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Anticipatory infrastructural practices: The coming of electricity in rural Kenya

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ABSTRACT

This paper explores how the extension of the national electricity grid in a village in rural Kenya affects households' energy using practices. Based on ethnographic research, this paper examines how people act while anticipating electricity as well as what energy practices emerge as part of life with a partial presence of electricity infrastructure.

Drawing on anthropological infrastructure studies and STS, the paper suggests members of a community participate in the formation of an electricity infrastructure through their preparatory practices. The making of electricity infrastructures through anticipatory actions has not yet been subject to research, but as the article argues, it is precisely by acquiring competences like stacking of resources or adjusting to breakdowns and volatile electricity prices that energy infrastructures are composed. The paper further argues that certain *objects of anticipation* allow for making preparations in relation to uncertain electric and political futures.

By leveraging the notion of *anticipatory infrastructural practices* the main contribution of this article is to enrich the understanding of participatory politics to also encompass mundane actions related to energy distribution and use. This is relevant in anticipation of a future where a dramatically higher number of people will become grid connected.

1. Introduction

Striving towards achieving universal access to modern energy services dominates international as well as national political agendas, as combating energy poverty is seen as a main entry point to realise UN's Sustainable Development Goals [1]. Providing electricity is an essential part of the Development Goals, as around 1 billion people, most of them living in rural communities, are not connected to an electricity grid, and another 1 billion people have access to only poorly functioning and unreliable electricity networks [2]. Though there is a huge demand for electricity by citizens in the global South and intense focus by the international community in providing it, few social scientific contributions address the implications of universal electrification processes [3]. Problematizing the notion of 'universal access' this article offers an analysis of the coming of electricity in rural Kenya. Through an ethnographic account of a varied set of responses to a partial presence of electricity infrastructure the article reveals a need to develop policy which is attentive to the challenges and ambiguities that exist around electricity provision and use.

Countering the energy challenge, increasingly many electrification

projects in Sub Saharan Africa have seen the light of day. In Kenya, the national electricity grid is expanding remarkably. The government-led national electrification programmes, which are carried out by Kenya Power¹ who owns and operates the electricity transmission and electricity system in Kenya, had connected 63% (5.9 million) of the Kenyan people in 2017, which is a substantial increase from 1 million people in 2010 [4]. With the Rural Electrification Programme² a part of the government's plans is to connect isolated, rural households. In 2014 only 12.6% of the rural population had grid access [6] making it the biggest group without connection [5]. The programme encompasses mainly initiatives to expand the national electricity grid, but also smaller decentralised grids run by diesel generators have been implemented as part of bringing electricity to remote communities [7,8].

Alongside government initiatives to accelerate rural electrification, NGOs and research institutions have for years worked to increase energy access in rural areas by implementing alternatives to centralised energy distribution. Among these alternatives, solar energy appears as one of the most prominent. Energy kiosks, mini grids and solar home systems have been developed, tested and installed to electrify areas beyond grid reach [7,9], and especially solar PV lanterns, as a smaller

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¹ The Kenyan Government has a controlling stake with 50.1% of the shares of Kenya Power, and 49.9% is owned by private shareholders.

² See also The Rural Electrification Authority <http://www.rea.co.ke>.

and more affordable solar product, have become a significant part of providing light in rural Kenya [7].

In short, electricity – coming from either the grid or solar – is spreading and access to electricity does no longer *solely* manifest itself as vague promises of a distant future. These developments in the Kenyan energy sector set the stage for this article's exploration of the anticipatory practices that are wired up with the coming electricity in rural Kenya. While different sources of electricity are becoming available we focus specifically on the expansion of the electricity grid and how it unfolds on ground. We take our point of departure in the village of Rafiki and focus on the practices that emerge as electricity becomes increasingly visible in the landscape. We meet villagers who hope for a future with electricity access and live in strong anticipation of the coming of electricity; planning, preparing and plotting their way towards a grid connection. We explore community responses to electricity's coming and once the connection is obtained; the anxieties and daily work-arounds and practices of composing an energy infrastructure with concern for both finances and traditions while dealing with an imperfect, yet ever expanding, infrastructure. As this article will illustrate, getting electricity access is not a straightforward process and neither is it straightforward to stay connected. Becoming and being an electricity consumer in Rafiki entails active engagement and extensive knowledge of resources to make an energy supply stable enough for everyday use.

During the previous two decades energy scholars have been pre-occupied opening the black box of invisible energy infrastructures which reside in the background of everyday life. These studies are contextualized in energy infrastructures in industrialized countries, where electricity supply is stable, reliable and affordable (to many). The consequences of yearlong dependency on grid electricity have been studied thoroughly but only few contributions address the ongoing global extension of electricity [10], which will have unknown but widespread effects. Thus, there is a need to anthropologically address the implications of the discourse and practice of electrification [10]. Akhil Gupta, for instance, argues that social scientists especially need to focus on electricity in the global South, as there is a lack of accounts of what these consumers are doing with energy, and why they switch back and forth between various energy sources [3].

By mobilizing anthropological infrastructure studies and STS, we leverage the notion of anticipatory infrastructural practices to argue how material objects impact on imaginaries about the future. As we show, electricity figures prominently in people's mind both due to its almost-presence, its absence and the promissory future it enacts. To understand better the coming of electricity to new places we examine household electricity consumption in rural Kenya to provide insights on how people act in the anticipatory phase of getting electricity and what kinds of practices develop when electricity actually arrives. We will first show how anticipation is expressed in everyday material practices where attention to physical objects in the landscape allows for making sense of uncertain electricity futures. Arguing that the very materiality of the electricity infrastructure mediates government operations in the area we suggest that staying attentive to electricity poles as they are being erected is also staying attentive to political forces of energy distribution.

We will then show what anticipatory practices emerge as part of life with and against a partial electricity infrastructure that follows in the wake of a grid connection. The continuous stream of blackouts reminds the villager of the necessity to stay attentive to what the various causes of instability might be. Describing how villagers stack multiple energy sources as a way to manage the unreliable supply and volatile electricity prices, we show that this material engagement of composing various energy sources is also political engagement. When the energy consumer composes resources to disentangle herself from relying completely on the unreliable grid and the governmental actors that run it, she engages herself in the minutiae details of energy production and consumption. This points to how centralised and decentralised energy

systems are closely related in anticipatory practices. Such anticipation happens as a way of handling uncertain economic futures, but anticipation also plays an important role in the formation of actual energy infrastructures.

Referring to the global energy challenges mentioned in this introduction in the discussion and conclusion section we discuss what implications our findings hold for rethinking different energy futures.

2. Theoretical framework

2.1. Understanding socio-technical change

Inspired by anthropological infrastructure studies³ and STS, the underlying approach of this article draws on concepts of socio-technical change. Central to socio-technical studies is the relationship between different parts of an infrastructure, and especially the heterogeneous networks of human and non-human actors that shape, change and stabilize the links between the actors [11]. Within this frame of reference scholars have studied the intrinsic social nature of physical objects introducing notions of scripts and fluidity to capture how artefacts, through their materiality, contribute to social change [11–13]. Technologies do not possess inherent transformative powers, nor are they taken into use independently of the social context of which they are part. Instead, implementation and use is a constant negotiation between technology and societal developments. Our analysis of anticipatory infrastructural practices should be understood within this socio-technical line of thought.

2.2. Studies of electricity infrastructures in developing countries

Studies of electricity in developing countries testify to the contested and disputed, yet desired attributes of rural electrification [3,11,14–16].

Sociotechnical studies address how unintended consequences of electrification such as illegal connections, electricity theft and public demonstration tend to follow the arrival of electricity [11,14,15]. A central point in these studies is that technical devices, such as electricity meters, act as mediators between state-controlled electricity operators and the consumer. An electricity meter can form state-citizen contracts that can be contested in the actual technology use, and thus it carries with it a potential to shape and spin off new relationships between the energy operator and the user. Forefronting the meter in her study, von Schnitzler [15] examines how prepaid electricity and water meters become re-scripted in the wake of apartheid when residents in a poor area in South Africa negotiate moral and political questions as they bypass the meters to get free electricity and water. Studied as an object of social and political negotiations, we see how the material engagement with the meter becomes a political engagement, as what often is considered to be a neutral device can take centre stage in much larger historical and political debates about citizenship [11,15].

Similarly, Tanja Winther's [14] study of electricity theft in Zanzibar draws attention to the distribution of rights and resources in regards to electricity use. Winther observes how husbands of several wives make unauthorised electricity connections in order to locally distribute electricity equally to the wives. In Winther's study husbands need to make up for the inequality of the energy distribution system in place. This system allows only one outlet per customer and is therefore not fitted to serve the social convention that wives must be treated equally. In this work, we see a glimpse of how energy engagement can present itself though in an unconventional and unexpected way, as husbands

³ Originating in American information studies [39,40], infrastructure studies is a growing interdisciplinary field of research. See for example the recently published Handbook of Infrastructures and Social Complexity [41] raising infrastructural practices as a concern in anthropology, sociology and science and technology studies.

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