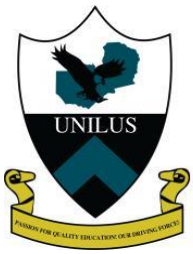

UNIVERSITY OF LUSAKA

SCHOOL OF TECHNOLOGY AND SOCIAL SCIENCE

INVESTIGATING THE EFFECTS OF LOAD SHEDDING ON INCOME GENERATION BY SMALL AND MEDIUM ENTERPRISES: A CASE STUDY OF SELECTED BUTCHERIES OF CHILANGA CENTRAL BUSINESS DISTRICT

A DISSERTATION SUBMITTED TO THE SCHOOL OF SOCIAL SCIENCES AND TECHNOLOGY OF THE UNIVERSITY OF LUSAKA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELOR OF ARTS IN DEVELOPMENT STUDIES.

BY

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@2025

Declaration

I Mutinta Muyabi Hereby declare that this dissertation is a result of my own work, and has never been submitted to this University and any other University and any work borrowed from other sources have been acknowledged.

Name of Student : Mutinta Muyabi

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Signature.....

Date: 3rd February 2026

Dedication

First and foremost, I give all glory to God for His grace, strength, and faithfulness throughout this journey. Without Him, none of this would have been possible and my husband at large for financial and academic support.

Acknowledgement

It would be impossible to thank everyone who has made either a direct or an indirect contribution to this research report. However, there are several individuals whose influence and help warrant some special recognition in a special way. To begin with, my hearty felt appreciation goes to my fellow students at University of Lusaka and the Supervisor for the valuable guidance they gave me in realization of this study. Further, thanks to all who volunteered and participated in the study, without them it would not have been a success.

Abstract

The study provides the general background information that sets its context on the effects of load shedding on income generation with a particular focus on SMEs in Chilanga Central Business District (CBD) of Lusaka province, Zambia. The main objectives were to examine the nature of load shedding experienced by butcheries and cold storage SMEs in Chilanga CBD; to assess how load-shedding affected employment (working hours, temporary layoffs) and customer behavior; and to identify coping strategies adopted by butcheries and cold-storage SMEs to manage the effects of load shedding in Chilanga CBD. The study employed a qualitative research method. The target population consisted of all registered and unregistered small and medium-sized butcheries operating within Chilanga CBD. A total sample of thirty (40) respondents were selected from Chilanga CBD. Research instruments were interview guides, a camera and a tape recorder. Findings showed that load shedding was experienced and affected business of butcheries in Chilanga CBD and effected employment and customer behaviour. In line with this objective, the findings showed that load shedding had bad effects on employee working hours. For SMEs facing load shedding, survival depends on adaptive responses such as adopting backup energy sources, adjusting operating hours or reconfiguring stock management practices. The implication of load shedding threatened the sustainability of butcheries, job insecurity particularly for casual workers and changing customer patterns and forced butcheries to adapt coping strategies like bulk sales or alternative storages solutions. In conclusion, for SMEs facing load shedding, survival depended on adaptive responses such as adopting backup energy sources, adjusting operating hours or reconfiguring stock management practices. From the findings recommendations were that government to assist butcheries and other SMEs with alternative energy sources so as to ensure that they have power throughout. Suggested future research was to establish effects of load shedding on Small Scale Entrepreneurs in selected Lusaka Central Business District.

Key concepts: Load shedding, income generation, Butcheries, operational costs, spoilage losses and coping mechanisms, population, businesses, generator and grid.

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ACRONYMS AND ABBREVIATIONS

CBD: Central Business District

ZCCI: Zambia Chamber of Commerce and Industry

ZAM: Zambia Association of Manufacturers

IEA: International Energy Association

FAO: Food Agriculture Organisation

ZCPC: Zambia Consumer Protection Commission

FDCL: Food and Drugs Control Laboratory

IFC: International Finance Corporation

UNIDO: United Nations Industrial Development Organisation

ZESCO: Zambia Electricity Supply Corporation

AFDB: African Development Bank

ILO: International Labour Organisation

ZIPAR: Zambia Institute for Policy Analysis and Research

ERB: Energy Regulation Board

IGC: International Growth Centre

MDS: Malaysia Department of Statistics

SME: Small and Medium Enterprise

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CHAPTER ONE

1.1 Introduction

Frequent power outages (load-shedding) are a major constraint for businesses that rely on electricity for refrigeration, lighting, and processing. For butcheries where, cold storage is essential to maintain meat safety and quality interruptions in power can increase spoilage, reduce sales opportunities, raise operating costs (fuel for generators, ice, dry ice), and ultimately reduce net income. In Zambia, repeated episodes of load-shedding have been reported to disrupt manufacturing and small business operations, making this an important local research topic (International Growth Center, 2019).

Ibrahim (2023) noted that Small and Mediums-sized Enterprises (SMEs) in Lusaka's food sector experience frequent revenue losses during power outages, with costs arising from wasted products, additional fuel for generators, and ice procurement. Similarly, the United States Department of Agriculture (USDA, 2023) highlights that meat stored above recommended safe temperatures becomes unsafe within hours, underscoring the critical importance of uninterrupted power supply for butcheries. In Zambia, repeated episodes of load-shedding have disrupted both manufacturing and retail operations, making the investigation of its effects on local enterprises urgent (International Growth Centre, 2019).

Chilanga Central Business District (CBD) provides a unique context for this study. It hosts numerous small and medium butcheries catering to both retail and institutional clients. These enterprises are essential for local food supply and employment, yet they face operational and financial challenges linked to electricity interruptions. Despite the significance of these challenges, there is a limited body of empirical research documenting the specific impacts of load-shedding on butcheries in Chilanga CBD, highlighting a gap this study seeks to fill.

1.2 Background to the Study

Zambia's electricity system is heavily dependent on hydropower and has experienced supply shortfalls during droughts and maintenance episodes. These supply shocks have led to scheduled and unscheduled outages that affect households and enterprises. Prior studies of Zambian SMEs report that power interruptions reduce

productivity, increase costs (diesel, ice, food loss), and can threaten business viability; similar effects have been documented in market studies and university theses examining SME resilience to load-shedding. Because meat is perishable and requires continuous refrigeration, butcheries are particularly vulnerable to income loss from outages (International Growth Centre, 2019).

Chilanga District, located in Lusaka Province approximately 15 kilometers south of the capital city, covers an area of approximately 1,354 km² and had an estimated population of about 225,276 in 2022 (CSO Report, 2022). The district is a rapidly developing area with a diverse economic activity. The district's economy is driven by a mix of industrial, commercial, agricultural, and service activities. One of the major contributors to local economic output is Chilanga Cement Plc, a leading cement manufacturing company that has established the district as an important industrial hub. In addition, Chilanga hosts numerous small and medium enterprises (SMEs) involved in retail trade, meat processing, construction materials, transport, hospitality, and cold-storage services. The district's fertile surroundings also support small-scale farming, particularly poultry, horticulture, and livestock rearing, which supply local markets and Lusaka's urban population. With its strategic location along the Lusaka–Kafue Road (T2), Chilanga benefits from steady trade flows and access to both rural and urban markets, making it a growing center of economic activity that blends industrial operations with vibrant local enterprise.

In terms of infrastructure, Chilanga benefits from proximity to Lusaka and access to major transportation routes, making it a strategic location for businesses serving both urban and peri-urban markets. However, the district also faces infrastructure challenges. According to the Chilanga District Integrated Development Plan, electricity access in the district remains below national targets, and issues around the transmission and distribution system are flagged as priorities for investment (chilangacouncil.gov.zm).

Given the perishable nature of meat products, butcheries and associated cold-storage enterprises require reliable power supply to maintain refrigeration and avoid spoilage, inventory losses, or service interruptions. In a district like Chilanga, where both residential and commercial demand co-exist and where load-shedding is a

documented challenge, SMEs in the meat business become especially exposed (Kintu, 2022; Ahmed et al., 2019)

1.3 Statement of the Problem

In Chilanga CBD, small and medium butcheries rely on national grid power for cold rooms and display refrigeration. Load-shedding threatens product safety, increases wastage and unplanned costs (such as buying ice, renting generator fuel), forces disposal of meat beyond safe time limits, and may reduce customer confidence all of which can reduce income generation. However, there was limited empirical, locality-specific evidence quantifying how load-shedding affects butcheries' revenues, costs, and coping strategies in Chilanga. This study filled that gap by measuring income impacts and documenting adaptive strategies used by butcheries in Chilanga CBD.

1.4 Research Objectives

1.4.1 General Objective

The general objective was to investigate the effects of load shedding on income generation by Small and Medium Enterprises in selected butcheries of Chilanga Central Business District.

1.4.2 Specific Objectives

In order to achieve the purpose of the study, the following specific objectives were to:

a) Examine the nature of load-shedding experienced by butcheries and cold-storage SMEs in selected chilanga central business district.
b) Assess the effects of load shedding on employment (working hours, temporary layoffs) and customer behaviour in Chilanga central business district.
a) Identify coping strategies adopted by butcheries and cold-storage SMEs to manage the effects of load shedding.

1.5 Research Questions

The study was guided by the following questions:

a) What was the nature of load shedding experienced by butcheries and cold-storage SMEs in selected chilanga central business district?
b) How did load shedding affected employment (working hours, temporary layoffs) and customer behaviour in Chilanga central business district?

c) What coping strategies did butcheries and cold-storage SMEs in Chilanga CBD employ to mitigate the effects of load shedding?

1.6 Significance of the Study

This study is significant to the following stakeholders:

No.	Stakeholder	Significance of the Study
1	**Academia**	Provides empirical evidence on how load shedding affects SME income generation, contributing to literature on energy disruptions and business resilience.
2	**Policy Makers (MCTI, Min. of SMEs)**	Helps guide formulation of SME-supportive policies, including energy-reliant business protection mechanisms.
3	**Electricity Utility (ZESCO)**	Offers micro-level insights on the economic effects of load shedding to inform improved scheduling and customer-support strategies.
4	**Local Government (Chilanga Council)**	Supports local planning and SME development initiatives by highlighting operational vulnerabilities of essential food enterprises.
5	**SME Community (Butcheries & Cold-storage operators)**	Provides practical evidence to inform investment decisions in alternative energy and business continuity strategies.

Table 1: Significance of the Study

This study is significant for several key stakeholders, as it seeks to provide a deeper understanding of how load shedding affects income generation by butcheries and cold-storage SMEs particularly in Chilanga CBD. The findings will offer practical insights into the nature and scale of load shedding faced by butchery traders in Chilanga. The study would further supply local government and electricity providers (such as ZESCO) with micro-level evidence of economic harm to food retailers, strengthening advocacy for targeted mitigation or schedule coordination.This can inform the development of low taxes by the government so that traders and other

Chilanga residents could buy alternative energy sources easily. This would eventually improve the living standards of the people as the effects of load shedding would potentially be avoided or reduced. The research provides evidence-based data that can guide policy formulation around energy use. Understanding the dynamics of load shedding and its consequences on butchery, business and cold storage SMEs can help in designing interventions that are more effective to manage business sustainably. This study contributes to the academic discourse by adding a locality-specific case study to the literature on load-shedding impacts on SMEs in Zambia and other hydropower-dependent economies. It offers a localized perspective that may be used for comparative studies or as a foundation for further research. In summary, this study plays a crucial role in bridging the dangerous gap between load shedding and income generation.

1.7. Delimitations of the Study

This study was delimited in several important ways. First, the research focused on butcheries and cold-storage enterprises only, excluding other SME categories in Chilanga CBD. This decision was made to ensure depth of analysis within one sub-sector rather than spreading the investigation across multiple types of businesses.

Second, the study concentrated on Income generation impacts, particularly financial losses resulting from stock spoilage, increased fuel costs for backup power, and reduced sales during outages. Other indirect impacts, such as reduced customer traffic or broader supply chain disruptions, were acknowledged but not examined in detail.

Third, data collection was delimited to enterprises located within Chilanga CBD. While the findings may provide insights for other districts in Zambia, the study did not claim to represent the entire SME sector at the national level.

1.8. Definitions of Concepts

Load Shedding: The deliberate, planned interruption of electricity supply by ZESCO in order to balance demand and supply during power shortages. Load shedding is commonly used in Zambia as a demand-side management strategy during power deficits (Ministry of Energy, 2022; ZESCO, 2023).

Income generation: The total income earned by butcheries and cold-storage enterprises through the sale of meat and related products, including daily cash flow. In business studies, Income generation refers to the ability of an enterprise to generate sales and income from its operations (Atrill and McLaney, 2020; Drury, 2018).

Butcheries: Small to medium-scale retail outlets that sell fresh meat to consumers and depend heavily on refrigeration for stock preservation. According to the Zambia Development Agency (ZDA, 2022), butcheries fall under the SME category within the retail sector due to their scale of operations and dependency on electricity for product preservation.

Operational Costs: All expenses incurred in running the enterprise, including electricity bills, generator fuel, maintenance, and staff wages. Operational costs in SMEs are typically categorized as recurrent expenditures necessary to sustain production and service delivery (Hill and Jones, 2012; Ibrahim, 2023).

Spoilage Losses: Financial losses resulting from the deterioration of perishable goods due to prolonged power outages and insufficient refrigeration. Spoilage losses are especially significant in food-related enterprises where cold-chain preservation is disrupted (FAO, 2019; Zim Trade, 2019).

Coping Mechanisms: Strategies adopted by enterprises to manage and adapt to the challenges posed by load shedding, such as investing in generators, solar power, or adjusting business hours. Coping mechanisms are defined as adaptive measures SMEs use to remain resilient in unstable operating environments (Teke and Manamela, 2021; AfDB, 2020).

1.9. Organization of the Study

The study was organized into five chapters, each addressing key aspects of the research

Chapter One: Introduction - This chapter provides the overall introduction to the study, including the background, problem statement, research objectives, and significance of the study. It sets the context for the research and outlines the purpose and scope of the investigation.

Chapter Two: Literature Review - This chapter reviews relevant literature on urbanization, housing challenges, and urban planning in Zambia and other developing

countries. It explores previous research, theories, and policies related to urbanization and housing quality.

Chapter Three: Methodology - The chapter outlines the research methods employed in the study, including the research design, data collection methods, and data analysis techniques. It provides justification for the selected methods and addresses ethical considerations.

Chapter Four: Presentation of Findings and discussion - This chapter presents the findings of the research, including analysis and interpretation of the data. This chapter included discusses the findings in accordance with the literature reviewed and theoretical framework upon which the study is hinged.

Chapter Five: Conclusion and Recommendations- This chapter summarizes the key findings of the study and offers recommendations for Butcheries and other SMEs in Chilanga CBD. It also suggests areas for future research.

1.10. Chapter Summary

Chapter one introduced the study of the effects of load shedding on income generation by butcheries and SMEs. The chapter highlighted the dependence of butcheries on electricity, the financial and operational challenges posed by load-shedding, and the limited empirical evidence for this locality. It also presented the research objectives, questions, significance, and definitions of key concepts. The next chapter reviewed empirical and theoretical literature, with particular emphasis on revenue loss, coping strategies, and SME resilience in electricity-dependent economies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of relevant literature that informs the study on the effect of load shedding on income generation among butcheries and cold-storage SMEs in Chilanga Central Business District. A literature review provides an analytical synthesis of existing scholarly work, enabling the researcher to identify what is already known about a topic and where gaps remain (Creswell, 2014). It draws on global, regional, and local studies to contextualize the research problem and establish the theoretical and empirical foundation for the study. This review is structured around the study's refined research objectives, covering outage patterns, revenue effects, employment and consumer behaviour, and coping mechanisms adopted by SMEs affected by power disruptions.

2.2 Empirical Review.

Below are the global, regional and local scholarly contributions to the study under investigation. The contributions have been reviewed under respective objectives.

2.2.1. **Effects of load shedding on income generation in selected butcheries**

Globally, frequency and duration of power interruptions are critical determinants of economic loss. Kintu (2022) emphasized that power outages during peak operational hours amplify financial losses by up to 50%. According to the World Economic Forum (WEF, 2022), countries with unreliable electricity lose between 1.5% and 4% of GDP annually.

In Pakistan, Malik et al. (2019) found that meat retailers faced load-shedding during midday and evening hours, coinciding with peak consumer demand, resulting in sharp revenue declines. Similarly, in the Philippines, Dela Cruz (2020) discovered that refrigeration-based enterprises suffered compounded losses when blackouts occurred during hot afternoon periods, accelerating meat spoilage.

In India, a study by Kaur and Singh (2018) found that SMEs experienced outages averaging four hours daily, often during core business hours. The researchers emphasized that predictable, scheduled outages were less damaging than erratic, unscheduled ones — a finding also supported by research in Bangladesh (Hossain & Alam, 2021).

Power supply reliability has been linked directly to enterprise performance and cost management. According to a World Bank Enterprise Survey (World Bank, 2021), firms

in low- and middle-income countries experience an average of 5.6 power outages per month, leading to losses equivalent to 6.8% of annual sales. Ahmed et al. (2019) found in Pakistan that butcheries lost approximately 18% of weekly revenues due to spoilage and unplanned downtime during load-shedding periods. In India, Singh and Mukherjee (2017) quantified similar effects in cold-storage enterprises, noting that firms spent 12–15% of operating budgets on backup energy, particularly generator fuel and ice procurement.

In Bangladesh, where small retail food outlets rely heavily on refrigeration, Islam and Hossain (2018) established that enterprises experienced up to 25% higher operating costs during periods of national grid instability. Comparable findings emerged from Latin America: in Ecuador, Alvarado et al. (2020) reported that SMEs operating in perishable goods sectors spent an average of 22% more on energy substitutes, leading to reduced net margins and higher product prices for consumers.

As observed by the International Energy Agency (IEA, 2022), such disruptions contribute to inflationary pressures by increasing the cost of production for perishable goods globally. Thus, power reliability is not only an infrastructural issue but also a determinant of economic competitiveness and price stability in SME sectors.

Scott et al. (2014) noted that electricity shortages in South Asia impose higher proportional costs on SMEs than on large corporations, particularly in energy-intensive sectors such as food storage. Similarly, a study by Alby, Dethier, and Straub (2013) using firm-level data from 25 developing countries established that power outages significantly decrease productivity by up to 6%, with the most severe effects in manufacturing and perishable goods industries.

Across Sub-Saharan Africa, studies highlight similar patterns. In Nigeria, Onwe and Adekunle (2020) reported that over 60% of outages occurred during the day, coinciding with business peak hours. The study established that Butcheries suffered disproportionately, with daily losses exceeding 20% of expected revenue.

A study in Kenya by Mwangi and Kamau (2022) established that butcheries in Nairobi's Central Business District faced outages averaging five hours daily, mostly during lunch and evening rush hours, which negatively affected customer inflows. Likewise, Chirwa (2021) in Malawi found that outages during weekends or public holiday's periods of high meat demand had more severe effects on SME performance.

South Africa's Eskom data (2023) confirms that rotational load-shedding schedules between 6 AM and 8 PM led to cumulative operational disruptions equivalent to 100–120 hours monthly. This aligns with Teke and Manamela's (2021) findings that daytime power cuts pose a higher economic threat than night time outages.

Within Sub-Saharan Africa, studies also indicate that the economic cost of power outages is disproportionately borne by SMEs. In Nigeria, Olanrewaju and Aremo (2021) observed that small butcheries and fish vendors suffered daily revenue losses of 10–30%, depending on the frequency of outages. Similarly, in Kenya, Odhiambo et al. (2018) reported that SMEs in Nairobi's perishable goods sector spent an average of KES 3,500 daily on generator fuel during prolonged blackouts, accounting for up to 40% of operational expenses.

In addition, research has highlighted that unreliable electricity is one of the primary constraints to SME growth (Adenikinju, 2020; Steinbuks & Foster, 2010). For instance, Adenikinju's (2020) study on Nigeria found that power disruptions led to average annual revenue losses of 15–20%, while small food processors reported spoilage losses exceeding 30%. Teke and Manamela (2021) observed similar findings in South Africa, where recurring load-shedding increased spoilage and generator fuel consumption for small businesses.

In Ghana, Boateng and Anokye (2020) found that businesses engaged in food preservation recorded 15% spoilage during recurring power cuts, translating to cumulative losses that discouraged long-term investment. Tanzania's case, as analyzed by Mgaya (2019), revealed that butcheries faced increased downtime costs and customer attrition, particularly when power cuts occurred during weekends, when demand for meat was highest.

South Africa presents one of the most detailed case studies. Teke and Manamela (2021) showed that small butcheries in Pretoria experienced losses amounting to ZAR 5,000 per week during Stage 4 load-shedding periods. Eskom's 2022 performance report corroborates this, estimating that the SME sector lost nearly ZAR 1.2 billion annually to electricity disruptions.

In Zambia, the situation mirrors regional experiences. The Energy Regulation Board (2023) reported that most load-shedding occurs between 8 AM and 6 PM — the peak operational hours for butcheries. ZESCO (2023) load-shedding schedules indicate that urban areas such as Lusaka, Chilanga, and Kitwe experience average daily outages lasting 4–6 hours.

Kintu (2022) observed that in Lusaka, most SMEs operate from 7 AM to 8 PM, meaning power interruptions during this window have severe impacts on productivity. A follow-up study by Banda (2023) in Kafue revealed that 70% of butcheries lost between ZMW 500–1,000 per day due to unscheduled blackouts. Moreover, research by the Zambia Association of Manufacturers (2022) highlights that small firms lack real-time communication from ZESCO regarding outage timings, resulting in wasted production time and unpreparedness.

ZESCO (2023) annual report acknowledges that load-shedding schedules have caused recurring supply disruptions, particularly affecting small businesses dependent on refrigeration. Ibrahim (2023) reported that Lusaka-based SMEs experienced a 35% reduction in average weekly sales due to spoilage and generator costs. Further, a study by the Zambia Institute for Policy Analysis and Research (ZIPAR, 2022) found that butcheries incurred higher production costs, with 28% citing daily spoilage and 19% reporting lower customer turnout due to product quality concerns.

In addition, Ibrahim (2023) found that frequent load-shedding in Lusaka reduced SMEs' monthly revenues by 25–35%, with butcheries and cold-storage enterprises being the most affected due to their dependence on refrigeration. However, the study treated SMEs as a single group, creating a gap this study addresses by disaggregating evidence by enterprise type in Chilanga District.

In Chipata and Livingstone, Phiri and Tembo (2021) observed that load-shedding-induced downtime reduced weekly revenues by between ZMW 2,000 and ZMW 4,000 for butcheries depending on size. The Energy Regulation Board (ERB, 2023) further notes that most SMEs cannot sustain extended generator use due to rising diesel prices, which directly translates into reduced profitability

2.2.2. Evaluate the relationship between load shedding and employment levels in the butcheries

Globally, electricity reliability plays a vital role in shaping both employment stability and consumer confidence within small and medium enterprises (SMEs), particularly in energy-dependent sectors such as food retail, meat processing, and cold-storage. According to the International Labour Organization (ILO, 2022**)**, frequent power disruptions result in decreased working hours, heightened operational stress, and job insecurity, especially for workers in informal and semi-formal enterprises. The United States Department of Agriculture (USDA, 2023) similarly notes that unstable power supply in developing economies undermines employee productivity and alters consumer purchasing behavior by eroding trust in perishable goods.

In Bangladesh, Hossain (2022) conducted a cross-sectional survey involving 160 cold-storage and retail employees and found that frequent power outages reduced working hours by up to 30%, primarily due to limited operating windows and spoilage-related downtime. The study further revealed that many workers experienced irregular pay and occasional layoffs when electricity was unavailable for extended periods. Comparable findings emerged in India, where Sinha and Kumar (2020) found that micro and small enterprises experiencing daily load-shedding exceeding four hours reported a 22% reduction in employee retention rates. Many employees shifted to other sectors with more stable income opportunities, particularly during peak blackout seasons.

Further evidence from Sri Lanka by Jayasekara (2021) revealed that inconsistent power supply led to both psychological and financial distress among SME workers, as unpredictable outages disrupted shift planning and payroll reliability. Similarly, Malaysia's Department of Statistics (2021) reported that enterprises facing power instability saw a 10–15% reduction in average weekly staff hours, leading to higher employee turnover.

Beyond employment, customer trust is a critical dimension of business performance. A longitudinal study in Brazil by Rodríguez (2021) demonstrated that power shortages eroded consumer trust in perishable goods retailers, leading to persistent sales declines even after power normalization. The study found that 48% of surveyed customers switched to supermarkets with reliable backup power systems. Similarly, research in Mexico by García and Ramos (2022) established that prolonged electricity

interruptions triggered a “trust shock” in consumer behavior, where buyers avoided outlets that had previously sold spoiled products.

In Southeast Asia, a World Bank (2021) report indicated that unstable power supply negatively affects food safety perception, leading to reduced customer loyalty and decreased market share among small meat retailers. These findings collectively highlight that the effects of load-shedding extend beyond immediate financial losses to include diminished labor stability and long-term reputational risks that compromise business resilience.

In Sub-Saharan Africa, empirical evidence suggests that load-shedding exerts both direct and indirect effects on employment stability and consumer confidence, particularly in perishable goods industries. Adenikinju (2020) in Nigeria established that power instability reduced labour productivity by up to 25%, forcing SMEs in the food sector to adopt rotational employment schedules and, in some cases, temporary layoffs. Workers in butcheries and fish markets were particularly affected due to the perishability of stock and the dependence of their work on refrigeration and lighting.

In Ghana, Boateng and Anokye (2020) found that small food vendors and meat processors experienced significant employment strain during the 2014–2015 energy crisis, with 38% of enterprises reporting reduced working hours and 21% resorting to casual or part-time labour to minimize losses. Similarly, Okeke (2021) in Nigeria reported that many SMEs adjusted operating hours to coincide with grid power availability, disrupting regular employment and resulting in unstable income patterns for employees.

Studies in Kenya mirror these findings. Mutinda (2022) observed that consumer confidence declined sharply during prolonged outages, as customers questioned the safety, freshness, and hygiene of meat products stored under unstable refrigeration. Nearly 65% of consumers in Nairobi’s low-income suburbs shifted their purchases to supermarkets or large butcheries equipped with standby generators. Likewise, Mwangi and Kamau (2022) highlighted that in Mombasa, butcheries reduced staff shifts by up to 40% during peak load-shedding seasons to control operational costs, leading to employee fatigue and job dissatisfaction.

In South Africa, the country most synonymous with rolling blackouts, the socio-economic consequences of load-shedding have been extensively documented.

Mokoena (2021) found that small food retailers and butcheries were compelled to reduce staff shifts during Stage 6 load-shedding, translating to lower employee earnings and heightened job insecurity. Teke and Manamela (2021) similarly reported that consumer turnout in local meat shops declined by 15–20% due to reduced refrigeration reliability and perceived health risks. Eskom's 2023 report confirmed that these operational disruptions collectively led to approximately R3.2 billion in annual losses across the SME food sector.

Furthermore, Chirwa (2021) in Malawi revealed that load-shedding negatively affected women-led food businesses, as unstable hours disrupted both income and household responsibilities. In Tanzania, Mgaya (2019) found that frequent power cuts not only caused employee underemployment but also strained customer relations due to inconsistent product quality, leading to reputational damage.

These studies illustrate that in the African context, employment instability and declining consumer confidence are intertwined consequences of energy unreliability. The inability of SMEs to guarantee consistent service undermines customer loyalty and workforce stability, eroding the foundation of enterprise sustainability.

In the Zambian context, the dual effects of load-shedding on employment and consumer confidence are increasingly evident, especially among small enterprises operating in temperature-sensitive sectors such as meat and dairy. Ibrahim (2023) found that frequent power outages forced 40% of butcheries in Lusaka to reduce employee working hours during blackout periods, directly cutting daily wages and increasing worker dissatisfaction. The Zambia Federation of Employers (ZFE, 2023) further reported that prolonged outages reduce employee morale and productivity, often resulting in absenteeism and higher turnover rates.

A study by Phiri and Tembo (2022) conducted in Kitwe and Ndola showed that during the 2022 load-shedding episodes, 35% of butcheries temporarily laid off workers to manage rising costs associated with generator fuel and spoiled inventory. Similar findings were echoed by Mwaanga (2023) in Lusaka, who noted that daily working shifts among cold-storage enterprises declined from an average of 10 hours to 6 hours during severe load-shedding periods.

From a consumer standpoint, power outages have a direct bearing on customer trust and buying behavior. The Zambia Consumer Protection Commission (ZCPC, 2023)

highlighted that 63% of consumers reported a loss of confidence in the freshness of meat products from outlets known to experience frequent outages. Banda (2023) found that in Livingstone and Chilanga, 55% of customers avoided butcheries that had previously sold spoiled meat, preferring supermarkets or suppliers with visible backup systems. The Food and Drugs Control Laboratory (FDCL, 2023) emphasized that inconsistent refrigeration increases the likelihood of bacterial growth in meat products, further undermining consumer confidence and food safety.

Additionally, ZIPAR (2023) observed that the cumulative effects of power disruptions contribute to higher unemployment in urban markets, as SMEs downsize or close entirely due to escalating energy costs. In Choma and Chilanga, small butcheries reported losing up to two employees per shop within six months of intensified load-shedding. These layoffs have broader implications for household income and local economic resilience, especially in communities where SMEs are primary sources of livelihood.

Moreover, consumer behavior in Zambia reflects a growing shift toward trust-based purchasing patterns. Chileshe (2023) found that customers increasingly evaluate butcheries based on visible power reliability indicators, such as the presence of generators or uninterrupted cold storage. Enterprises lacking these assurances face declining foot traffic and long-term reputational harm.

From a social standpoint, the effects of load-shedding extend beyond the enterprise level to influence community livelihoods. Workers affected by reduced shifts or layoffs face economic insecurity, while customers experience decreased access to safe, affordable meat products. This cyclical effect weakens both household welfare and the microeconomic stability of urban markets like Chilanga.

2.2.3. Coping Mechanisms Adopted by Butcheries and Cold-Storage SMEs

Globally, SMEs employ a range of coping mechanisms to mitigate the impact of unreliable electricity supply. According to the International Finance Corporation (IFC, 2022), common measures include investing in generators, ice storage, and solar power systems. However, these strategies often come with high capital and maintenance costs.

In India, Sharma and Desai (2019) found that 68% of cold-storage businesses used diesel generators, yet profit margins declined by up to 12% due to escalating fuel prices. Similarly, in Pakistan, Ahmed et al. (2019) observed that butcheries adopted ice-based cooling systems to preserve meat during outages, but the added logistics costs offset any savings.

A study by Alvarado and Torres (2020) in Colombia revealed that enterprises using hybrid solar systems achieved long-term cost savings after an initial two-year recovery period. Furthermore, a United Nations Industrial Development Organization (UNIDO, 2021) report indicated that SMEs adopting renewable energy solutions showed improved resilience and reduced spoilage losses by up to 30%.

In Africa, coping mechanisms vary by country and energy infrastructure. In Nigeria, Moyo and Nyembe (2021) observed that SMEs increasingly relied on shared cold-storage facilities to minimize generator fuel costs, while others adjusted operating hours to align with power availability. A study by Amponsah et al. (2020) in Ghana noted that butcheries formed cooperatives to invest in communal generators, a strategy that improved cost-efficiency.

In Kenya, Wanjiru and Mutua (2021) reported that enterprises in the meat sector diversified into solar-powered refrigeration, supported by microfinance initiatives from energy NGOs. Similarly, in Tanzania, Lyimo (2020) found that while solar systems reduced operational costs in the long run, limited access to financing restricted widespread adoption.

South African SMEs displayed adaptive efficiency through predictive scheduling and mobile alerts from Eskom (Eskom, 2022). However, Teke and Manamela (2021) noted that even with these measures, smaller enterprises struggled with maintenance costs, making generator dependency unsustainable during extended Stage 6 load-shedding.

In Zambia, coping strategies include generator use, ice purchases, and temporary storage collaborations. Ibrahim (2023) found that 72% of Lusaka-based butcheries relied on small diesel generators, yet 60% reported reduced profits due to fuel expenses. Moyo and Nyembe (2021) observed that SMEs in Ndola formed storage

partnerships with supermarkets possessing backup power to preserve stock during outages.

The Zambia Development Agency (ZDA, 2022) reported that fewer than 15% of SMEs have adopted solar power solutions, mainly due to high initial costs and limited credit facilities. In Chilanga, informal coping practices such as purchasing pre-chilled ice blocks or reducing daily stock quantities are prevalent (ERB, 2023).

While these measures provide short-term relief, they rarely ensure long-term sustainability. As noted by the Zambia Chamber of Commerce and Industry (ZACCI, 2023), the cost-effectiveness of coping strategies must be evaluated not just by immediate loss reduction but by their contribution to consistent revenue streams and customer retention.

In summary, Zambia's experience mirrors broader regional trends — energy unreliability is a catalyst for employment reduction and consumer mistrust in SMEs. Unless addressed through reliable infrastructure, alternative energy solutions, and improved communication between suppliers and enterprises, these challenges would continue to hinder both economic productivity and consumer welfare.

The literature review emphasized the critical role of microfinance and credit in enhancing drought resilience among small-scale farmers. Access to credit can significantly influence the adoption of drought adaptation strategies, but several barriers hinder its accessibility. The global, regional, and local perspectives have shown that while microfinance has the potential to provide much-needed financial services to small-scale farmers, the challenges of collateral, high-interest rates, and financial illiteracy remain significant obstacles. Addressing these challenges through tailored financial products, innovative lending models, and improved financial literacy is crucial for enhancing the ability of small-scale farmers to adapt to drought and other climate-related shocks. The case of Chongwe District in Zambia provides valuable insights into these issues, highlighting the need for context-specific solutions to improve financial accessibility and promote drought resilience.

2.3. Research Gap

The reviewed literature provides valuable insights into the operational, financial, and adaptive challenges posed by load shedding to SMEs worldwide. However, several gaps remain:

1. **Limited Focus on Specific Sectors:** Most global and regional studies assess SMEs broadly without narrowing down to specific sectors such as butcheries and cold-storage enterprises, which face unique refrigeration-related vulnerabilities.
2. **Underrepresentation of Peri-Urban Contexts:** Zambian studies have primarily focused on urban hubs such as Lusaka and Ndola. Peri-urban centers like Chilanga, where SMEs face distinct infrastructural and financial constraints, which is an area of focus for this study, remain largely unexamined.
3. **Insufficient Exploration of Coping Mechanisms:** While coping strategies are documented, most studies stop at descriptive analysis. There is limited exploration of the effectiveness, sustainability, and scalability of these mechanisms for small-scale enterprises in peri-urban contexts.
4. **Lack of Practical, Context-Specific Recommendations:** Policy-focused recommendations exist at the national and international level, but there is a lack of localized strategies tailored for small butcheries and cold-storage enterprises operating under financial and infrastructural constraints.

By addressing these gaps, this study contributed to the literature by offering a focused, context-specific analysis of how load shedding influenced Income generation in butcheries and cold-storage enterprises in Chilanga CBD.

2.4. Theoretical Framework

This study was anchored on three main theories: Goldratt's (1984) Theory of Constraints; Wernerfelt's (1984) Resource Based View; and Bertalanffy's (1968) Systems Theory.

a) Theory of Constraints (TOC)

The study is guided by Theory of Constraints (TOC) which holds that every system has at least one constraint that limits its performance, and improving the system requires managing this constraint. The theory identifies load shedding as a primary constraint to operations of many organisations and businesses. Applied to the current study, load shedding acts as a significant, external constraint for the operations of butcheries and SMEs. It disrupts core activities such as refrigeration, processing

machinery, and lighting, which are essential for maintaining product quality and business operations. By focusing on the constraint (load shedding), businesses can understand how it impacts their output (such as, sales volume, profitability) and identify specific strategies to mitigate its effects, such as investing in generators or solar power.

b) Resource-Based View (RBV)

This theory posits that a firm's competitive advantage is rooted in its resources and capabilities that are valuable, rare, inimitable, and non-substitutable. The theory frames a stable electricity supply as a crucial, non-substitutable resource for performance. It proposes that load shedding hinders core processes (production, storage, sales), increases costs through alternative energy solutions like generators, and damages customer relations and reputation due to service interruptions, ultimately reducing profitability and growth. Applied to this study, the theory maintains that a consistent and reliable electricity supply is a critical, resource for a modern butchery and cold-storage SME. Load shedding diminishes the value of other resources, such as skilled labour and capital, because they cannot be effectively utilized without electricity. This theory is therefore essential for the current study because through its tenets, it is highly predictable that business that can develop or acquire more resilient resources, such as the ability to maintain cold chains during outages (like, through backup power), can sustain its competitiveness on the market.

c) Systems Theory

This theory holds that an organisation or community is an interconnected system where each component affects the functioning of the whole. In this context therefore, electricity supply is a crucial sub-system that supports other sub-systems such as production, communication, and service delivery. When load shedding occurs, it disrupts the smooth functioning of these interconnected systems-reducing productivity, slowing business operations, and ultimately lowering income. From that perspective therefore, the Systems Theory shows a lot of its relevance to the current study. It is so in that, it helps explain how disruptions in one part of the system (power supply) have ripple effects on economic activities and income generation.

Together, these theories will guide the study in analysing both the direct economic effects of load shedding and the strategic adaptations enterprises adopt to sustain operations and Income generation.

2.5. Conceptual Framework

The conceptual framework for this study illustrates the relationships between the independent, mediating, and dependent variables. It illustrates the potential effects of load shedding on income generation in Zambia.

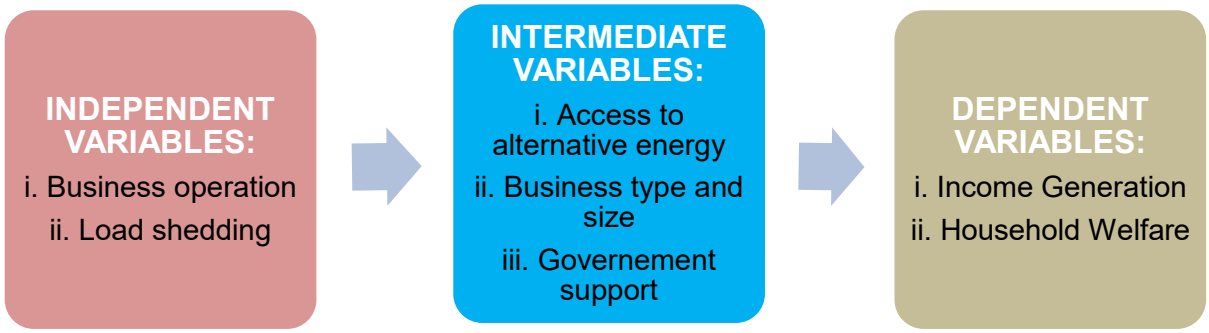

***Figure 1: Conceptual Framework*:**

a) Independent Variables

Load shedding forms the central independent variable in this study. It encompasses three core dimensions:

- Frequency (how often outages occur),
- Duration (the length of each outage), and
- Predictability (whether outages follow a known schedule or are unplanned).

These dimensions significantly disrupt the operations of butcheries and cold-storage SMEs in Chilanga CBD, which rely heavily on uninterrupted refrigeration. Frequent and prolonged outages lead to meat spoilage, operational downtime, and reduced customer confidence in product safety. Unpredictable outages further undermine planning and productivity. Therefore, increased load shedding places direct pressure on business performance, customer patronage, and ultimately, income generation.

b) Mediating Variables.

Access to Alternative Energy

This mediating variable captures the extent to which butcheries and SMEs can mitigate the adverse effects of load shedding through backup energy solutions. Alternative energy sources such as diesel generators, solar systems, inverter batteries, and ice-storage techniques provide temporary operational continuity during outages. SMEs with reliable backup power can maintain cold-chain integrity, reduce spoilage, and continue serving customers, thereby cushioning the income shock caused by electricity interruptions. However, high capital and fuel costs may limit the feasibility of these options for small-scale operators in Chilanga CBD.

Business Type and Size

This variable reflects the structural characteristics of butcheries and SMEs that influence their vulnerability to load shedding.

Business type determines reliance on refrigeration (e.g., meat sales require strict cold-chain maintenance).

Business size influences the scale of financial loss during outages; smaller businesses may experience lower spoilage due to reduced stock levels, whereas larger enterprises incur higher losses.

For enterprises in Chilanga CBD an area experiencing high outage frequency smaller or moderately sized butcheries may manage inventory more flexibly, reducing exposure to spoilage and sudden revenue loss. Conversely, larger butcheries without adequate backup systems suffer greater operational and financial risks.

Government Support

This variable represents the policies and interventions provided by government agencies to help SMEs cope with electricity disruptions. Government support may include:

- Subsidies for alternative energy equipment,
- Tax incentives for adopting renewable technologies,
- SME financing schemes,
- Load-shedding communication systems, and
- Improvements in national energy infrastructure.

Effective government support can moderate the negative effects of load shedding by reducing operational costs, enhancing preparedness, and enabling SMEs to adopt resilient energy solutions. Where such support is limited or inconsistent, SMEs in Chilanga CBD remain highly exposed to income fluctuations.

c) Dependent Variables

1. Income Generation:

Income generation refers to the ability of butcheries and cold-storage SMEs to earn revenue through the sale of meat products. It reflects the financial health and operational continuity of the business. Adequate and reliable power supply ensures that products are well preserved, customer trust is maintained, and sales volumes remain stable. Load shedding disrupts this process by causing spoilage, reducing trading hours, lowering product quality, and decreasing customer traffic. As a result, income generation drops significantly. This variable enables the study to measure the extent to which electricity disruptions impact business profitability in Chilanga CBD.

2. Household welfare:

This variable captures the broader socioeconomic outcomes associated with declining SME income. When butcheries and SMEs experience financial losses, business owners and employees face reduced earnings. Household welfare in this context includes:

- Ability to meet basic needs (food, health, education),
- Household spending power,
- Stability of livelihoods,
- Quality and safety of food consumed.

Load shedding indirectly affects household welfare through its impact on business income, forcing families to make difficult economic trade-offs, especially in low-income peri-urban communities like Chilanga.

d) Summary of Relationships

The conceptual framework illustrates that load shedding characterized by its frequency, duration, and unpredictability directly affects the operational capacity,

revenue generation, and overall performance of butcheries and cold-storage SMEs. These effects then extend to household welfare, influencing livelihood stability and economic well-being.

The impact of load shedding, however, is not uniform; it is shaped by three mediating factors:

a. Access to alternative energy,
b. Business type and size, and
c. Government support.

These mediating variables determine whether SMEs experience severe or moderate losses, the strategies they adopt, and their capacity to sustain operations during outages. Collectively, they define how load shedding translates into real-life business outcomes within the context of Chilanga CBD.

CHAPTER THREE

METHODOLOGY

3.1 Introduction.

This chapter presented the methodology that was employed to investigate the effect of load-shedding on income generation among small and medium butcheries in Chilanga Central Business District (CBD). It presented research method, design of the study, study area, target population, study sample, and sampling techniques that the study employed. The chapter also provided the research instruments, data collection

techniques as well as delimitation and limitation of the study. The section of Ethical considerations was also discussed in this chapter.

3.2. Research design

A qualitative research method was one in which a researcher sought in-depth understanding of social phenomena within their natural settings. It focuses on the "why" rather than the "what" of social phenomena and relies on the direct experiences of human beings as meaning-making agents in their everyday lives (Kombo and Tromp, 2011). The three major focus areas of qualitative researches were individuals, societies and cultures, and language and communication. Although there are many methods of enquiry in qualitative research, the common assumptions are that knowledge is subjective rather than objective and that the researcher learns from the participants in order to understand the meaning of their lives. To ensure trustworthiness, the researcher attempts to maintain a position of neutrality while engaged in the research process. As qualitative research methods were mainly descriptive, on the effect of load shedding on income generation by small and medium enterprises in Chilanga central business district.

3.3. Research Design

The term 'research design' has been defined differently by different scholars. Kumar (2011) defines a research design as a plan; structure and strategy of investigation so conceived as to enable one obtain answers to research questions or problems. On the other hand, Kombo and Tromp (2006) define it as, "the structure of the research" (P. 70). It is used to structure the research, and to show how all of the major parts of the research project work together to try to address the central research questions. Furthermore, Orodho (2003) defines research design as a scheme, outline or plan that is used to generate answers to research problems. The plan being talked about in the definitions above includes an outline of what the researcher intends to do from the formulation of the research problem to the final analysis of the data (Kerlinger, 1986). The research design provides the basis on which appropriate research methods that must be employed in investigating a given phenomenon must be selected.

3.3.1. Descriptive Research Design

In that case, the study was based on the descriptive research design with narrative forms in establishing how load shedding affected income generation by butcheries and

SMEs in Chilanga CBD. The descriptive research design was used because the expressions by the respondents were being described. On the other hand the study used narrative forms because the researcher wanted to get cross-checked information from the respondents. As indicated by Kombo and Tromp (2006), a descriptive research design was one whose major purpose was description of the state of affairs as it exists. The research reports the findings. Descriptive studies are not only restricted to fact findings, but may often result in formulation of important principles of knowledge and solutions to significant problems. When using the research design, the researcher constructed questions that would solicit desired information; identified individuals that were surveyed; and summarised the data in a way that provided the designed descriptive information.

3.4 Study Area

The study focused on the Chilanga Central Business District (CBD), located approximately 20 kilometers south of Lusaka along the Great North Road. Chilanga is characterized by both formal and informal commercial activities, including butcheries, grocery shops, and food outlets. The district experiences frequent power interruptions due to grid instability and high demand, making it an ideal setting for examining the impact of load-shedding on income-dependent enterprises.

Mapping of butcheries in Chilanga CBD revealed that most establishments are concentrated along primary trading streets and near local markets, reflecting areas of high consumer traffic. Only a limited number of these butcheries possess backup generators or solar-battery systems, while the majority rely solely on the national grid for refrigeration and lighting. This spatial pattern provided a natural variation for analyzing how location and resource availability affected income resilience during outages (Moyo & Nyembe, 2021).

Figure 2: Chilanga CBD.

Source: Chikuma et al. (1991)

3.5 Target Population

The study population comprised all registered and unregistered small and medium-sized butcheries operating within Chilanga CBD. The choice of butcheries was guided by their heavy reliance on electricity for refrigeration, lighting, and meat preservation. Unreliable power supply therefore had direct consequences on inventory quality, customer retention, and profitability (Ahmed et al., 2019).

3.6. Study Sample

3.6.1. Sample Size Determination

A study sample was a selection of members from the population under study. As has been stated by Rudestam and Newton (1992), a study sample represents the entire population. Researchers meet a lot of challenges in their work. Among other challenges researchers meet include time, manpower and insufficient financial strength. On this note some scholars like Robson (1993) say that in qualitative research, the sample size was small. In addition, there were no precise rules to determine the size of the sample to be investigated. However, that was not to mean that even one person exclusively could make a sample size. The idea was to have a considerable number so as to have sufficient information. Basing on this information, this study had a sample comprising butcheries totaling to 40. A sample of forty (40)

butchery owners were sufficient because Chilanga CBD was not a very big area. Looking at the number of active butcheries in Chilanga, it can be estimated that the total number of would be slightly above 40, hence choosing that number.

Comparable studies reinforce this choice: Moyo and Nyembe (2021) studied 35 butcheries in Harare, while Omondi et al. (2020) sampled 30 SMEs in Kisumu, Kenya. Both achieved robust results using similar sample sizes. Thus, the current study aligns with methodological precedents in regional SME energy research.

3.7. Sampling Techniques

The study utilized stratified purposive sampling, combining purposive identification with stratification to ensure representativeness across different operational profiles. Stratification was based on three key characteristics namely **Enterprise Size** – Micro, small, and medium butcheries categorized by staff count and daily turnover; **Backup Power Availability** – Presence or absence of generator, solar, or hybrid systems; and **Location** – Main road butcheries, market-proximal butcheries, and peripheral establishments.

Stratified purposive sampling

Strata	Micro (N=20)	Small (N=12)	Medium (N=8)
Main road butcheries	*5*	3	2
Market-proximal butcheries	*5*	3	2
Peripheral establishment	*5*	3	2
Vendors butcheries	*5*	3	2
Total	20	12	8

Source: Chilanga Central Business District

Within each stratum, butcheries were randomly selected to reduce bias while ensuring that each category was adequately represented. Stratified purposive sampling is widely recognized for its ability to balance diversity and focus, particularly in small-scale business research (Adenikinju, 2020; Bryman, 2016).

3.8. Research Instruments

In this study, the following research instruments were used: a Key Informant Interview Guide (KIIG), a camera and a tape recorder.

An interview guide is one of the instruments used in research. It is a document prepared by the researcher, where one prepares an outline of topics to be used when interacting with the respondents (Stuckey, 2013). The Key Informant Interview (KII) guide was used to gather qualitative insights from stakeholders directly or indirectly involved in SME operations and energy distribution. Respondents include Butchery traders, major meat distributors and Zambia Electricity Supply cooperation (ZESCO) officers.

These stakeholders provided expert perspectives on energy supply patterns, regulatory requirements, and the broader socio-economic implications of load-shedding. The KII guide followed semi-structured questioning to allow flexibility and probing, consistent with qualitative standards outlined by Patton (2015).

This gave the researcher the flexibility to pose more enhanced questions with a view to collecting more detailed information. Stuckey (2013) says that the researcher has a duty to provide the subject with some topics that reflect the issue under study. This obviously helps the researcher to explore the issue under study in depth. Kombo and Tromp (2014) add that once the data has been collected from the respondents, it has to be recorded in accordance with the instructions issued. Hence, this study used an interview guide as one of the instruments.

In this study, a Camera was also used. This, according to Rundell and Fox (2006), is a device for recording visual images in the form of photographs, Cinema films or video signals. With this instrument, pictures were taken and documented to show evidence of the data collected.

A cellphone (tape recorder) was used in this study as an instrument of data recording. It was used to record conversations between the researcher and traders on one hand as well as traders and customers; and the researcher and customers on the other. The researcher was able to replay the recorded data to ensure authenticity.

3.9. Data Collection Techniques

3.9.1. In-Depth Interviews (IDIs)

A subset of 10–12 butcheries was selected for IDIs to explore in greater depth issues such as decision-making processes, customer management during outages, and

attitudes toward adopting alternative energy sources. The IDIs facilitated deeper understanding of behavioural responses and provided context for interpreting quantitative results.

Such interviews are central to mixed-methods designs because they capture dimensions of resilience and adaptation that statistical measures alone cannot reveal (Creswell and Creswell, 2018).

3.9.2. Participant Observation

Field observations complement survey and interview data by providing real-time assessment of operational conditions. Observations focus on meat storage practices, generator usage, and temperature fluctuations in cold rooms during outage periods.

When permitted, thermometers or simple data loggers record internal temperatures to determine whether they exceed safe storage thresholds (4°C–5°C), following FoodSafety.gov (2023) guidelines. This allows estimation of spoilage rates and potential financial losses associated with power interruptions.

3.10 Data Analysis

3.10.1 Qualitative Analysis

As described by Marshall and Rossman (1999), data analysis was the process of bringing order, structure and meaning to a large amount of the data that has been collected. In this study, the Qualitative data from KIIs and IDIs underwent thematic content analysis in accordance with the research questions and objectives. Each theme was analysed using simple computation.

3.11. Validity and Reliability

Validity refers to the extent to which the study measures what it intends to measure. To ensure internal validity, triangulation across data sources (questionnaires, transaction logs, KIIs, and IDIs) were implemented. Construct validity was maintained by aligning indicators of income loss, outage duration, and coping cost with definitions established in prior literature (Adenikinju, 2020; Scott et al., 2014).

Reliability was enhanced through standardized data collection procedures, consistent questionnaire administration, and rigorous pre-testing. Clear coding protocols ensured reproducibility of qualitative findings.

Although the study's external validity was limited to Chilanga CBD, its methodological framework provided a model applicable to other Zambian districts and similar SME clusters across Sub-Saharan Africa.

3.12. Ethical Considerations

The study conforms to ethical standards in social science research. All participants provided informed consent after being briefed on the study's objectives, confidentiality assurances, and their right to withdraw. No personal identifiers appeared in any report, ensuring anonymity.

Data collection was scheduled outside of peak trading hours to minimize disruption. Ethical clearance was sought from the relevant institutional review board in accordance with Zambian research regulations.

3.13 Limitations of the Study

Potential limitations include incomplete financial records among informal enterprises, recall bias in self-reported data, and the relatively small sample size which may constrain generalizability. Seasonal fluctuations in meat demand and supply could also influence reported income variations.

Mitigation strategies include use of sales diaries, triangulation across multiple data sources, and careful interpretation of outliers. The methodological rigor ensured that despite these constraints, findings remained credible and insightful for policy and practice.

3.14. Chapter Summary

This chapter outlined the methodological framework for investigating the effect of load-shedding on income generation among butcheries in Chilanga CBD. The study employed a mixed research method, mixed-methods cross-sectional design, integrating quantitative measurements of financial loss with qualitative exploration of coping strategies. The combination of stratified purposive sampling, triangulated data collection, and rigorous analysis enhances validity and ensures that the results contribute meaningfully to both academic discourse and practical policy formulation.

CHAPTER FOUR:

PRESENTATION OF FINDINGS AND DISCUSSION

4.1 Introduction

The previous chapter presented the description of the methodology used in the study. This chapter presents raw data regarding the effects of load shedding on income generation among SMEs in Chilanga district of Lusaka province. The findings were presented according to the research questions, which guided the study themes.

4.2 The nature of Load shedding experienced by butcheries

The following qualitative data was derived from interviews with respondents from Chilanga CBD. The aim was to gather insights into the effects of load shedding on income generation among SMEs in Chilanga CBD with a particular focus on butchery business and cold-storage SMEs.

4.2.1. Load shedding experience

The study surveyed 40 butchery business operators in Chilanga Central Business District to understand their load shedding experience.

Duration of Load Shedding

Group	Frequency	Number of respondents
Main road butcheries	*2-4 hours*	18
Market-proximal butcheries	*1-2 hours*	12
Peripheral establishment	*More than 4 hours*	10
Total	**24 hours**	**40**

Source: Chilanga Central Business Centre

In terms of their load shedding experience, all the 40 respondents representing 100% of the selected sample, said that they experienced load shedding every day, and that it lasted for about 4-8 hours. In terms of whether there was prior notice or a load shedding schedule, 30 of the 40 respondents said, there was no prior notice. The other 10 said that previously there used to be but it ended without any mention. It was

imperative to mention at that point that finding was very consistent with Kaur and Singh (2018) in whose Indian study on the effects of load shedding on income generation stated that SMEs experienced outages averaging four hours daily. They stated that predictable scheduled outages were less damaging than the erratic unpredictable ones. From this finding, the researcher concluded that load shedding negatively affected business of butcheries in Chilanga CBD. This is so because it occurred during peak business hours, a time when the customer base was very active in the market.

4.2.2. Effects of load shedding on sales and costs

Objective number 1 as has already been stated, aimed at finding out the frequency and duration of load shedding experienced by butcheries and cold-storage SMEs. From the same theme, this sub theme sought to find out the effects of load shedding on daily/ weekly revenue and costs of selected butcheries. It was found out from all the 40 respondents that load shedding had severely affected revenue. It was so because they had challenges with backup power and cold storage facilities. During interviews, a number of responses were captured. For example, from butchery 1, which was a medium scale butchery the respondent said

> *When power goes off, the cold room stops and the meat starts warming up. After a few hours, it begins to change colour. I usually discount the meat to avoid throwing it away, so I lose a lot of money. Sometimes customers don't buy because the fridges are off and they think the meat is unsafe.*

Qualitative findings indicate that small scale butcheries experience the highest impact of load shedding as they are highly limited in terms of access to back up power. One respondent owning a small butchery inside the market said as was documented:

> *Load shedding affects us badly. The freezers switch off and the meat softens. If power is off for more than eight hours, we are forced to cook some of the meat to reduce losses. Customers avoid buying when they see the fridges not working.*

This finding is justified by the figure below showing a butchery trader showing a piece of meat that had started changing colour from one of the fridges which were off. He stated that the price of that meat was to reduce.

Figure 3: A butchery trader showing a piece of meat that has started changing colour from one of the fridges due to power outage.

Source: data collection.

It was further found out from one respondent who owned a large scale butchery with a generator as a backup source of power for his business. According to him load shedding greatly affected his revenue. He said,

> *The generator helps, but fuel is too expensive. It is not sustainable. I have reduced my profit margin because I spend too much on fuel. As you know business depends on the availability of the customer. I regret to tell you that the noise of the generator drives some customers away and that negatively affects my business.*

4.2.3. Extra costs incurred.

In line with the effects of load shedding on revenue and costs, 40 respondents were interviewed, representing 100% of the study sample. 30 respondents, representing 75% of the study sample said that load shedding caused product losses in that the prices either reduced to attract customers or products thrown away completely as they lost value. On average, this category of respondents gave 45% as an estimated loss in a month. One small butchery owner had this to say:

> *Load shedding has made it hard to plan. Some days you make money, some days you lose everything. We pay more for ice blocks and*

temporary storage during long outages. Income is not stable anymore. Sometimes we are even forced not to stock because we fear losses.

On the other hand 10 respondents representing 25% of the study sample said that they incurred losses in terms of buying fuel for generators, generator maintenance and solar battery maintenance. It was estimated by this category of respondents that in a month their average loss was 35%, a factor too significant to ignore. One participant who owned a large butchery with a generator was quoted saying,

Even with backup power, profit margins have gone down because diesel is very expensive. We used to make good money but now with load shedding, the cost of running the generator cuts our profits significantly. Some customers avoid us when the generator noise is too much.

As was documented in the presentation of findings section, the general impression from the respondents was that load shedding had very negative effects on revenues and costs. This was because almost all the respondents had challenges with back-up power and cold-storage facilities. This negative effect resulted into customers avoiding to buy as they thought the products were not safe, traders reducing prices by big margins so as to have the meat products sold out within a short space of time, using generators and solar which also had operation costs and even failing to stock the products for fear of power outages. From this finding, it was evident that load shedding affected the traders greatly were revenue and extra costs were concerned. It was so because instead of making good profits, the traders either had little profit or incurred losses completely. From the literature reviewed, it is clear that this finding is highly in tandem with Mwangi and Kamau (2022) in whose Kenyan study avow that in the Nairobi CBD, as a result of a daily five hour power outage period, butcheries suffered negative consequences as customer inflows were greatly reduced, affecting the revenue of the business. This finding is also in line with Onwe and Adekunle's (2020) study that states that as result of having over 60% daily power outage in Nigeria, Butcheries suffered disproportionately with daily losses exceeding 20% of the expected revenue. In addition, the finding can be said to be in tandem with Wernerfelt's (1984) Resource Based View that holds that a firm's competitive advantage is rooted in its resources. It can be understood that butcheries and Cold-storage SMEs in

Chilanga lose their competitive advantage because of load shedding which is an important resource in their business operation.

4.3.0 Effects of load shedding on employment and customer behaviour.

4.3.1. Effects of load shedding on employees' working hours

The second objective sought to find out the effects of load shedding on employees' working hours. 40 respondents were interviewed on this theme representing 100% of the study sample. It was found out from all the 40 respondents that load shedding affected employees' working hours negatively. This was so because at times employees would work for few hours only when power was available. This affected their salaries because working hours were few. It was also found out that at times the employees would be at their work places for more hours than usual because they were waiting for power to be restored, which affected their salaries. Because of waiting some employees complained that work turned out to be boring and tedious. The figure below shows employees sitting idly waiting for power to be restored as they are unable to cut the meat using an electric cutting machine.

Figure 4: Employees waiting for power to be restored as they are unable to cut the meat using an electric cutting machine

Source: Data collection.

It was however, interesting to learn that even in that case, the employers would not easily adjust the salaries upwards claiming that they were not the cause of power outages. This forced some employees to leave and seek other jobs elsewhere.

4.3.2. Influence of load shedding on customer numbers and buying behaviour.

It was found out from all the 40 respondents that load shedding had a negative influence on customer numbers and buying behaviour. The respondents said that customer numbers reduced greatly by an estimate of about 30%**.** This was so because many customers feared buying meat that was not good or had gone bad. The buying behaviour was also affected negatively because customers started buying in smaller quantities or not buying at all as they had preservation challenges as well. One butchery manager had this to say, *"Load shedding has severely reduced the numbers of our customers. Sometimes we even see that someone wants to buy but they just by-pass us because they think our products are not good as you can see I have a lot of meat in my butchery but customers are not there."* The figure below illustrates this:

Figure 5: A butchery trader complaining that there are no customers to buy the meat products due to load shedding.

Source: Data collection.

However, it was found out from all the 40 respondents that load shedding affected employees' working hours negatively. That was so because at times employees would work for few hours only when power was available. This affected their salaries because working hours were few. It was also found out that at times the employees would be at their work places for more hours than usual because they were waiting for power to be restored, which affected their salaries. It was however, interesting to learn that even in that case, the employers would not easily adjust the salaries upwards claiming that they were not the cause of power outages. That forced some employees to leave and seek other jobs elsewhere. This finding is in tandem with Moyo and Chikozho (2024) who argue that load shedding has multiple effects on employees' working hours and customer behaviour. According to them, load shedding negatively affects not only employment rates but also consumer behaviour. They argue that it is difficult for employees to lobby for upward adjustment of their salaries as they already know that business owners are incurring losses.

In line with employees' job security, the findings indicate that some customers were forced to stop working by the business owners because of load shedding. It is so in that as the business owners incur losses, they fear that they would fail to pay their workers. As presented in chapter four of this study, it was found out in line with customer behaviour that as a result of load shedding, customers avoided buying or bought very small quantities of meat products. It was so because they thought that the meat was not safe because of power outages. This finding aligns very well with Goldratt's (1984) Theory of Constraints which posits that every system has at least one constraint that limits its performance, and improving the system requires managing this constraint. It can thus be said that load shedding acts as a constraint to operations of many butcheries and cold-storage SMEs in Chilanga such that employees' work and customer buying behaviour are negatively affected. In line with the literature that was reviewed, this finding is very consistent with Van Zyl and Ndhlovu (2022) who argue that load shedding has very negative effects on employment practices and workforce management. They argue that it becomes difficult to effectively manage the workforce when there is load shedding because inflow of revenue is reduced. It is important to note that this finding is also very much in line with the Systems Theory that underpinned this study. It can be seen that as held by this theory, a break in one system of the organisation or business affects the

operations of other systems within the organisation or business. In Chilanga butchery business, it can thus be said that due to load shedding (one of the main factors in the operations of butcheries) other systems such as workforce management and customer retention are negatively affected.

4.4. Coping strategies adopted by Butcheries and cold-storage SMEs

4.4.1. Measures used to cope with load shedding

Objective number 3 sought to find out coping strategies adopted by butcheries and cold-storage SMEs to manage the effects of load shedding. 40 respondents were interviewed representing 100% of the study sample for this research. It was found out from 10 respondents that they used diesel generators as a coping strategy as in the figure below.

Figure 6: A butchery with a diesel generator being readied after a power outage.

Source: Data collection.

However, it was clear from them that though this was what they resorted to using, it turned out to be more expensive as they incurred fuel and generator maintenance costs. It was also found out from 10 of the 40 respondents that were interviewed that they used solar energy as their copying strategy. According to them, this was not a very reliable source of power as it could hardly run bigger refrigerators, limiting the stock. In addition, solar energy was not very reliable during rainy seasons because of cloud cover which limited the solar battery charging capacities. 10 out of the total number of respondents that were interviewed said that they purchased ice blocks as a coping strategy for load shedding. This was also not a permanent solution because they could reach a time when all the ice blocks had melted and the meat was not even half way sold out. On the other hand, 5 of the total number of respondents interviewed said they resorted to using ice blocks but with reduced stock so as to sell it out quickly. The other 5 on the other hand said they resorted to diversifying the products. They would either sale smoked, dried or already cooked meat. Though this helped them, it was limiting in that a very small stock would be sold out per day. It was further found out from all the respondents interviewed that despite the challenges faced, they did not receive any form of assistance from the government or other bodies.

4.5. General insights

It was found out from all the respondents interviewed that load shedding was very serious and it severely affected their businesses. Asked on what could be done to reduce the negative effects of load shedding, the general responses were use of generators, use of solar energy, use of ice blocks, reducing the stock, diversification of products and promoting products that do not require heavy refrigeration.

As documented in the study, a number of coping strategies were adopted by butcheries and SMEs to manage the effects of load shedding. Among the strategies adopted include use of diesel generators, use of solar energy, use of ice blocks, reduction of stock, employee layoffs, adjusting working hours and diversification of products such as selling smoked, dried or already cooked meat. In line with the theoretical framework, this finding is in tandem with the Bertalanffy's (1968) Systems Theory which holds that an organisation or community is an interconnected system where each component affects the functioning of the whole. In this context therefore, electricity supply is a crucial sub-system that supports other sub-systems such as

production, communication, and service delivery. When load shedding occurs, it disrupts the smooth functioning of these interconnected systems-reducing productivity, slowing business operations, and ultimately lowering income. Hence, the importance of coping strategies. For SMEs facing load shedding, survival depends on adaptive responses such as adjusting operating hours, adopting backup energy sources, or reconfiguring stock management practices.

4.6. Chapter Summary

The qualitative data reveal that load shedding has significantly affected income generation among SMEs in Chilanga CBD, leading to business owners incurring severe losses. Despite this, butchery business traders show resilience by adopting coping mechanisms such as using generators, solar energy and purchasing ice blocks among other. It was however found out that those coping strategies were often inadequate for long-term sustainability.

Chapter Five:

Conclusion and Recommendations

5.1 Introduction

This chapter presents the conclusion and recommendations of the study. The chapter made appropriate recommendations arising from the study. The research sought to find effects of load shedding on income generation among butcheries and SMEs in Chilanga CBD. The conclusion was in line with the findings and discussions.

5.2 Conclusion

This study has explored the effects of load shedding on income generation among butcheries and other SMEs in Chilanga CBD, drawing upon a relevant literature review and theoretical framework to contextualize its findings. The study made use of three objectives, the first of which sought to determine the frequency and duration of load shedding experienced by butcheries and cold-storage SMEs in Chilanga CBD. This objective was successfully fulfilled and its subsequent research question answered. In line with this objective, the findings indicated that load shedding occurred on a daily basis with a duration of about 4-8 hours. In another instance, it was found out that many a time load shedding happened without prior notice, though at times a load shedding schedule was provided. This finding was discussed and found to be in

agreement with Kaur and Singh (2018) whose Indian study states that load shedding averaging a duration of about four hours daily in India affected income generation among SMEs. Their study also stated that predictable scheduled outages were less damaging than the erratic unpredictable ones. From this finding, the researcher concluded that load shedding negatively affected business of butcheries in Chilanga CBD.

The findings further showed that load shedding negatively affected inflow of revenues and costs. It was found out that revenues among all traders significantly dropped due to product spoilage resulting into failure to buy by customers among other reasons. This finding was discussed and found to be in tandem with Mwangi and Kamau's (2022) study that avows that in the Nairobi CBD, as a result of a daily five hour power outage period, butcheries suffered negative consequences as customer inflows were greatly reduced, affecting the revenue of the business. This finding was also found to be in line with Onwe and Adekunle's (2020) study that states that as a result of having over 60% daily power outage in Nigeria, Butcheries suffered disproportionately with daily losses exceeding 20% of the expected revenue. Among the costs found out was employee layoff as a result of reduced revenue to carter for salaries, which further links the finding to Goldratt's (1984) Theory of Constraints which posits that every system has at least one constraint that limits its performance, and improving the system requires managing this constraint so as to business productivity, profitability, and growth.

The aim of the second objective was to find out the effects of load shedding on employment and customer behaviour. In line with this objective, the findings showed that load shedding had bad effects on employee working hours. It was so in that some employees worked for fewer hours and that attracted a reduction in their salaries, while others worked for more hours and there was no increase in their salaries. On the other hand some employees were forced to leave work because of reduced revenue which would affect their salaries. In line with customer behaviour, it was found out that customers generally avoided buying as they thought that the products were unsafe because of load shedding. These findings were found to be very consistent with Van Zyl and Ndhlovu (2022) who argue that load shedding has very negative effects on employment practices and workforce management. The findings were also very much in line with the systems theory that underpinned the study. It can be seen that as held

by this theory, a break in one system of the organisation or business affects the operations of other systems within the organisation or business. In Chilanga butchery business, it can thus be said that due to load shedding (one of the main factors in the operations of butcheries) other systems such as workforce management and customer retention are negatively affected.

Identifying coping strategies adopted by butcheries and cold-storage SMEs to manage the effects of load shedding was object number three. The study fulfilled the objective and its subsequent research question was well answered. In line with this objective, it was found out that butchery traders and cold-storage SMEs in Chilanga adopted among other coping measures use of back-up power, reduction in operational hours, temporary employee layoff to reduce the size of the workforce, use of ice blocks and diversification of products. This finding was found to be in tandem with Wernerfelt's (1984) Resource Based View which argues that a firm's competitive advantage is rooted in its resources. For SMEs facing load shedding, survival depends on adaptive responses such as adopting backup energy sources, adjusting operating hours or reconfiguring stock management practices.

5.3 Recommendations

The study has presented an insight into the phenomenon of effects of load shedding on income generation. The researcher, based on the findings of the study, came up with the following recommendations:

i. The government to assist butcheries and other SMEs with alternative energy sources so as to ensure that they have power throughout.
ii. The government to reduce on tax so that Butcheries and other SMEs are able to easily buy back-up power sources such as generators and solar systems.

5.4. Further research

The following suggestions were proposed:

i. Effects of load shedding on Small Scale Entrepreneurs: A case study of selected Barber shops in Lusaka Central Business District.
ii. Socio-economic Effects of Load shedding on Employee Productivity in Butcheries: A case study of selected Butcheries in Chipata Central Business District.

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APPENDICES

Appendix 1: Interview guide (owners/Managers):

UNIVERSITY of LUSAKA

SCHOOL OF TECHNOLOGY AND SOCIAL SCIENCES

Dear Respondent,

I ……., a student researcher conducting a study on "INVESTIGATING THE EFFECT OF LOAD SHEDDING ON INCOME GENERATION BY SMALL AND MEDIUM ENTERPRISES: A CASE STUDY OF SELECTED BUTCHERIES OF CHILANGA CENTRAL BUSINESS DISTRICT

Purpose:

The interview aims to gather insights on the frequency and duration of load shedding, effects of load shedding on employment and customer bahaviour and coping strategies in butcheries and cold-storage SMEs. Responses will remain confidential and are for academic use only.

Section A: Background Information

1. Please describe your business (type, size, years of operation).
2. How many employees do you have?
3. What are your main products/services?

Section B: Frequency and Duration of load shedding

(Objective 1)

4. How often do you experience load shedding?
5. How long does it usually last?
6. Do you get prior notice or a load-shedding schedule?

Section C: Effects of load shedding on employment and customer behaviour

(Objective 2)

7. Has load shedding affected your employees' working hours or job security?
8. How has it influenced customer numbers or buying behaviour?

9. How has load shedding affected your sales or revenue?
10. What extra costs have you incurred (e.g., generator fuel, product loss)?
11. Can you estimate your average weekly or monthly losses?

Section D: Copping Strategies

(Objective 3)

12. What measures do you use to cope with load shedding (e.g., generator, solar, adjusting hours)?
13. How effective are these measures?
14. Have you received any external support (from government or other bodies)?

Section E: General Insights

15. How serious is load shedding for your business?
16. What can be done to reduce its negative effects on SMEs?