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An exploratory review of electricity subsidy reform in Lesotho: Implications for the utility and households

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- Lifeline tariffs
- Cross-subsidisation

Abstract

Although electricity subsidies play an important role in protecting poor and vulnerable households, they have to be funded. Thus, this paper uses descriptive analysis to examine the implications of the electricity lifeline tariff in Lesotho on both the utility and households over the period 2014-2022. The analysis is carried out by comparing variables at least 5 years before the implementation with those recorded in the years that have passed since. With the current implementation strategy, the utility sustained significant negative financial effects due to reduced revenue collections. Nevertheless, households experienced positive effects due to the lifeline tariff, such as increased electricity consumption, improved affordability, reduced consumption of polluting sources and increased use of electricity for cooking. Despite these, many households perceived electricity to be expensive and claimed they would reduce their consumption should electricity prices increase. This is corroborated by the declining consumption trend before the introduction of the lifeline tariff, and the fact that households still face electricity and energy poverty. This study concludes that the lifeline tariff is beneficial to the targeted households. However, it should be implemented by charging low-consumption households below cost and high-consumption households above cost to cross-subsidise the electricity consumption of the targeted households.

1. Introduction

Electricity subsidies play a significant role in protecting the poor and vulnerable households (orphans, old-age, unemployed and low-income earners) against high and rapidly increasing prices (Abdallah *et al.*, 2015). Hence, these subsidies are a sensitive social measure implemented to provide for the minimum needs of those with inadequate capacity to pay, thereby promoting social harmony and political stability (Sinha, 2015; Chian, 2014). Even though subsidies enable the targeted households to pay for electricity consumption at below-cost prices, they must be funded, and a variety of policy mechanisms resulting in different consequences are utilised to realise this. The first route is the introduction of the subsidy at the cost of the utility. This normally leaves the power sector in a state of disrepair, resulting in a collapse of energy utilities and an inability to supply power for normal social and economic activities.

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The second route is funding the subsidies from the government budget. This makes the power sector reliant on a complicated system of fiscally unsustainable budget transfers with the same consequences as the first option (Khalid and Salman, 2020). For many countries that implemented either of the two discussed methods, to put the power sector back on its feet, governments had to undertake far-reaching sector reforms, including scrapping the subsidies entirely in some cases (Chian, 2014; Giuliano *et al.*, 2020; Komives *et al.*, 2009; Lampietti *et al.*, 2007). Therefore, an effective subsidy mechanism needs to strike a delicate balance between social welfare and economic development to be sustainable.

A third policy mechanism that is utilised relies on cross-subsidies being self-funding. This is based on non-linear pricing to achieve distributional objectives targeting poor and vulnerable households, which normally consume low amounts of energy (Kanbur *et al.*, 1998). In this mechanism, the targeted low-consumption households pay tariffs that are below cost while high-consumption households and commercial/industrial customers pay tariffs that are above cost to cross-subsidise the targeted households (Cardenas and Whittington, 2019). This approach also incentivises electricity conservation as the cost increases with greater consumption. This is crucial for economies like Lesotho that import the bulk of their electricity from other countries (LEWA, 2022). However, some literature contends that cross-subsidies would hamper the introduction of competition in the liberalised power distribution sector, suppress industrial development and eventually hurt power sector finances in the long run (Urpelainen, 2018; Sinha, 2015). Despite these drawbacks, the ideal implementation of cross-subsidies does not place any financial burden on the utility or depend on the fiscal budget since it is self-funding and sustainable.

The cross-subsidy model of electricity pricing was recommended in Lesotho prior to the implementation of the lifeline tariff (Mpholo *et al.*, 2020). The aim was to cushion poor and vulnerable households against the proposed hikes in cost-reflective electricity tariffs. Hence, the electricity regulator, Lesotho Electricity and Water Authority (LEWA), introduced the electricity subsidy in the 2019/20 financial year only for households in the form of a low lifeline tariff for the first 30 kWh/month and maintained a higher standard tariff for all household consumption above 30 kWh, though not to the recommended above-cost level for appropriate cross-subsidisation (LEWA, 2019). Thus, it is necessary to assess the implications of the implemented electricity lifeline tariff to determine whether it met its intended objectives without leading to dire negative financial and socio-economic consequences.

This paper uses descriptive analysis to examine the implications of the implemented lifeline tariff in Lesotho over the period 2014-2022, on both the utility, Lesotho Electricity Company (LEC), and households to explore the need for reforms and for enhancing the impact on the targeted households. It considers the overall implications on the financial conditions of the utility company, electricity consumption, as well as household energy usage behaviour and expenditures. The analysis is carried out by comparing relevant variables at least 5 years before the implementation of the lifeline tariff with those recorded in the years that have passed since.

The study makes a number of contributions to the growing literature on electricity subsidy reforms. Firstly, it completes the picture of the implemented policy mechanism by sharing the practical consequences of its implementation. Secondly, it focuses on the experience of Lesotho, which does not receive much attention in academic and policy circles. The effective implementation of the lifeline tariff in Lesotho can serve as an important case study for countries of a similar nature and hence will not need to reinvent the wheel. Thirdly, it expands on other studies by incorporating the perceived effects of the lifeline tariff by households mainly with regard to behavioural changes and affordability of electricity. Finally, it offers policy reforms to improve the current policy mechanism to avoid the inevitable negative consequences of implementing unsustainable short-term gain frameworks.

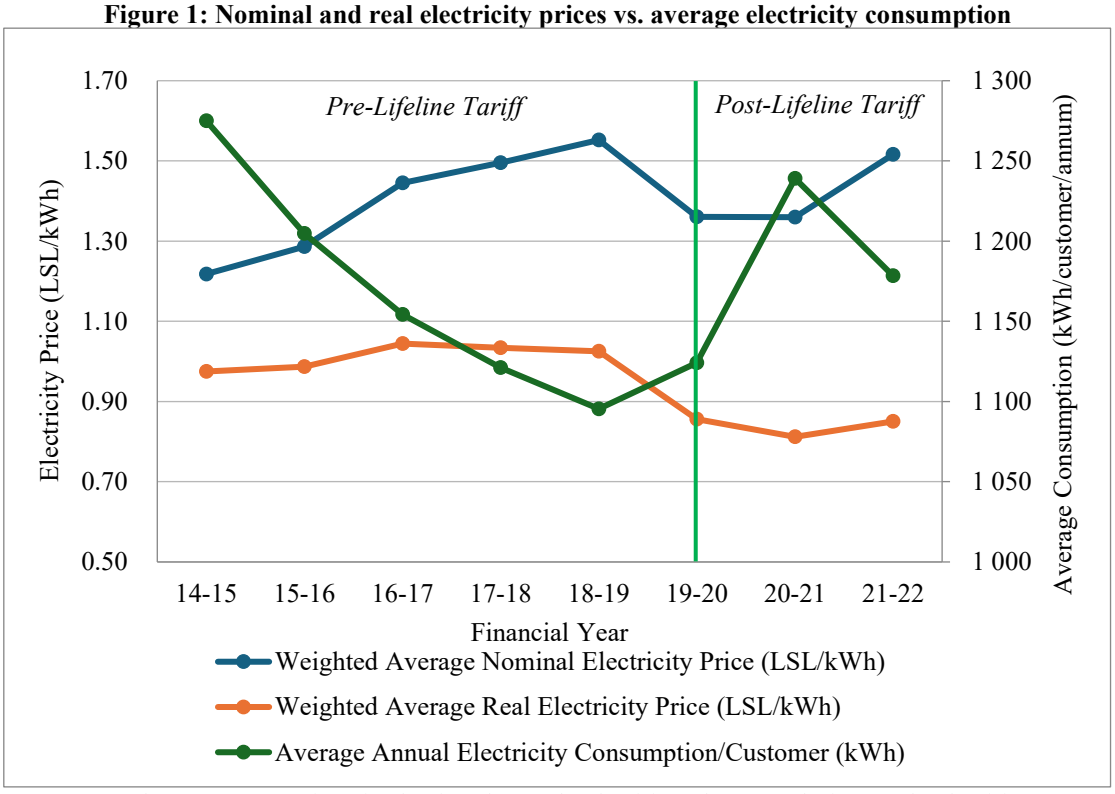
The rest of the paper is organised as follows. Section 2 starts with an analysis of the co-movements in electricity consumption, prices and income in Lesotho. This is followed by Section 3, which analyses the winners and losers from the implementation of the lifeline tariff, and Section 4, which presents household survey results on the perceived effects of the lifeline tariff on electricity consumption and affordability. Section 5 discusses the main findings of the study while Section 6 concludes the paper with policy implications.

2. Co-movements in electricity consumption, prices and income

In Lesotho, nominal electricity prices for household customers increased before the introduction of the lifeline tariff, and even real prices[2] showed a small increase, while average electricity consumption declined. Figure 1, which portrays annual trends in weighted average nominal and real electricity prices as well as the average electricity consumption per customer, shows that the nominal and the real electricity prices were LSL[3] 1.22/kWh and LSL 0.97/kWh in 2014/15, respectively, while electricity consumption was 1 275 kWh per customer. However, nominal electricity prices increased by about 27% to LSL 1.55/kWh in 2018/19, whereas real electricity prices only rose by about 5% to LSL 1.03/kWh over the same period. On the contrary, electricity consumption declined by about 14% to 1 095 kWh per customer. Thus, the customers became more sensitive to increases in real price and changed their behaviour by reducing their electricity consumption as it became more expensive over that period (Thamae *et al.*, 2015a).

After the implementation of the lifeline tariff, nominal and real electricity prices fell on average, while electricity consumption per customer increased significantly, as illustrated in Figure 1. Introducing a lifeline tariff for every household customer without any form of cross-subsidisation had the effect of reducing average nominal electricity prices by about 12% to LSL 1.36/kWh in 2019/20 and the average real electricity prices by about 16% to LSL 0.86/kWh. Although in 2021/22 the average nominal electricity prices rose by about 11% to LSL 1.52/kWh, the average real electricity prices continued to fall by about 0.1% to LSL 0.85/kWh. Apparently linked to this overall decline in household electricity prices, electricity consumption rose by about 3% and 13% in 2019/20 and 2020/21, respectively, peaking at 1 239 kWh per household customer in 2020/21. However, in 2021/22, the average electricity consumption dropped back by about 5% to 1 179 kWh. This could have been largely caused by the eroded incomes of customers due to the effects of the COVID-19 pandemic, as well as rising inflation, which is largely attributed to the Russia-Ukraine war (CBL, 2022).

Figure 1: Nominal and real electricity prices vs. average electricity consumption



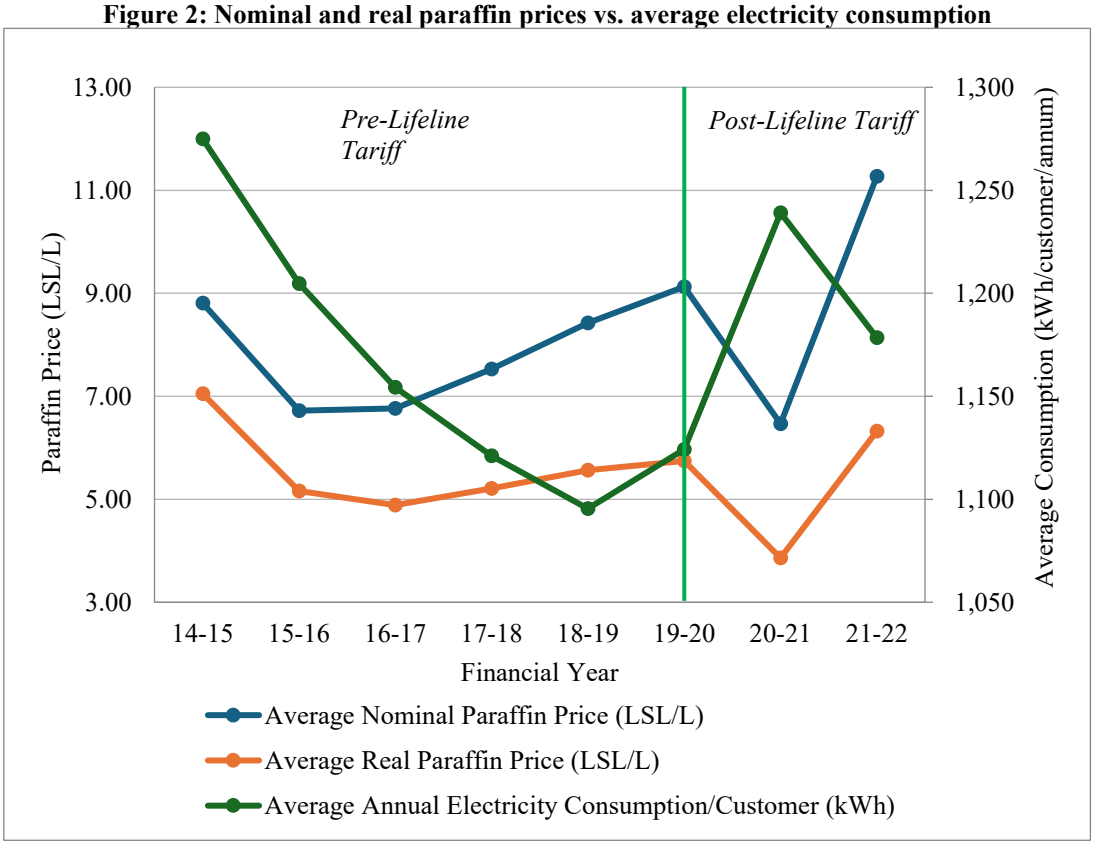
Source: Authors' own computation using data from the Lesotho Electricity and Water Authority, Lesotho Electricity Company and the Bureau of Statistics.

Prices for paraffin[4], which is a substitute for electricity, generally displayed a positive correlation with the average electricity consumption prior to the implementation of the lifeline tariff, but a negative one thereafter. Figure 2 portrays the annual trends in nominal and real paraffin prices as well

[2] Real prices are expressed in 2010 constant prices using the data on consumer price index (CPI) from the Lesotho Bureau of Statistics (BoS).
[3] USD 1 ≈ LSL 18.
[4] Paraffin prices are obtained from Lesotho's Department of Energy (DoE).

as in average electricity consumption per customer. In particular, real paraffin prices dropped by about 21% from LSL 7.05/L in 2014/15 to LSL 5.56/L in 2018/19, with the lows of LSL 4.89/L registered in 2015/16. During the same period (from 2014/15 to 2018/19) electricity consumption decreased by about 14% from 1 275 kWh per customer to 1 095 kWh per customer. This implies that customers might have shifted their demand to electricity substitutes such as paraffin as they were relatively cheaper than what they had been previously over the period considered. Nonetheless, since the implementation of the lifeline tariff in 2019/20, electricity consumption increased to 1 239 kWh per customer despite real paraffin prices falling to LSL 3.86/L in 2020/21. Thereafter, electricity consumption fell to 1 179 kWh regardless of the real paraffin prices rising to LSL 6.32/L in 2021/22. Thus, developments in paraffin prices appeared to have had little or no influence on trends in electricity consumption after the implementation of the lifeline tariff.

Figure 2: Nominal and real paraffin prices vs. average electricity consumption

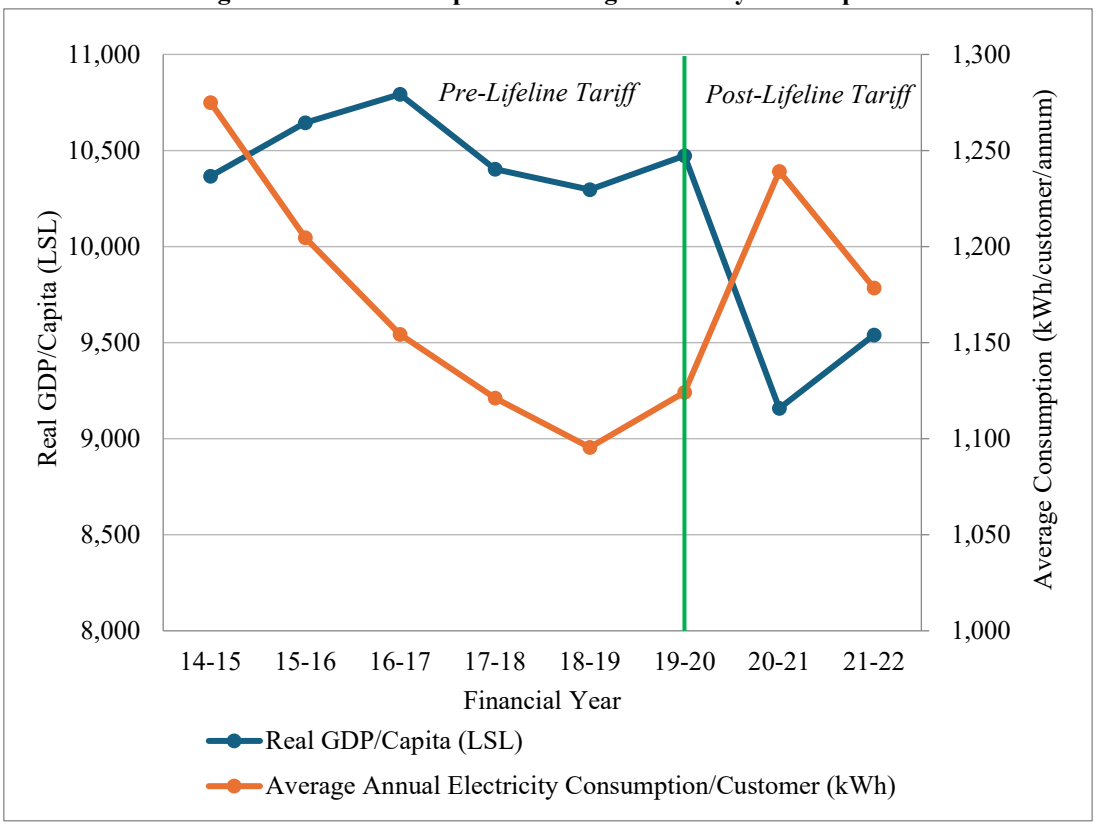


Source: Authors' own computation using data from the Lesotho Electricity and Water Authority, Lesotho Electricity Company, the Bureau of Statistics and the Department of Energy.

Trends in electricity consumption were largely positively linked with movements in real GDP per capita[5] before the introduction of the lifeline tariff, similar to earlier studies (Thamae *et al*., 2015a), but they became negatively related afterwards. As portrayed in Figure 3, which depicts annual trends in real GDP per capita and average electricity consumption per customer, real GDP per capita, despite peaking at LSL 10 793 in 2016/17, generally fell by about 1% from LSL 10 367 in 2014/15 to LSL 10 297 in 2018/19. During the same period, electricity consumption also experienced a downward trend with a fall of about 14% from 1 275 kWh per customer to 1 095 kWh per customer. This indicates that a deep fall in electricity consumption could have been exacerbated by a decline in the purchasing power of customers, who were already facing relatively higher electricity prices over that period. Nevertheless, after the introduction of the lifeline tariff in 2019/20, electricity consumption rose to 1 239 kWh per customer. This occurred despite real GDP per capita plummeting by about 13% between 2019/20 and 2020/21, reaching a low of LSL 9 158 in 2020/21, as a result of the impact of COVID-19-imposed restrictions (CBL, 2022). Subsequently, electricity consumption dropped to 1 179 kWh, irrespective of real GDP per capita recovering by about 4% to LSL 9 539. Therefore, movements in income seemed to have had no effect on electricity consumption following the implementation of the lifeline tariff.

[5] Real GDP figures are expressed in 2012 constant prices and real GDP per capita is calculated as real GDP divided by population size using the data from Lesotho's BoS.

Figure 3: Real GDP/capita vs. average electricity consumption



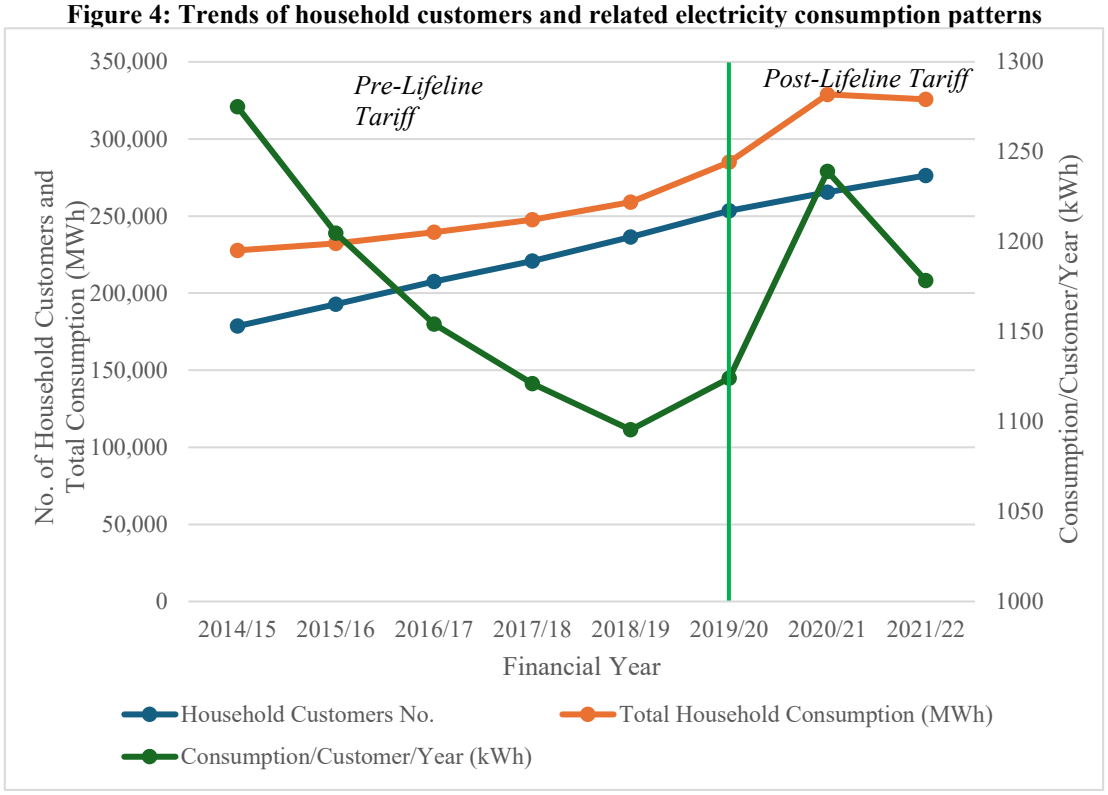
Source: Authors' own computation using data from Lesotho Electricity Company and the Bureau of Statistics.

3. Winners and losers from the implementation of the lifeline tariff

This section identifies the winners and losers resulting from the introduction of the household lifeline tariff in the electricity sector. It evaluates the scale of benefits and costs for both the utility and the household customers. It also assesses whether the beneficiaries correlate with the targeted poor or vulnerable households. This is to avoid situations like that of Pakistan where it was found that the biggest beneficiaries of the electricity subsidies were the richest 20% of the population (Trimble *et al.*, 2011). Moreover, policy reforms are inherently characterised by winners and losers (Lampietti *et al.,* 2007). Nevertheless, the crucial issue is to balance the outcome such that there are no long-term potential negative consequences for the losers, which could render the reforms unsustainable or, at an extreme end, result in social and/or political backlash.

Generally, the introduction of the household lifeline tariff appears to have immediately benefited the household customers, as illustrated by Figure 4, with a distinct upward change in the trend of energy consumption/customer/year since 2019/20. Despite the increasing household customer numbers connected to the national electricity grid, the average annual energy consumption per customer had been steadily declining from about 1 275 kWh in 2014/15 to just over 1 100 kWh in 2018/19. However, when the household lifeline tariff was introduced in 2019/20, the consumption picked up for two consecutive years, reaching about 1 240 kWh in 2020/21, before slightly declining the following year, most probably due to the COVID-19 pandemic effects. Clearly, household customers, targeted beneficiaries of the lifeline tariff, have benefited significantly as they are using more electricity due to it being more affordable.

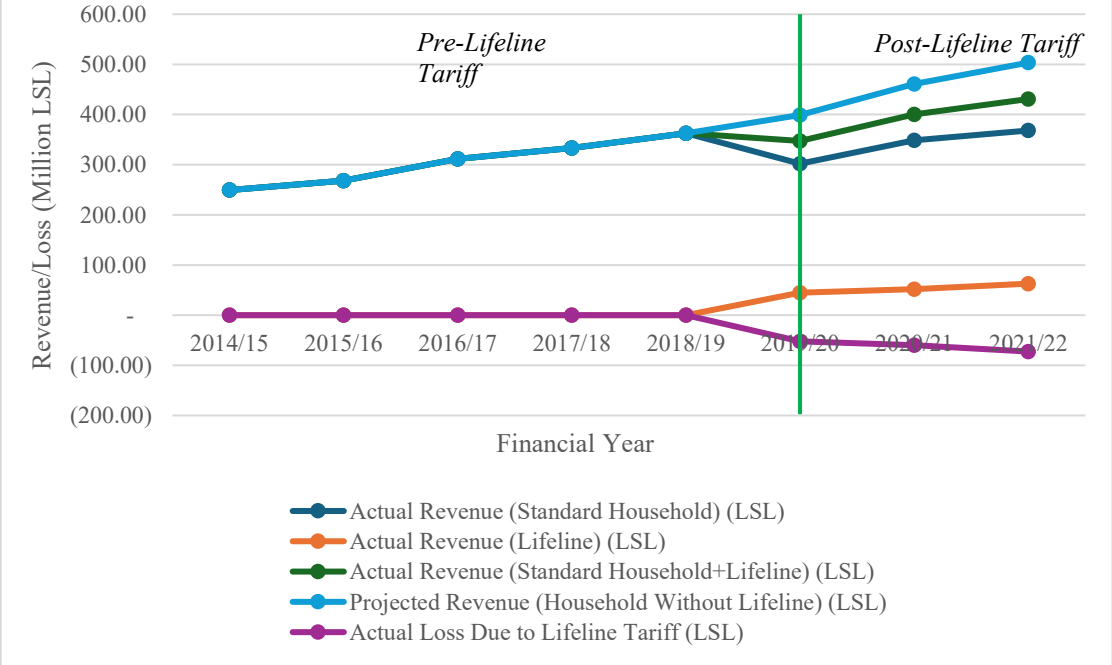
Figure 4: Trends of household customers and related electricity consumption patterns



Source: Authors' own *computation* using data from the Lesotho Electricity and Water Authority and Lesotho Electricity Company

The utility, LEC, sustained a significant negative financial impact due to the reduced revenue collections from household customers, as shown in Figure 5. Without the lifeline tariff, the projected revenue collection would have increased steadily from about LSL 360 million in 2018/19 to about LSL 500 million in 2021/2022. However, with the introduction of the household lifeline tariff for the first 30 kWh per month and no increase to the standard household tariff for subsequent higher consumption to cross-subsidise the lifeline tariff, the actual collected revenue from the household energy consumption dropped by around LSL 52 million in 2019/20 to LSL 73 million in 2021/22.

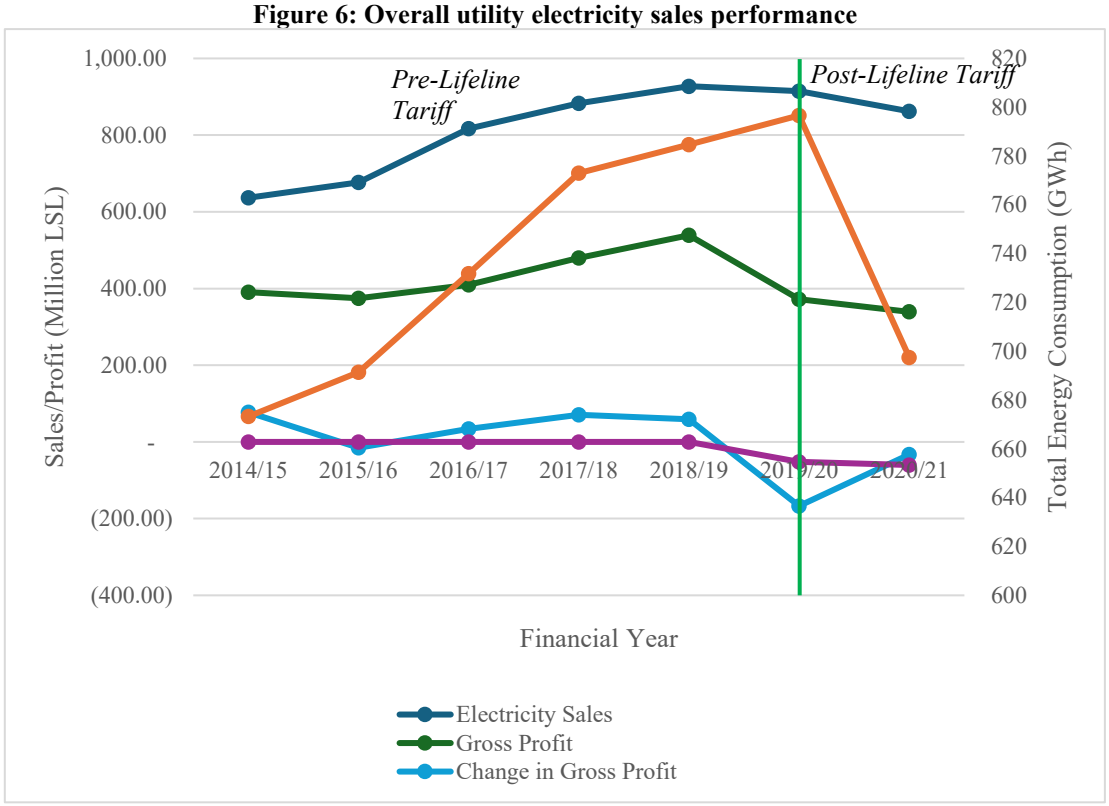
Figure 5: Trends of LEC revenue collection from household customers' electricity consumption



Source: Authors' own computation using data from the Lesotho Electricity and Water Authority and Lesotho Electricity Company

A clear dip in the financial performance of the utility coincided with the introduction of the household lifeline tariff, worsening its economic efficiency and financial viability as prices are linked to costs (Thamae *et al.*, 2015b; Kanbur *et al.*, 1998). This is illustrated by the overall electricity sales in Figure 6 and other financial ratios in Figure 7 and Figure 8. Figure 6 shows that the overall electricity consumption increased from 2018/19 to 2019/20 while the corresponding revenue dropped, with a resultant negative change in gross profit of about LSL 167 million coinciding with the introduction of the lifeline tariff. However, a note has to be taken that, out of the LSL 167 million drop in gross profit in 2019/20, the introduction of the household lifeline tariff appears to account for about LSL 52 million (31%), as illustrated in Figure 5, calculated using household energy consumption data. The other 69% decline is due to the lack of inflationary adjustment (0% increase) for all tariff categories in the same financial year because the regulator penalised the utility for non-compliance by disallowing the return on assets, hence reducing the revenue requirement by close to LSL 100 million (LEWA, 2019). Subsequent drops in 2020/21 in both consumption and sales can be attributed to the onset of the COVID-19 pandemic and associated restrictions on movement and commercial activities.

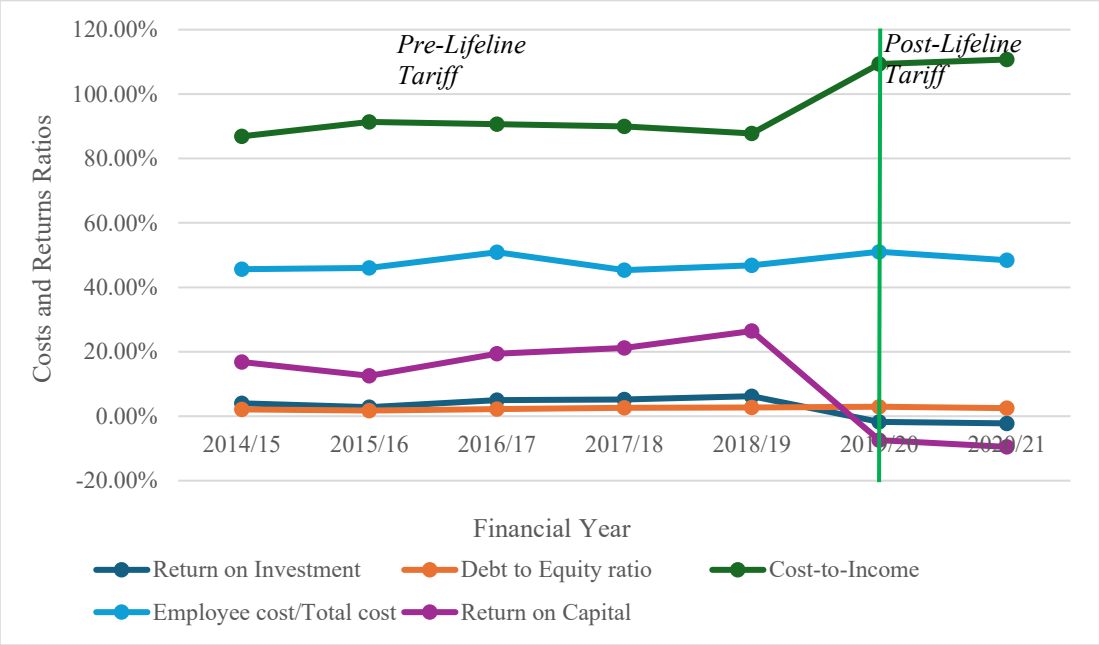
Figure 6: Overall utility electricity sales performance



Source: Authors' own computation using data from the Lesotho Electricity and Water Authority and Lesotho Electricity Company

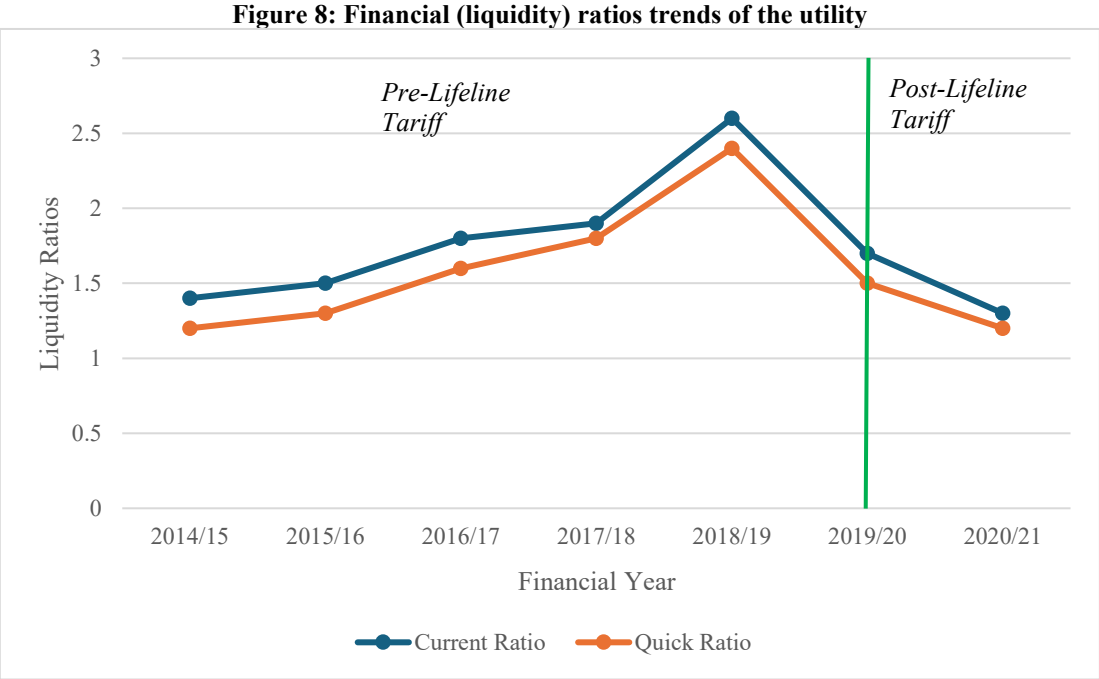
The negative effect of the losses in revenue collections and resulting drops in gross profits since 2019/20 are visible in the overall financial performance of the utility in terms of costs, returns (Figure 7) and liquidity (Figure 8). While the ratios of debt to equity and employee cost to total cost remained largely constant at respective averages of 2.4% and 48%, Figure 7 shows that the cost-to-income ratio shot from 88% to around 110%, the return on capital dropped from 26% to about -9%, and the return on investment decreased from 6% to less than -2%. In addition, the liquidity (current and quick) ratios in Figure 8 demonstrate a corresponding 50% decrease from ample liquidity in 2018/19 (2.6 and 2.4, respectively) to a less secure state in 2020/21 (1.3 and 1.2, respectively). Hence, the utility was probably compromised in its ability to pay short-term obligations or debts within one year.

Figure 7: Trends of the financial (cost and returns) ratios of the utility



Source: Authors' own computation using data from the Lesotho Electricity and Water Authority and Lesotho Electricity Company

Figure 8: Financial (liquidity) ratios trends of the utility



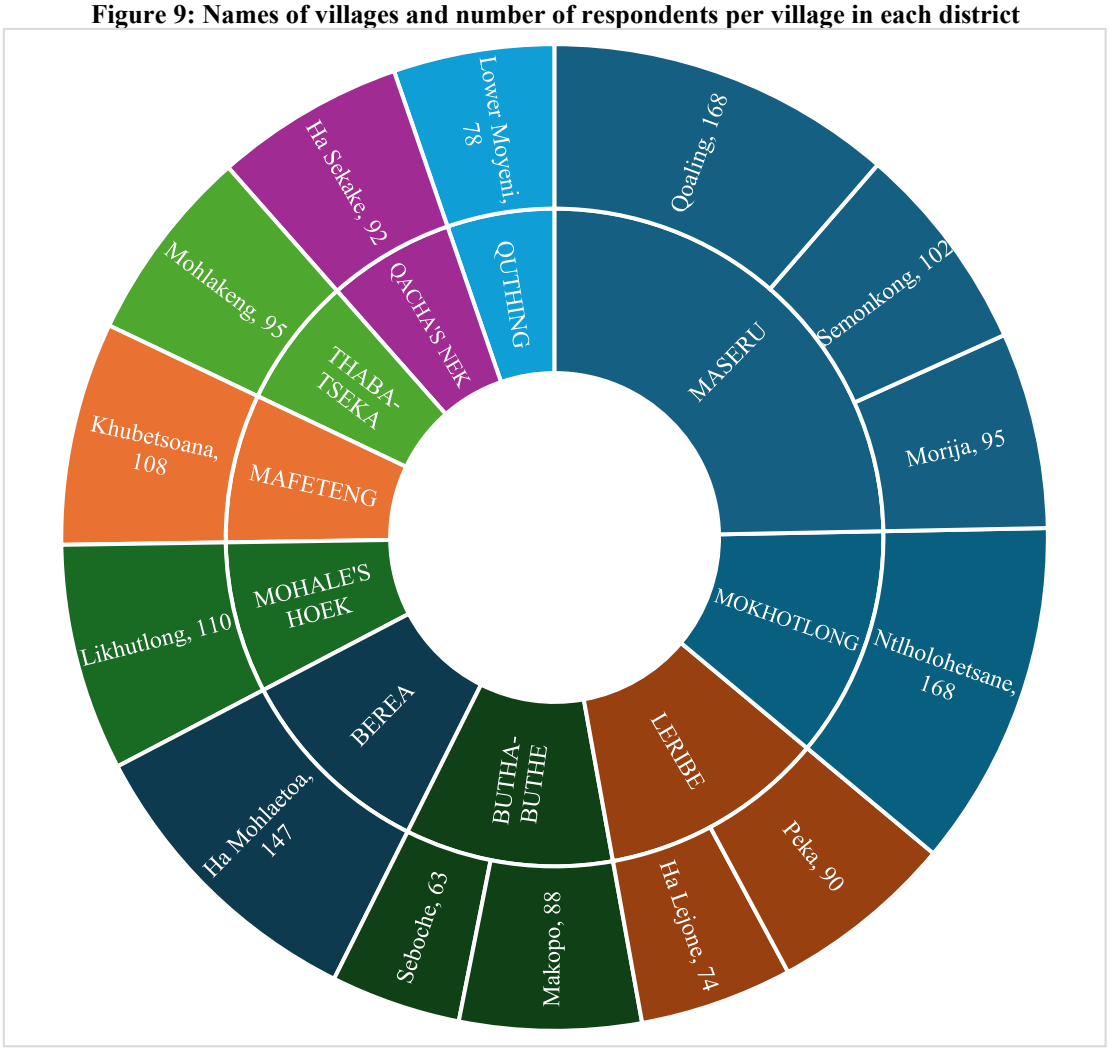
Source: Authors' own computation using data from the Lesotho Electricity and Water Authority and Lesotho Electricity Company

4. Household perceptions

This section analyses the survey data collected to evaluate the perceived effects of the lifeline tariff on electricity consumption. It includes household demographics, electricity affordability and usage as well as overall expenditure patterns. Due to limited resources, only 14 villages across all 10 districts of Lesotho were purposively selected, and a total of 1 478 households were interviewed between August and September 2022. The villages included 3 rural or peri-urban villages that were surveyed in March 2017 (Mpholo *et al*., 2018) prior to the implementation of the lifeline tariff, plus 11 additional urban or peri-urban villages. The sampled villages were selected to give a balanced representation of both types of environments (rural, peri-urban and urban), as well as the regional locations. Validation of the chosen villages and survey questionnaire was sought from the Lesotho BoS.

The survey questions were conducted to determine the extent to which the lifeline tariff has been perceived to influence the behavioural consumption patterns of the households, especially the targeted consumers (poorest and vulnerable households). For every village that was selected, all households were interviewed, noting that there were some vacant houses, which could not be included in the survey. Figure 9 gives the names of the villages and the number of households surveyed per village in each of the 10 districts of Lesotho.

Figure 9: Names of villages and number of respondents per village in each district

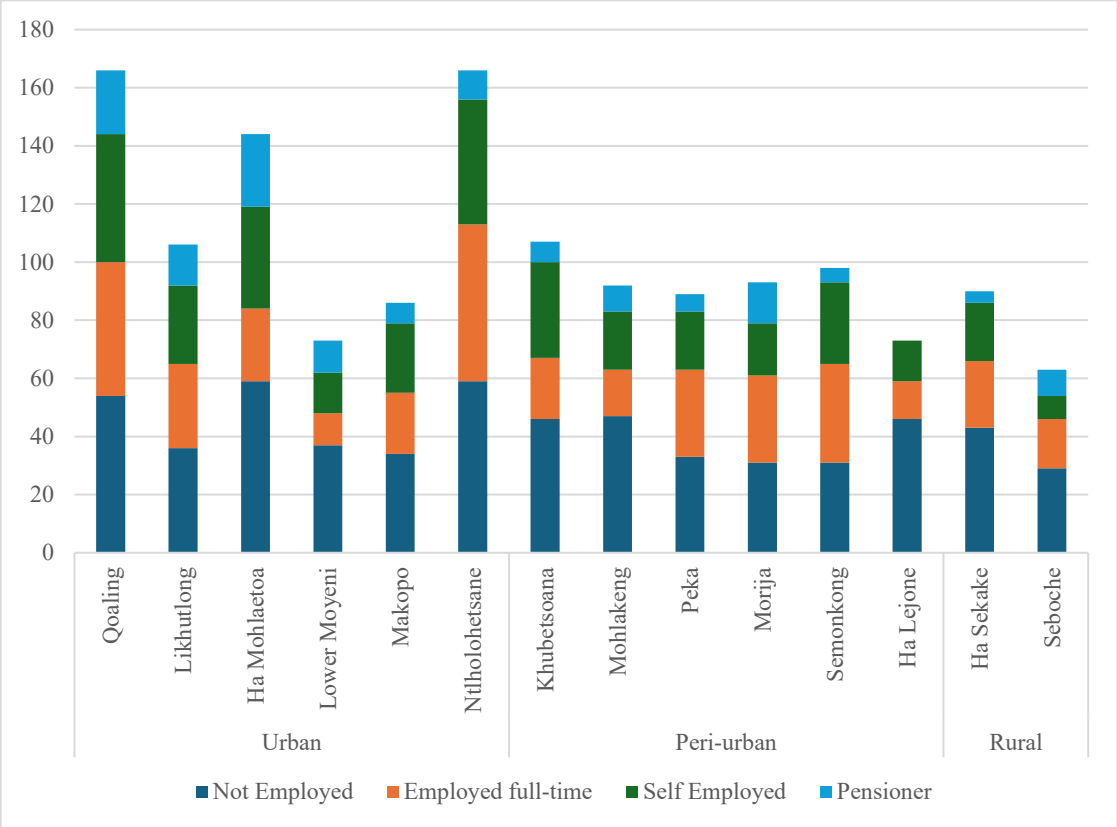


Source: Authors' own computation using survey data collected in 2022

4.1 Household demographics

Overall, 40% of household heads were not employed. Figure 10 shows the distribution of the employment status of household heads disaggregated by village and settlement type. From the graph, it is observed that the majority of household heads were unemployed, while those on pension, either old age government pension or retirement pension, were the smallest category.

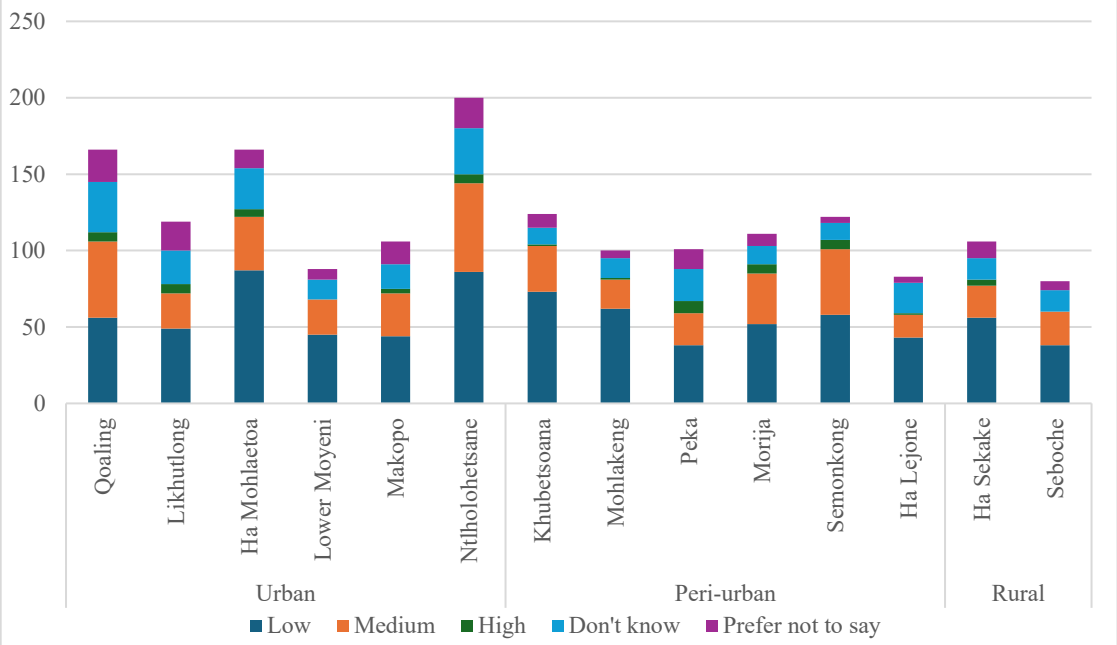
Figure 10: Employment status of household head



Source: Authors' own computation using survey data collected in 2022

Furthermore, the majority of households fell into the low-income category. According to Figure 11, which depicts the income distribution of household heads disaggregated by village and settlement type, about 50% of the respondents came from low-income households (earning below LSL 2 000 per month). The second highest category was of respondents coming from the middle-income category (earning between LSL 2 000 and LSL 9 999 per month), while the high-income category (earning LSL 10 000 and above per month) was the least represented.

Figure 11: Household income (per month)

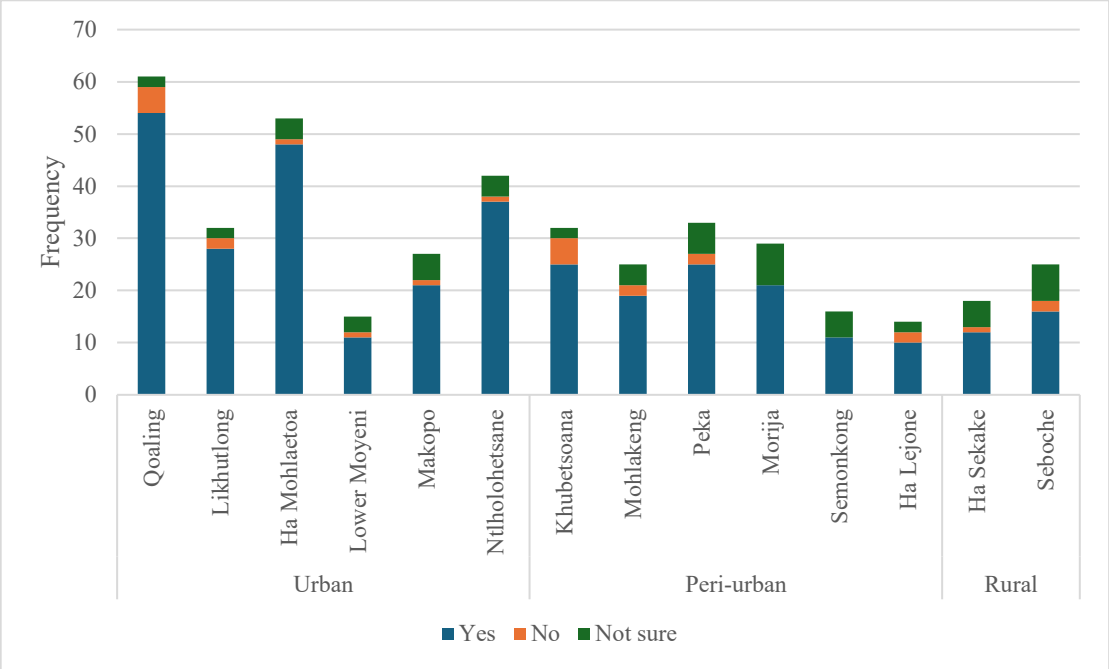


Source: Authors' own computation using survey data collected in 2022
Notes: Low = Below LSL 2 000; Medium = LSL 2 000 – LSL 9 999; High = LSL 10 000 and above

4.2 Affordability, accessibility and usage of electricity

The cost of electricity consumption was perceived to be more affordable due to the lifeline tariff. Figure 12 highlights the affordability of electricity due to the lifeline tariff amongst those who were aware of it. From the graph, it can be observed that about 70% or more of the respondents claimed that electricity became more affordable due to the lifeline tariff. People cited that electricity was very cheap on the 1st day of every month, and they waited to buy electricity on that day. They were not aware that the subsidy would still apply for any day of the month if it was the first time to buy electricity in that month.

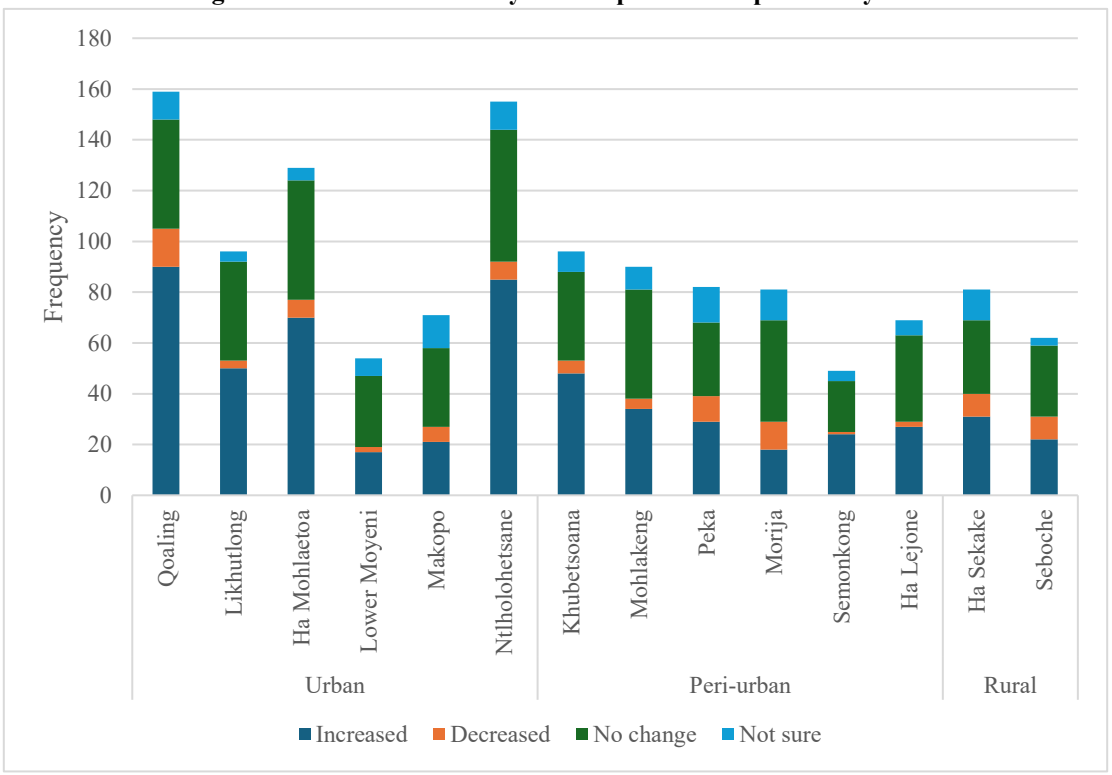
Figure 12: Electricity affordability due to the lifeline tariff



Source: Authors' own computation using survey data collected in 2022

A significant number of households increased electricity consumption in the past four years. Figure 13, which depicts what happened to the level of electricity consumption in the past four years, illustrates that about 40% of the households reported an increase in their electricity consumption. This pattern is even more pronounced in urban villages and could be due to the cheaper cost of electricity following the introduction of the lifeline tariff, amongst other factors. Furthermore, even though a considerable number of households indicated that they did not experience any change in electricity consumption, only a limited number across all settlements claimed that their electricity consumption declined in the past four years.

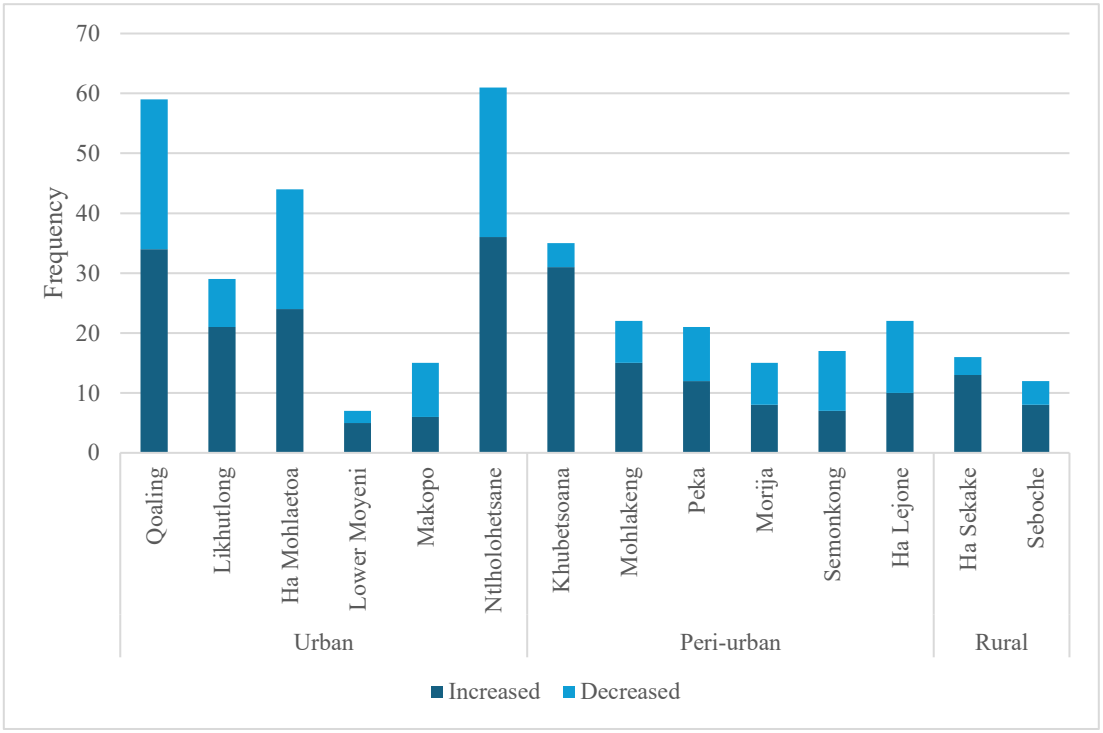
Figure 13: Level of electricity consumption in the past four years



Source: Authors' own computation using survey data collected in 2022

A sizeable number of households that increased their electricity consumption in the past four years managed to reduce the consumption of polluting sources of energy. Figure 14 depicts what happened to the consumption of polluting energy sources such as biomass and paraffin for households that increased their electricity consumption in the past four years. About 30% of the households reduced the consumption of polluting energy sources, while the rest still increased it. This shows that to some extent, the lifeline tariff, among other factors, could have helped some households to replace some of the dirty energy sources with clean ones (Mothala *et al.*, 2022; Hosier and Kipondya, 1993). However, for households that increased their electricity consumption, a possible explanation could be that the lifeline tariff has increased their disposable income and were able to buy more electricity.

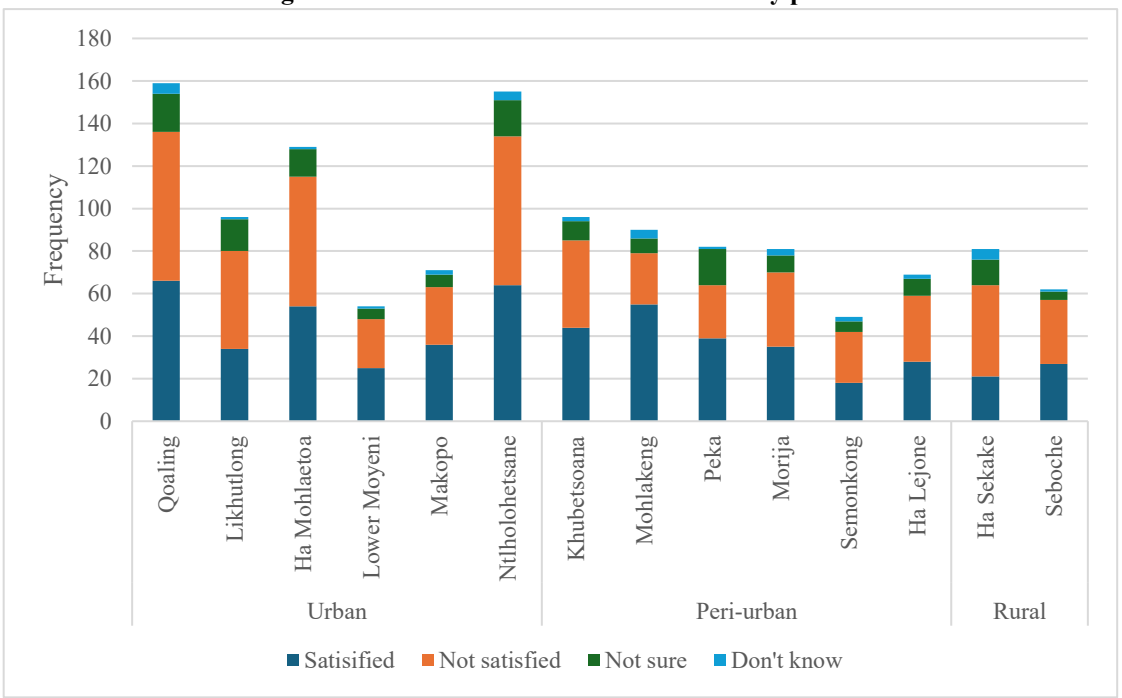
Figure 14: Consumption of polluting sources of energy for households that increased electricity consumption in the past four years



Source: Authors' own computation using survey data collected in 2022

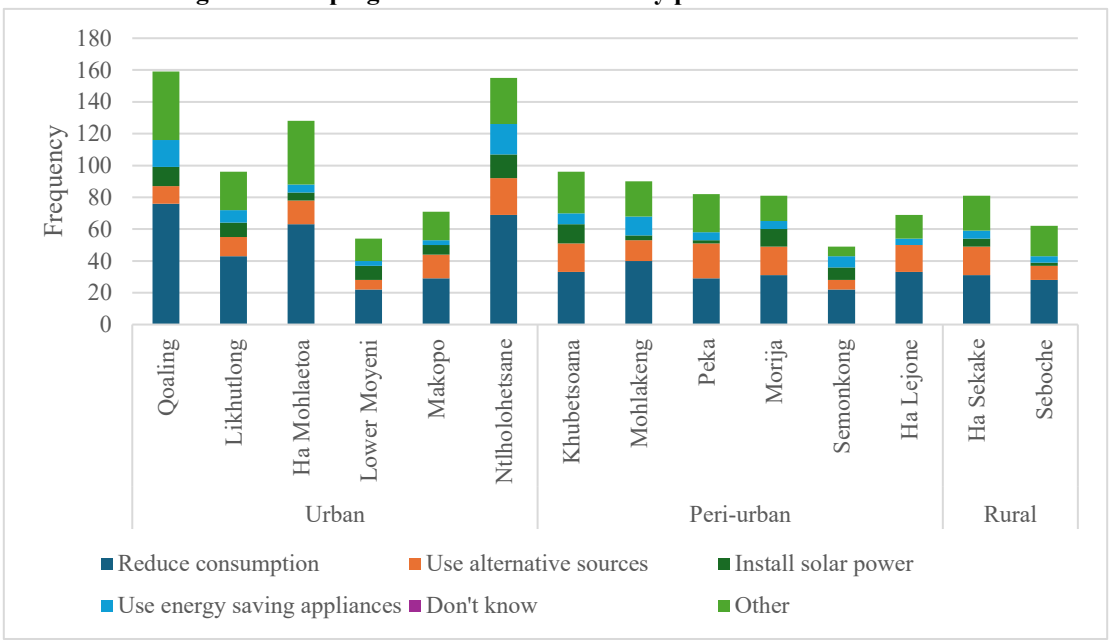
People were generally not satisfied with the prevailing electricity prices, and if the tariff could increase in the future, many intended to change their electricity usage patterns. As shown in Figure 15, many households (slightly over 50%) perceived electricity to be very expensive, especially when it is needed for energy-intensive applications such as cooking and space heating. Figure 16, which illustrates the coping mechanisms if electricity prices rise in the future, shows that many households would most likely reduce their electricity consumption, while others would use energy-efficient appliances, install solar power or use alternative sources. Of households that responded "other", most outlined that they would continue to use electricity as they became accustomed to it and had no alternatives.

Figure 15: Satisfaction with current electricity prices



Source: Authors' own computation using survey data collected in 2022

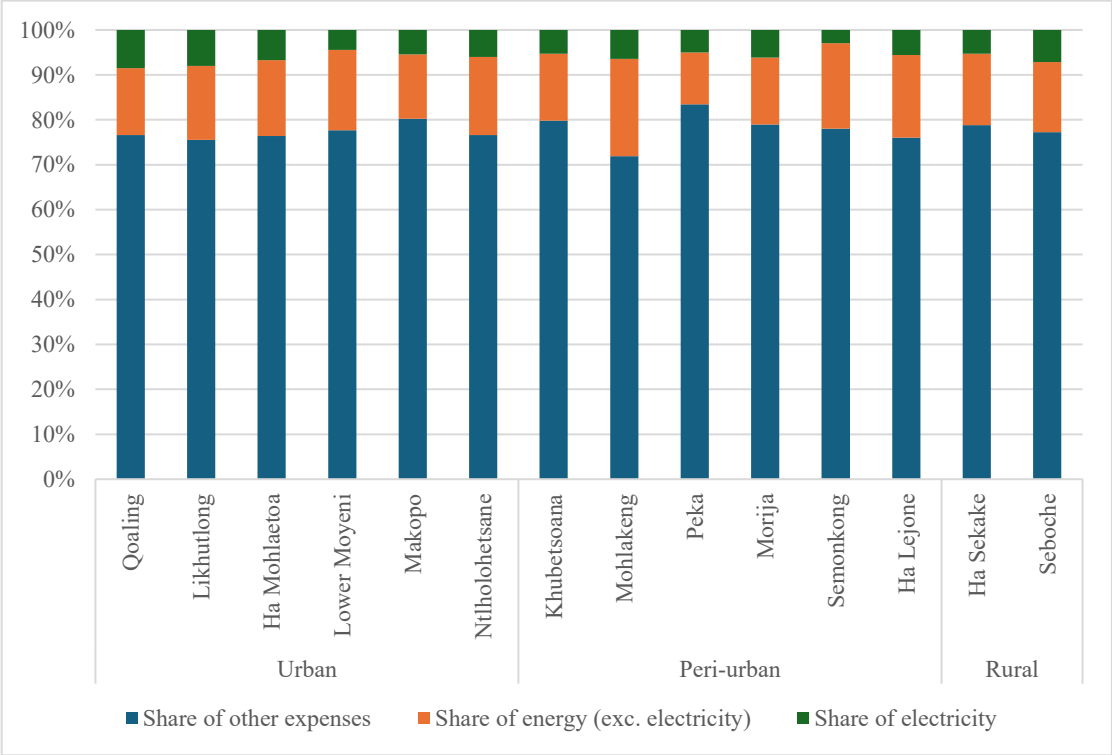
Figure 16: Coping mechanisms if electricity prices rise in the future



Source: Authors' own computation using survey data collected in 2022

Overall, households across all settlement types were electricity and energy poor. Figure 17 shows the distribution of monthly electricity and energy expenditures relative to total household expenditure. Household expenditure on electricity generally accounted for about 6% of the total monthly expenditure, while the share of energy (including electricity) on overall expenditure was about 22%. Globally, households are regarded as energy poor if they spend more than 10% of their total expenditure on energy sources. In the case of electricity, the World Bank considers any household that spends more than 5% of its total expenditure on electricity to be electricity poor (Kojima and Trimble, 2016). Thus, households in all the surveyed villages generally faced both electricity and energy poverty.

Figure 17: Monthly electricity and energy expenditure relative to total household expenditure



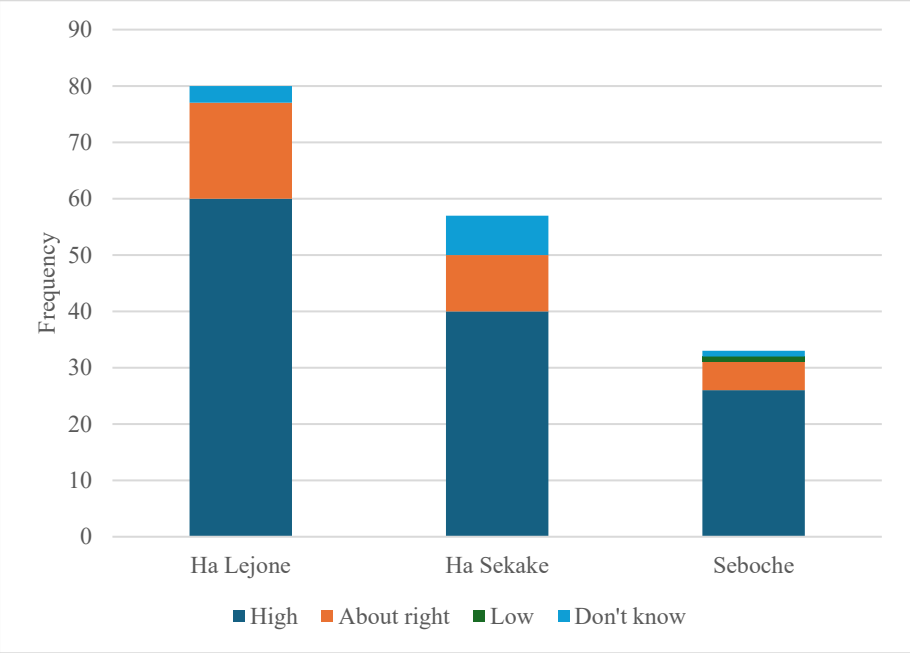
Source: Authors' own computation using survey data collected in 2022

4.3 Comparison of survey results before and after lifeline tariff implementation

This sub-section compares the results of the 2017 survey on electricity use and affordability (Mpholo *et al.*, 2018) with the 2022 survey results described in the preceding sub-sections. This comparison is based on the following three villages: Ha Lejone (Leribe District), Ha Sekake (Qacha's Nek District) and Seboche (Butha-Buthe District).

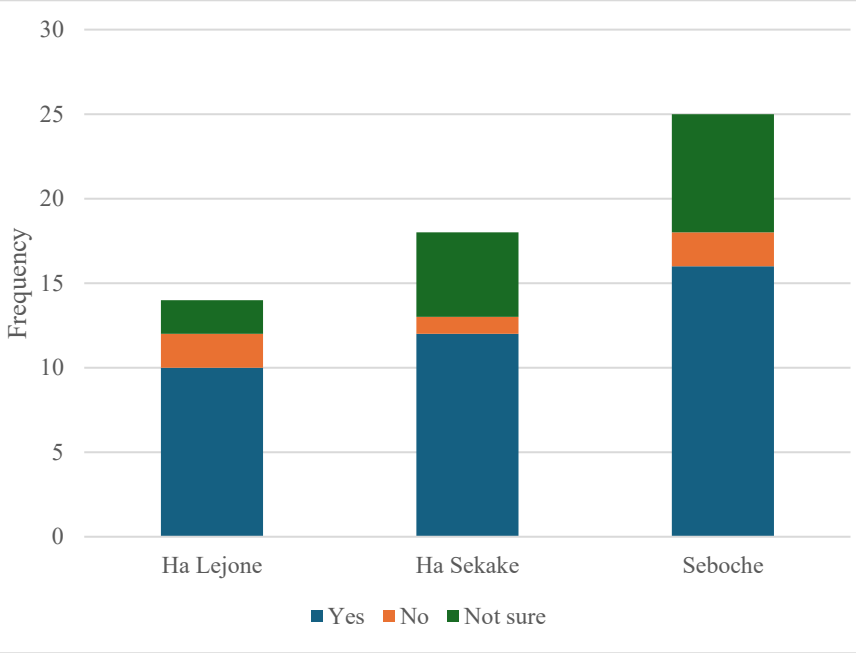
Although the majority of households previously considered electricity prices to be high, a considerable number that were aware of the implementation of the pro-poor tariff agreed that the initiative made electricity more affordable. Figure 18 shows the households' perceptions of electricity unit price as of 2017, while Figure 19 shows households' views of electricity affordability due to the introduction of the lifeline tariff (for those who were aware of it). It can be seen that, in 2017, more than 70% of the households in all the villages perceived electricity prices to be high. However, in 2022, over 60% of those who were aware of the implementation of the pro-poor tariff acknowledged that the move made electricity more affordable.

Figure 18: Perception of electricity unit price as of 2017



Source: Authors' own computation using survey data collected in 2017

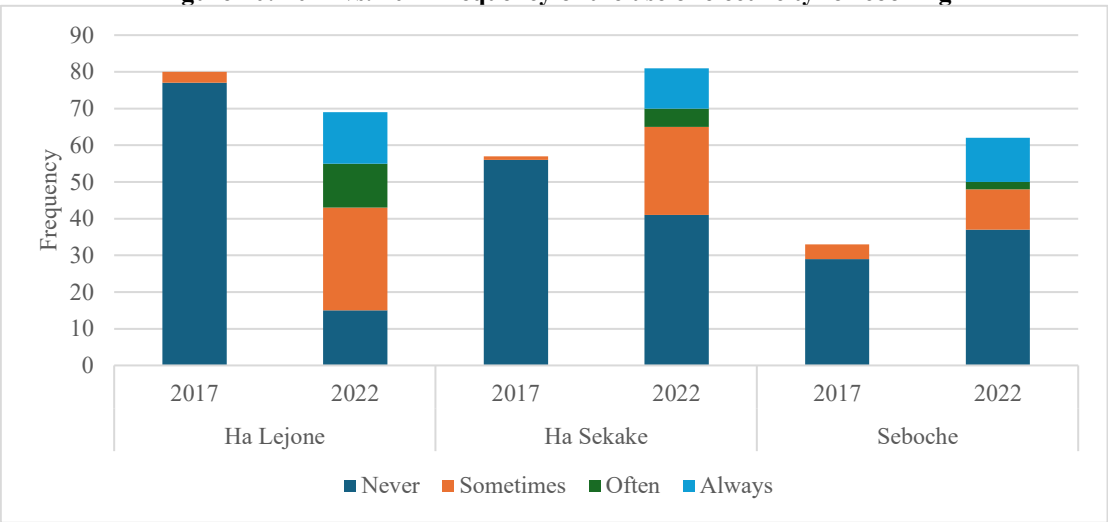
Figure 19: Electricity affordability due to the lifeline tariff as of 2022



Source: Authors' own computation using survey data collected in 2022

A significant number of households adapted in terms of using electricity for cooking (and lighting), but rarely for space heating. Figure 20 to Figure 22 compare the frequencies of the use of electricity for cooking, space heating and lighting, respectively. Use of electricity for cooking increased, with over 78% (from about 4% in 2017) of households in Ha Lejone and over 40% (from about 2% and 12% in 2017) of households in Ha Sekake and Seboche, respectively, indicating that they use electricity for cooking. Moreover, almost all the households during these two periods used electricity for lighting. In contrast, the majority of households (over 80%) still did not prefer to use electricity for space heating.

Figure 20: 2017 vs. 2022 frequency of the use of electricity for cooking

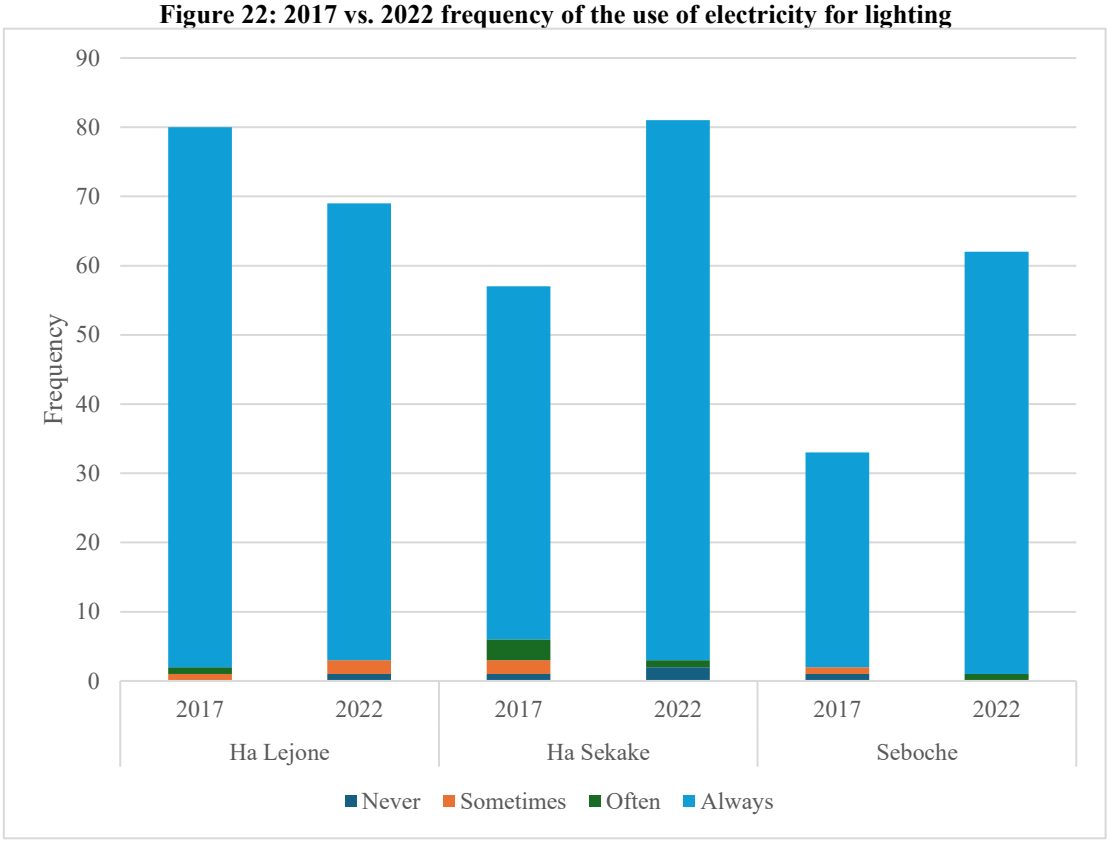


Source: Authors' own computation using survey data collected in 2017 and 2022

Figure 21: 2017 vs. 2022 frequency of the use of electricity for space heating

Source: Authors' own computation using survey data collected in 2017 and 2022

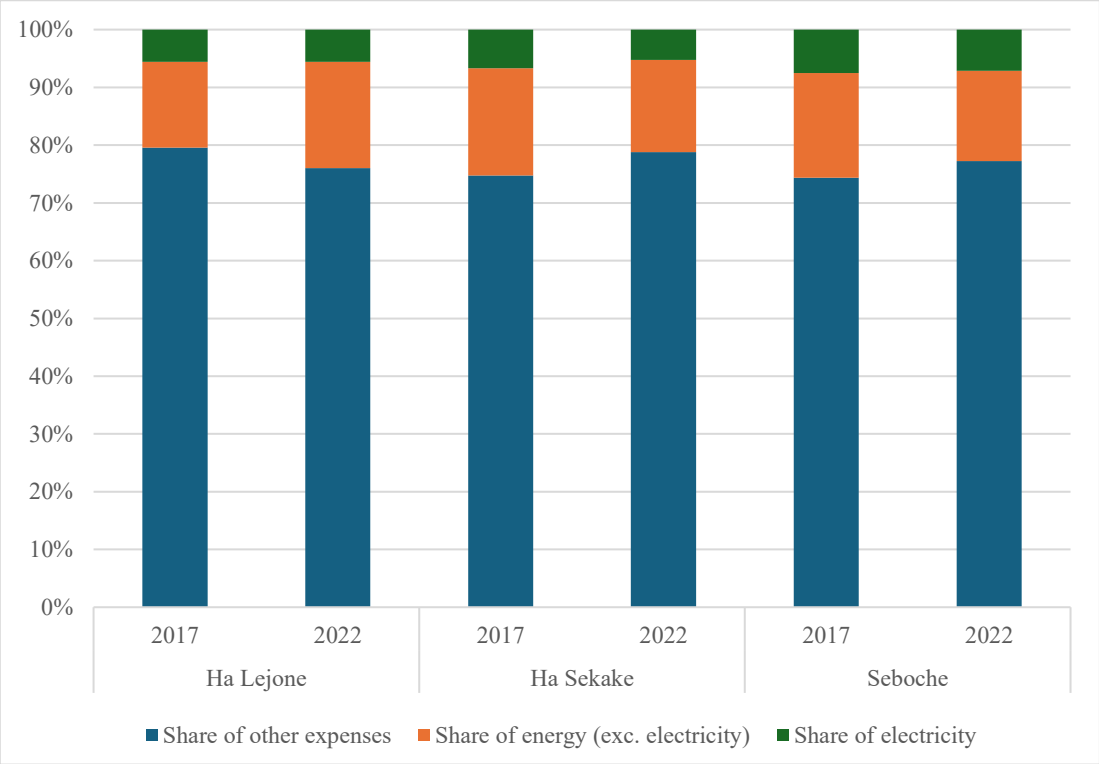
Figure 22: 2017 vs. 2022 frequency of the use of electricity for lighting



Source: Authors' own computation using survey data collected in 2017 and 2022

On average, household electricity and energy poverty moderately declined. As portrayed in Figure 23, the proportion of household expenditure on electricity to overall expenditure fell from 6.7% (2017) to 5.3% (2022) in Ha Sekake and from 7.5% (2017) to 7.1% (2022) in Seboche, while it remained the same at 5.6% in Ha Lejone. Similarly, the share of household energy expenditure to overall expenditure declined from 25.2% and 25.6% in 2017 to 21.2% and 22.7% in 2022 in Ha Sekake and Seboche, respectively, but it increased from 20.4% in 2017 to 24% in 2022 in Ha Lejone. Even though the households in these villages still faced both electricity and energy poverty, it seemed the introduction of the lifeline tariff had modestly reduced such poverty.

Figure 23: 2017 vs. 2022 monthly electricity and energy expenditure relative to total household expenditure



Source: Authors' own computation using survey data collected in 2017 and 2022

5. Discussion

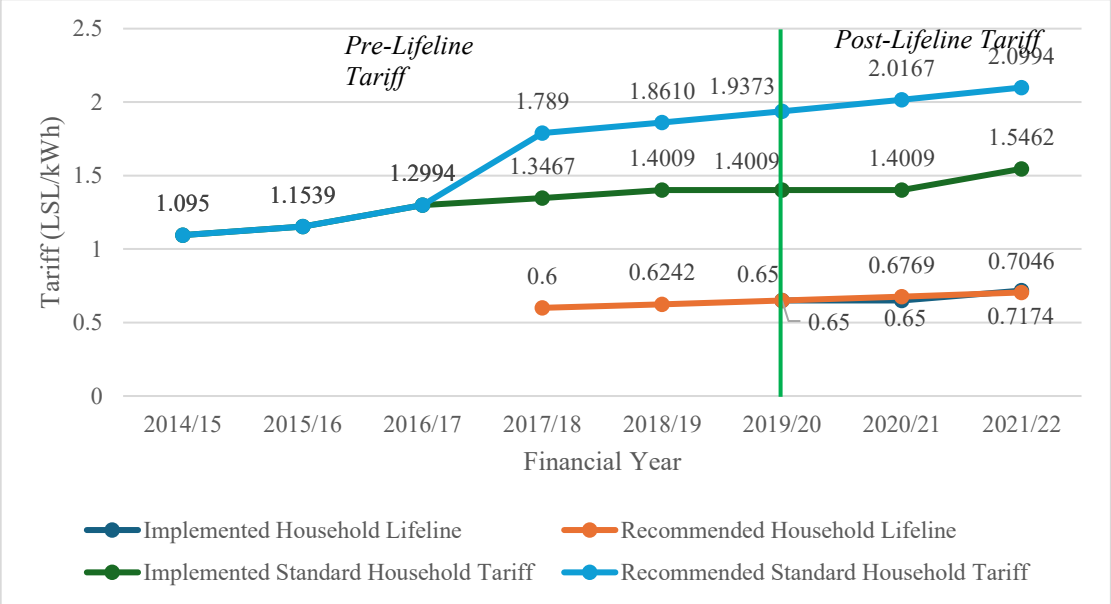
Although households have experienced positive effects due to the lifeline tariff, such as increased electricity consumption and affordability, the lifeline tariff is a subsidy and can have negative impacts on the performance of the utility or the government if it is not well implemented (Klug *et al.*, 2022; Kelly and Geyer, 2018; Urpelainen, 2018; Komives *et al.*, 2009). Hence, someone has to fund the subsidies. Currently in Lesotho, the subsidy is implemented at a cost to the utility services (expansion, quality upgrades, operations costs, etc.). This inevitably leads to a number of negative consequences, including ageing infrastructure inadequate to meet demand. In some countries, governments provide subsidies from the fiscal budget, absorbing a significant proportion of public resources for other equally crucial social and economic programmes. Many governments found this huge public expenditure to be unsustainable, and most such subsidies had to be scrapped or drastically reformed (Chian, 2014; Giuliano *et al.*, 2020; Trimble *et al*., 2011; Komives *et al.*, 2009; Lampietti *et al.*, 2007).

To avoid the foregoing challenges, the implementation of the lifeline tariff in Lesotho was proposed to be self-financing (Mpholo *et al.*, 2020). This required setting the tariff for the lower block (lifeline tariff) below cost recovery and the higher block (standard tariff) above it, placing the burden of financing the subsidy on the higher-consumption consumers, rather than the utility or the government. The negative effect of the lifeline tariff on the financial performance of the utility took place because the proposed cross-subsidy was not implemented. The failure to implement the cross-subsidy also leads to errors of inclusion for higher-consumption household customers who benefit even though the majority do not fall under the 'poor and vulnerable' category. Therefore, effective implementation of subsidies needs to be targeted and limited to avoid costly subsidies to users who are able to pay (Angel-Urdinola and Wodon, 2012; Trimble *et al.*, 2011). The cross-subsidisation mechanism effectively addresses this issue as the subsidy benefits are only enjoyed by the targeted low-consuming poor and vulnerable households.

Based on the poverty line, a lifeline tariff of LSL 0.5/kWh to LSL 0.6/kWh (2017/18 tariffs) for a threshold of up to 30 kWh/month, which was 35% to 42% lower than the existing household tariff of LSL 1.37/kWh, was recommended for implementation (Mpholo *et al.*, 2020). To cross-subsidise the lifeline tariff and hence maintain the financial standing of the utility, other tariffs were to be increased. The recommended standard household tariff would need to have increased to LSL 1.79/kWh with subsequent inflationary adjustments, as demonstrated by Figure 24. Tariffs for all other customer categories would have required an uplift of 4.5%, as shown in Figure 25. Comparing both Figure 24 and Figure 25, it is evident that the biggest discrepancy for cross-subsidising the lifeline tariff has been in the

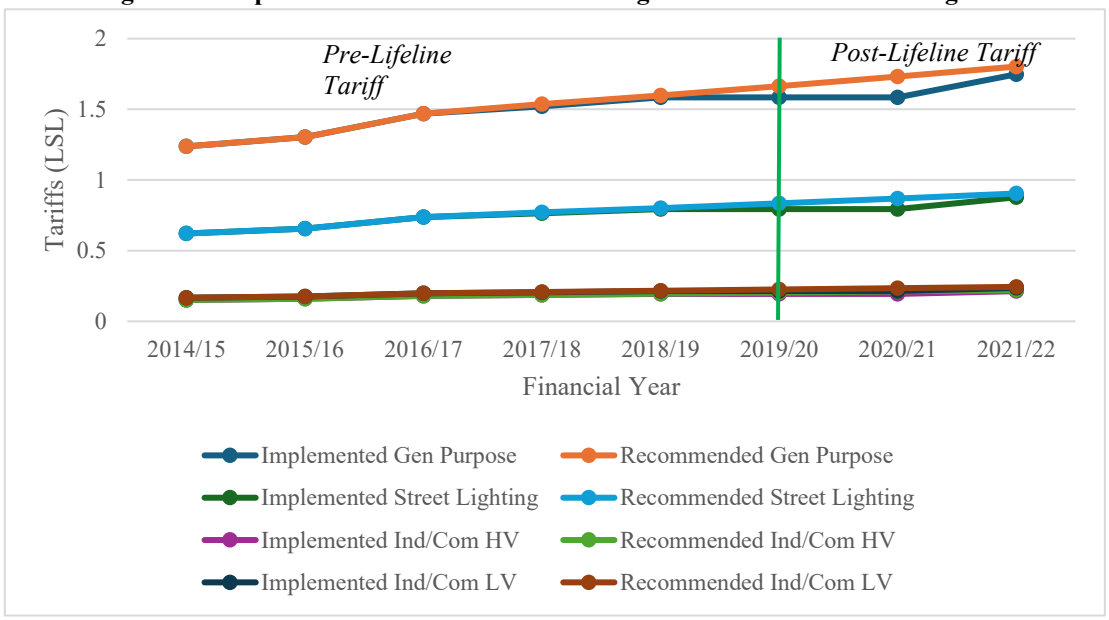
household customer category, with the implemented standard household tariff falling short of the recommended values by around 25% to 30%.

Figure 24: The implemented household tariffs vs. the recommended ones



Source: Authors' own computation using data from the Lesotho Electricity and Water Authority

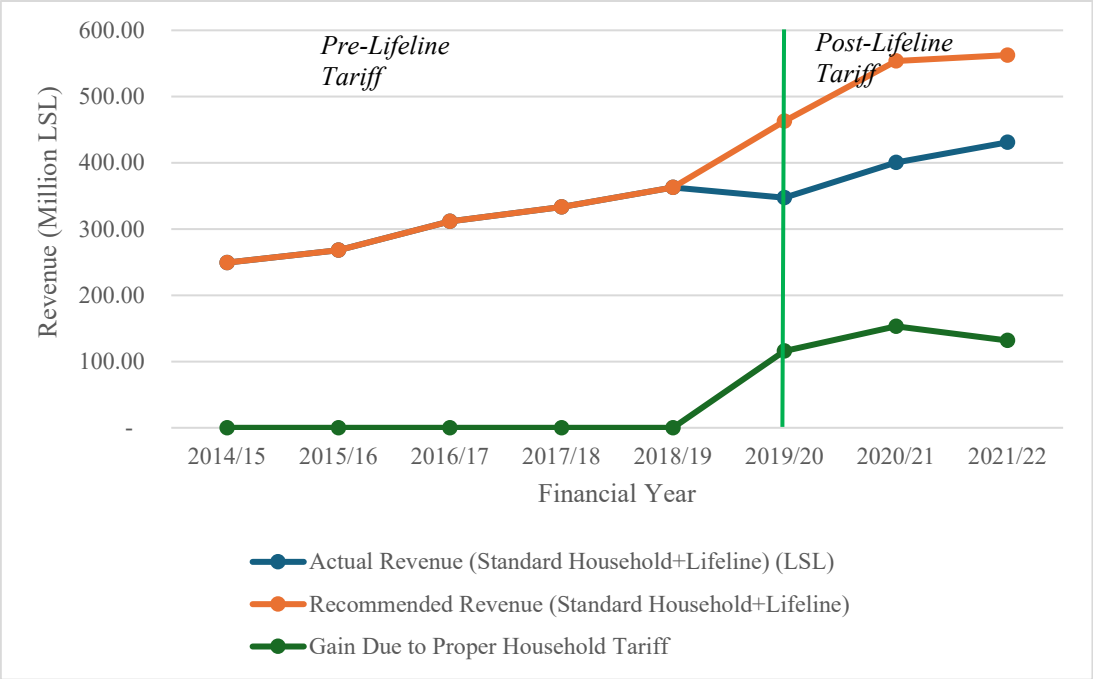
Figure 25: Implemented vs. recommended charges for other customer categories



Source: Authors' own computation using data from the Lesotho Electricity and Water Authority
Notes: Ind/Com=industrial or commercial; HV=high voltage; LV=low voltage

The electricity regulator, LEWA, in its 2019/20 electricity tariff determination (LEWA, 2019), defined the vulnerable groups as the poor, orphans, old-age, unemployed and low-income earners, who could be assisted by the introduction of pro-poor tariffs to promote their consumption of electricity. However, the subsequent implementation of the household lifeline tariff was not targeted (i.e. it applied to all household customers even those who were able to pay). Moreover, the corresponding standard household tariff for providing cross-subsidisation was not set at the recommended level nor adjusted for inflation. If the recommended standard household tariff levels were used with a 4.1% per annum inflationary adjustment (average annual inflation rate of the years under study), the revenue collected from the household energy consumption alone would have increased by around LSL 116 million in 2019/20, as shown in Figure 26. This would have made a substantial contribution towards the required cross-subsidy, provided that non-vulnerable household customers would not have significantly reduced their consumption because of the tariff increase. The remaining cross-subsidy requirement of about LSL 51 million would have been compensated by the tariff increases of other customer categories.

Figure 26: Current vs recommended revenue from household energy consumption



Source: Authors' own computation using data from the Lesotho Electricity and Water Authority

6. Conclusion and policy implications

The lifeline tariff in Lesotho was designed and introduced in order to meet the basic needs of the poor and vulnerable households (old, unemployed and sick people as well as orphans). This paper therefore used descriptive analysis to assess the implications of the electricity lifeline tariff in Lesotho on both the utility and households over the period 2014-2022. The results highlighted that this objective has largely been successfully achieved. The study has demonstrated that households are experiencing a number of positive improvements since the introduction of the lifeline tariff, such as increases in average electricity consumption per household, reduction of usage of substitute polluting energy sources, adoption of electricity for cooking (mainly in urban and peri-urban areas), and a moderate decline in electricity and energy poverty. The lifeline tariff certainly has come as a needed economic relief for the targeted households, as about 40% of the household heads surveyed are not employed and about 50% of the respondents came from low-income households (earning below LSL 2 000 per month). Moreover, about 70% of the survey respondents who were aware of the implementation of the lifeline tariff agreed that the initiative made electricity more affordable. However, although household electricity and energy poverty moderately declined, households across all settlement types were still electricity and energy poor. This probably explains why households were generally not satisfied with the prevailing electricity prices, and if the tariff were to increase in the future, many intended to change their electricity usage patterns. The utility, LEC, has sustained a serious negative financial impact due to the implementation of the lifeline tariff because of the resulting reduced revenue collections from household customers. The negative effect of reduced revenue collections and resulting lower gross profits since 2019/20 are visible in the overall financial performance of LEC in terms of costs, returns and liquidity. This implies that the utility is most probably compromised in its ability to pay short-term obligations or debts within one year. The negative effect on the utility from the introduction of the household lifeline tariff can be attributed to the failure to introduce mitigation measures against the revenue loss. The most ideal measure would be to implement the self-financing cross-subsidisation mechanism where high-consumption users pay an above-cost standard tariff to fund the lower targeted low-consumption poor and vulnerable households hence maintaining the overall revenue collection of the utility. Overall, the study found that the lifeline tariff is beneficial to the target group of the poor and vulnerable. Hence, for their benefit, the lifeline tariff is recommended to be sustained. Moreover, the biggest winners with the current implementation scenario are non-poor households, as the subsidy is applied to all households at the cost of the utility. However, the recommended cross-subsidisation needs to be implemented to offset the current decline in revenue to the utility, which is bound to create long-term chronic operational and infrastructure problems.

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Declarations

Ethical approval: Not applicable

Data availability: All data sources have been provided in the paper

Competing interests: The authors declare no competing interests.

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