kitchen and living room and to power one outdoor security light. As a mason, Jonathan was able to construct his own household biogas digester to fuel cooking with the decomposed manure of cattle (cf. Phillips 2021). But the family has other energy needs that are not being met. Jonathan related, "Electricity stopped before it arrived at my house. In the original plan, it was supposed to be there, but then when they came back a second time, we learned it was not going to reach us" (interview, June 26, 2019, Kikwe Ward). He complained that even if he wanted to pay the non-REA connection fee through TANESCO (including the 350,000 shilling deposit and the per-meter wiring fee), "you can't even get TANESCO now. TANESCO won't come until REA has finished its work." One of Jonathan's neighbors, an older woman, complained, "Electricity was for the benefit of a few people. It's even harder to get electricity now. The poles just aren't there" (interview, June 26, 2019, Kikwe Ward).

These limited supplies of connection material have left many of Meru's residents with a sense that achieving connection is either random luck or politically driven. I heard over and over again that "people got connections by preference [*kwa upendeleo*]" (household interviews, June and July 2019, Kikwe Ward). One man whose household had been included in the implemented plans noted, "REA is bringing electricity to rural areas. They are definitely achieving something. Yet you will find that some of the connections are political. A minister will influence the lines to certain places" (interview, June 26, 2019, Kikwe Ward). The constraints and operationalization of this electrical triage are part of a longer history and context of political favoritism and disfavoring in Tanzania (Green 2014; Kelsall 2000; Makulilo 2012).

Village leaders kept pressing district officials about the change in plans and failed promises. Jonathan described the highly performative visit of a key Meru official who came to the village to respond to incessant complaints. During his visit, the official demonstrated outrage on behalf of the village population and made a big show of calling "the head of REA" directly on his cell phone in front of the audience to demand immediate action. People applauded and cheered, with hope restored as to the fulfillment of the original plan. "But to this day," Jonathan shook his head, "no one has shown up" (interview, July 1, Kikwe Ward).

Some folks were holding out that while they may not have been included in the first phase of plans, subsequent plans would bring a change of fortune. "Electricity is not yet reaching with Phase I. But they say it will arrive with Phase II" (interview, June 27, 2019, Kikwe Ward). William, the Tanzanian director of one of the international energy advocacy organizations with whom I spoke, explained some of what happens behind the scenes:

TANESCO has their Master Plan: first we will serve Village A, then Village B, then Village Z. During implementation, many things change. Politics intervenes. Places that have elected opposition parties will be deprioritized. Or, this or that minister will have their home village newly prioritized. (interview, June 25, 2019, Arusha City)

This change in plans impacts not only the affected households but also private-sector investors in renewable energy technologies who may base their own energy development plans on the places that lie low on TANESCO's list. For example, William observed, "The private [solar energy] sector decides to develop Village Z [with solar minigrids], because the Master plan says it will not have energy for five years. But then the government swoops in and installs grid electricity there." When I asked if he saw such pivoting in planning as predatory, he replied, "Not all. The government *needs* the private sector. What is going on here is politics. And the users prefer grid electricity."

What is important to note here is the importance of the dimensions of time and space in the politics of infrastructure. As Anand, Gupta, and Appel (2018, 17–18) write,

the relationship between having pipes and having water is always up for grabs, and it can swing one way or the other depending on the social and political climate. … Many projects do not work out as planned because, as they are implemented, social and political pressures force alterations in their design and in their function.

The principles of infrastructural triage that drive governments' initial planning for grid expansion are not necessarily the principles applied to actually place poles months down the line when implementation occurs, particularly in the face of disappearing connection supplies. At the level of household connection, social and political influence come to dominate. It is the very function of infrastructures' planning, production, and maintenance over time and across geographical space that renders their effects uncertain.

Electricity and the landscape of value

How do people construe the value of electricity in this uneven and triaged electrical landscape? I take here the value of electricity to be the meanings derived from people's expectations of connecting their households to the grid, of gaining easier access to its services, and of bestowing its utility upon others. These actions are valuable to the extent that they prompt "potent" spatiotemporal transformations, that is, to the extent that they "create potentialities for constructing a present that is experienced as pointing forward to later desired acts of material returns" (Munn 1992, 11).

In Meru, those people whose homes were connected during the rural electrification scheme directly observed the most immediate benefits. They saved time and money that could now be directed to other purposes. For people in Meru, grid electricity is cheap energy, even if its hydro- and coal-fired labor is displaced onto other places and bodies. One can squeeze about eight days of electricity for basic energy needs (including light, radio, television) out of a REA voucher equivalent to US$0.43. This replaces the need to purchase lamp kerosene or flashlight batteries. Grid electricity also transforms the structure of time by lengthening hours of light, thus prolonging the workday and enabling children's evening study. It opens up hours previously dedicated to procuring power outside the home. As one gentleman put it, "electricity comes and finds you at home" (*Umeme unakukuta nyumbani*) (interview, June 26, 2019, Kikwe Ward). He elaborated, "Electricity comes to you. You don't have to go to electricity. It's not like lamp kerosene that you have to go and purchase."

Small solar panels also provide power for many in this community, including households recently electrified. People generally reported that they continued to use the panels for small energy needs but that they needed and wanted grid electricity to power larger appliances like televisions and refrigerators (Figure 4). Everyone I spoke to insisted that solar remained most essential as a backup, given frequent grid outages that sometimes lasted days on end.

Figure 4 Electrical appliances in a newly electrified home in Meru. Photograph by the author.

For many people in rural and peri-urban Meru with and without household connections, the value of electricity can be summed up as a transformation in the time and place of light. One elder woman looked at me like I was crazy when I asked her why she wanted electricity: "*Kazi ya umeme si mwanga tu*?" (Isn't the whole point of electricity to get light?) (interview, June 29, Kikwe Ward). Electric light recreates the space of households, facilitating housework in homes with minimal windows.[9] It extends the day to allow children to study in the evenings, after they finish daily chores of fetching water, helping to cook, or assisting with agricultural labor. Indoor and outdoor lighting can enhance both sociality and security, reconfiguring the use of space, creating places where people gather. The light wards off thieves as well as — one elder couple laughingly asserted — "witches" (*wachawi*), who fear being spotted and identified in the light (interview, July 1, 2019, Kikwe Ward).

The value of electric light is both material and symbolic in Meru. Light has long been part of a political and spiritual discourse of development, enlightenment, and religious conversion in Tanzania. Each year since independence in 1961, the Mwenge wa Uhuru (Torch of Freedom) is "raced" across Tanzania to highlight accomplishments in development. On its journey, it passes through each region in Tanzania to symbolize freedom and light, bringing "hope where there is despair, love where there is enmity, and respect where there is hatred" (Consulate of the United Republic of Tanzania 2015). In narrating histories of development, education, and technological advancement, Tanzanians will often speak in terms of darkness and light: *tulikuwa tumekaa kwenye giza* (we were living in the dark) or *tumepata mwanga kidogo* (we got a bit of light). Living in the light is often associated with embracing modernity, schooling, gender equality, or Christianity.

So light is important to people — for economic development, physical security, daily comfort, and social symbolism. But the centrality of light in poor populations' valuations of electricity is bemoaned by TANESCO and off-grid energy entrepreneurs, who hope to create more viable energy markets through increasing demand and diversifying the use of electricity. Many of these advocates acknowledge that electric light is the first step to building such markets. According to Nye (1990, 264), "a GE manager [in the United States] once called electric light the 'entering wedge that made possible all further sales.'" In Tanzania, too, the government, nongovernmental organizations (NGOs), and start-ups understand a demand for light as the first crucial step to developing national consumption and viable markets. Such groups are also thus engaged in targeted initiatives to increase "the productive

use of energy" in rural places in an effort to ride the initial momentum of demand introduced by electric light (solar company, interview, March 20, 2018, Arusha City).

Even though not everyone is connected to the new electricity wiring, nearly all people with whom I spoke did experience a palpable reorientation to place and, to varying extents, improvement in the conditions of their lives following REA grid expansion. Their worlds became simultaneously wider—with expanded horizons of communication, consumption, and ideas—and more localized, as they were able to meet the demands of their everyday lives closer to home. When services and goods procured in town could now be purchased locally, people could direct their time and labor to other ends besides travel. Many noted expanded access to desired goods and services. Some stores now had refrigeration, and so new products could be sold and consumed. The new electric mill offered cheaper prices for daily grinding needs than the diesel-fueled mill they had used previously.

Most people with whom I spoke emphasized electricity as a *means* through which they could pursue valued ends. They generally spoke of what they wanted to *do* with electricity (open a business, buy a television) but also who they wanted to *be* (a businessperson, a salon owner, a faster tailor). As Nye (1990, 390) has argued, "people do not merely use electricity. Rather the self and the electrified world have intertwined." With electricity, the village could host its own welding shop and other workshops enabling construction, and young men were aspiring to these village trades. A number of women enthusiastically noted the closer presence of hair salons—places they could get their hair blown out and stay connected with urban styles. People certainly associated electricity with economic opportunity, new forms of consumption, and elevated livelihoods. Several women indicated that they would purchase a refrigerator so they could sell juice and yogurt. Others wanted to become providers of electricity, charging phones, laptops, or other battery-operated devices. The more direct one's access to electricity was, the brighter one's material future seemed to shine.

In this way, the meanings associated with electricity constitute *narratives* about the relationship between electricity and the people, times, and places it illuminates. Penny Harvey (2018, 80), in her research on roads, argues that infrastructure projects are configured in relation to "modern understandings of the future, as a time/space of potentiality for change and improvement." Infrastructures, she writes, are "'future oriented' and 'future positive'" (Harvey 2018, 82). But such infrastructures also configure a *terrain* of temporality that marks some places and people as future bearing, while others are cast in shadows of the past or in a present of stasis. Electrified hubs in Meru either had been or soon became social, economic, and political centers. There is a cumulative effect of electricity that draws resources over time, almost as a magnet. Schools and businesses are built where there is electricity; educated outsiders who come to provide medical or technical services will want to live with electricity; land comes to have more value, and there are more opportunities to run businesses or lease housing or shop space. Electrified spaces are thus understood to be aspirational and future-positive places that promise better days ahead. People also viewed electricity as constituting an axis of inclusion and exclusion. Those with electricity tended to find themselves in a hub of resource provision (like phone charging for family and friends) and thus also social interaction. Many hosted gatherings to watch television or enjoy a well-lit evening of radio, storytelling, or conversation. At the other end of this axis, some felt left in the shadows. As Harvey, Jensen, and Morita (2017, 12) note, "the very act of creating zones of visibility and intervention also generates areas of opaqueness." For Lukas, the peripheral location of his home positioned him not only in space but also in time. While Lukas still strives toward a more positive future, he views it as further away and markedly less positive than the people and places the grid has already illuminated. The future, in Meru, sits in electrified places.

Conclusion

Masoud Kipanya, a well-known cartoonist for the Tanzanian daily *Mwananchi*, published a political cartoon in June 2019 that shows several thatched-roof houses sitting alongside—but unconnected to—high-voltage wires

Figure 5 Cartoon by Masoud Kipanya, June 1, 2019. Reprinted with permission. From https://twitter.com/masoudkipanya/status/1134727747794812928.

(Figure 5). From one of the houses emerge snatches of a phone conversation: "Hello, my child. How are things in the city? And we are happy here, electricity has passed by our village." The cartoon captures a number of themes that have emerged in this article. Like the earlier cartoon, it points to the inequality, and at times the insult, of the triage of electricity resources in Tanzania. Space and distance are clearly not the only issues that have determined access and connection; rather, we might presume that the economic and social positioning of this community has limited its ability to secure scarce resources. But this cartoon captures and comments on something more, even if with tongue in cheek, that is, that proximity — and not just connection — also matters to people. The future-positive spectacle of electricity constitutes a sense of place, purpose, and promise for those who labor alongside it. It signals a becoming that very much aligns with the ideologies of development that sustain people through lives of hardship and the politics of inequality. I am making the case not that the spectacle alone is *good* for people but rather that it *signifies* — it means something to them.

In addition to blurring the binary between having and not having electricity, I have shown that people construct electricity's value spatially, temporally, and materially, in relation not only to a *remembered past* but also to an *anticipated future*. They live and experience value in relation to perceptions of time and senses of place, discourses that fuel and fan electricity's politics as well as shifts in mobility, exchange, agency, and selfhood. Yet this value is not a durable structure; rather, it is produced, experienced, and engaged by people and their actions.

Finally, the main material effect of recent grid expansion has been to reshape the *terrain* of labor and expectation and the social networks in which they are embedded. Rural electrification has rechanneled and shortened existing physical routes and rendered more proximate social pathways to electricity. In the process, new hubs of light and livelihood have materialized. But alongside these centers, new peripheries also emerge, cast in darker shadows than before. Futures are brighter in electrified places, not only because they are now well illuminated, but because people understand that infrastructure begets infrastructure, as capital begets capital, while "uneconomic" areas that lack infrastructure tend to remain unbuilt. This reality points to the long-term implications of short-term priorities for electrification and the significance of infrastructural triage in contexts of scarcity. Electrification policies *imply* that what is at stake in such triage is the question of *primacy* (who will get electricity first?) — that all will eventually have their turn. But with rural electrification essentially picking off the most economically productive spaces and

households, prospects for the future development of less "salvageable" places by the public or private sector remain dim. Taking the long view, the premises of this triage feel more ominous. Understanding the long-term constraints of, and constraints on, under- and unserved areas needs to be centered in the process of imagining and realizing sustainable and just energy futures.

Acknowledgments

Notes

1 Important exceptions can be found in Adunbi (2020), Chalfin (2014, 2020), Cross (2020), Dean (2020), and Doughty (2020).

2 I conducted all household interviews in KiSwahili. Translations from Swahili into English are my own. In this article, I provide the original KiSwahili for particularly apt quotes. Interviews with government officials, engineers, scholars, and advocates were conducted in a mix of English and KiSwahili.

3 Tanzania's vibrant civil society includes a number of nonprofit organizations that promote energy access and the development of renewable energy technologies and markets. These include Tanzanian NGOs, international organizations, and energy trade associations.

4 As an approximate reference, 50 MW today could power a city of 1 million people located in sub-Saharan Africa (where energy consumption remains relatively low). The same size city in a highly industrialized country with high energy consumption (such as the United States or Australia) would require 1,500 MW. Today, Tanzania's national electrical capacity is 1,500 MW. The United States' capacity is 1.22 million MW.

5 This is not to suggest that "rural development" has not been of interest to Tanzanian leaders; rather, efforts to improve well-being in rural places have tended to focus on expanding education and health care, improving smallholder agriculture, and building roads.

6 The agreements themselves have been mired in scandal, with high-level Tanzanian officials charged with corruption in 2017.

7 Taylor (2015) highlighted the centrality of electricity as an electoral issue across political parties, despite a failure by all to engage the issue with any depth and a propensity to make unrealistic promises in the face of political pressure.

8 In 2021, President John Magufuli passed away suddenly at the age of sixty-one. He has been succeeded by Tanzania's first female president: Samia Suluhu Hassan. It remains unclear how this leadership transition, and the ongoing COVID-19 crisis, will impact electricity policy in Tanzania.

9 Tanja Winther's 2008 ethnography *The Impact of Electricity* beautifully documents the gendered nature of these shifting dynamics in island Zanzibar.

References

Adunbi, Omolade. 2020. "Crafting Spaces of Value: Infrastructure, Technologies of Extraction and Contested Oil in Nigeria." *Cambridge Journal of Anthropology* 38(2): 38−52.

Anand, Nikhil, Akhil Gupta, and Hannah Appel, eds. 2018. *The Promise of Infrastructure*. Durham, NC: Duke University Press.

Basso, Keith H. 1996. "Wisdom Sits in Places: Notes on a Western Apache Landscape." In *Senses of Place*, edited by Steven Feld and Keith H. Basso, 53−90. Santa Fe, NM: School of American Research.

Bowker, Geoffrey, and Susan Leigh Star. 1999. *Sorting Things Out: Classification and Its Consequences*. Boston: MIT Press.

Boyer, Dominic. 2019. *Energopolitics: Wind and Power in the Anthropocene*. Durham, NC: Duke University Press.

Chalfin, Brenda. 2014. "Public Things, Excremental Politics, and the Infrastructure of Bare Life in Ghana's City of Tema." *American Ethnologist* 41(1): 92−109.

———. 2020. "Experiments in Excreta to Energy: Sustainability Science and Bio-Necro Collaboration in Urban Ghana." *Cambridge Journal of Anthropology* 38(2): 88−104.

Consulate of the United Republic of Tanzania. 2015. *Symbols*. Dar es Salaam: Consulate of the United Republic of Tanzania. http://www.tanzaniaconsul.com/symbols.html.

Tuan, Yi-Fu. (1977) 2001. *Space and Place: The Perspective of Experience*. Minneapolis: University of Minnesota Press.

United Republic of Tanzania. 2014. *National Electrification Program Prospectus.* Dar es Salaam: United Republic of Tanzania.

———. 2017. *Energy Access Situation Report, 2016: Tanzania Mainland*. Dar es Salaam: United Republic of Tanzania.

———. 2020. *Energy Access and Use Situation Survey II in Mainland Tanzania, 2019/20: Summary of Key Findings.* Edited by National Bureau of Statistics and the Rural Energy Agency. Dar es Salaam: United Republic of Tanzania.

van der Straeten, Jonas. 2014. "Legacies of a Past Modernism: Discourses of Development and the Shaping of Centralized Electricity Infrastructures in Late- and Postcolonial Tanzania." In *International Symposium for Next Generation Infrastructure: Conference Proceedings*, edited by Tom Dolan and Brian Collins, 275–80. London: UCL Department of Science, Technology, Engineering and Public Policy.

Weiss, Brad. 1996. *The Making and Unmaking of the Haya Lived World: Consumption, Commoditization, and Everyday Practice.* Durham, NC: Duke University Press.

———. 2016. *Real Pigs: Shifting Values in the Field of Local Pork*. Durham, NC: Duke University Press.

Werner, Cynthia, and Duran Bell. 2003. *Values and Valuables: From the Sacred to the Symbolic*. Lanham, MD: AltaMira Press.

Wilhite, Harold. 2013. "Energy Consumption as Cultural Practice: Implications for the Theory and Policy of Sustainable Energy Use." In *Cultures of Energy: Power, Practices, Technologies*, edited by Sarah Strauss, Stephanie Rupp, and Thomas Love, 60–72. New York: Routledge.

Winther, Tanja. 2008. *The Impact of Electricity: Development, Desires, Dilemmas*. New York: Berghahn Books.