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Becoming Modern: Households' Electricity Use and Coping with Power Outages in Post-Socialist Dar es Salaam

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Abstract

Since its invention in the 1880s, electricity has been regarded as a pervasive driver of modern life. As scholars have shown elsewhere, ideas of modernity have influenced the provision and use of electricity in cities across the globe. By and large, scholars have examined electricity-modernism in terms of the construction of high-tech electric infrastructure by major actors. Those who have studied power failures. This article examines electricity-modernism from the perspective of everyday electricity use and the experience of power outages, a lens rarely used by scholars. It draws from oral history interviews and archival sources to show how ideas of modernity circulated in residential electricity use in post-socialist Dar es Salaam. The article argues that the idea that electricity is a tentacle of modernity prevailed in Tanzania's official narratives, in residential electricity use, and in households' power-outage coping strategies. By so arguing, the article shifts electricity-modernism from sites of electric infrastructure building to the homes where electricity and its failures are assigned meaning.

Keywords: Dar es Salaam, modernity, electricity, power outages, post-socialist.

Introduction

Historians have noted a long-standing and compelling connection between technology and modernity spanning over a century (Misa, 2003; Feenberg, 2011). Although modernity has been used for nearly a hundred years to analyse socio-cultural changes driven by technological progress, its exact meanings remain unclear (Wohl, 2002; Feenberg, 2003). It has also been difficult for scholars to determine precisely when modernity began, making it a matter of traces rather than of clearly defined historical moments (Nicholls, 2013). However, modernity is generally associated with the universal aspiration for progress and better living conditions (Misa, 2003), a perspective which this article borrows. As one of the key technological developments in human history, electricity exemplifies this long-lasting technology-society modernist discourse. This article thus uses post-socialist electricity provision to explore how ideas of becoming modern influenced households' adoption of electric technologies and coping with power outages. The article intentionally focuses on post-socialist Dar es Salaam to capture the complex landscape of electricity modernism after the mid-1980s. This was a period during which electricity and domestic electric technologies gained momentum in African Tanzanian homes. This article does not aim to theorise modernity as a specific epoch in human history nor to provoke debates on electric modernism. Instead, it explores modernity in simple terms and briefly reflects on the modernist thinking that influenced the electrification process over time.

Since the nineteenth century, advocates of electricity have depicted it as a modern technology—luxurious, comfortable, and transformative innovation for society (Nye, 1990; Gooday, 2008; Pursell, 1999). For instance, at the Manchester Exhibition in 1908, electric companies showcased models of houses and kitchens to illustrate how "... electricity is working wonders … unsullied by soot or smell, it is roasting, stewing, boiling, chopping.…" (Nebeker, 2009, p. 238). One of the earliest electric companies in America, Westinghouse, promoted electricity as an 'electric servant' that could replace domestic servants (Nye, 1990; Nebeker, 2009). Similarly, Nye (2010, p. 18) asserts that "[u]tility companies [in North America] portrayed the wired house as a 'home of a hundred comforts'." From street lighting to curing diseases, electricity was depicted as all-encompassing—a liberator of human societies from traditional, dirty, expensive, unhealthy, and environmentally unfriendly energy technologies such as oil, wax candles, gas, kerosene, charcoal, and firewood (Cubitt, 2013).

The modernist narratives influenced electricity provision and use worldwide. Even in the global North, the early adopters of electricity saw themselves as modern compared to those who were unelectrified (Hård, 2023). As electricity travelled from the global North to the European colonies in Africa, it carried similar modernist accounts. Colonial administrators denied 'black' African access to electricity because it was a marker of European colonial modernity, and they used it to reinforce colonial class and race politics (Chikowero, 2007; Hasenöhrl, 2018; Ghanadan, 2008). Colonial Dar es Salaam was not exceptional. Colonialists electrified their homes earlier to showcase their wealth and connection to the modern world in the metropoles (Hård, 2023). Similarly, post-independence leaders inherited and perpetuated electricity modernist ideas. They regarded large hydropower dams as symbols of socio-economic modernisation, and the provision of electricity aimed to modernise local communities and economic production (Hoag, 2013; Miescher, 2014; Minja, 2024). Such studies have adequately analysed how modernist thinking prevailed and shaped the building of high-tech electrical power infrastructure in colonial and postcolonial Africa. However, little has been done to address how similar narratives have influenced households' decisions to electrify and cope with unreliable power, a characteristic of electricity provision in post-socialist Dar es Salaam.

Therefore, the article takes a rare lens that goes beyond the big actors' decisions to build large electrical infrastructure systems (Hughes, 1983; van der Straeten, 2023). It studies electricity modernity through everyday household electricity use as households grapple with power failures, hence, diverging from studies which have analysed power outages in global South cities in terms of vulnerability and failed modernism, showing that power outages, especially viewed from households coping strategies, reveal a broader picture of electricity-modernism, like does households decision to electrify and use electricity.

The article focuses on the everyday use of electricity in homes because households are vital sites of moral economy (Silverstone and Hirsch, 2006) and socio-cultural spaces where electricity is not only put into use but also assigned meanings. It argues that electricity modernism in households features both in how people electrify and adopt electric appliances as well as the way they cope with frequent power outages. The article re-evaluates and historicises the complex and contested landscape in which electricity, as a modern technology, interacts with its users (Gooday, 2008; Chatterjee and Pérez-Zapico, 2022) rather than taking electricity as the elusive and simplistic autonomous force of modernisation.

Methodologically, the article uses a qualitative approach. It analyses archival sources, government reports, and oral history interviews to analyse the ideas and experiences of electricity in the light of electricity modernism. It specifically employs what Tarazona et al. (2021) call 'alternative archives,' such as newspapers, personal memories, electricity bills, and photographs. A few archival sources shed light on how electrification was a state endeavour during the socialist period, and how modernism prevailed during the post-socialist period. Oral history interviews and newspaper articles revealed how the concept of modernity influenced households' adoption of electricity and electrical appliances, as well as their coping mechanisms in the event of a power outage.

Oral history interviews were conducted in Kiswahili; therefore, unless stated otherwise, the direct quotes used in this article are the author's translations into English from original interviews. The article is organised into five sections. The following section explains how modernism influenced the provision of electricity during the socialist period. This section is followed by the one which describes how liberalism deepened residential electricity modernism. Again, the fourth section offers a historical overview of power outages in post-socialist Tanzania and how electricity modernism featured in household coping strategies. The fifth section is a conclusion.

Tanzania's socialist ideologies and electric modernism

For most African Tanzanian households in Dar es Salaam, electricity was a postcolonial phenomenon. Except for a few streets and households in modern-day Kariakoo and Ilala, African premises were unelectrified at independence in 1961(TNA 32575; UKNA CO 691/175/2). Even most electrified African homes in colonial Dar es Salaam lacked modern electrical appliances since they were not regarded as necessary for daily life (Mwakikagile, 2006; Brennan and Burton, 2007; Smiley, 2009). In this context, the post-independence government strived to expand African Tanzanians' access to electricity as an essential service which were denied for nearly 50 years of colonisation (Ghanadan, 2008). It also strived to electrify new areas to propel modern developments, which will showcase the fruits of independence.

'Modernising the country' predominated the ideas behind Tanzania's electricity initiatives in the 1960s-1980s. The First President of Tanzania, Julius K. Nyerere, viewed electricity as a tool of both urban and rural modernisation. Scott (1998, p. 321) highlights Nyerere's high modernist perspective on electricity provision, saying that "electrification and tractors, those emblems of development, were on the tip of Nyerere's tongue." Tanzanian leaders believed that electricity could revolutionise the country's economy from a peasant activity to a modern and highly developed one (*The Nationalist*, 26.9.1966). These modernist ideals were explicitly articulated in Tanzania's Second Five-Year Plan that the provision of electricity to rural and urban areas was a "modernisation programme" (URT, 1969, p. 75). To achieve its modernisation project, Tanzania nationalised the electric utility in 1964, earlier than any other parastatal (URT, 1969) and established a new electrification policy in 1965. The two institutional interventions transformed the Tanzania National Electric Company (TANESCO) into a national agent for socio-political and economic modernisation (TANESCO, 1967). As TANESCO's Manager, F. S. Batty, stated, electricity was the foundation of Tanzania's 'modern' economy, and the company was "ready to carry out to the full, the obligations the Government has placed upon it" (*The Nationalist*, 26.9.1966). Under the new institutional

arrangements, TANESCO obtained three core roles: to provide a cheap, abundant, and uninterrupted power supply while remaining financially sustainable; to deliver efficient public service around the clock; and to act as the government's agent of socio-economic modernisation (TANESCO, 1976).

The new roles designed TANESCO to operate as a key instrument in the rural and urban modernisation initiatives, including financing some rural electrification schemes (TANESCO, 1967). Yet, as a national electricity company, TANESCO was responsible for generating, transmitting, distributing, and selling electricity to industrial, commercial, residential, and public consumers. In industries, electricity was expected to power sophisticated and modern machines. In commerce, retailers used electric lighting to showcase products and make their business premises modern and appealing (*The Nationalist*, 26.9.1966). Public streets were installed with electric lights to display modernity and the fruits of independence. TANESCO promoted electricity and electrical appliances as modern— 'clean', 'safe', and efficient compared to charcoal, firewood, and kerosene, which were considered unhealthy and environmentally damaging (Figure 1).



Figure 1: TANESCO's pavilion at the Dar es Salaam trade fair in 1964.

Source: TANESCO directors' and account report, 1965.

The provision and use of electricity in Tanzanian households in the 1960s-1980s was complex. With limited resources and generation capacity, TANESCO was compelled to target only a few areas and consumers. The priority was industrial and commercial users and key social service facilities to propel development for all. Government houses were also given a special priority. In the early 1980s, almost all government houses in Dar es Salaam had small kitchens with electrical appliances such as an oven stove, often an extra electric hotplate, electric fans, and, in some cases, a refrigerator. Houses of high-ranked government workers were favoured with

some extra modern appliances (Lewinson, 2006; Mchome, 2022). This enabled them to use electricity beyond lighting purposes compared to those who lived in non-government houses, who used electricity mainly for lighting (SNA No. F13O: 8). During this period, Tanzanians with European or Asian backgrounds in Upanga, Kisutu, Kariakoo, Oysterbay, some parts of Mikocheni and Ilala were the other main users of modern electrical appliances. They were electrified and economically well-off since the colonial era compared to African Tanzanians, so they enjoyed the electrical world for a long time (Hård, 2023; van der Straeten, 2023).

In terms of grid expansion, the government expanded the grid beyond parochial colonial electrification enclaves. By the mid-1980s, new areas such as Magomeni, Sinza, and some parts of Temeke, Ilala, Mikocheni and Kinondoni were electrified, although a large number of African Tanzanian households remained unelectrified (Interview, retired TANESCO engineer, Magomeni, 28.8.2018; Interview, electricity user, Msewe, 24.8.2018). One of the reasons was that residential consumers came fourth in the socialist electrification priority list. Electricity has to bring collective benefit for all people in the country through powering proactive economic activities and social services first. Additionally, the rural transformation programme shifted the focus of electricity provision, trying to balance between rural and urban areas.

Electrifying urban houses, while leaving productive villages without electricity, was perceived as a betrayal and a perpetuation of economic inequality whereby urban areas could develop as places of conspicuous consumption, widening the gap between rural and urban households. A Dar es Salaam resident expounded on this, saying, "It was like a 'sin' to have items such as a car or television in homes. The government considered them to be luxury goods that perpetuated social differences. One had to justify where they obtained the money to buy luxurious household items" (Interview, electricity user, Magomeni, 22.8.2018). Moreover, the socialist government discouraged the importation of electrical appliances by imposing high import tariffs. These socialist measures made electricity and modern electrical appliances a costly amenity in most urban homes in Dar es Salaam in the 1960s-1980s. As one of the interviewees noted:

Electricity was expensive. Only a few people could afford to connect to the grid and benefit from it. Those who had electricity in their homes mainly used it for lighting, ironing, and electric fans. We only heard stories about refrigerators, washing machines, and electric cooking appliances from European and Indian housemaids. People's main concerns were obtaining food and clothes rather than electricity, and living conditions were grim (Interview, electricity user, Msewe, 24.8.2018).

Therefore, although the socialist government in Tanzania had succeeded in expanding the electricity supply to new areas and key sectors, residential electrification to non-governmental African Tanzanians in Dar es Salaam remained insignificant by the mid-1980s. For the Tanzanian socialist government, electricity was a tool for industrial and economic modernisation (Öhman, 2007; Hoag, 2013; Miescher, 2010) rather than household modernisation. Industrialisation and other forms of economic production the focal point of its electrification initiatives. Similar to the colonial period, whereby government works were major electricity consumers (TNA 5 No. 13694), industries continued to be the main electricity users between the 1960s and 1980s (accounting for about 65% of all electricity generated in the country), followed by domestic/residential users (who consumed 23% of generated electricity) (TANESCO, 1985). Those few electrified African Tanzanian homes continued to

lack modern electrical appliances. In this way, little had changed in the households' use of electricity in the mid-1980s compared to the early 1960s. The socialist ideologies were short-lived as liberalism soon ushered in with a different agenda that altered the household electricity landscape.

Electric modernism: Beyond socialist restrictions

Households in Dar es Salaam witnessed changes in the level of household electricity provision and use in the post-socialist era. There was a deepening of domestic electricity and the use of electrical appliances in African Tanzanian homes compared to the colonial and socialist periods. Electrification processes are not independent of the underlying socio-political, economic, and technical forces because technologies are not designed solely to change culture but to meet specific socio-cultural needs. Whether modern or traditional, technologies are embedded in broader historical processes and shaped by socioeconomic and political contexts (Hård and Jamison, 2005; Nye, 1990). In this regard, when examining why households adopted and used electricity technologies in the post-socialist period, it is essential to consider the role of the broader historical developments rather than solely focusing on the households and electricity alone as independent forces.

Post-socialist Tanzania saw economic reforms in the 1980s and electricity reforms in the 1990s, which deepened domestic electricity use. Before the reforms, both economic and electricity provision conditions deteriorated. The economic crisis of the 1980s had crippled Tanzania's foreign balance of payment, making it difficult to purchase petroleum products for electricity generation and spare parts for repair and maintenance of thermal power plants. This dropped TANESCO's infrastructure generation capacity and increased technical power loss (World Bank, 1986). As a national utility, TANESCO experienced a financial crisis since it depended on government budgetary allocation.

In addition, the socialist modernism programmes, which forced the company to electrify small towns, rural areas and ujamaa villages based on their socialist strategic significance rather than their immediate economic returns (URT, 1969), had prevented it from operating as a proper commercial company (Mchome, 2022; van der Straeten, 2023). The technical and economic conditions of the utility did not allow the connection of new customers (World Bank 1986). Therefore, although the reforms of the 1980s were geared toward broader economic revival, the Bank introduced special reforms within TANESCO to make it a viable commercial company, turning it from the state instrument of industrial and rural modernisation (World Bank, 1993).

The economic crisis of the 1980s benefited domestic electricity consumers. It enabled the connection of more houses and the promotion of electrical appliances as a result of the industrial decline it caused. Some industries reduced production due to a lack of raw materials and repairs. Other industries were completely closed (World Bank, 1993). Because TANESCO had made industries its major electricity consumer since the 1960s, the industrial decline compelled it to find new alternative consumers. The company turned to the expansion of the residential consumer base and promotion of the use of electrical appliances in ordinary households. In response to industrial decline, the Tanzanian government introduced a one-million-USD project, which involved the dissemination of 5,000 modern electric cooking stoves to households connected to the national grid to expand non-industrial electricity usage

(World Bank, 1986; World Bank, 1993). It also increased its local production of modern electric cookers from 1493 in 1981 to 12674 in 1986 (URT, 1995). It is significant to note that these government initiatives were not aimed at modernising households but to make them use more electricity to compensate for the gap left by the industrial decline.

Furthermore, the electricity reforms, which were introduced in response to the economic crisis, improved technical operations from the 1990s, bolstering TANESCO's ability to add more residential consumers. The reforms enlarged grid capacity by adding 1683 megawatts between 2000 and 2015 (Eberhard et al., 2018) and minimised technical losses from 21% in 1988 to 16% in 1993 (World Bank, 1993; World Bank, 1994; *Daily News*, 10.04.1991). These technical developments enabled the addition of about 36,000 new domestic consumers annually, something which was impossible in the 1980s. TANESCO's capacity to add more consumers to the grid increased in the 2000s, whereby it was able to connect more than 100,000 residential customers annually (URT, 2004).

The liberal reforms and their trends were transformative in modernising households in Dar es Salaam. They made residential electricity connection and the adoption of electric appliances a national agenda from the late 1980s, particularly because of their associated urban energy issues. As Nkonoki (1981) and Sunseri (2005) aptly noted, economic reforms of the 1980s were expected to raise energy prices. There was a fear among national and global actors that urban households in developing countries could escalate overreliance on biomass energy, especially firewood and charcoal. Therefore, to avoid another urban energy crisis like what occurred in the 1980s, Tanzania planned to modernise urban household energy in the 1990s by promoting more usage of electricity (*Daily* News, 15.8.1990; *Uhuru*, 26.01.1990).

Energy studies during this time reveal that households viewed electricity as a modern cooking technology and that electric cooking was the cheapest option (SNA No. F13O:6). Many households preferred electric cookers to charcoal, gas and kerosene stoves because, as noted, "the electric cookers are modern, easy to use and cheaper based on the monthly bills." However, the high initial cost of electrification and high electricity tariffs were a challenge to homes, "where income is just enough for subsistence, much as they would like to become modern by having electric cookers and refrigerators, they cannot see themselves being able to afford such items" (SNA No. F13O:8). Therefore, when establishing its First National Energy Policy in 1992, Tanzania advocated the expansion of local manufacturing of modern electric devices and the reduction of electricity tariffs (SNA No. F13O:8). The policy specifically stated that the "expansion of the electricity distribution systems and the manufacture and dissemination of simple and cheap electric cookers will be effected to enable households to substitute electricity for fuelwood and charcoal" (SNA No. F13O:8). This strategy sought to expand electricity connection and use by low-income households.

Statistical evidence on the extent to which these initiatives expanded electricity as modern household technologies is hard to come by. But the scant evidence available indicates that the share of residential electricity users grew from 19% in 1978 to 31% in 1990 (World Bank, 1993). Domestic electricity consumption doubled within five years in the early 1990s, "due to: (i) greater purchasing power resulting from improved economic conditions in the latter part of the decade; (ii) expanded availability of electricity appliances; and (iii) the low tariff that applies to this group of consumers" (World Bank, 1993, p. 23).

Figure 2 shows residential electricity users and sales from 1976 to 2010. The figure indicates a relatively flat curve in the 1970s and 1980s, which suggests a sluggish growth in household electricity connections and use up to the 1980s. It also reveals a rapid increase in the number of domestic electricity customers and usage from the early 1990s onwards. This indicates a high number of household connections, access to and use of modern electric appliances in that period. Thus, it is not surprising that Hosier and Kipondya (1993, p. 465) found that non-government households connected to the grid began "to cook with electricity with greater frequency" because of "relative shifts in energy prices, the gradual acquisition of electric cooking devices, the abolition of the import duty on electric cookers, and the continued subsidy of electricity."

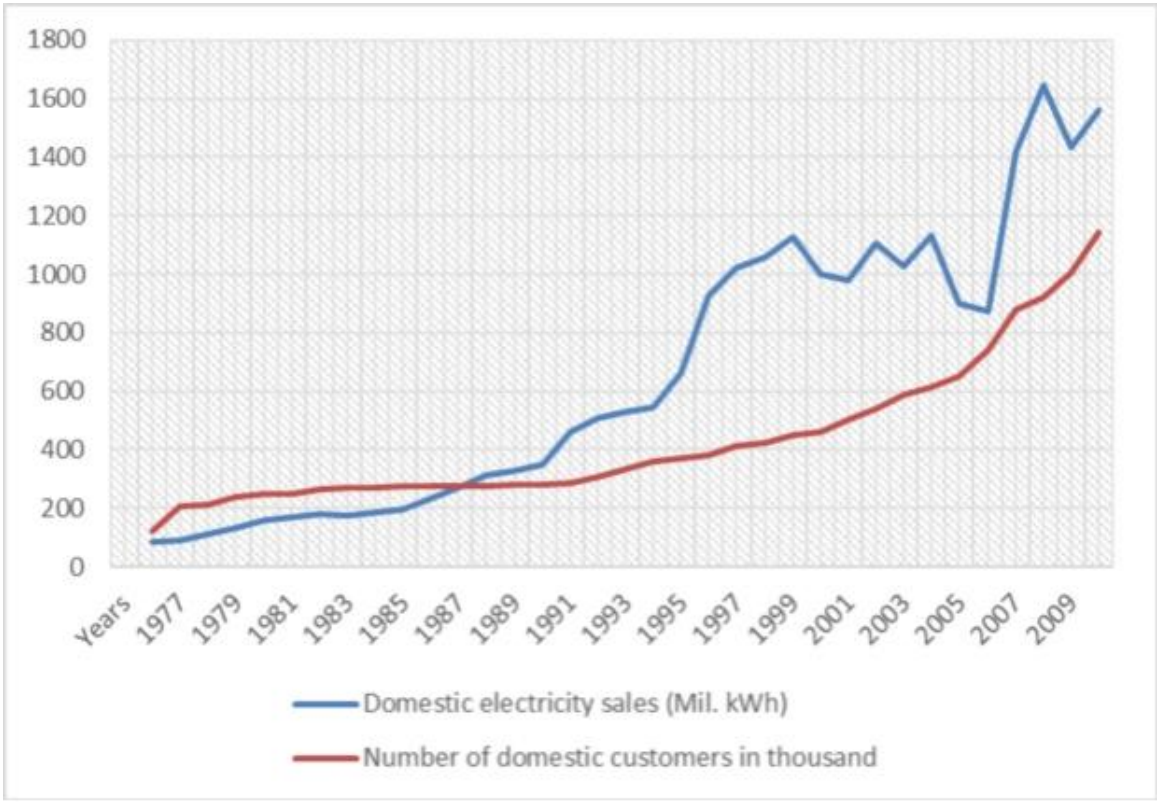


Figure 2: TANESCO's residential electricity users and sales, 1976-2010.

Source: Developed from TANESCO and EWURA (2018) and Diu (2011).

Statistical evidence from other sources also confirms the growth indicated in Figure 2. For instance, Maliyamkono and Mason (2006) show that domestic electricity consumption grew from 16% in 1974 to 40% in 2005. Moreover, the Tanzania National Bureau of Statistics, Energy Access, and Use Situation Survey II in Tanzania Mainland affirms that the percentage of connected households in Dar es Salaam rose from 59 in 2000 to 86 in 2020 (URT, 2020). These developments illuminate the changes in socialist political-economic restrictions.

Liberal reforms affected almost all aspects of Tanzanian lives (Meertens, 2000). They were a form of new urban socio-cultural modernity. One notable effect was the growth of urban informal economies in Dar es Salaam. More than 40% of households in Dar es Salaam engaged in various small-scale income-generating activities powered by electricity on their premises (Ilskog, 2008). In the new post-socialist urban landscape, some households domesticated

electric artefacts not exclusively as modern technologies for comfort and luxury, but also to enable households to become sites of economic production. Modern electric appliances expanded what residents could do at home in order to earn income. For instance, an electric refrigerator in some homes enabled the making of ice cream and ice bars making. In some areas, televisions were purchased not for increasing household comforts and leisure but for enhancing the film and opera business, which was common in the 1990s and the early 2000s.

Moreover, liberal reforms also jettisoned socialist restrictions on material possessions, reduced import taxes on commodities, and propelled the growth of Dar es Salaam as Tanzania's market centre for modern. Modern electrical goods such as computers, washing machines, kettles, fans, air conditioners, refrigerators, televisions, CD/DVD players, and mobile phones found their way to the domestic space beginning with well-off families in the mid-1990s and followed by the low-income families in the 2010s (Ghanadan, 2008; Ilskog, 2008). These socio-economic changes expanded the availability, affordability and access to electrical power appliances by many middle- and low-income families. For instance, while in the 1990s a television was a luxurious asset for high-income households, it became a common appliance even in low-income homes in the 2010s. Low-income families hooked their houses so as to domesticate televisions and enjoy other electricity end services, particularly electric lighting (Mchome, 2022).

Despite the fact that Dar es Salaam residents used electricity for small income generation at home, the idea of becoming modern influenced their decision to electrify and acquire appliances. Under the liberal reforms, electricity and its appliances became emblems of modernity. The number of electrical appliances in Tanzanian markets from the mid-2000s and TANESCO's efforts to enlarge the number of residential consumers motivated them to electrify (Mchome, 2022). The growth of television kiosks and watching of operas, soccer and films made unelectrified homes view themselves as less modern. It created socio-cultural tensions in children's upbringing since in homes lacking televisions, children had to cross several houses and streets to watch films and operas. Noting this socio-cultural change and its role in modernising homes through electricity, one interviewee said: "My children always went to watch television in their neighbours' homes or video kiosks. For this reason, I worked day and night to get money to electrify. [. . .] I managed to modernise my house with a television, and the children stayed at home" (Interview, electricity user, Kinondoni, 19.8.2018). People electrified homes and adopted domestic electric appliances to keep pace with post-socialist modernity and its socio-cultural changes.

The perception that electricity was synonymous with modernity influenced many homes in post-socialist Dar es Salaam to electrify. For decades, electrified households were viewed as more modern and luxurious than unelectrified ones. Winther (2008) explains the situation in Zanzibar that electrified homes were not only modern but also increased the masculinity of their owners. A husband who was able to electrify his home increased family love and chances to marry more wives. Moreover, electrified homes in Zanzibar attracted neighbours during evening time who visited to watch various televised programmes and news (Winther, 2008). In post-socialist Dar es Salaam, people electrified homes to entertain and furnish their guests with modern amenities of life.

The expansion of modern houses led by improved household income necessitated domestic electrification. Electricity complemented household modernity. This was clearly noted by an

interviewee saying: "To look more modern, a house needs to be well-lit with electricity rather than with kerosene lamps and candles." He further stated that: "[. . .]. It is not attractive to have a big house and then light it using kerosene lamps. Similarly, a big sitting room needs a television and a music system." Traditional technologies cannot light a bungalow or double-storey house properly. The interviewee claimed further that "a sitting room becomes unpleasant when it lacks electricity and a television. [. . .]. Nowadays, people need to live more comfortably, having houses with space, good lighting, and modern electrical things (Interview, electricity user, Tabata, 6.8.2018). From the 1990s, Dar es Salaam has witnessed the growth of modern houses compared to the *makuti* and *Swahili* houses of the colonial and socialist eras. Modern houses compelled many residents to connect their homes and acquire electrical appliances to complete their household modernism.



Figure 3: Households' electricity-modernism in post-socialist Dar es Salaam.

Source: Photo by the author.

The broader changes brought by the liberal economy deepened households' electricity use in Dar es Salaam. Liberal policies opened the door for informal economic activities, such as petty street trade and entrepreneurship. They also expanded foreign investors, foreign trade, imports and employment in the private sector, which together enlarged households' income and the availability of goods (including electrical appliances). Moreover, the National Strategy for Growth and Poverty Reduction (NSGPR) I in 2005 and NSGRP II in 2010 enlarged urban and rural households' access to and use of electricity technologies as a strategy toward poverty alleviation. More importantly, liberal policies changed not only the macroeconomies but also household income and purchasing power. For instance, household income in Dar es Salaam grew by 32% in the 2000s (URT 2009). These socio-economic changes enabled households to purchase materials beyond their urgent needs. For example, households' ownership of television, radios and mobile phones in Dar es Salaam grew threefold in the late 2000s compared to the late 1990s (URT, 2009).

Moreover, liberal reforms also provided room for greater consumption of electric technologies and lavish lifestyles, which were discouraged in the socialist era. The possession of expensive modern electrical appliances defined households' affluence and modernism. For low-income homes, possession of electrical items and electric lighting was an emblem of progress from acute poverty. The growth of 'informal' business, including hairdressing salons, barbershops, retail shops, and other petty trade which revolutionised electricity connection and use in households. Besides this growing electricity-modernism, electrified households have been experiencing power outages, which have hindered their everyday use of electricity over the years.

Power outages and electricity-modernism in household coping strategies

The and use of electricity in post-socialist Dar es Salaam was a paradox. There was growth on the one hand and unreliable supply on the other. The supply resembled Gupta's (2015, p. 559) description that "having electricity and being connected to the grid are two different issues." Electrified homes had no assurance of lighting and power all the time. This state has continued to characterise household electricity provision and use in Dar es Salaam since the 1980s. Households have been experiencing frequent power outages in the form of power shedding and grid failures (Mchome, 2022). Before the 1990s, many households were not disconcerted by grid failures because many were unconnected or used electricity mainly for lighting. For them, power failures were a nuisance rather than a significant obstacle due to low usage of electricity. But as households expanded electricity connections and increased their use of electrical appliances, power outages caused uproar and frustration, which forced them to adopt different coping strategies.

The first wave of power outages began in the early 1980s due to Tanzania's economic crisis. It was estimated that Dar es Salaam recorded more than 500 power outages between 1981 and 1983(World Bank, 1986; World Bank, 1993). Another wave occurred between the early 1990s and the mid-2000s, caused by the fall of water levels at Kidatu and Mtera hydropower dams. The two dams were the largest power infrastructure built from 1966 to 1988 under the socialist government to expand electricity provision in the country. By the mid-1980s, the dams contributed over 80% of hydropower in the national grid (Öhman, 2007; Ghanadan, 2008). The dominant narratives on the fall in water levels were the increase in human activities, which damaged the Usangu Catchment's environment. However, some scholars have challenged this ecological explanation by showing that the drop resulted from high-modernist politics of technology transfer during the planning and construction of the dams in the 1960s-1980s (Öhman, 2007; Mchome, 2022). Built in the high-modernist era, Kidatu and Mtera builders ignored opposing views and ended up building the dams with insufficient hydrological data (SNA SIDA File FB13). Consequently, the dam dried up in 1992, causing acute power outages in Dar es Salaam (Öhman, 2007; van der Straeten, 2023).

Dar es Salaam witnessed another decade of persistent power outages between 2004 and 2014, whereby TANESCO executed power shedding for up to 24 hours. In some areas, it took up to two days without electricity (Interview, electricity user, Kimara, 10.08.2018; Mbezi-Beach, 10.10.2018; Ubungo, 20.08.2028). The power outages were caused by poor hydrological conditions in the country and failure of the Independent Power Producers (IPPs) and the Emergency Power Producers (EPPs), which were introduced in the 1990s and 2000s, respectively (Degani, 2023; Cooksey, 2002; Grey, 2015). Instead of generating power to

augment hydropower infrastructure, both IPPs and EPPs, as exemplified by IPTL and Richmond Development LLC, fell into grand corruption scandals involving top TANESCO and government officials. The scandals changed public perception from seeing power outages as an 'Act of God' (drought) to a result of state agents who contrived and profited from IPPs and EPPs. Households viewed power outages as a result of years of political mismanagement and leaders' abandonment of socialist values to the extent that they installed clientelist capitalist robbers to exploit people (Degani, 2022). The ecology-based rhetoric no longer justified electricity failures.

Apart from these periodic outages, households have been experiencing daily power failures because of informalities and vandalism, which characterise TANESCO's infrastructure. There are prolonged and daily repair services which frequently curtail power supply (Ghanadan, 2008; Degani, 2023; Köpke, 2021; Mchome, 2022). To what extent did households' experiences of power outages and coping strategies reveal electricity modernism? This is the main question which the next part of this section explores.

Power outages and how households have responded in post-socialist Dar es Salaam reveal electricity-modernism in greater measures. Suffice it to say, households continued to view electricity as modern power amidst power outages. For many households, power outages delayed their march to modernity—they blocked the way to modern life. They saw power outages toward traditional household energy technologies they had forsaken. As Michael Andindilile stated in a newspaper article that "all Tanzanians […] want to march with modernity, to use electricity and save other sources of energy, such as wood", but what they had was "to pray and hope that Tanesco will come up with a solution to the electricity woes" (*Daily News,* 03.12.1994). As Andindilile noted, power outages forced households "to adapt to the candle and kerosene," which they viewed as less modern compared to electricity (*Daily News,* 03.12.1994). Households viewed this century as an era of modern science and technology, and electricity was the modern technology to make them achieve modern development. However, TANESCO's "supply of electricity in pieces every year, even in a big city like Dar es Salaam" derailed their modernity efforts (*Thisday,* 20.10.2009). One resident in Dar es Salaam lodged a complaint to a newspaper editor, that:

For several years now, Tanzanians have been urged to cook with electricity to curb deforestation and desertification. The citizens have responded positively by acquiring modern electric cookers and other appliances. But most people have abandoned their electric cookers and switched back to charcoal and firewood because of unreliable power supply (*Sunday News,* 24.12. 2000).

As he explained, households abandoned their electric cookers because power outages rendered them useless, forcing them to rely on 'traditional' (non-modern) cooking technologies. Others used them less regularly because they feared they would be damaged. The idea that power outages forced people to revert to traditional cooking technologies stemmed from the fact that Tanzania initiated campaigns towards modern cooking technologies, especially electric cooking, in the 1990s (SNA SIDA No F13O:8). Households responded by adopting electric cookers (Hosier and Kipondya, 1993). Still, power outages derailed that household's electricity-modernism. In the broader landscape, households opted for strategies other than abandoning modern electric appliances.

Although power outages became a new socio-cultural burden and economic burden in post-socialist Dar es Salaam, households did not abandon the use of electricity. The proportion of electrified homes grew from 75% in 2016 to 88% in 2020 (URT, 2020). Households continued to use electricity in cooking activities by acquiring variegated electric appliances such as rice cookers, kettles, microwaves, deep fryers, toasters, blenders, juicers, pressure cookers, mixers and other modern cooking amenities—compared to the 1990s. Moreover, they have adopted electric fans, air conditioners, computers, televisions, and mobile phones more than in the early 2000s. The use of these appliances has made electricity a primary domestic energy source and emblem of modernity since the aim of the adoption of these appliances has remained the same: to modernise homes by simplifying domestic tasks and increasing comforts (Interview, electricity user, Msewe, 24.8.2018; Interview, TANESCO engineer, Ubungo, 18.8.2018). Households have adopted protective gears such as fridge guards, television guards and other forms of voltage regulators to minimise the impacts of power outages on appliances (Mchome, 2022).

Additionally, households have constantly been improvising their electrical appliances to make them more resilient to power outages. As Hård and Jamison (2005) have contended, technologies have both opportunities and challenges; thus, users learn to live with the dangers that surround them. Indeed, households' electricity users have learned to live with the dangers that surround them. They learned to restore appliances damaged by power outages and strengthen their capacity through repairs. This has been the common and ongoing power outage coping mechanism, and it has grown in the post-socialist era urban environments (Mchome, 2022b). One of the questions we asked our interviewees was why they prefer repairing appliances, after being damaged by a power outage, to purchasing new ones or abandoning their usage. For households, both repairing and purchasing a new one were expensive, but not as expensive as abandoning the usage. As one of them commented, "repair restored the service which an electric appliance was designed for at low cost" (Interview, electricity user, Magomeni, 22.8.2018). Another interviewee pinpointed that "to abandon the usage of an appliance because it has been ruined by a power outage or high voltage is to deprive your own family from benefiting from the amenities of modern life. And, repair is more affordable than that in many households" (Interview, electricity user, Ubungo, 20.08.2028).

Although power outages dispossessed their modern amenities for a while, repairs brought them back. Actually, households in Dar es Salaam have been doing more than repairing electric appliances. They redesign appliances' power-supply systems to lengthen their life and enable them to adapt to the vulnerable grid. As in Jackson's (2014) assertion that the ongoing repair of technical artefacts results in achieving resilience of a higher established order, households' repairs have been making appliances more resistant to power disruptions (Mchome, 2022b). The purchase and repair of appliances illuminate on the electricity-modernism. Households cannot just abandon the use of electric appliances which are within their economic affordability.

Households in post socialist Dar es Salaam also coped with power outages through adopting different electric power and lighting backups, such as electric and solar rechargeable torches, lanterns and lamps. Significantly, well-off families have been going beyond to generate their own electricity through oil-powered generators and solar technologies, especially small solar home systems (SHS). In the 1990s and the early 2000s, off-grid electricity generation was

common in business premises rather than in homes. Nonetheless, the number of households in Dar es Salaam which generate their own electricity when TANESCO's grid fails has grown rapidly in the last two decades (Eledi-Kuusaana, 2023; Koepke, 2021).

Own-electricity generation as a power outage backup mechanism intensely emulates the growing electricity modernism in post-socialist Dar es Salaam. Compared to the lighting technologies such as candles, kerosene wicks, and kerosene lamps, which they used in the 1980s to the early 2000s, electric lighting devices were viewed as modern as the electricity that comes from the TANESCO grid. As one resident noted, in the 1980s-2000s, kerosene lamps and candles were common household lighting backups. But nowadays, "we use modern electric lighting devices which do not produce smoke. We have forgotten candles, kerosene wicks and lamps" (Interview, electricity user, Kinondoni, 19.8.2018). While many households still cook with charcoal, no household would like to use kerosene lighting devices. The presence of modern electric lighting gadgets has enhanced households' coping strategies in post-socialist Dar es Salaam (Mchome, 2022; Eledi-Kuusaana, 2023).

Another way in which own-electricity generation reveals electricity-modernism is that it shows households' desire for an uninterrupted electricity supply. Hård and Jamison (2005) affirm that technologies are not designed solely to change culture but to meet specific socio-cultural needs. Similarly, Heidegger (1977) reminds us that, although users might think that they are the ones who use technology to order and improve their lives, it is technology that dehumanises and gains control over its users to the extent that users cannot live comfortably without a certain technology. Households in Dar es Salaam viewed electricity as a necessity of and for the modern life and have to be available all the time. They therefore ensured continuity of supply by their own electricity generation during power outages to maintain their modernity and meet socio-cultural needs such as refrigeration, electric cooling, watching television, lighting and so on.

In connection with that, households' own-electricity generation has also experienced a changing scene of modernism, particularly in the technologies used. Households consider solar power (photovoltaic) technology as a more modern electricity backup than oil-powered generators. As a result, SHS usage in Dar es Salaam increased from approximately 0.7% of households in 2012 to around 1.3% in 2016. The share of households with small solar lighting devices increased from 4% to 26% between 2012 and 2016 (URT, 2016). Solar power's modernism relies on the fact that it's available in various electric forms, such as torches, lamps, and lanterns, which are cost-effective and user-friendly. Additionally, the use of uncontrolled generators in the evening made streets and homes restless, and neighbours complained about sleepless nights during power outages. Nowadays, people generate electricity by using modern technology that has no fumes and noise (Interview, government officer, Mbezi-Beach, 10.10.2018). With solar power, households obtained electric power and lighting free from typically polluting, smelly and noisy oil-powered generators (Cubitt, 2013, p. 318).

Conclusion

This article has shown how domestic electricity and power outages coping strategies reveal electricity-modernism. At the state level, the socialist Tanzanian government viewed electricity as an instrument of socio-economic modernisation in the 1960s-1980s. It thus concentrated on building large hydropower dams to modernise industries, social service provision, and rural

economies. However, the socialist state's overemphasis on industrial and economic modernisation derailed electricity-modernism in households by limiting universal access and the availability of cheap electrical appliances. However, the liberal reforms adopted in the mid-1980s as a response to the economic crisis transformed Tanzania's urban political economies, lowered electricity tariffs, reduced import duties on electric appliances, ended socialist restrictions, raised people's wages, improved electric infrastructure and capacity, hence, enabled households to electrify and purchase electric devices for simplifying work, comfort and modernity. The deepening of electric technologies in homes from the 1980s went hand in hand with a growing power outage crisis. Households' electricity users saw power outages as an obstacle to their initiatives towards modern life, but they never stopped to see electric technologies as a marker of modernity, something which compelled them to develop different coping mechanisms. They adopted various electric power and lighting backups, restored electrical appliances which were damaged by power outages, and expanded the use of electric appliances, which suggests that they still viewed electricity as desirable modern domestic technology despite frequent failures.

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