THE IMPACT OF CORONAVIRUS DISEASE OF 2019 (COVID-19) ON HOUSEHOLD FOOD SECURITY IN HIGH DENSITY RESIDENTIAL AREAS OF LUSAKA, ZAMBIA: EXPERIENCES FROM NG'OMBE SETTLEMENT.

BY

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A Dissertation submitted to The University of Zambia in partial fulfilment of the requirements of the Master of Science in Geography.

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DECLARATION

I, Lizzy Michelo (2019123461), hereby declare that this dissertation is my own work and that it has not been previously submitted at The University of Zambia or any other university for the award of any academic qualification. All published work or material from other sources incorporated in this dissertation have been acknowledged and adequate reference thereby given.

Signature:  **Date:** 24th April, 2024

CERTIFICATION OF APPROVAL

This dissertation by Lizzy Michelo has been approved as a partial fulfilment of the requirements of the award of the degree of Master of Science in Geography by The University of Zambia.

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Examiner 3	Signature	Date
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Chairperson Board of Examiners	Signature	Date
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Supervisor	Signature	Date

DEDICATION

To my late elder sister Winfridah Michelo who inspired in me the desire to love school. My sister, you would have been proud.

ACKNOWLEDGEMENTS

I would like to thank God almighty for all the blessings and strength that have kept me going during my studies.

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ABSTRACT

COVID-19 undermines food security both directly by disrupting food systems and indirectly through the impacts of lockdowns on household incomes and physical access to food. COVID-19 and responses to the pandemic weaken food production, processing and marketing but the most concerning impacts are on the demand side, economic and physical access to food. This dissertation therefore, was assessing the experiences of residents of high density residential areas of Ng'ombe in terms of household food security before and during COVID-19 pandemic era. The objectives of the study were to: identify experiences attributed by COVID-19 on household food security, determine the dietary diversity before and during the COVID-19 pandemic and assess how the households are responding towards food security strategies associated with COVID-19 in Ng'ombe. A mixed method approach was used to conduct this study. The study sample was 235 respondents. Data was collected using interview guides and questionnaires. Data was analyzed using descriptive statistics, paired t-test and chi-square using R statistical computing software and excel. The results were presented using tables, pie charts and graphs. The study revealed that Ng'ombe residents had a devastating experience during the COVID 19 era among which include reduction in income, hunger, job loss, skipped or reduced meal sizes and compromised diet. The above findings would cause malnutrition and other illnesses in line with nutritional deficiencies. The Covid-19 had significant impacts on food security and dietary diversity in Ng'ombe. This dissertation also pinpointed on areas that government and other actors would intervene to protect the food security of households left vulnerable by COVID-19 for example empowering the affected households with money for businesses and jobs creation to those that have qualifications.

Keywords: COVID-19, Food security, High density areas, dietary diversity

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LIST OF ABBREVIATION

Abbreviation	Definition
COVID-19	CoronaVirus Disease of 2019
CSO	Central Statistics Office
FAO	Food and Agriculture Organization
GRZ	Government of the Republic of Zambia
HLPE	High Level Panel of Experts on Food Security and Nutrition
IPC	Infection Prevention and Control
LCC	Lusaka City Council
UNCTAD	United Nations Conference on Trade and Development
W H O	Word Food Organization
WFP	World Food Programme

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter of the research report includes the background to the study of the experiences of residents of Ng'ombe high density residential areas in terms of household food security before and during COVID-19 pandemic era. The statement of the problem, the research questions and the objectives of the study are given. It also comprises the justification, scope, significance of the study and limitations of the study.

1.2 Background

Providing food has perennially challenged humanity (FAO, 2010). Globally, approximately 820 million people grapple with hunger daily, while over two billion lack essential nutrients, impacting health and life expectancy (WHO, 2019). The multifaceted roots of food insecurity intertwine with poverty, limited access to social services, epidemics like COVID-19 and deficient public policies (Abdullah et al, 2019; Sriram and Tarasuk, 2016).

The COVID-19 pandemic significantly exacerbated food security and nutritional well-being worldwide (Picchioni, 2022). Public health measures adopted globally to curb the pandemic, while essential, spawned adverse consequences including economic downturns, mental health challenges, disrupted education and heightened food insecurity particularly affect countries in sub-Saharan Africa (Hamer et al, 2021). Vulnerable populations bore the burden of these measures, exacerbating global food insecurity and compromising community nutrition (Picchioni, 2022).

Since 2019, acute food insecurity worldwide surged from 135 to 345 million in 2022, largely attributed to the pandemic's economic fallout (World Food Program, 2022; Mhango, et al, 2022). Zambia, for instance, witnessed a rise in food insecurity, with projections estimating further escalation (IPC, 2022). Ranking low on the Global Food Security Index, Zambia reflects broader global challenges in ensuring food accessibility, affordability, quality, safety and sustainability (Economist Impact, 2023).

The adverse impacts of COVID-19 induced food insecurity extend beyond immediate concerns, with long-term ramifications on health and well-being, particularly for marginalized populations and children under five (Mhango, et al, 2023). This crisis underscores the need to reassess global food security and nutritional paradigms, as enunciated by the 1996 World Food Summit, emphasizing access to sufficient, safe, and nutritious food for all (Barrett, 2010).

COVID-19's complications on food systems have been profound, disrupting food value chains, decimating incomes, and intensifying health care burdens, especially in densely populated areas like Ng'ombe (Smith and Wesselbaum, 2020; Devereux et al, 2020). Thus, this study's aim was to provide realistic insights into food security dynamics within Ng'ombe, illuminating avenues for tailored interventions amidst the broader global crisis. A mixed method approach was used to conduct this study. The study sample was 235 respondents. Data was collected using interview guides and questionnaires.

Understanding the localized impacts of the pandemic on food security within Ng'ombe is crucial for targeted intervention and policy formulation. While macroeconomic interventions are indispensable, grassroots initiatives are vital for effecting change at the community level.

1.3 Statement of the problem

In pre Covid-19, every individual would have consistent access to safe, nutritious, and sufficient food to maintain a healthy and active life (Smith, 2020). However, the reality is starkly different, especially amid the COVID-19 pandemic (Harris, 2020). The pandemic has exacerbated existing vulnerabilities within food systems, disrupting supply chains, diminishing household incomes, and amplifying food insecurity, particularly in densely populated urban areas like Ng'ombe (Abi-Habib, 2020).

The situation is worsened by the prevalence of informal sector workers who cannot work remotely, leading to sudden income loss akin to breadwinners becoming disabled overnight (Malapit, 2020). Consequently, households are confronted with challenges in affording food, jeopardizing not only their nutritional well-being but also their ability to maintain health, pursue education, and sustain livelihoods (Devereux, 2020).

To address these pressing concerns, this study aims to investigate the experiences of Ng'ombe residents regarding household food security before and during the COVID-19 pandemic. By

identifying the specific impacts of COVID-19 on food security, understanding dietary changes, and assessing coping strategies, this research seeks to provide actionable insights for policymakers, governmental agencies and non-governmental organizations to develop targeted interventions that mitigate the adverse effects of the pandemic on food security in high-density areas.

In doing so, I hope to contribute to the collective efforts aimed at ensuring that vulnerable populations in Ng'ombe and similar communities have equitable access to nutritious food, thereby fostering resilience and well-being amidst the on-going challenges posed by the COVID-19 pandemic.

1.4 Purpose of the study

The primary goal is to understand how Ng'ombe residents have been affected by household food security issues amid the COVID-19 pandemic.

1.5 Objectives of the study

i. To identify the impacts of COVID-19 on household food security in densely populated residential areas of Lusaka.
ii. To determine changes in dietary diversity before and during the COVID-19 pandemic in these areas.
iii. To evaluate households' responses to COVID-19-related food security challenges.

1.6 Research questions

i. How has household food security changed since the onset of COVID-19?
ii. In what ways is COVID-19 contributing to changes in food security?
iii. What strategies are households employing to cope with COVID-19-related food insecurity?
iv. How effective are these strategies perceived to be?

1.7 Hypothesis

COVID-19 has negative effects on household food security in high density residential areas of Ng'ombe.

1.8 Significance of the study

This research would provide insights into the effects of COVID-19 on household food security in high-density residential areas, informing government policy makers and aiding non-governmental organizations in addressing food security challenges. Additionally, it may contribute to academic literature on food security in such areas during the COVID-19 period, facilitating broader understanding and potential solutions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter reviews related literature concerning COVID-19 and food security in various parts of the world and the conceptual framework.

2.2 Related Literature

The global outbreak of the COVID-19 pandemic has triggered widespread concerns regarding food security, with various studies examining its multifaceted impacts on different regions and populations. While much of the existing literature has tended to generalize the effects of COVID-19 on food security at a national level, recent research has started to delve deeper into understanding the nuanced challenges faced by specific communities and households.

The proximate causes of the emerging food emergency in several parts of the world can be attributed to the outbreak of COVID-19 and the subsequent implementation of control and mitigation measures, which have had significant economic repercussions (United Nations, 2020). This has prompted scholars to investigate the differential impacts of the pandemic on various aspects of food security.

Osakwe (2021) conducted a study in Zambia focusing on the challenges of developing productive capacities amidst the COVID-19 crisis. The research shed light on how Zambian communities, particularly those involved in production activities, have been affected by the pandemic. Similarly, Mulako (2021) explored the impact of COVID-19 on household incomes and food consumption in Zambia, examining the repercussions in both rural and urban settings. These studies provide valuable insights into the localized effects of the pandemic on livelihoods and food access.

Ahmad (2022) contributed to the discourse by investigating household food security in urban and semi-urban areas of Indonesia during the COVID-19 pandemic. By focusing on specific geographic contexts, the study highlighted the diverse experiences and coping mechanisms adopted by households facing food insecurity amidst the crisis.

Furthermore, Kamel et al. (2020) conducted a comprehensive analysis of the overall impact of the COVID-19 pandemic on food security. Their study encompassed a broader perspective, encompassing various regions and populations affected by the crisis, thus providing a comprehensive overview of the challenges and potential strategies to address them.

In addition to the aforementioned studies, further research is warranted to deepen our understanding of the complex interplay between COVID-19 and food security. Future investigations could explore the long-term implications of the pandemic on food systems, resilience-building strategies at the community level and policy interventions aimed at mitigating food insecurity in the post-pandemic era.

2.3 Conceptual Framework

The conceptual framework adopted in this study builds on complementary insights drawn from the FAO's 'four pillars approach' (FAO 2008) and the analysis of food security impacts of COVID-19 (Devereux et al. 2020). Devereux et al. (2020) have also reflected on the potentials of this framework in explaining food security impacts of COVID-19.

The COVID-19 pandemic has significantly impacted global food security, exacerbating existing vulnerabilities and creating new challenges. In response to this crisis, the Food and Agriculture Organization (FAO) has outlined four pillars for addressing food security: availability, access, utilization, and stability. This literature review examines the implications of COVID-19 on food security through the lens of FAO's conceptual framework, highlighting the interplay between the pandemic and each of these pillars.

2.4 Availability

COVID-19 has disrupted food availability through various channels. Border closures, transportation restrictions, and disruptions in agricultural supply chains have led to shortages of food supplies. Additionally, labour shortages due to illness and lockdown measures have hindered agricultural production and harvesting activities, further impacting food availability (FAO, 2020).

2.4.1 Access

Access to food has been compromised by the economic fallout of the pandemic. Job losses, income reductions, and disruptions in livelihoods have diminished purchasing power, making it difficult for vulnerable populations to afford an adequate diet. Lockdown measures have also restricted physical access to food outlets, exacerbating food insecurity, particularly in urban areas with limited access to supermarkets (FAO, 2020).

2.4.2 Utilization

The pandemic has affected the utilization of food, primarily through changes in dietary habits and nutritional intake. Economic constraints have forced households to rely on cheaper, less nutritious food options, leading to an increased risk of malnutrition and diet-related health problems. Moreover, disruptions in food assistance programs and school closures have deprived vulnerable populations, including children and pregnant women, of essential nutrients (FAO, 2020).

2.4.3 Stability

COVID-19 has introduced unprecedented levels of instability in food systems worldwide. Price volatility, market uncertainty, and panic buying have contributed to fluctuations in food prices and availability, posing challenges for both producers and consumers. The socio-economic impacts of the pandemic, including unemployment and income inequality, have further destabilized food systems, exacerbating food insecurity and social unrest (FAO, 2020).

The COVID-19 pandemic has disrupted all four pillars of food security as outlined by FAO, posing significant challenges to global efforts to ensure access to safe, nutritious, and affordable food for all. As the world continues to grapple with the on-going crisis, it is imperative to address the multifaceted impacts of COVID-19 on food security through coordinated action at local, national, and international levels. Future research should focus on developing innovative solutions and policy interventions that strengthen food systems, enhance resilience, and promote equitable access to food in the face of emerging challenges.

Figure 1 below provides a visual summary of the key components discussed in the literature review, facilitating a better understanding of the complex interactions between COVID-19 and food security.

COVID-19 Pandemic: The central node represents the COVID-19 pandemic, which serves as the overarching context for understanding its impact on food security in high-density residential areas.

Food Security in High-Density Residential Areas: This node summarizes the conceptual framework of food security in high-density residential areas, emphasizing the factors influencing accessibility, affordability, and availability of food within these communities.

Impact of COVID-19 on Food Security: This section delineates the various impacts of the COVID-19 pandemic on food security, including disruptions in supply chains, loss of livelihoods, closure of informal markets, and increased vulnerability among marginalized populations.

Interventions and Coping Mechanisms: This node illustrates the interventions and coping mechanisms deployed to address food insecurity in response to the COVID-19 pandemic. These include social protection programs, community initiatives, and promotion of urban agriculture.

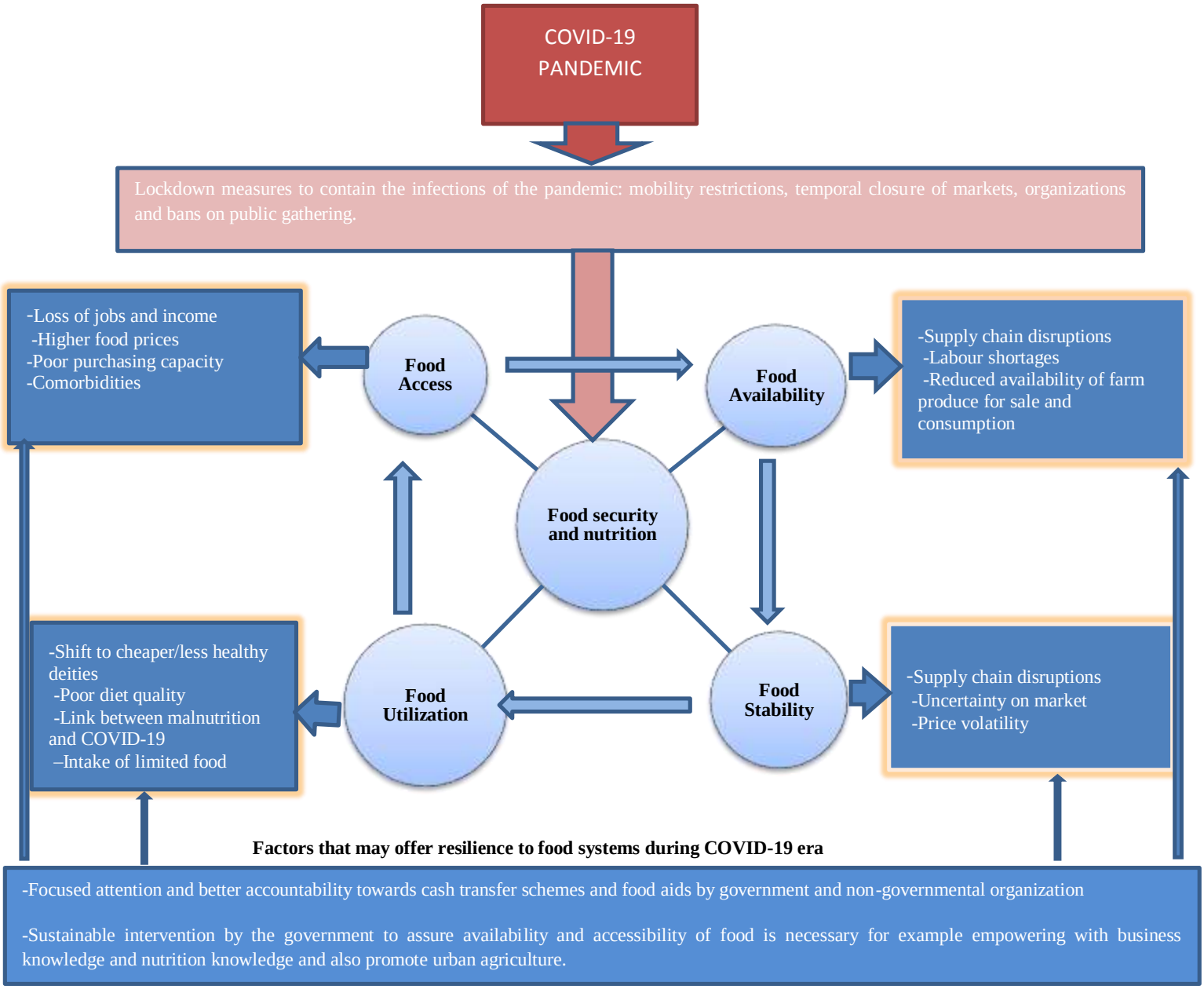

Figure 1: *The impact of COVID-19 on the four dimensions of food security*

(*Source, Author*)

The gap in the literature review lies in the lack of specific focus on the implications of COVID-19 on food security within densely populated residential areas, using FAO's four pillars framework. While the review provides a comprehensive overview of the general impacts of the pandemic on food security globally, it does not delve deeply into the unique challenges faced by densely populated urban areas like Ng'ombe.

CHAPTER THREE

DESCRIPTION OF THE STUDY AREA

3.1 Overview

This chapter describes the physical and socio-economic characteristics of the study area. It describes the location of Ng'ombe settlement in Lusaka Province. Ng'ombe was selected for this study because of the high cases of COVID-19 and it is a highly populated area.

3.2 Location

The Ng'ombe settlement**,** located in Lusaka, Zambia**,** it is an informal urban settlement. It serves as a peri-urban community within the city. The map below show the location of Ng'ombe in Lusaka city.

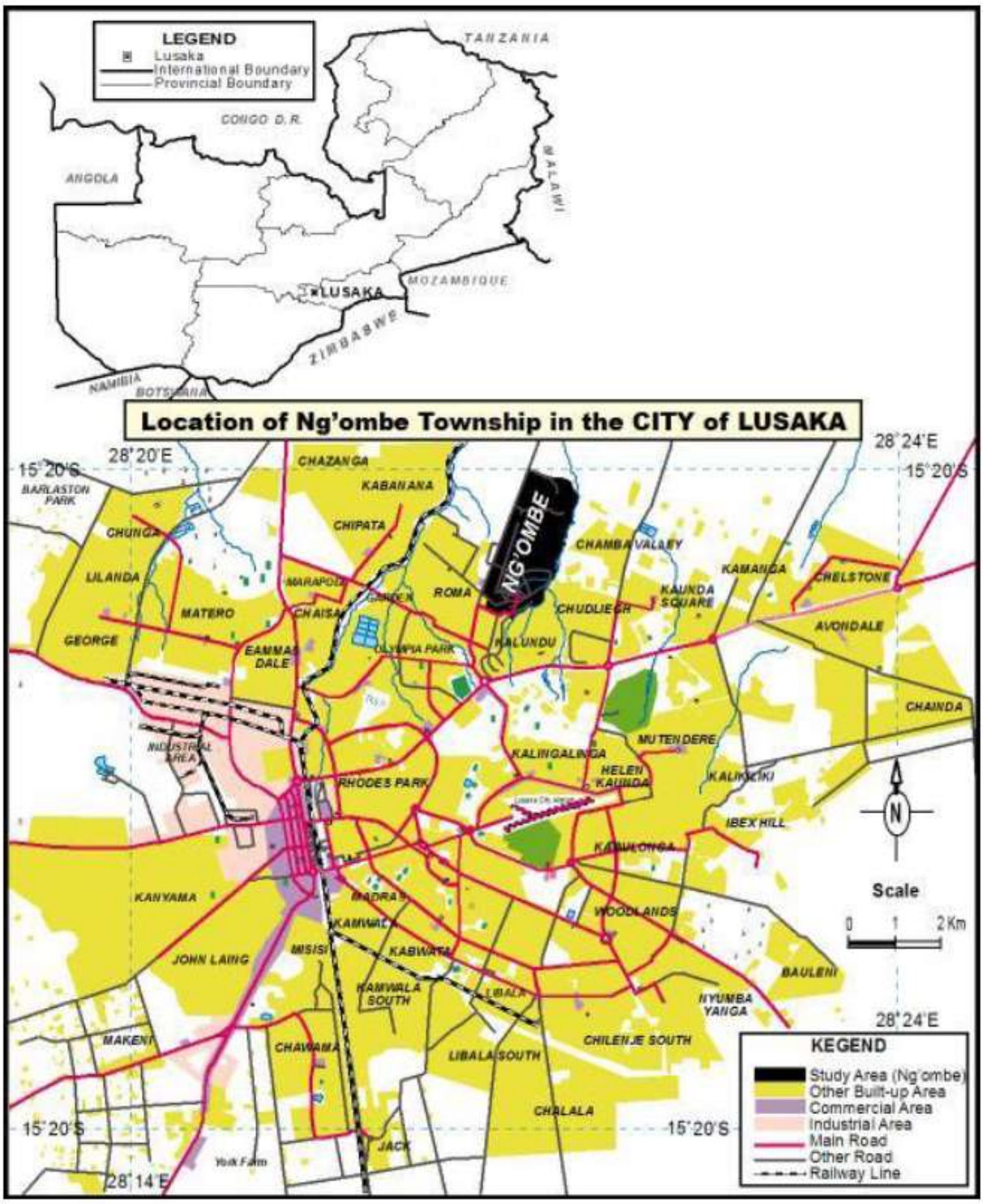

Figure 2: *The location of Ng'ombe high density residential area .*

(*Source,Mr Chalila)*

3.2 Physical characteristics

3.2.1 Temperature and Rainfall

Ng'ombe lies on a plateau region with altitudes of between 900 and 1300m (GRZ, 2010).

It has mean daily temperature ranging from 23-26 degrees Celsius in the hottest month October to 16-20 degrees Celsius in the coldest months June and July (LCC, 2019). It is 1281m above sea level. The climate is classified as warm and temperate. It receives annual rainfall in the range of 800mm to 1000mm.

3.2.1 Vegetation, Soils and Rocks

Ng'ombe area has three main vegetation types. The vegetation types are dry Miombo, Mopani and Savannah. The common soils are reddish to brown clay to loamy soil types that are moderately to strongly leached, with high agricultural potential. They are mainly Haplic lixisols, Haplic Acrisols and Haplic Luvisols. The rock system is described as a crystalline basement complex that comprises quartzite and schist (Nkhuwa, 2003).

3.3 Social-Economic Characteristics

3.3.1 Infrastructure

The study area is well serviced by major and minor roads with commuter public buses and taxis transport. It is covered and serviced by the local radios and television network. The area is also well covered by telecommunication networks such as Airtel, MTN and Zamtel. Public sheltered markets as well as open air markets are found in this area (Hichaambwa and Tschirley, 2010).

3.3.2 Population

Ng'ombe settlement had a total projected population of 92 000 (LCC, 2012) and an annual population growth rate of 3.6 percent for 2011 to 2035. In general, informal settlements in Zambia have densities of up to 1,500 persons per hectare (approximately 4222 persons per square kilometer) (CSO, 2013).

The high population density has led to many squatter and informal settlements in Lusaka district. The population of Ng'ombe is predominantly young with up to 70% of the population below the age of 35 (CSO, 2018).

3.3.3 Economic Activities

The economic activity in this area encompasses trade, small scale entrepreneurs and street vending. In summary, Ng'ombe settlement engages in various economic activities within the context of informal urban living, and efforts are ongoing to enhance living conditions and promote equity.

3.3.4 Challenges

Ng'ombe faces challenges related to water supply, food, road and housing infrastructure and sanitation.

CHAPTER FOUR

METHODOLOGY

4.1 OVERVIEW

This chapter presents methodology and procedures that was used in order to collect information for the study. The sub-topic covered in this chapter include research design, area of study, population, the sample and sampling procedures, data collection instruments, validation of instruments and data analysis procedures.

4.2 Philosophical Consideration

The choice of the methodology used in this research is influenced by the researcher's ontological and epistemological orientation. According to Bryman (2012) epistemological considerations are mainly concerned with the question of what is regarded as "suitable knowledge in a discipline." While ontological considerations are concerned with the nature of reality and characteristics. Therefore, this study adopted pragmatism as a research paradigm. Creswell (2014) mentioned that pragmatism is the philosophy that permits mixing paradigms, assumptions, approaches and methods of data collection and analysis. Pragmatism is all about the notion "what works". This is mainly referring to the pragmatic theory of truth. Pragmatism is simply oriented toward solving practical problems in the real world rather than being built on assumptions about the nature of knowledge (Creswell, 2014 and Shannon-Baker, 2016). As a research paradigm, pragmatism is based on the proposition that researchers should use the philosophical and methodological approach that works best for the particular research problem that is being investigated. (Clark, 2011 and Morgan, 2014).

Pragmatic ontology approach says that, what is necessary and sufficient for the dispositional causation of events is interpreted realistically and assumed to exist (Thompson 2005). Pragmatic epistemology is that knowledge which is always based on experience. One's perceptions of the world are influenced by our social experiences. Therefore, this research used social constructivism (Morgan 2014). Social constructivism is an interpretive framework whereby individuals seek to understand their world and develop their own particular meaning that correspond to their experience (Creswell, 2013).

4.3 Research Design

To gain an in-depth understanding of the topic, this study was carried out using the convergent parallel design. The research process was symbolized as quantitative and qualitative (Silverman, 2010). A convergent parallel design entails that the researcher concurrently conducts the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyzes the two components independently and interprets the results together (Creswell and Pablo-Clark, 2011). The advantages of using mixed method research are that it validates the quality of conclusions derived from one type of study by checking it against mixed designs. It also balances the shortcomings of one method utilizing the supremacy of the other method (Tashakkori and Newman, 2010).

4.5 Selection of Respondents

This study utilized stratified sampling, a research technique aimed at achieving a representative sample of the population under investigation (Kumar, 2012). The households in Ng'ombe were segmented into four distinct strata due to the uneven distribution of residences. Subsequently, 235 households were evenly allocated among these strata, with approximately 59 households randomly selected from each stratum using simple random sampling. Ng'ombe has approximately 150 000 residents (Magdalena, 2014). The sample size for this was 235. The sample size was calculated using an online sample calculator at 5% margin error, 95% confidence level with 150000 total populations (Raosoft, 2010). Each member of the population was assigned to a specific stratum, with the objective of achieving internal homogeneity within each stratum while maintaining distinctiveness between them.

To ensure fair selection of members from each stratum, systematic walks were conducted, alternating directions each day from the stratum's centre. This approach guaranteed that every member within each stratum had an equal opportunity of being included in the sample. Following the selection process from each stratum, the samples were merged to form the final sample for the study, effectively representing the entire population and providing reliable estimates for the research objectives.

Purposive sampling was used to select 10 key informants. The purposive sampling technique, also called judgment sampling, is the deliberate choice of participants due to the qualities the participant possesses (Creswell, 2013). It is a nonrandom technique that does not need underlying theories or a set number of participants (Silverman, 2010). The type of purposive sampling used was expert sampling. Furthermore, key informants were purposely selected from various entities including Ng'ombe Urban Health Centre, Ng'ombe Catholic Church and officials from the Food and Agriculture Organization (FAO), Ministry of Agriculture and World Food Programme (WFP). The selection method employed was Snowball Sampling also recognized as chain referral sampling. This technique involves initially selecting participants based on predetermined criteria and subsequently requesting them to refer to other potential participants, thus facilitating a comprehensive and diverse range of informants for the study.

4.5 Data collection procedures

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses and evaluate outcomes (Kumar, 2011).

Semi-structured interviews were used to collect data from the key informant. A semi-structured interview is a data collection method that relies on asking questions within a predetermined thematic framework. However, the questions are not set in order or in phrasing. Semi-structured interviews introduce more detail and richness due to their more open-ended nature. Participants are asked to clarify, elaborate, or rephrase their answers if need be. These interviews were done using an instrument called a semi-structured interview guide.

Structured interviews were employed to gather data from households' respondents in Ng'ombe compound, utilizing a questionnaire. This method involves the interviewer posing a predetermined set of questions to each participant. By preplanning the questions, consistency is ensured across all interviews, facilitating easy comparison of responses and reducing interviewer stress associated with improvising questions on the spot (Bryman, 2012).

4.6 Data analysis methods

Quantitative data was analyzed using descriptive statistic, paired t-test and chi-square using R statistical computing software and excel. The paired sample t-test, sometimes called the dependent sample t-test, is a statistical procedure used to determine whether the mean difference between two sets of observations is zero. (Yim *et al*, 2015). A chi-square (χ^2) statistics is a test that measures how a model compares to actual observed data. The data used in calculating a chi-square statistic must be random, raw, mutually exclusive, drawn from independent variables, and drawn from a large enough sample (Bryman, 2012). Thematic analysis was used to analyse qualitative data. Thematic analysis is a method for analyzing qualitative data that entails searching across a data set to identify, analyze, and report repeated patterns (Braun and Clarke 2014). It is a method for describing data, but it also involves interpretation in the processes of selecting codes and constructing themes (Creswell, 2014). The data was transcribed and coded into themes. Then thematic analysis method was used to analyse the data and the inferences were drawn (Bryman, 2012). The methodological approach employed in this study involved a rigorous implementation of thematic analysis, as detailed below:

Data Familiarization: This initial phase comprised multiple readings of the transcripts to attain a comprehensive understanding of the data's content and contextual nuances.

Coding of Data: The subsequent step involved a systematic process of labeling segments of the data with descriptive codes, encapsulating their essence concisely. These codes, often formulated as concise sentences, facilitated the identification of patterns within the dataset. As coding progressed, related codes were clustered to form preliminary themes, capturing the underlying concepts embedded in the data.

Theme Definition and Naming: Each identified theme underwent a thorough review to ensure clarity, coherence, and relevance to the research objectives. Themes were then defined and labeled based on their content and alignment with the research context, accompanied by concise descriptions elucidating their significance and relationship to the research question.

Organizing Themes: The subsequent stage involved organizing the themes in a coherent manner, considering their interrelations and the emergence of overarching or sub-themes within the dataset.

Interpretation within Research Context: The interpreted themes were then contextualized within the broader research framework, with a focus on elucidating their implications for theory, practice, or policy. This involved a critical examination of how the identified themes contribute to a deeper understanding of the research topic.

Thematic Analysis Findings Report: Finally, the findings of the thematic analysis were presented in a structured and coherent manner, providing a narrative that articulates the significance of each theme in relation to the research question or objectives. The type of thematic analysis used in this study was inductive thematic analysis.

Then both quantitative and qualitative results were presented using tables, pie charts and graphs.

4.7 Ethical Consideration

This study adopts a mixed-method approach, integrating both qualitative and quantitative research methodologies. As a result, it necessitates the assessment of validity and reliability within the quantitative paradigm, and credibility within the qualitative domain.

Validity pertains to the degree to which the scores derived from a measurement accurately represent the intended variable. Within the realm of validity, two aspects will be considered: communicative validity and pragmatic validity. Communicative validity ensures mutual understanding between the researcher and participants, establishing a shared language to facilitate effective communication. Pragmatic validity involves validating knowledge by engaging with community leaders, exploring their perspectives and understanding of their experiences (Petty et al., 2009).

Qualitative research, unlike quantitative methods, prioritizes the exploration of meaning and interpretation rather than quantifiable measurements. Therefore, its strength lies in the generation of rich insights rather than numerical data. The focus is on the quality of the interpretive process, which ultimately enhances the credibility of the findings. Pragmatic validity will also be employed to validate knowledge obtained through discussions with community leaders regarding their actions.

In both qualitative and quantitative methodologies, the researcher is expected to establish close rapport with participants, often entering their private spheres. This raises ethical considerations

that must be addressed throughout the research process to ensure ethical integrity in the study design, inquiry, methods, analysis, presentation, and findings (Nalube, 2014). Consequently, the researcher prioritized participants' autonomy, allowing them the freedom to choose whether to participate. Data collection was conducted in the participants' native language, Nyanja, to facilitate meaningful expression.

Participants were not subjected to any harm, and their privacy, confidentiality, and anonymity were rigorously maintained. Personal identifiers were omitted from any shared information to safeguard participants' identities. Participation was entirely voluntary, and no coercion was exerted. At the conclusion of each interview, participants were graciously thanked for their time and contribution to the study.

CHAPTER FIVE

RESULTS AND DISCUSSION

5.1 Overview

This chapter presents the results and discussion of findings as per research objectives. The personal characteristics of respondents are presented first followed by the findings on the experiences attributed by COVID-19 on household food security, dietary diversity before and during the COVID-19 and strategies associated with COVID-19.

5.2 Characteristics of Respondents

Table 1: *Respondents age distribution-summary*

(Source: Field data, 2021)

Gender	% Counts	Minimum	Median	Mean	Stdv	Maximum
Female	32.3	25.0	44.0	44.1	10.16	71.0
Male	67.7	25.0	39.0	40.9	9.730	64.0

This study investigated a sample of 235 respondents from Ng'ombe high density residential area. This constituted 32.3% female headed households and 67.7% Male headed households. The minimum and maximum ages for the respondents were 25 and 71 respectively with the mean age of 41 years. The distribution of the age variable by gender is given in table 1 above.

5.2.1 Marital status

Table 2: *Showing tabulated Statistics: Gender, Marital status*

(Source, field data: 2021)

	Married	%	Single	%	Widowed	%	All	%
Female	9	3.82	41	17.45	26	11.06	76	32.34
Male	130	55.31	20	8.51	9	3.83	159	67.66
All	139	59.14	61	25.96	35	14.89	235	100

Out of the 76 females observed only 9 were married, 41 were singles and 26 were widowed. When it comes to the male out of 159 male respondents 130 were married, 20 were single and 9 widowed. Therefore, the researcher concluded that in this residential area a big number of men are married and most of the female are singles. The distribution of the marital status variable by gender is shown in table 2 below.

5.3 Head of the household Level of Education

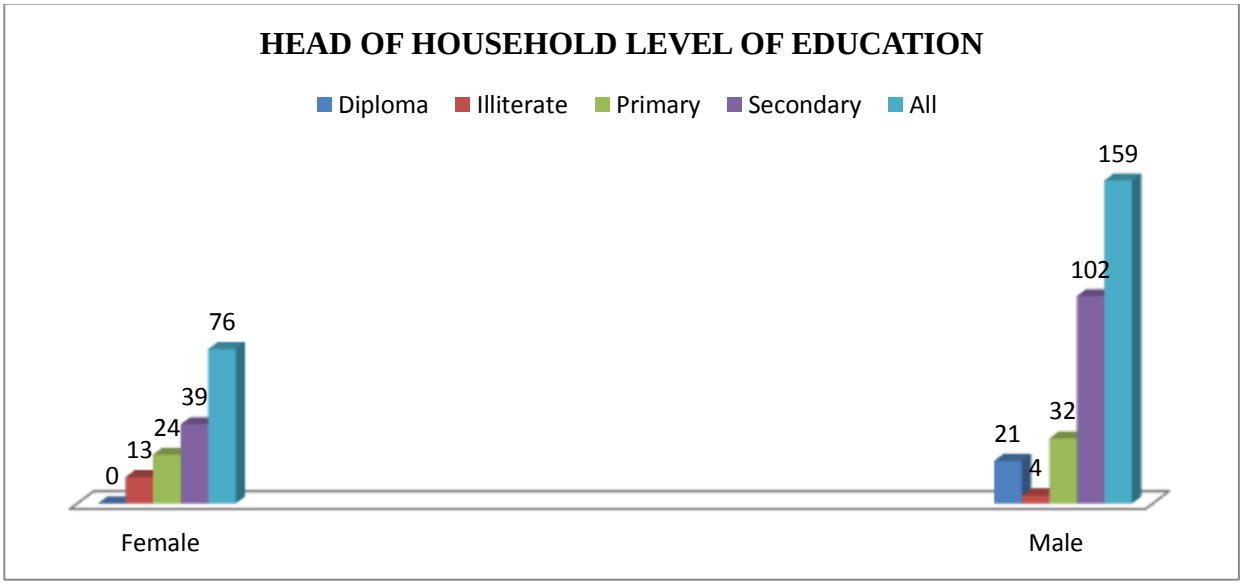

Figure 3: *Household head education status*

(Source: Field data, 2021)

A further analysis was done to check on the education level attained by the respondents. The analysis revealed that a significant number had attained up to secondary level education and none of the females attained tertiary education. It also showed that 17.1% of the females are illiterate

as compared to only 2.5% males. Therefore, this shows that men are more educated in this residential area than females. Education levels also affect food security, if the head of the household especially a woman, is not educated, she will have less knowledge on how to balance the meals. Details are given in figure 3 above.

5.4 Head of the house's Nutrition knowledge

Table 3: *Respondent's nutrition knowledge-counts*

(Source: Field data, 2021)

	Nutrition Knowledge					
Gender	No	%	Yes	%	Total	%
Female	32	13.62	44	18.72	76	32.34
Male	80	34.04	79	33.62	159	67.66
Total	112	47.66	123	52.34	235	100

Nutrition knowledge was one of the most important variables in this investigation to help assess the food security in high density residential areas of Lusaka. Approximately 52% of the respondents confirmed having nutrition knowledge and they are able to balance their meals. Table 3 above shows the counts of nutrition knowledge by Gender. This is supported by a Mosaic plot showing the proportions by Gender. The plot shows that a larger proportion of males did not have the nutrition knowledge. To the contrary the larger proportion of females had nutrition knowledge.

Table: 4 *Pearson's chi-square test for Gender and Nutrition knowledge (source, field dataset)*

Pearson's chi-square test for Gender and Nutrition knowledge		
X-squared value	Degrees of freedom	p-value
1.0796	1	0.2988

Further, a chi-square test was carried out at 5% level of significance, to investigate whether nutrition knowledge depends on Gender. The test results gave a p-value of 29.88% (clearly greater than 5%), revealing that there is no significant dependence between nutrition knowledge and Gender. See table 4 above.

5.5 Effects of COVID-19

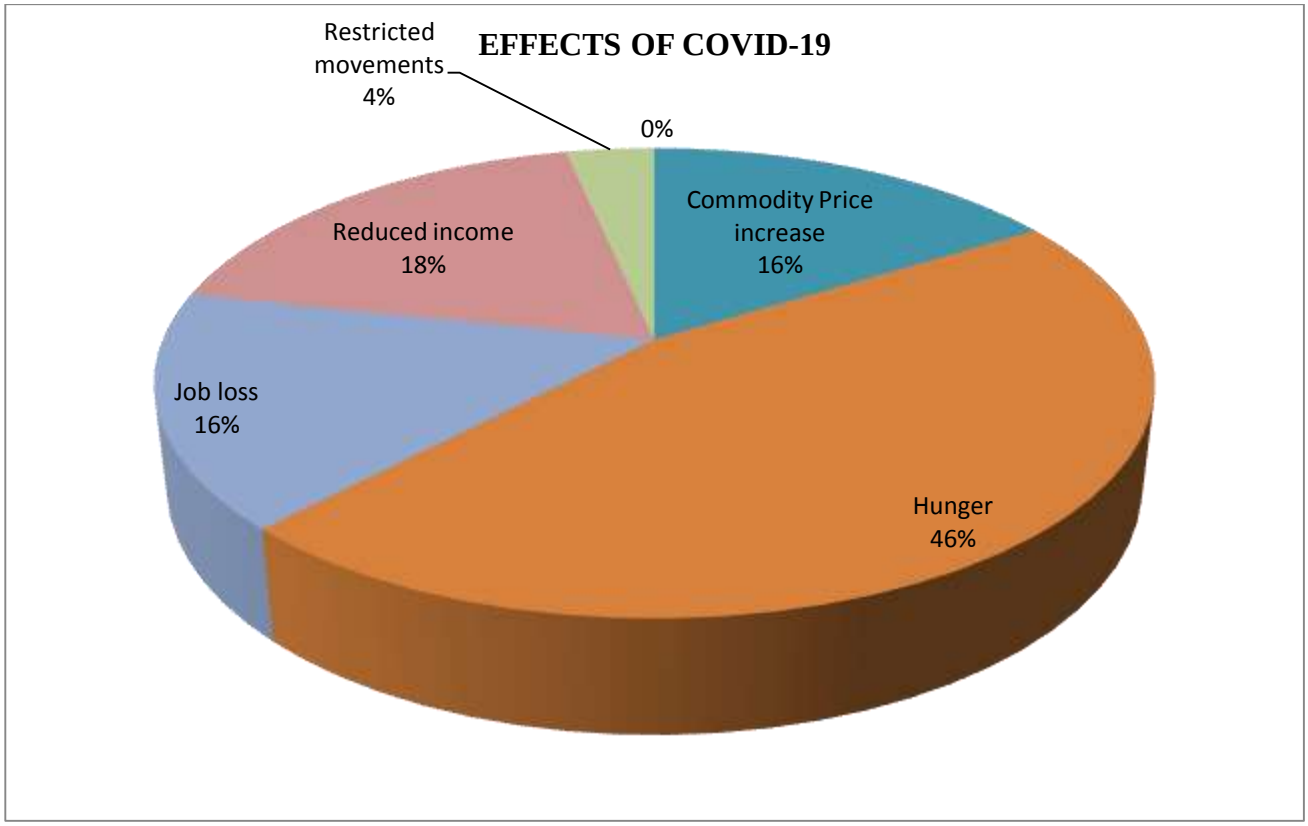

Figure 4: *Effects of COVID-19*

(Source: Field data, 2021)

The largest proportion, 46.0%, of the respondents stated that they experienced hunger during the COVID 19 era. Obviously, this has a detrimental effect on food security as people are not only having a shortage of food but also lack of nutritious food. About 18.3% stated that the effect of COVID 19 has been restricted movements hindering them to do their normal daily businesses. Figure 4 above displays the details of the results of this analysis.

5.6 Income provider

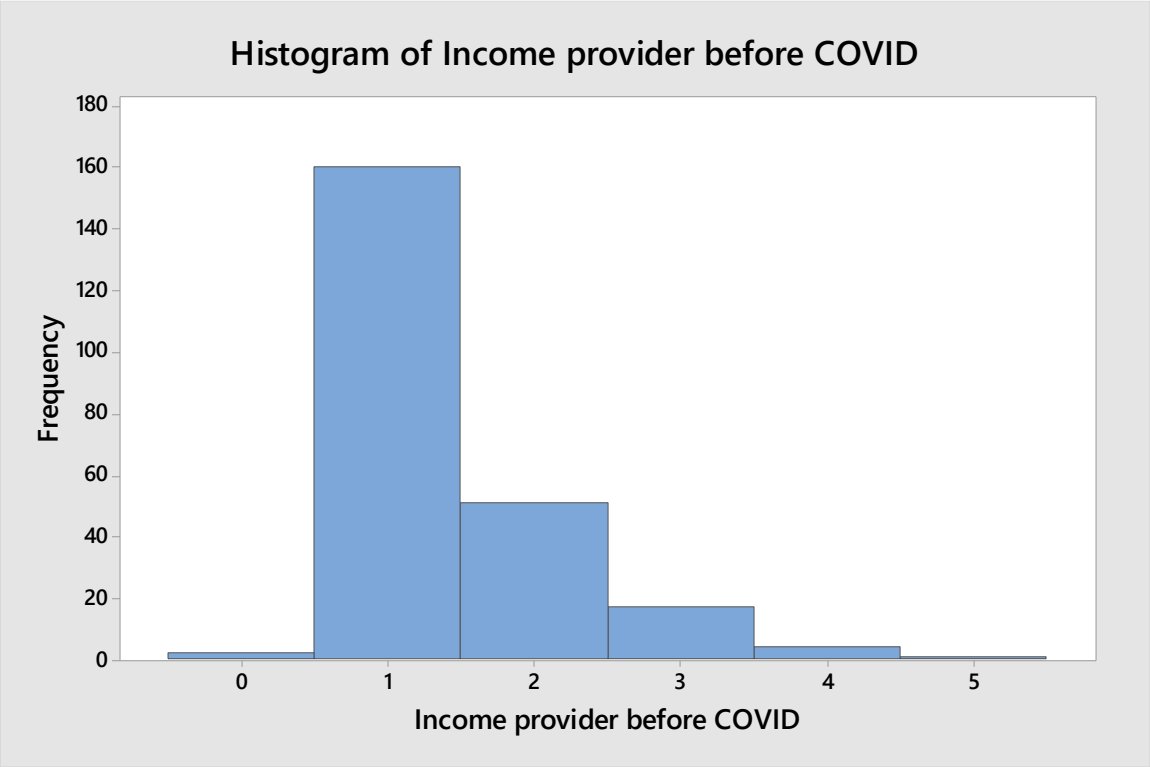

Figure 5a: *Income providers (Counts before COVID-19)*

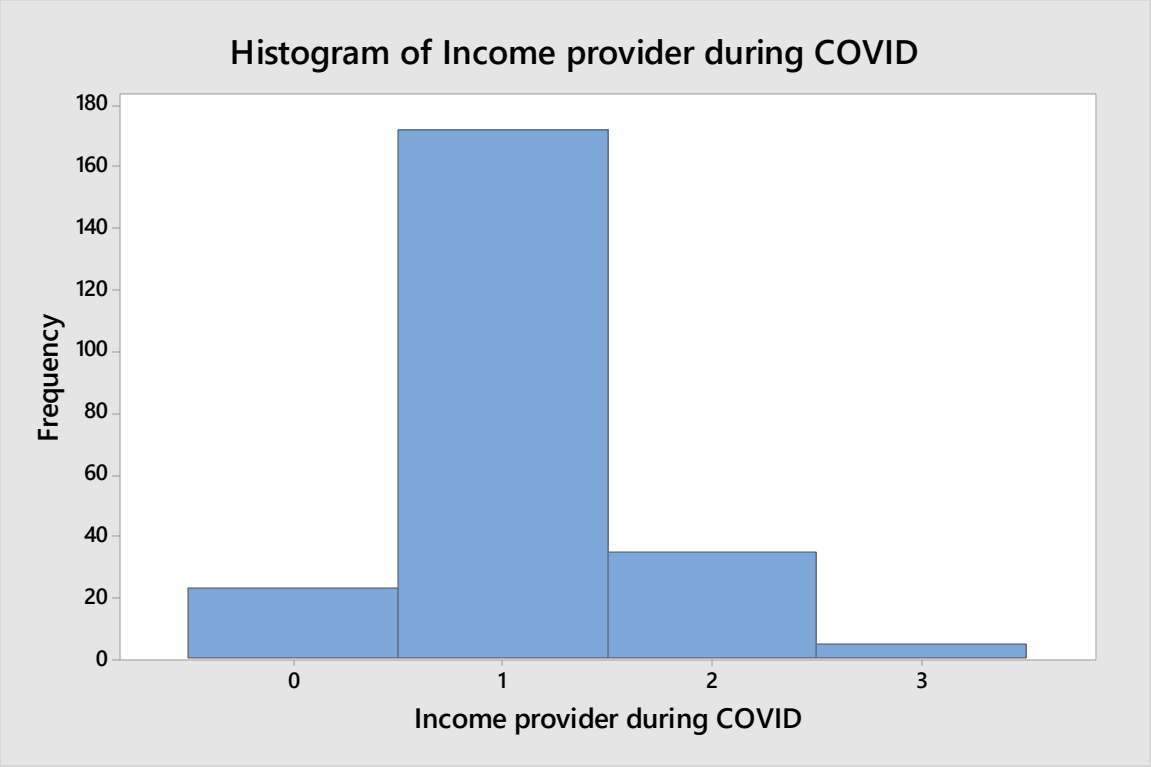

Figure 5b: *Income providers (Counts during COVID-19)*

(*Source: Field data, 2021*)

Figure 5a and 5b show the number of income providers per household before and during COVID 19, respectively. Figure 5a shows that each household on average had 2 income sources, showing no statistically significant change. In table 5b, no household had 4 and 5 income providers. The number of families with only 1 income provider increased from 130 to 195. This could be the case that most household members lost their jobs and business during the COVID 19 era making it impossible to provide any income in their households. This is likely to have a negative impact on household food security as overall income is reduced.

5.7 Income before and during COVID-19

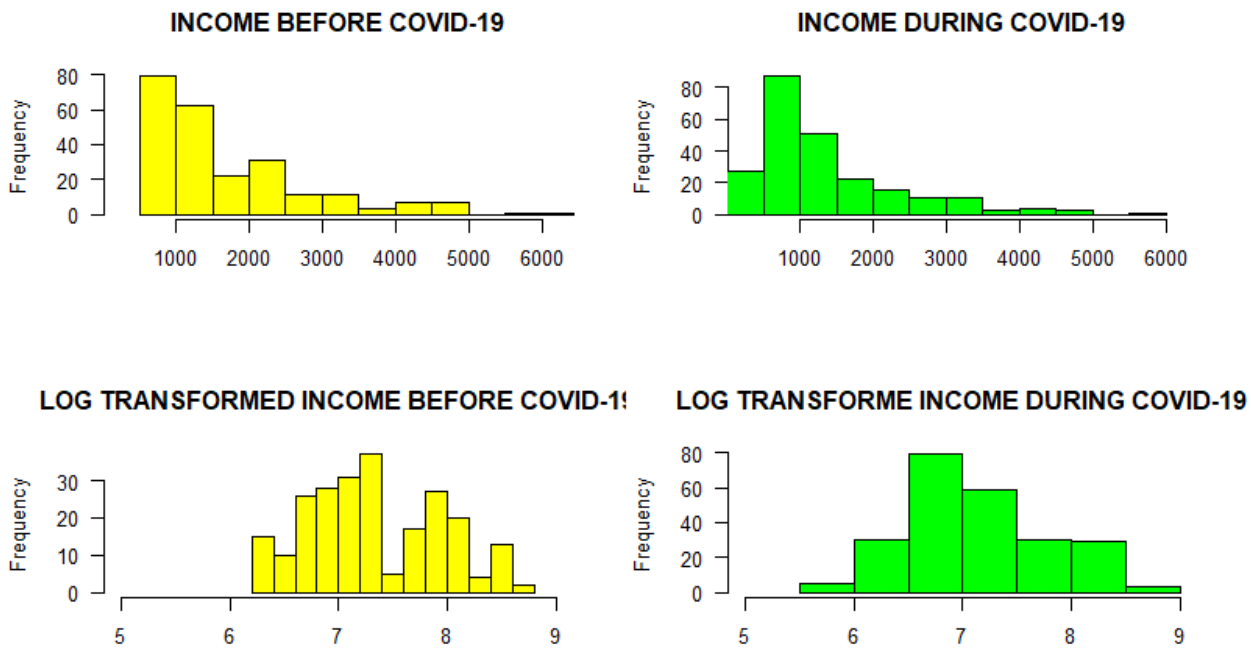

Figure 6: *Income before and during COVID-19*

(Source: Field data, 2021)

The researcher found it fit to analyze the monthly income before and during COVID 19 as this might have an impact on food security in high density residential areas. Figure 6 shows the histograms of income (both original and log transformed income). The two histograms in the first row are highly positively skewed, that is, very few people earned monthly income above K2500 both before and during COVID 19. A log transformation was done to obtain an approximately symmetric distribution of income for further analysis. The second row shows the two histograms approximately symmetric. So, a paired t-test requirement was met, that is, data must be approximately normally distributed.

Table 5: *Showing a paired t-test for income before and during COVID-19 (Source, Dataset 2021)*

Paired t test for income before and during COVID-19				
t-value	Degrees of freedom	p-value	95% C.I.	Estimate of the mean difference
1.0796	1	0.2988	$(-0.2342, -0.1629)$	0.1985

A paired t-test, at 5% level of significance, was carried out to determine whether there was a significant difference in income earned before and during COVID 19. The test results revealed (p-value less than 5%) that there is a significant difference in the income earned before and during COVID 19. In fact both limits of the confidence interval, (-0.2341946, -0.1628773), are negative (see table 5 above), implying that monthly income during the COVID 19 era significantly reduced. This may have a detrimental effect on food security as households may not afford enough nutritious food for their households.

5.8 Nutrition change

Table 6: *Nutritional change (Counts during COVID-19)*

(Source: Field dataset, 2021)

	Nutrients					
Change	Carbohydrates	%	Vitamins	%	Proteins	%
Increase	0	0	0	0	0	0
Same	16	6.81	22	9.36	20	8.51
Decrease	219	93.19	213	90.64	215	91.48
Total	235	100	235	100	235	100

Respondents were also asked whether there was a change in the nutrients (Carbohydrates, Proteins, and Vitamins) during the COVID 19 era. The following shows a summary count of their responses. There was 0% increase in all the nutrients. Those who said their nutrients remained the same were less than 10% in all the nutrients and 90% and above responded that their nutrients decreased during Covid-19. Generally, the majority said they observed a decrease in all cases and none observed an increase. This means that the majority had no variety of food even though the little food they were buying reduced further. See table 6 above.

5.8 Nature of the job

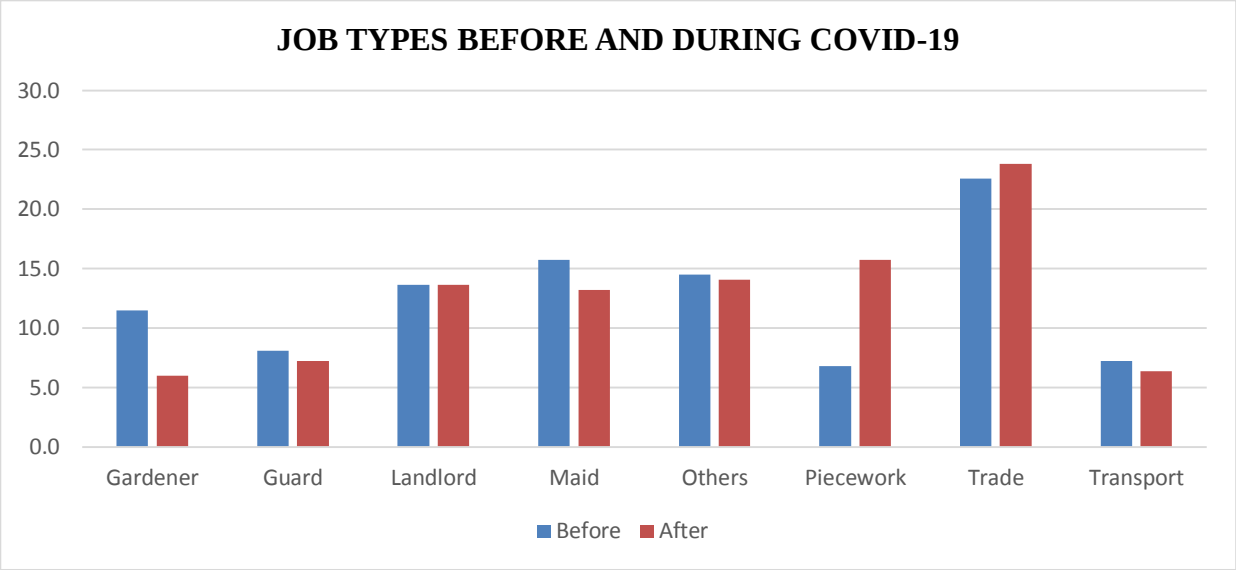

Figure 7: *Job types before and during COVID-19*

(Source: Field data-2021)

Figure 7 above shows the job types of the respondents before and during COVID 19 era. Generally, the picture shows that most of the people lost their jobs during COVID-19 except for landlords which remained the same. Piecework increased during COVID-19 because a lot of people when they lost their jobs they decided to be looking for piece work. The majority were involved in general trading both before and during the COVID 19 era but the number increased during COVID-19. We can then deduce that a lot of people lost their jobs during COVID-19 resorting to piece works and trade.

5.9 Food cut

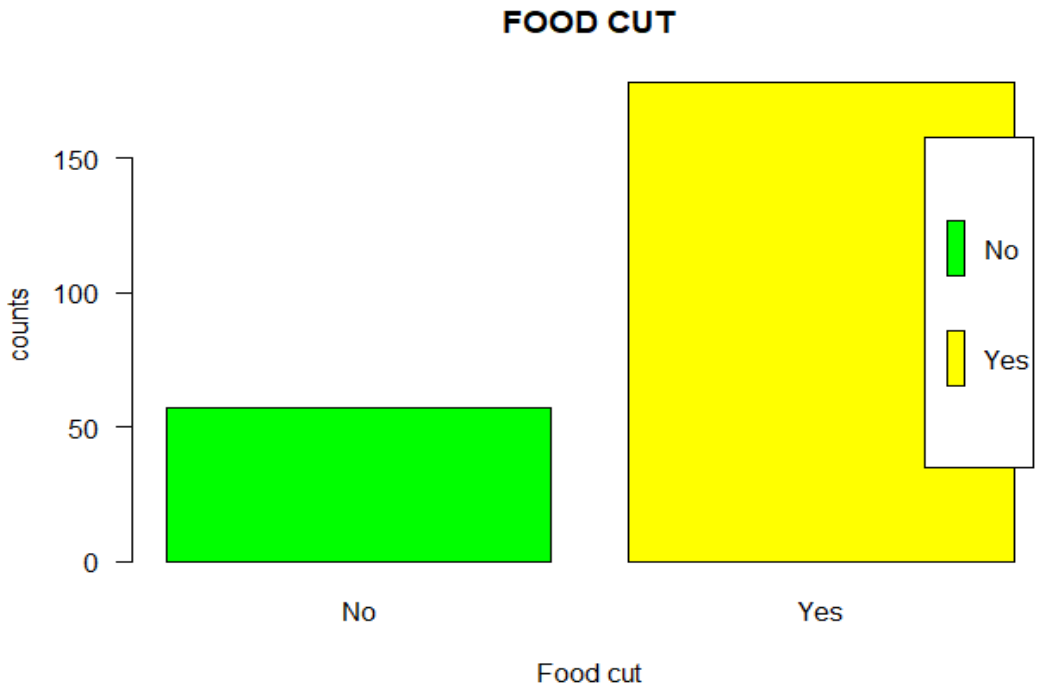

Figure 8: Number of people that said yes they reduced or cut their meals during COVID-19and those that said no.

(Source; Field data, 2021)

The Respondents were asked whether or not there was a reduction in the food provision in the households. The majority, 75.7 % (178 out of 235) of the respondents stated that there was a reduction in the quantities of food consumed per day. They also said that they cut some meals and also reduce the size of the meals so that their food can stay longer. See figure 8 above showing the number of households which cut or reduced on food provision during the COVID-19 era.

5.10 Food Strategies

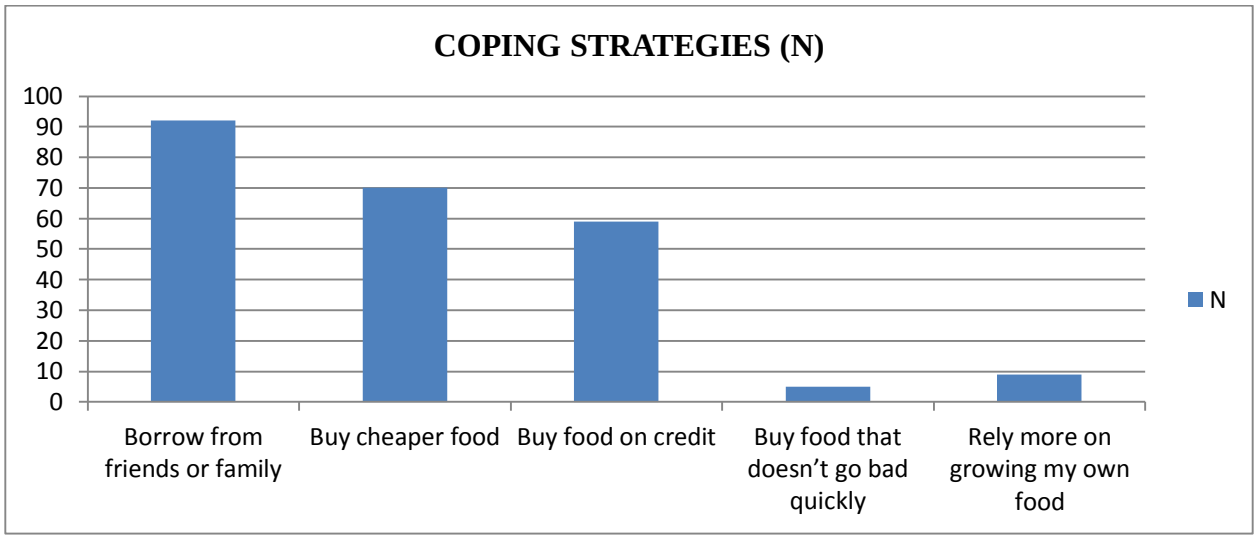

Figure 9: *Food coping strategies*

(Source: Field data-2021)

The respondents were also asked about how they are strategizing in terms of food during this COVID-19.The 92 out of 235 stated that they strategized by borrowing food from family or friends to supplement on the food quantities to provide for their families. Only 5 families out of 235 said that they strategized by buying food which does not go bad easily.

5.11 Diarrheal cases

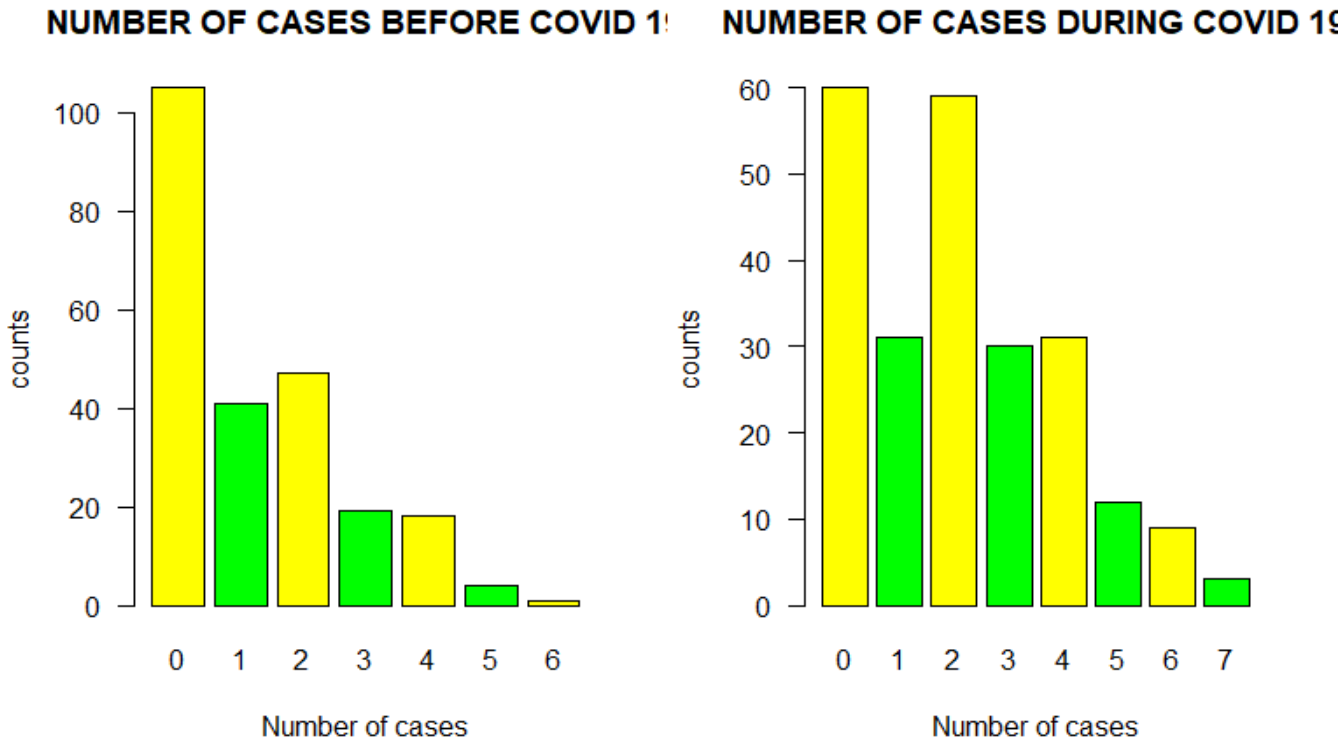

Figure 10: *Show the number of Diarrhea cases per household.*

(Source: Field data-2021)

The bar charts in figure 10 above show the number of Diarrhea cases per household before and during COVID 19. The number of households which recorded 2 or more Diarrhea cases significantly increased during COVID 19 era, otherwise everything else remained the same. This implies that the food consumed in this residential area is not nutritious enough during this COVID-19 period.

5.12 Discussion of the findings

Discussion of the findings reveals a substantial impact of the COVID-19 pandemic on the local economy, particularly evident in reduced incomes among respondents due to factors such as job losses, reduced work hours, or pay cuts. For instance, Osakwe (2020) found that "44 per cent of firms in Zambia decreased their temporary workforce since the onset of the pandemic, with 91 percent reporting decreased liquidity." Similarly, Tran et al. (2020) noted a "66.9 percent decrease in household income in Vietnam due to COVID-19." The prevalence of food insecurity also rose during the pandemic globally. Hamadani et al. (2020) observed a "51.7 percent increase in food insecurity in Bangladesh," while Niles et al. (2020) found that "32.3 percent of households in the USA experienced very low food security."

Furthermore, households facing food shortages tended to consume less diverse foods, with some experiencing reduced food intake or skipping meals entirely. This pattern resonates with findings from Uganda by Kansiime et al. (2021), highlighting "reduced food consumption, especially among low-income families," during the pandemic. Notably, household income significantly influenced food security, with lower-income households experiencing higher levels of food insecurity, as observed in Bangladesh by Ahmed et al. (2020). Additionally, age emerged as a significant factor, with younger respondents (<30 years) facing a higher risk of food insecurity, consistent with Elsahoryi et al. (2020) in Jordan.

Contrastingly, Abdullah et al. (2021) found in Malaysia that households with older heads were more food insecure, suggesting nuanced relationships between age and food security. "The number of income providers during the pandemic played a pivotal role in determining household income, subsequently impacting food security," as evidenced by Charvadeh et al. (2021). Moreover, an increase in diarrhea cases during the pandemic underscores the inadequacy of nutrition, suggesting heightened food insecurity in the studied area.

These findings underscore the multifaceted impact of the COVID-19 pandemic on economic stability and food security within the community, necessitating targeted interventions to mitigate its adverse effects.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Overview

This chapter presents the conclusion, recommendations, limitations and delimitations. It also gives a proposal for future research on the topic.

6.2 Conclusion

In light of the study's objectives, which aimed to assess the impacts of COVID-19 on household food security, track changes in dietary diversity and evaluate responses to pandemic-related food security challenges, several key findings emerged.

Firstly, respondents encountered significant obstacles due to restricted movements, which impeded their ability to engage in income-generating activities crucial for food provision. Consequently, households experienced heightened levels of hunger, largely stemming from job losses, reduced wages and diminished dietary quality compared to pre-COVID-19 circumstances.

An analysis employing paired t-tests to compare income levels before and during the pandemic demonstrated a notable decline in income during the COVID-19 period. In response to these challenges, residents implemented various coping mechanisms, such as reducing meal frequency, skipping meals entirely and opting for more affordable food alternatives, leading to observable shifts in dietary diversity.

In summary, this study elucidates the stark realities faced by the Ng'ombe residential community during the COVID-19 era, including heightened hunger, decreased income, an uptick in diarrhoea cases, and a reduction in the availability of nutritious food options. These findings underscore the imperative for targeted interventions to address the exacerbated food security and nutritional issues in densely populated residential areas like Lusaka.

6.3 Recommendations

Based on the findings regarding the impacts of the COVID-19 pandemic on household food security and dietary diversity, it is crucial to acknowledge the significant challenges faced by respondents. Restricted movements have hindered their ability to engage in usual income-generating activities, leading to notable hunger among households due to job losses, pay cuts, and a decline in dietary quality compared to pre-COVID-19 times. To address these issues, the following recommendations are proposed for consideration:

1. Recognize the profound effects of the COVID-19 outbreak on households' food security and dietary diversity. This should prompt governments, NGOs, health systems and global organizations to take action to mitigate its negative consequences on people's quality of life.
2. Implement sustainable government interventions to ensure the availability and accessibility of food, which is essential for maintaining food security among households.
3. Introduce government actions to enhance household dietary diversity and improve food security status. Strategies may include distributing free food baskets to impoverished households, providing nutrition consultations and encouraging donor support for affected communities.
4. Increase the dissemination of nutrition knowledge among the Zambian population through various channels such as social media, radio and television. This effort aims to improve food security and dietary diversity both during and beyond the COVID-19 era.
5. Implement health interventions to mitigate the detrimental effects of food and economic crises during the COVID-19 pandemic outbreak. These interventions should be accompanied by policies aimed at sustaining economic stability and food security within affected areas.
6. Provide support to populations vulnerable to food insecurity, not only through medical care but also by ensuring access to clean and safe water and implementing adaptable food-based intervention programs.
7. Promote agriculture and rural development in rural areas to encourage individuals to return to farming activities. This initiative can contribute significantly to both food security and economic stability.

These recommendations aim to address the multifaceted challenges posed by the COVID-19 pandemic on household food security and dietary diversity, ultimately safeguarding the well-being of communities in densely populated residential areas like Ng'ombe.

6.4 Limitations of the Study

The following were the limits encountered during this study;

- Due to the constraints imposed by the COVID-19 pandemic, our study may have experienced sampling bias. The population density of the area influenced the composition of our sample, potentially skewing the results towards certain demographic groups or socioeconomic strata.
- Conducting research during a pandemic presents unique challenges, including limitations on in-person interactions and access to certain locations. This affected the completeness and accuracy of our data collection process.
- While our study focused on a densely populated area, the findings were not fully generalizable to other regions or populations. Factors such as local COVID-19 transmission rates, government interventions, and socioeconomic disparities significantly impact the applicability of our results to different contexts.
- The dynamic nature of the COVID-19 pandemic means that conditions and circumstances can change rapidly over time. Our study was conducted during a specific period, and therefore, the findings may not reflect the current situation or future developments in the area under investigation.
- In studies relying on self-reported data, there is always a risk of bias due to factors such as social desirability, memory recall, and respondent honesty. The stress and uncertainty associated with the pandemic further influenced participants' willingness and ability to provide accurate information.
- The complex interplay between COVID-19 dynamics, population density, and various socioeconomic factors introduces challenges in interpreting our findings. While we have endeavored to account for these complexities, there may be shades and contextual factors that were not fully captured or understood in our analysis.

6.5 Delimitations of the Study

The following were the delimits encountered during this study;

- Due to COVID-19 restrictions and safety concerns, access to certain populations within densely populated areas was restricted or limited. This could impact the representativeness of the sample or the feasibility of conducting fieldwork in specific locations.
- COVID-19-related restrictions lead to fluctuations in the availability of participants or access to certain locations over time. This affected the duration of the study.
- The pandemic raised unique ethical considerations related to participant safety and informed consent, particularly in densely populated areas where the risk of transmission is higher. This influenced recruitment strategies and data collection protocols.
- Given the unprecedented nature of the pandemic and its differential impact across regions and demographic groups, findings from research conducted in densely populated areas during this time had limited generalizability beyond the specific context studied.
- Prioritizing the health and safety of the researcher and participants was paramount during the pandemic. Delimitations related to health and safety protocols were explicitly outlined, including measures to mitigate the risk of COVID-19 transmission during data collection activities.

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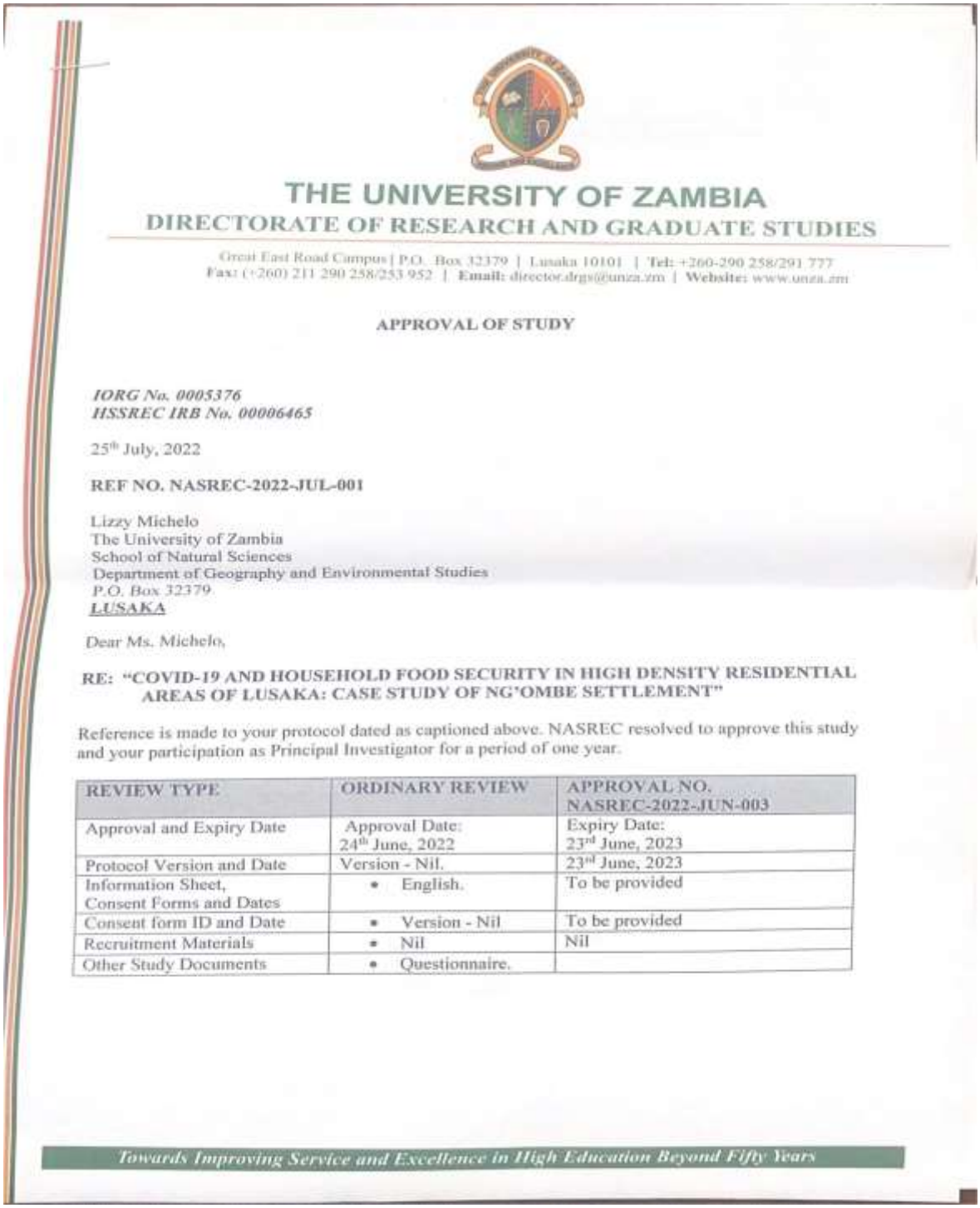
APPENDICES

Appendix 1



THE UNIVERSITY OF ZAMBIA
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APPROVAL OF STUDY

IORG No. 0005376
HSSREC IRB No. 00006465

25th July, 2022

REF NO. NASREC-2022-JUL-001

Lizzy Michelo
The University of Zambia
School of Natural Sciences
Department of Geography and Environmental Studies
P.O. Box 32379
LUSAKA

Dear Ms. Michelo,

RE: "COVID-19 AND HOUSEHOLD FOOD SECURITY IN HIGH DENSITY RESIDENTIAL AREAS OF LUSAKA: CASE STUDY OF NG'OMBE SETTLEMENT"

Reference is made to your protocol dated as captioned above. NASREC resolved to approve this study and your participation as Principal Investigator for a period of one year.

REVIEW TYPE	ORDINARY REVIEW	APPROVAL NO. NASREC-2022-JUN-003
Approval and Expiry Date	Approval Date: 24th June, 2022	Expiry Date: 23rd June, 2023
Protocol Version and Date	Version - Nil.	23rd June, 2023
Information Sheet, Consent Forms and Dates	• English.	To be provided
Consent form ID and Date	• Version - Nil	To be provided
Recruitment Materials	• Nil	Nil
Other Study Documents	• Questionnaire.	

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Ethical clearance

ïe conditions will apply to this approval; As Principal Investigator it is your responsibility to
e that the contents of this letter are adhered to. If these are not adhered to, the approval may be
nded. Should the study be suspended, study sponsors and other regulatory authorities will be
med.

ditions of Approval

- No participant may be involved in any study procedure prior to the study approval or after the expiration date.
- All unanticipated or Serious Adverse Events (SAEs) must be reported to NASREC within 5 days.
- All protocol modifications must be approved by NASREC prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address.
- All protocol deviations must be reported to NASREC within 5 working days.
- All recruitment materials must be approved by NASREC prior to being used.
- Principal investigators are responsible for initiating Continuing Review proceedings. NASREC will only approve a study for a period of 12 months.
- It is the responsibility of the PI to renew his/her ethics approval through a renewal application to NASREC.
- Where the PI desires to extend the study after expiry of the study period, documents for study extension must be received by NASREC at least 30 days before the expiry date. This is for the purpose of facilitating the review process. Documents received within 30 days after expiry will be labelled "late submissions" and will incur a penalty fee of K500.00. No study shall be renewed whose documents are submitted for renewal 30 days after expiry of the certificate.
- Every 6 (six) months a progress report form supplied by The University of Zambia Natural and Applied Sciences Research Ethics Committee as an IRB must be filled in and submitted to us. There is a penalty of K500.00 for failure to submit the report.
- When closing a project, the PI is responsible for notifying, in writing or using the Research Ethics and Management Online (REMO),both NASREC
- and the National Health Research Authority (NHRA) when ethics certification is no longer required for a project.
- In order to close an approved study, a Closing Report must be submitted in writing or through the REMO system. A Closing Report should be filed when data collection has ended and the study team will no longer be using human participants or animals or secondary data or have any direct or indirect contact with the research participants or animals for the study.
- Filing a closing report (rather than just letting your approval lapse) is important as it assists NASREC in efficiently tracking and reporting on projects. Note that some funding agencies and sponsors require a notice of closure from the IRB which had approved the study and can only be generated after the Closing Report has been filed.
- A reprint of this letter shall be done at a fee.

All protocol modifications must be approved by NASREC by way of an application for an amendment prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address or methodology and methods. Many modifications entail minimal risk adjustments to a protocol and/or consent form and can be made on an Expedited basis (via the IRB Chair). Some examples are: format changes, correcting spelling errors, adding key personnel, minor changes to questionnaires, recruiting and changes, and so forth. Other, more substantive changes, especially those that may alter the risk-benefit ratio, may require Full Board review. In all cases, except where noted above regarding subject safety, any changes to any protocol document or procedure must first be approved by NASREC before they can be implemented.

Should you have any questions regarding anything indicated in this letter, please do not hesitate to get in touch with us at the above indicated address.

On behalf of NASREC, we would like to wish you all the success as you carry out your study.

Yours faithfully,

Dr. E. M. Mwanaumo

CHAIRPERSON
THE UNIVERSITY OF ZAMBIA NATURAL AND APPLIED SCIENCES RESEARCH ETHICS COMMITTEE - IRB

cc: Director, Directorate of Research and Graduate Studies
Assistant Director (Research), Directorate of Research and Graduate Studies
Assistant Registrar (Research), Directorate of Research and Graduate Studies

Appendix 2

HOUSEHOLDS QUESTIONNAIRE

CONSENT STATEMENT

Dear Sir/Madam, my name is Lizzy Michelo. I'm a student from the University of Zambia. The purpose of my visit here is to find about your experience on food security during this COVID-19 and before COVID-19. I would like to ask you questions on your household's general characteristics and on your experiences of food security in this COVID-19 period and before COVID-19. This interview will take approximately 20 minutes. Your participation is voluntary. If you choose not to take part, you have the right not to participate and there will be no consequences. This is for research purposes. All the information provided by you will be completely anonymous and will not be linked to you in any way that can identify you.

Do you have any question? **<Enumerator: pause and respond to any question raised, then continue with the following statement>**. May I continue to ask you questions? […..] 1=Yes 2=No.

Thank you for agreeing to help me learn about your experiences during this COVID-19 period.

SECTION A: DERMOGRAPHIC

1. Age of the head of the household ……
2. Gender of the head of the household: Male …… Female …….
3. Marital status of the head of the household: Single …… Married ……widowed…… Divorced.
4. Household size by gender

	No.	Below 15	15-49	50-65	Above 65
Males					
Females					

5. Residential status

Rental	Owner	Others (specify)

6. Household head education status

	Husband	Wife
Illiterate		
Primary		
Secondary		
Diploma		
University		
Others (Specify)		

SECTION B: ECONOMIC PROFILE

1. Number of Household member who used to bring income in the house before COVID-19 ……
2. Number of household members who brings income in the house during COVID-19……
3. Give reasons if there is any reduction in the number of household who bring income in the

   ……
   …...
4. Household sources of income and estimated monthly incomes

OCCUPATION	Monthly wage		Trade		Transport		Piecework		Landlords		Others	
	B	D	B	D	B	D	B	D	B	D	B	D

5. Give reasons if there is any reduction in the monthly income before and during COVID-19

   ……

SECTION B: EFFECTS OF COVID-19

6. Has any member of this household suffered from COVID-19?
   .....
7. If yes, how many members?
   ……..
8. What has being the effects of COVID-19 on your household?
   a) Positive effects
      ……
   b) Negative effects
      ……..
9. Nutrition knowledge

Animal protein	Plant protein	Carbohydrates	Fruits / vegetation	Fat and oils

10. Change of food groups before and during the COVID-19 outbreak in Ng'ombe residential area.

Serial no.	Foods 1=increase 2=Same 3=Decrease	A week before the COVID-19 outbreak	Last 7 days during COVID-19
1.	Maize		
2.	Rice		
3.	Nshima		
4.	Sweet potatoes		
5.	Irish potatoes		
6.	Cassava		
7.	Vegetables		
8.	Legumes		
9.	Milk and milk products		
10.	Fruits		
11.	Animal proteins		
12.	Fish		
13.	Eggs		
14.	Oils and fats		
15.	Bread		
16.	Giggies		
17.	Soft drinks		
18.	Flitters/ buns		

11. Generally how many household members would suffer from diarrhoeal diseases in a year before COVID-19? ……
12. Generally how many household members suffered from diarrhoeal diseases in a year during COVID-19? ……..

13. Please choose the appropriate response for each item:

	1=Yes 2=No 3=Not sure	How often in a month? Less often = 0-10 days Quite often =11-20 days Very often = 21- 30 days
Did your household ever cut the size of your meals or skip meals because there was not enough money for food due to COVID-19?(If yes , please indicate how often)		

14. Which of the strategies, if any, now to afford food? If not using them now, how likely are you to use these if your household has challenges affording food in the future during the COVID-19?

Please choose the appropriate response for each item:

Coping strategies	No/Yes	Likelihood of future use(1=very unlikely, 2= unlikely, 3 =likely, 4=very like
Borrowing food from friends or family		
Buy cheaper foods		
Buy food on credit		
Buy food that does not go bad easily		
Rely more on growing my own food		
Others (please specify)		

Appendix 3

KEY INFORMANT INTERVIEW GUIDE

CONSENT STATEMENT

Dear Sir/Madam, my name is Lizzy Michelo. I'm a student from the University of Zambia. The purpose of my visit here is to find out about the general overview of food security in Zambia then narrowing down to urban high density residential areas before COVID-19 and during COVID-19. This interview will take approximately 20 minutes. Your participation is **voluntary**. If you choose not to take part, you have the right not to participate and there will be no consequences. This is for research purposes. All information provided by you will be completely anonymous and will not be linked to you in any way that can identify you.

Do you have any questions? <**Enumerator: pause and respond to any questions raised, then continue with the following statement>.** May I continue to ask you questions? […….] 1=Yes 2=No.

Thank you for agreeing to help me learn about food security before and during COVID-19 in urban high density residential areas and Zambia as a whole.

SECTION A: BIO DATA

Name of Institution ……..

Position of respondent……

Gender……

SECTION B: COVID-19 AND FOOD SECURITY

1. Generally, how was food security in Zambia before COVID-19 and how is food security during COVID-19? …….....
   ……..
2. Generally, how was food security in high density residential before COVID-19 and how is food security in high density residential areas during COVID-19 of Lusaka? **.....**
   ……

3. Is food easily accessible in high density urban residential settlement of Lusaka? .....……
   ……..
4. Did you have serious cases of food shortages before COVID-19 in the high density residential areas? .....
   …….
5. Do you have any cases of shortages of essential foods during this Covid-19 in this settlement? .....
6. Generally are the people in these areas able to have three nutritious meals per day?
   ……
   ……..
7. What are the positive effects of Covid-19 on food security?
   ……..
   …….
8. What are the negative effects of Covid-19 on food security?
   …….
   …….
9. What could be some of the strategies that these people in urban high density residential area use in order to have food in their homes?

THANK YOU SO MUCH