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# Illuminating insecurity: effects of load-shedding on personal security in Chimwemwe ward, Kitwe, Zambia

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## ABSTRACT

This paper evaluates the impact of load shedding on personal security in Chimwemwe Ward, Kitwe, Zambia, using Cohen and Felson's 1979 Routine Activities Theory (RAT). The research explored how frequent load shedding leads to higher levels of criminal activities and affects personal security among the residents. Systematic random sampling led to a sample size of 389 respondents, with data collected through questionnaires, and analysed using SPSS for descriptive statistics. The results indicate that load shedding has a significant effect on personal security; 48.2 % of the respondents indicated that they felt very insecure to walk alone in the dark during load shedding. Again, 58.5 % of the population surveyed felt highly concerned for their safety when staying alone at home during load shedding. The study further found that 10.8% of the victims of crime during load shedding changed their attitude towards life, while a similar percentage engaged in abnormal behaviours due to the crimes perpetrated against them. Despite these concerns, few residents did something to enhance their security, revealing a gap between perceived risk and proactive safety measures. These results highlight the need for expedited development and improvement of the security infrastructure, safety programmes rooted in communities, and more effective mechanisms for the reporting of crime, to mitigate the undesirable effects that load shedding could have as immediate consequences for personal security. Finally, the study makes recommendations for further research on the vulnerabilities of specific populations and the exploration of alternative energy solutions aimed at enhancing community resilience.

**Keywords:** Load-Shedding, Personal Security, Routine Activities Theory, Community Safety

## INTRODUCTION

Load shedding refers to the interruption or "shedding" of power supply by a power utility company to its customers because it is unable to produce and supply enough electricity to meet demand (Larik *et al.*, 2018; Nagaraja *et al.* 2019; Nkhuwa, 2019; Inglesi-Lotz, 2023). A power utility company relieves pressure on the power plant by ceasing to supply electricity to specific areas of the grid in order to prevent a national blackout (Nagaraja *et al.* 2019). This is accomplished by scheduling power outages.

Load shedding disrupts daily life, causes food spoilage, damages electric appliances, and results in production downtime in house industries. According to Umar and Kunda-Wamuwi's (2019) findings, problems with small business operationalisation have been identified, and recommendations for

government subsidies on alternative energy sources have been made. Similarly, Mutambo *et al.* (2023) emphasise the economic burden faced by small businesses due to persistent power outages. Households cope by implementing load shifting and fuel switching strategies, which is an extra cost. For example, low-income areas rely heavily on firewood to cook their meals. According to Ngoma *et al.* (2016) and Musademba *et al.* (2012), the economic burden is significant because energy costs can consume up to 64% of income during load shedding. Additionally, load shedding affects gender relations as well as women's productive time, which increases the likelihood of inequality as men make household energy decisions and women spend more time in the private sphere (Mukoni, 2012). In the end, this affects efforts to reduce poverty and promote sustainable development in impacted areas.

While load shedding affects various aspects of daily life, its impact on personal security, defined as "freedom from human-caused physical violence and crime" (Gasper and Gomez, 2015, p.6) as well as "security from physical violence, other crimes against life and property, accidents, abuse, and neglect", is particularly important, especially in low-income communities like Chimwemwe Ward. A steady supply of electricity is crucial for high living standards that guarantee personal safety, hence a safer living environment. For instance, sufficient electricity supply enables the safe storage of food, thus reducing the incidences of food poisoning due to expired or rotten food products (Matekenya, Tracey, and Marco, 2017). On the other hand, unstable power supply compromises food safety, putting at risk households relying on refrigeration from getting foodborne diseases. Moreover, good electricity supply is a core component in the reduction of maternal mortality through ensuring that women give birth confidently in hospitals without the fear of power outages (Koroglu, Irwin, and Grépin, 2019). Yet, this stability is compromised by the frequency of load shedding that makes life less secure and more difficult for the affected population. With regard to personal security, stable electricity supports active security systems, reducing incidents of crime and making residents feel safe in their home (Amadi, 2015). By contrast, load shedding creates avenues for thefts, exploitations, and fraud (Amadi, 2015; Goldberg, 2015).

Since June 2015, Zambia has experienced persistent load shedding (Ngoma *et al.*, 2016; Owen, 2016), which is primarily due to the country's reliance on hydropower for generation. In 2021, then-Minister of Energy, Mr. Matthew Nkhuwa, in his *Ministerial Statement on Reduced Load Shedding in the Country,* issued to the National Assembly of Zambia stated that the installed capacity stood at 2,976 MW, with hydropower accounting for more than 80%. He further said that due to low rainfall patterns in previous years, water levels in major reservoirs fell, resulting in a significant power deficit (Nkhuwa, 2021).

The deficit was made worse by rising electricity demand, which increased by 150 to 200 MW per year (Nkhuwa, 2021). In this regard, the government resorted to load shedding schedules, with customers experiencing power outages lasting up to 12 hours per day. The situation improved with the commissioning of the 750 MW Kafue Gorge Lower Power Station in July, 2021, which was expected to reduce the power deficit and the load shedding hours (Nkhuwa, 2021).

The El Niño-induced drought of the 2023/2024 rainy season reduced rainfall and water levels in the Zambezi and Kafue River basins, reducing the installed capacity from 3,777 to 900 MW (Kapala, 2024). This is puzzling, since adding the previous installed capacity of 2,976 MW to the 750 MW from the commissioning at Kafue Gorge Lower Power Station in July 2021, results in 3,726 MW, not 3,777 MW. This gives rise to the conjecture that the Minister Kapala either omitted the 51 MW difference in the Ministerial Statement or gave an erroneous figure. Nonetheless, the resulting power deficit necessitated an extension of load shedding hours to 12 hours

per day again, with the government taking additional steps to manage limited resources and prevent further damage to power-generating equipment (Kapala, 2024). However, it should be noted that most likely the 3,777 MW figure reported by Kapala is for the year 2022, while the Energy Regulation Board (2024) gave a new total of 3,811.3 MW for 2023. This increase is primarily due to the addition of the 34 MW Riverside Solar project by Copperbelt Energy Corporation in 2023 (CEC) (Energy Regulation Board, 2024).

The Zambian government has responded to the difficulties by taking a more comprehensive stance in resolving the energy crisis. Short-term solutions include importing electricity, resuming operations at the Ndola Energy Power Plant, and building a 100 MW solar PV power plant in Chisamba (Kapala, 2024). In addition to approving the Open Access and Net Metering Regulations, which aim to increase both industrial and household contributions to the national grid, the government has promulgated new statutory instruments that will aid in amending the licensing procedure for private energy providers (Kapala, 2024). In reality, all of these efforts are steps towards mix diversification, which will increase the sustainability and dependability of Zambia's power supply.

There are many reasons which call for research into the effect of load shedding on personal security in Chimwemwe Ward. Firstly, it shows how power cuts increase vulnerability in low-income communities through the compromise of personal security and living standards. For instance, power cuts may lead to the spoilage of foodstuffs; could lead to unsafe environments and thus cause an increase in crime and insecurity at home; or disrupt income-generating activities that are important for the sustenance of livelihoods. These issues directly have an impact on personal security by eroding the basic conditions required to ensure a safe and stable life. Secondly, this study is also useful in informing policy-making at the local and national levels with respect to the macro-destructive effects of the energy shortage. By addressing such interlinked effects (from compromised food safety conditions to unsafe conditions at childbirth and disruptions of economic activities) the study creates a relevant policy space in which responses to energy shortages are able to meet the specific needs of the people of Chimwemwe Ward. Thirdly, the research may raise public awareness of the broader social and economic ramifications of load shedding, emphasising the urgent need for sustainable energy solutions. In this regard, by documenting these effects on personal security, the study advocates for targeted investments in infrastructure and alternative energy sources to mitigate the negative effects of power outages on vulnerable populations.

## LITERATURE REVIEW

Security has traditionally been defined as maintaining the territorial integrity, stability, and vital interests of states through state or international diplomatic, legal, or coercive instruments. However, in the 1990s, the concept was extended to include non-military risks related to violent wars and impacting the protection of people, communities, and governments (International Peace Academy, 2004). The liberal perspective of security aims to provide freedom from persistent challenges such as malnutrition, disease, and repression, as well as interruptions of everyday life routines. This human-centred view comprises seven key elements: economic security, food security, health security, environmental security, personal security, community security, and political security (World Bank, 1994).

Gaspar and Gomez broadly define personal security in their analysis of the 1994 Human Development Report (HDR) as protection against physical violence, crimes, accidents, abuse, and neglect (Gasper and Gomez, 2015). They further go on to suggest that the HDR's labelling 'personal security' is not a very perfect one because many other categories also become 'personal' (*ibid*, p. 5). This perhaps serves more to present various issues that are of relevance in an orderly

manner (*ibid*, p. 5). Personal security is meant to protect citizens from the physical abuse of the state and its institutions (Gierszewski, 2017) and personal/abusive victimisation (Giblin, 2008). This has two facets: concerns dealing with violent crime and property crime, and an observable direct relationship between crime and personal security (Zugazaga *et al.*, 2016). Emotional aspects of it are also present (Abdo-Katsipis, 2018).

Personal security is the feeling of being free from fear of physical harm or the prospect of being physically harmed. It is achieved by knowing that the threats causing fear have been eliminated. Threats to personal security include physical torture, war, ethnic tension, crime, street brutality, rape, domestic violence, child abuse, suicide, and substance abuse (UNDP, 2009).

While personal security involves protection from threats like violence and crime, external factors contribute to these risks. For example, load shedding has been proved to contribute to vulnerabilities in personal security. A study by Umar and Kunda-Wamuwi (2019) revealed that load shedding is negatively impacting homes and personal security, as evidenced by burglary and physical assaults on residents in poor urban households in Zambia. As indicated by Amadi (2015), load shedding caused an increase in crime and vulnerability and also resulted in a decrease in economic growth and leisure time within the Niger Delta due to the rise in the frequency of power outages that Nigeria was experiencing, while Umar *et al.* (2022) found that load-shedding disrupts local economies, household routines, and causes economic losses. In addition, Mukupa *et al.* (2018) discovered that the amount of time that households are without electricity is long enough to have a negative impact on the livelihoods of Zambians and the economy.

These studies are similar to the current study, relating to households. However, the current study differed from earlier ones in that it explored the effect of load shedding on personal security as defined by Gasper and Gomez in 2015. Secondly, unlike Umar and Kunda-Wamuwi's 2019 study, which focused on two residential areas of Lusaka district, the current study focused on one, Chimwemwe ward, in Kitwe district. Although Umar and Kunda-Wamuwi's study provided valuable insights, it did not explore the broader implications for personal security, such as crime risk. By focusing specifically on Chimwemwe Ward, this study addresses this knowledge gap and provides a more nuanced understanding of how load shedding compromises the safety and well-being of low-income residents. This study is justified further by the shifting energy dynamics in Zambia. For example, although the study by Umar and Kunda-Wamuwi's was conducted during earlier phases of load shedding, the dynamics of the energy crisis have changed since then with the commissioning of the Kafue Gorge Lower Power Station and the new solar projects. Thus this study offers new viewpoints and contributes toward the development of appropriate interventions for the affected community.

Two studies conducted in Zimbabwe, one by Mukoni (2012) and another one conducted by Musademba *et al.* (2012), prove that load shedding in Chinhoyi made women overly burdened. In their roles as main caregivers and house managers, they had to source alternative energy sources, such as firewood, make sure that their families received meals, manage all other household chores without electricity, and navigate unsafe environments after dark to fulfill these responsibilities, thereby turning them into potential sexual assault victims. According to Mukoni (2012), load shedding propelled the perpetuation of gender disparity through an increase in the time that men spent in the public sphere. However, another study conducted by Umar and Kunda-Wamuwi (2019) established that certain marital partnerships changed due to load shedding. Because sexual assault and gender disparities are just examples of gender-based violence (GBV), a threat to personal security, the two studies and the current study compare quite evenly in that:

GBV refers to the use of physical, mental, social, or economic violence against a person because of his gender, as well as the threat of physical, sexual, or psychological injury to such person (Perrin *et al.* 2019).

## Theoretical Framework

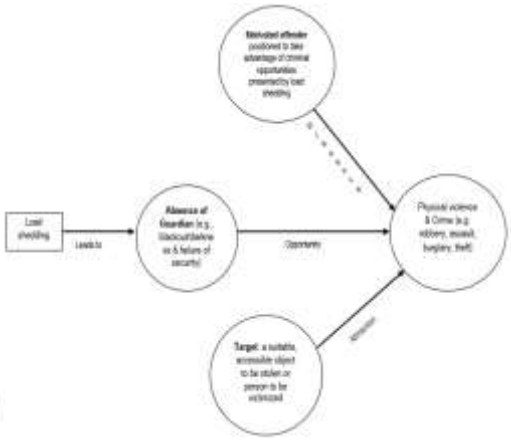
The study used Cohen and Felson's 1979 Routine Activities Theory (RAT) to understand the potential effects of load shedding on personal security. RAT was chosen due to its explanatory capacity of crime occurrence, which is an important factor in the concept of personal security presented in this paper. According to Cohen and Felson (1979), three things need to happen for a crime to happen: a motivated offender with criminal intentions and the capacity to carry them out; a suitable victim or target; and there must be no capable guardian present to stop the crime from happening. These three conditions must be met in both space and time for a crime to be committed.

RAT explains a macro view of crime where the changes within the social and economic conditions are hypothesized to affect the overall levels of crime and victimisation. Cohen and Felson (1979) explained that criminal activities represented something like a "structurally significant phenomenon" because crimes were neither random nor insignificant. The daily routines that people follow make some individuals more likely to be seen as suitable targets by offenders who carefully assess their opportunities. RAT links criminal behaviour with the regular patterns of social interaction and holds the view that crime is a normal outcome that is shaped by the availability of opportunities. When a target is unprotected and the potential rewards adequate, a motivated offender is likely to act. The probability of a crime occurring increases with the offender's perceived vulnerability of the target, that is, the easier and more appropriate the target, the greater the risk of crime.

Moreover, it is the concentration of motivated offenders within a population that affects crime rates. If offenders perceive their goals can be legally attained, they will be less likely to offend, suggesting criminal motivation can be reduced based on the perception of legal alternatives. For example, in the case of load shedding in Chimwemwe Ward, some residents may engage in criminal activities such as burglary or theft as part of their strategy to cope with economic stressors. However, providing legitimate opportunities for income generation, like small-scale entrepreneurship supported by reliable electricity, would decrease the likelihood of such crimes since viable alternatives would be at hand. The presence of able guardians is another important factor to prevent crime. A guardian can be a person providing direct protection or can be a passive measure like security systems and video surveillance. Security measures like these prevent crimes because they limit accessibility to appropriate targets for offenders. RAT is premised on the interaction of targets, opportunity, and motivation with the presence of guardians usually deterring offenders and making even the most lucrative targets undesirable. Therefore, opportunity and lack of supervision increase the risk of crime and the likelihood of committing a crime.

In line with RAT, this study hypothesized that physical violence and crime occur when offenders and targets meet during load shedding hours because offenders make use of the opportunities provided by load shedding to commit crimes. See Figure 1.

**Figure 1:** Conceptual Model of the Effects of Load Shedding on Personal Security



*Derived from literature concept*

## METHODOLOGY

### Description of study area

This study was carried out in Chimwemwe Ward, Kitwe, Zambia. According to official statistics at the time of the research, Chimwemwe ward had 14, 193 residents, out of the district's total population of 517, 543. The population was made up of 6, 908 men (48.7%) and 7, 285 women (51.3%). It is one of the Wards of Chimwemwe Constituency, along with Buntungwa, Kawama, Lubuto, Twatasha, and Itimpi (Central Statistical Office, 2012). Because of the banks and international chain stores that are located there, Mupeta (2020) refers to Chimwemwe as a "town within a city." Chimwemwe Ward is around 7 kilometres from Kitwe's Central Business District (CBD).

### Sampling Strategy

Field work for this study was conducted between August and December 2022. The study adopted probability sampling design, particularly systematic random. The sampling was systematically done at the moment of data collection. The first house was randomly selected, after which every 36th household was selected while walking on the residential roads of Chimwemwe Ward. Given the population of 14,193, at the time of the study, the sample size was 389. This was arrived at by using Yamane's sample calculation formula (Yamane, 1967):

$$n = \frac{N}{1 + Ne^2}$$

Where: $n$= sample size, N=population size, and $e$=margin of error (MoE).

### Data Collection and Analysis Methods

Questionnaires were used to collect data. The Principal Investigator and a Research Assistant administered questionnaires to every 36th respondent/household randomly picked while walking on Chimwemwe Ward's residential roadways. Before inviting respondents to participate in the study, the researchers described what it was about. When the respondents agreed to participate, the researchers read the questions to them and ticked or wrote down their answers, rather than leaving the questionnaires for the respondents to complete on their own. The questionnaires were then numbered, and the collected data was entered into SPSS for analysis. Descriptive statistics were used to analyse the quantitative data that were obtained. The data analysis process involved cleaning and preparing the dataset to ensure accuracy and consistency. This included detecting missing numbers, outliers, and anomalies, coding variables for easy analysis in SPSS, and performing necessary transformations. Descriptive statistics, such as mean, mode, and median, were used to summarise the dataset's key properties. The descriptive statistics were then evaluated to understand the data's properties and patterns.

## FINDINGS AND DISCUSSION

The proportion of the participants aged between 18-27 years was 25.3%, probably the biggest single slice of the participants. 29.6% of the respondents were within the age group of 28-37 years, making this group the most represented. The participation by the 38-47-year-old age category was 21.6%, which is relatively moderate. The percentage represented by the 48-57-years age segment was 23.2%, nearly as representative as the younger age groups. Finally, the age group 58-67 years had the smallest representation, only 0.3% of the respondents, implying very minimal participation of older people.

The majority of the participants (59.3%) were female, while the rest (40.2%) were male. 97.4% of participants said their dwellings had an electricity connection from ZESCO, while 2.3% did not. The majority of the participants (85.8%) said they experienced load shedding in their Ward, while 13.7% said they did not.

### Effects of Load Shedding on Chimwemwe Ward Residents' Personal Security

#### *Psychological Impact and Behavioural Changes*

### *View of Life*

The data shows that 10.8% of the respondents who were victims of crime during load shedding reported a change in view of life, thus showing a great psychological impact. In comparison, responses on the contrary were only 2.3%. The finding is consistent with the idea that traumatic experiences can lead to a re-evaluation of personal safety and the broader security environment. For instance, Ahmed *et al.* (2023) remark on the wider social implications of power outages in Zambia: how persistent disruptions begin to erode the sense of security and well-being of residents and shift their outlook toward life.

### Behavioural Adjustments

Similarly, 10.8% of the respondents were compelled to do things they would normally not do as a consequence of crimes committed during load shedding, whereas 2.3% did not. This plainly indicates that emotions about the experience of crime have pushed a part of the population to change and adopt some defense or precautionary behaviours they would not have considered otherwise necessary. These changes can be in terms of avoiding particular areas, changing daily routines, or adopting new security measures. This mirrors what Cohen and Felson (1979) referred to as "defensive behaviour" in their Routine Activities Theory, which posits that once a threat has been identified, people will change their routines and take precautions against it. Chimwemwe Ward data demonstrates the same trend, where residents avoid some areas, alter daily schedules, and install new safety measures to assist in enhancing their security during dark hours. This is a little similar to the findings by Bwalya Umar *et al.* (2022) in a study on economic and social adaptations that emanated from load shedding in Kitwe, Zambia.

## ***Community Awareness and Crime Prevalence***

### Knowledge of Crime Victims

That 26.3% knew someone who was a victim of crime during load shedding between 2020 and 2022, illustrates that the occurrence of crime during load shedding is not an isolated incident but a recurring event affecting a fair percentage of the community. This is further underlined by the fact that, on average, respondents reported an estimated number of 3.59 times when friends, relatives, or acquaintances were victims of crime incidents. This replicates the proposition by Gasper and Gómez (2015) where they affirm that in most cases, contexts where many community members often witness or hear of a crime affecting the people they know tend to magnify personal security concerns.

### Violent and Property Crimes

Violent and property crimes against acquaintance average 4 and 3.61 times, respectively, pointing to the prevalence of both violent and non-violent crimes in the community during load shedding. This partly aligns with the research conducted by Lawson (2022), where he established that electricity outages were positively correlated with an increase in residential fires, another form of property risk in Cape Town. The relatively high standard deviations of 6.133 for violent crimes and 6.283 for property crimes indicate variability in the frequency of incidents, thus suggesting that whereas some individuals or families may experience repeated victimisation, others might not be that frequently affected.

## ***Perception of Safety***

### Insecurity after Dark

Nearly half, 48.2%, said that they did feel very insecure when out alone after dark during load shedding. The extent of the fear is increased when considering 17.3% who felt somewhat insecure and 5.4% who felt reasonably insecure to bring the total to over 70% who felt some degree of insecurity. The fact that 19.8% of the respondents said they do not walk alone after dark is a high percentage of people who are afraid and hence avoid, probably curtailing their free movement and involvement in evening activities. A study that brings out this feeling of insecurity includes that by Nduhuura *et al.* (2021), which observes that power outages in urban

setups in developing countries increase the fears of crime and lower the quality of life.
*Insecurity at Home*

58.5% were very concerned about the safety of their homes in the event of having to spend time alone at home during load shedding. From this pervasive anxiety, one might deduce a general feeling of vulnerability amongst members of the community who believe that their homes—where one should be safe—might be under threat during these periods. Bwalya Umar *et al.* (2022) also note that load shedding creates heightened vulnerability in households during the hours of darkness since this might encourage criminal activities, which in turn undermine the feeling of safety that homes provide.

### *Concerns about Specific Crimes*

#### Mugging, Assault, and Break-Ins

The specific crimes the residents were most concerned about during load shedding show that over half (55.2%) were extremely worried about being mugged or held up, assaulted (56.7%), and having their homes or property broken into (49.2%). This aligns with the findings of Mukoni (2012), who observed similar concerns in Zimbabwe, where residents feared for their safety and that of their families during power outages. From these results, one can extrapolate just how much this reflects an envisioned threat to life and property because of load shedding. This is probably due to the enhanced scope of such criminal elements in the absence of light and other security measures.

#### Family Safety

The concerns also extend to family members, as 58% of the respondents were very concerned about a family member becoming a victim of a break-in and 57.7% were very concerned about a family member being assaulted. This level of concern suggests that this concern regarding the fear of crime during load shedding is not an individual perception and extends to other loved ones' safety, exacerbating this feeling of insecurity within households.

### *Protective Measures Taken by Residents*

#### Breaking of Routines and Installations of Security Measures

56.2% of Chimwemwe Ward residents changed their routines or activities in the aftermath of load shedding for safeguarding purposes, and 35.6% installed new locks or security bars. The respondents' measures were a matter of urgency in preventing mishaps that could possibly happen, though almost half of the population did not do the same, probably because of the tight budget or fatalism, at 42% and 62.6%, respectively. This behaviour typifies the coping mechanisms discussed by Malik *et al.* (2022), where it was established that students in Pakistan equally created new routines and security measures to minimize the risks that emanate from frequent power outages.

#### Low Diffusion of Advanced Security Measures

Despite the high levels of concern, the majority of the respondents did not put in place more advanced security measures like burglar alarms (94.1% had not) or purchase firearms (97.4% had not). This would, therefore, imply that although risks are recognised, the cost, accessibility, or even legal restrictions are some of the barriers that may prevent the residents from taking such extreme steps. It mirrors the findings of Ndaguba (2018), who examined the financial constraints limiting community health centers to implement high-end security measures in South Africa during the shedding.

#### Other Defensive Actions

As many as 17% of the respondents indicated getting a dog as a means of protection, which is relatively inexpensive and culturally more acceptable, compared to less than 1% who said they bought a gun, possibly because of either the legal restrictions on gun ownership or community reluctance to escalate security precautions that far. This confirms the previous findings by Owen (2016), who observed that in Zambia, people often resort to security systems that are culturally included and highly accessible; in this case,

dogs, as opposed to heavily costlier and more complicated security systems.

## CONCLUSION

The findings point to the fact that load shedding has high and multi-faceted effects on Chimwemwe Ward residents' personal security. The level of fear and concern over various crime forms, coupled with behavioural changes and protective measures adopted by the respondents, portrays a community under stress. While some residents have done something to improve security, the general feeling of vulnerability remains very strong—an indicator that load shedding has an effect reaching beyond mere inconvenience to profound social and psychological impacts. These findings thus show that interventions targeting the root causes of insecurity at the time of load shedding—for instance, improved lighting, community policing, and support for victims of crime—are necessary.

## RECOMMENDATIONS AND PRACTICAL INTERVENTIONS

### Improved Security Infrastructure

The local council should invest in improving security infrastructure in Chimwemwe Ward during load shedding, including increasing the presence of law enforcement and installing public lighting that can operate independently of the grid.

### Community-Based Safety Programmes

Community-based safety programmes that encourage collective action during load shedding periods should be developed to mitigate the effect of power outages on personal security. They could include neighbourhood watch initiatives or training on how to stay safe during an outage. For example, these trainings could focus on how to handle alternative lighting equipment without causing accidents, advice on locking of doors and windows before the commencement of a blackout to reduce burglary; how to avoid isolated areas whenever there is an outage to reduce attack susceptibility.

### Further Research on Vulnerable Populations

Future research on the identification of those populations within an urban setting who are most vulnerable during load shedding, and the social and economic characteristics that contribute to their vulnerability, could help in tailoring interventions toward those in greatest need.

### Investigation of crime reporting mechanisms

This involves investigating why most residents are unwilling to report the crime during load shedding. Understanding such barriers could lead to crime reporting mechanisms that are more effective in implementation and build trust between the community and law enforcement agencies.

### Policy Development

Policymakers should incorporate the findings into energy and security policy development processes dealing with the challenge of unreliable power supply and its consequences on personal security. Integrating energy planning into strategies for personal safety can create more resilient communities.

## REFERENCES

Abdo-Katsipis, C.B. (2018) 'Personal Security and Electoral Demobilization: A Comparative Analysis', *Digest of Middle East Studies*, 27(1), pp. 53–78. Available at: https://doi.org/10.1111/dome.12130.

Ahmed, I., Parikh, P., Munezero, P., Sianjase, G. and Coffman, D. (2023) 'The impact of power outages on households in Zambia', *Economia Politica*, 40(3), pp. 835–867. Available at: https://doi.org/10.1007/s40888-023-00311-0.

Amadi, H.N. (2015) 'Impact of Power Outages on Developing Countries: Evidence from Rural

Households in Niger Delta, Nigeria', *Journal of Energy Technologies and Policy* [Preprint]. Available at: https://www.semanticscholar.org/paper/Impact-of-Power-Outages-on-Developing-Countries%3A-in-Amadi/2e49306908d722170a1912832aff9f125982dcba (Accessed: 16 August 2024).

Central Statistical Office (2012) *Zambia 2010 Census of Populations and Housing: National Analytical Report*. Lusaka: Central Statistical Office. Available at: https://www.zamstats.gov.zm/wp-content/uploads/2023/12/National-Analytical-Report-2010-Census.pdf (Accessed: 19 August 2024).

Cohen, L.E. and Felson, M. (eds) (1979) 'Social Change and Crime Rate Trends: A Routine Activity Approach (1979)', pp. 203–232. Available at: https://doi.org/10.4324/9781439817803-12.

Energy Regulation Board (2024) *Energy Sector Report 2023*. Lusaka: Energy Regulation Board. Available at: https://www.erb.org.zm/wp-content/uploads/files/esr2023.pdf (Accessed: 19 August 2024).

Gasper, D. and Gómez, O.A. (2015) 'Human security thinking in practice: "personal security", 'citizen security' and comprehensive mappings', *Contemporary Politics*, 21(1), pp. 100–116. Available at: https://doi.org/10.1080/13569775.2014.993906.

Gierszewski, J. (2017) 'Personal Security within the Human Security Paradigm'. [object Object]. Available at: https://doi.org/10.24356/SD/23/2.

Goldberg, A. (2015) 'The economic impact of load shedding: the case of South African retailers'. Available at: https://repository.up.ac.za/handle/2263/52398 (Accessed: 16 August 2024).

Inglesi-Lotz, R. (2023) 'Load shedding in South Africa: another nail in income inequality?' Available at: https://doi.org/10.17159/sajs.2023/16597.

International Peace Academy (2004) *The Security-Development Nexus: Conflict, Peace and Development in the 21st Century*. New York: International Peace Academy, p. 17. Available at: https://www.ipinst.org/wp-content/uploads/publications/security_dev_nexus.pdf (Accessed: 16 August 2024).

Kapala, P. (2024) *Ministerial Statement on the Power Supply Deficit in the Country*. Ministerial Statement. Lusaka: National Assembly of Zambia. Available at: https://www.parliament.gov.zm/sites/default/files/images/publication_docs/Ministerial%20Statement%20by%20-%20Mr%20Kapala%2C%2013.06.24.pdf (Accessed: 16 August 2024).

Koroglu, M., Irwin, B.R. and Grépin, K.A. (2019) 'Effect of power outages on the use of maternal health services: evidence from Maharashtra, India', *BMJ Global Health*, 4(3), p. e001372. Available at: https://doi.org/10.1136/bmjgh-2018-001372.

Larik, R., Mustafa, M.W., Aman, M., Jumani, T., Sajid, S. and Panjwani, M. (2018) 'An Improved Algorithm for Optimal Load Shedding in Power Systems', *Energies*, 11(7), p. 1808. Available at: https://doi.org/10.3390/en11071808.

Lawson, K. (2022) 'Electricity outages and residential fires: Evidence from Cape Town, South Africa', *South African Journal of Economics*, 90(4), pp. 469–485. Available at: https://doi.org/10.1111/saje.12329.

Malik, A.A., Memon, P.A., Ali, H., Mallah, M.A., Bux, K. and Haq, M.U. (2022) 'Impacts of Coping Strategies for Electricity Load Shedding among University Students', *Pakistan Journal of Medical and Health Sciences*, 16(5), pp. 1165–1167. Available at: https://doi.org/10.53350/pjmhs221651165.

Marchetti-Mercer, M.C. (2023) 'Resilience is not enough: The mental health impact of the ongoing energy crisis in South Africa', *South*

*African Journal of Science*, 119(9/10). Available at: https://doi.org/10.17159/sajs.2023/16608.

Masinga, F., Madzivhandila, T. and University of Limpopo (2023) 'Loadshedding Impact on Food Spoilage: An Analysis of Household Experiences in South Africa', *The African Journal of Governance and Development (AJGD)*, 12(2), pp. 182–197. Available at: https://doi.org/10.36369/2616-9045/2023/v12i2a11.

Matekenya, T.D., Tracey, C. and Marco, V. (2017) 'Frequent load shedding: its effects on the cold chain and milk quality in the large scale dairy value chain in mashonaland east province, zimbabwe | International Journal of Development Research (IJDR)', *International Journal of Development Research*, 7(2), pp. 11660–11664. Available at: https://www.journalijdr.com/frequent-load-shedding-its-effects-cold-chain-and-milk-quality-large-scale-dairy-value-chain (Accessed: 16 August 2024).

Mukoni, M. (2012) 'The impact of load shedding on gender relations in heterosexual households in Mkoba north, Gweru, Zimbabwe: Implications for sustainable development', in. Available at: https://www.semanticscholar.org/paper/The-impact-of-load-shedding-on-gender-relations-in-Mukoni/5c3e1d1046d72b93c034bd4bd438cee48d10489a (Accessed: 16 August 2024).

Mukupa, G.M., Phiri, M. and Kunda, D. (2018) 'The Impact of Load Shedding on The Cost of Living: A Zambian Perspective', *World Journal of Research and Review (WJRR)*, 6(3), pp. 07–15. Available at: https://www.wjrr.org/download_data/WJRR0603019.pdf (Accessed: 16 August 2024).

Mupeta, M. (2020) 'Chimwemwe: Town Within City', *Zambia Daily Mail*. Available at: http://www.daily-mail.co.zm/chimwemwe-town-within-city/ (Accessed: 17 December 2021).

Musademba, D., Kanyepe, M., Madiye, L. and Hove, T. (2012) 'Effect of Load Shedding in Chinhoyi Urban Residential Areas, Zimbabwe', *International Journal of Energy Engineering*, 2(5), pp. 232–241. Available at: https://doi.org/10.5923/j.ijee.20120205.07.

Mutambo, H., Kawimbe, S., Mbeki-Kombe, C., and Mwange, A. (2023) 'Impact of Load-Shedding on Operations of Small-Scale Enterprises in Developing Countries: A Review of Literature', *Journal of Economics and Sustainable Development* 14(13), pp. 54-82. Available at: https://iiste.org/Journals/index.php/JEDS/article/view/61619.

Nagaraja, B.S., Nagraj, A.M. and Nandan, N. (2019) 'Design & Development of Optimum Load Shedding with Voltage Stability Indicators in Power System', *International Journal of Engineering Research & Technology (IJERT)*, 7(8). Available at: https://www.ijert.org/research/design-development-of-optimum-load-shedding-with-voltage-stability-indicators-in-power-system-IJERTV8IS070180.pdf (Accessed: 16 August 2024).

Ndaguba, E.A. (2018) 'Load Shedding and Community Health Centres in South Africa: A Conceptual Scholarship', *STUDIES ON ETHNO-MEDICINE*, 12(04). Available at: https://doi.org/10.31901/24566772.2018/12.04.556.

Nduhuura, P., Garschagen, M. and Zerga, A. (2021) 'Impacts of Electricity Outages in Urban Households in Developing Countries: A Case of Accra, Ghana', *Energies*, 14(12), p. 3676. Available at: https://doi.org/10.3390/en14123676.

Ngoma, R., Tambatamba, A., Oyoo, B. and Louie, H. (2016) 'Domestic electric consumers' response to load-shedding: A case study of Kitwe, Zambia', in *2016 IEEE Global Humanitarian Technology Conference (GHTC). 2016 IEEE Global Humanitarian Technology Conference (GHTC)*, Seattle, WA: IEEE, pp. 481–487. Available at: https://doi.org/10.1109/GHTC.2016.7857323.

Nkhuwa, M. (2021) *Ministerial Statement on the Reduced Load Shedding in the Country*. Ministerial Statement. Lusaka: National Assembly of Zambia. Available at: https://www.parliament.gov.zm/node/8764 (Accessed: 16 August 2024).

Owen, A.D. (2016) *Policy Report on the Electricity Sector in Zambia, African Power Platform*. Available at: https://www.africanpowerplatform.org/resources/reports/east-africa/zambia/526-policy-report-on-the-electricity-sector-in-zambia.html (Accessed: 16 August 2024).

Perrin, N., Marsh, M., Clough, A., Desgroppes, A., Yope Phanuel, C., Abdi, A., Kaburu, F., Heitmann, S., Yamashina, M., Ross, B., Read-Hamilton, S., Turner, R., Heise, L. and Glass, N. (2019) 'Social norms and beliefs about gender based violence scale: a measure for use with gender based violence prevention programs in low-resource and humanitarian settings', *Conflict and Health*, 13(1), p. 6. Available at: https://doi.org/10.1186/s13031-019-0189-x.

Umar, B.B., Chisola, M.N., Mushili, B.M., Kunda-Wamuwi, C.F., Kafwamba, D., Membele, G. and Imasiku, E.N.S. (2022) 'Load-shedding in Kitwe, Zambia: Effects and implications on household and local economies', *Development Southern Africa*, 39(3), pp. 354–371. Available at: https://doi.org/10.1080/0376835X.2020.1870934.

Umar, B.B. and Kunda-Wamuwi, C.F. (2019) 'Socio-Economic Effects of Load Shedding on Poor Urban Households and Small Business Enterprises in Lusaka, Zambia', *Energy and Environment Research*, 9(2), p. 20. Available at: https://doi.org/10.5539/eer.v9n2p20.

UNDP (2009) *Community Security and Social Cohesion Towards a UNDP Approach, UNDP*. Available at: https://www.undp.org/rolhr/publications/community-security-and-social-cohesion-towards-undp-approach (Accessed: 16 August 2024).

World Bank (1994) *World Development Report 1994: Infrastructure for Development*. Available at: https://openknowledge.worldbank.org/handle/10986/5977 (Accessed: 16 August 2024).

Yamane, T. (1967) *Statistics: An introductory analysis*. 2nd edn. New York: Harper and Row.

Zugazaga, C., Werner, D., Clifford, J.E., Weaver, G.S. and Ware, A. (2016) 'Increasing Personal Safety On Campus: Implementation Of A New Personal Security System On A University Campus', *College Student Affairs Journal*, 34(1), pp. 33–47. Available at: https://doi.org/10.1353/csj.2016.0001