

**DEVELOPMENT OF AN AGRICULTURAL FOOD ENTERPRISE MODEL IN RURAL
TOWNS IN VHEMBE DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA**

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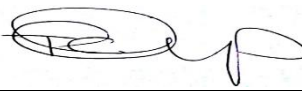
DECLARATION

I, **Tjale Cloupas Mahopo**, declare that the thesis (or interrelated, publishable manuscripts/published articles) that I herewith submit for the Doctoral Degree in Sustainable Agriculture at the University of the Free State is my independent work and that I have not previously submitted it for a qualification at another institution of higher education.

This thesis includes two original papers published in peer-reviewed journals, four unpublished publication manuscripts, one to be submitted as part of a book publication, and three in manuscript formats. The development and writing of the papers (published and unpublished) were my principal responsibility. A declaration in the dissertation indicates the nature and extent of the co-authors' contributions.

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A handwritten signature in black ink, appearing to read 'Tjale Cloupas', is written over a horizontal line.

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ABSTRACT

Introduction: The street food enterprise underwrites food security by bringing food to local communities. It is a growing source of employment and income for economically challenged households. Yet, it continues to face challenges such as lack of support from various stakeholders. This study aimed to develop an agricultural food enterprise model of competitiveness for the street food enterprise in rural towns in the Vhembe District of the Limpopo Province in South Africa.

Methods: A cross-sectional study design and mixed methods approach were used. Five hundred and eleven (511) street vendors of ready-to-eat foods participated in the study. Convenient sampling was done in three rural Vhembe District towns. Quantitatively, a structured questionnaire was used to measure their socio-economic and operational characteristics, and the dietary diversity of the foods sold. A convenient sampling was further used to sample 55 participants for a qualitative study. A six-step value chain analysis and Porter's Diamond Model of Competitiveness components were used as a guiding framework. In-depth interviews were used to explore the perceived challenges and proposed solutions. Descriptive statistical analysis, thematic qualitative analysis, and value chain analysis using components of Porter's Diamond Model were applied across the study. A SWOT analysis was performed in the final step to diagnose the value chain's details and inform the development of the street food model.

Results: The vendors were mainly South African women aged 35-54 years who were primarily motivated into the enterprise by unemployment and financial challenges. Their businesses contributed about 82% of their household income. The foods they sold had poor diversity, with 70% comprising fewer than five food groups and starchy staples, a common food group. The value chain is short with poor infrastructure. It includes purchasing, storage, transportation, production, and consumption. The main actors involved are input suppliers (formal and informal traders), transporters, local authorities, and customers. The vendors perceived four main factor conditions of Production, Chance condition (new inventions and technologies, shifts in the financial market, decisions of foreign governments, and wars), Role of government, and Related and supporting industries as the conditions inhibiting the competitiveness of the street food enterprise. Poor government support, the cost of water, and costly finance were critical subcomponents. Thus, the result of the study informs a Diamond Model of Competitiveness with a partially different structure from that of Porter's Diamond Model. The results suggest that the factor conditions that explain the competitiveness of an informal survivalist enterprise like street food vending are prioritised differently than when used to explain the competitiveness of a formal organisation.

Recommendations: Government needs to adopt a collaborative approach to the transformation of street vendors, while protecting them from the impact of factors that inhibit their competitive performance. Key strategies include access to water, short-term finance solutions, improved infrastructure, and provision of relevant training.

Keywords: Street Food Enterprise, Agricultural Food Enterprise, Value Chain, Porter's Diamond Model, Competitiveness, Dietary Diversity.

DEDICATION

This thesis is dedicated to my loving wife, Vhuthu Mahopo, and my two wonderful children (Orearabile and Rorisang) for their understanding and support during the tough times in my studies. My parents have supported all my decisions regarding my studies since my undergraduate degree, both financially and psychologically. I dedicate this work to my in-laws for always being available whenever I needed them to assist my family in my absence during my studies. Your prayers did not go unnoticed, Charis Missionary Church.

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
CHO	Carbohydrate
DDS	Dietary Diversity Score
DOH	Department of Health
FAO	Food and Agricultural Organisation
FHI 360	Family Health International 360
G	Gram
GDP	Gross Domestic Product
HDD	Household Dietary Diversity
HDDS	Household Dietary Diversity Score
HIV	Human immunodeficiency virus
IQR	Interquartile Ranges
kJ	Kilojoules
MA	Makhado Town
MDD	Medium Dietary Diversity
MDD-W	Medium Dietary Diversity for Women
MSEs	Medium and Small Enterprises
MU	Musina Town
NDP	National Development Plan
NGO	Non-Governmental Organisations
PDM	Porter's Diamond Model
PMC	Porter's Model of Competitiveness
Q1	Quarter 1
Q2	Quarter 2
RDA	Recommended Daily Allowance
RDI	Recommended Daily Intake
SF	Street foods
SFV	Street Food Vendors
SMEs	Small Medium Enterprises
StatsSA	Statistics South Africa
SPSS	Statistics Package for Social Sciences
SSA	Sub-Saharan Africa
SWOT	Strengths, Weaknesses, Opportunities, Threats
TH	Thohoyandou Town
VC	Value Chain
VCA	Value Chain Analysis

WDDS	Women's Dietary Diversity Score
WIEGO	Women in Informal Employment: Globalizing and Organizing
WRA	Woman of Reproductive Age
WHO	World Health Organisation
ZAR	South African Rand

DEFINITION OF OPERATIONAL TERMS

Agricultural food enterprises are small and medium enterprises focusing on food production. In this study, agricultural food enterprises refer to street food enterprises. These are commonly family or one-person businesses, where most owners work without licenses (Edeme & Nkalu, 2018). The study mainly refers to street food enterprises that sell only cooked food in the small towns of Limpopo province.

Competitiveness in business refers to a company's ability to achieve more sales or customer loyalty than their competitors due to quality, price, or a combination of both factors (Eskandari, Miri, Gholami & Nia, 2015).

Dietary diversity is the variety or the number of food groups people eat over a given time (FAO and FHI 360, 2016). In this study, dietary diversity refers to the number of food groups sold by street food vendors over the period examined.

The informal sector is defined as establishments that employ fewer than five employees who do not have income tax deducted from their salaries/wages. Alternatively, as employers, own-account workers, and persons helping without being paid in their household businesses who are not registered for either income tax or value-added tax. The study used the definition used by Statistics South Africa (2021).

Street foods are ready-to-eat foods and beverages prepared and sold by vendors, especially on streets and other similar public places [World Health Organization (WHO), 2019]. This study focuses on food cooked, served on a plate, and sold to customers on the street.

Street vendors are people who sell goods and services in broadly defined public spaces, including open-air spaces, transport junctions and construction sites (WIEGO, 2014). This study also refers to street vendors as those who sell cooked food in the street and sometimes operate illegally.

Value chain analysis refers to the full range of activities required to bring a product or service from conception, through the different phases of production, to delivery to the final consumer and final disposal after use (Kaplinsky, Morris & Readman, 2002). In this study, value chain analysis is defined as the activities performed by street vending enterprises to create value for their customers.

CONTRIBUTION OF AUTHOR STATEMENT

Mr. TC Mahopo: He is a Ph.D. candidate. He wrote all the chapters and two published articles as the first author. The candidate also prepared the four manuscripts to be submitted for publication in accredited peer-reviewed journals.

Dr. CN Nesamvuni: She critically reviewed all manuscripts and the final dissertation. She provided input at all stages as Ph.D. supervisor.

Prof. J Van Niekerk: He critically reviewed manuscripts and the final dissertation. He provided input as a Ph.D. co-supervisor.

Prof. AE Nesamvuni: He critically reviewed all manuscripts and the final dissertation. He provided input as a Ph.D. co-supervisor.

Mrs M de Bruyn: She assisted in data capturing and analysis preparation. She participated in the review of two published manuscripts.

1 CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Although there is enough food production globally, a growing population and rising levels of income, combined with natural degradation and climate change, pose enormous challenges to our global food system (Abdul, Id, Mainuddin & Sonobe, 2020). The world's population requires healthy, affordable, nutritious food produced sustainably. This is vital for a green society (Campi, Dueñas & Fagiolo, 2021). However, global food security has been affected due to the rise of poverty in the developing world (Bamhu, 2019; Doibale, Mohite, Sawase & Pagadal, 2019; Kinlocke & Thomas-Hope, 2019; Makwara, 2019). The informal food supply sector plays a vital role in household food and nutrition security (Abdul et al., 2020; WIEGO, 2020). Besides its excellent opportunities for new business entrepreneurs, the sale of street foods makes a sizeable contribution to local economies and developing countries (Sarker, Rahman, Cao & Xu, 2019).

There is an increasing recognition that informal trade is crucial in promoting the Gross Domestic Product (GDP), especially in developing countries. This could eventually reduce poverty (IBRD, 2019). Mungai and Ogot (2017) maintain that informal trading in Sub-Saharan Africa (SSA) accounts for about 90% of the new jobs created and about 85% of total employment. Studies in Kenya and Ghana also noted the vital contribution of informal food enterprises to creating employment and reducing poverty and malnutrition (Osei Mensah, Ohene-Yankyera & Aidoo, 2018). Moreover, street food vending contributes to nutrition and food security for the masses because foods sold in the street are regarded as a potential vehicle for micronutrient fortification (Imathiu, 2017; Steyn et al., 2014).

In South Africa, the National Development Plan (NDP) 2030 requires that South Africa's rural communities have more significant opportunities to participate fully in the country's economic, social, and political spheres (NDP, 2011). However, a study in Durban highlighted the lack of access to high-quality essential services that enable people to be well-nourished, healthy, and increasingly skilled (Roever, 2014). The NDP requires an estimated 11 million jobs, with 90% new jobs, to be created in small and medium enterprises by 2030. This has not been reflected in the recent increase in unemployed people in South Africa.

Statistics South Africa (Statistics SA) (2021) reported a high rise in poverty in the past decade, despite the poverty decline from 2006 to 2011. In the second quarter of 2022, the sixth quarter since the outbreak of the SARS-CoV-2 pandemic, unemployment increased, despite reported decreases in the previous quarter. At the national level, the unemployment

rate was 33.9% in the second quarter, a decrease of just 0.6% compared to the first quarter of 2022. The provinces most impacted by unemployment were the Western Cape which recorded a 2.3% increase in the official unemployment rate, followed by increases in the provinces of North West (2.1%), the Free State (1.3%), and Limpopo (0.7%).

Many big industries have introduced rationing job measures to enhance efficiency and maximise profit (Mireia et al., 2016). Moreover, about 56% of the population (30.3 million people) live in poverty at the national upper line (less than ZAR 992), while a total of 13.8 million are food insecure (Statistics SA 2021). The NDP Vision 2030 highlighted that rural areas are most affected by the rise in poverty and inequality than urban areas, with many households trapped in a vicious cycle of poverty (NDP, 2011). Choudhury et al. (2011) noted that most people have alternative ways of generating income, thus creating employment for their households to ward off hunger and food insecurity. These alternative income streams include street food enterprises, with no formal support given to this sector.

Rural economies should be supported by agriculture, mining, tourism, agro-processing, and fisheries. This is especially true as informal rural traders outnumber urban traders (Gamielien & Van Niekerk, 2017; Steyn et al., 2014). Legodi and Kanjere (2015) noted that informal trading had grown faster in South Africa because of the lack of formal employment opportunities. Street food vending solves social and economic problems affecting households in developing countries (Cortese, Veiros, Feldman & Cavalli, 2016; Mramba, 2015; Osei Mensah et al., 2018; Sarker et al., 2019), including in South Africa (Garg & Phaahla, 2018; Steyn et al., 2014). Individuals from poor backgrounds resort to informal businesses to support their households. Moreover, studies showed that women are the most at risk and are primarily engaged in street food vending to support their families (Bamhu, 2019; Chauke, 2015; Eliku, 2016; Gadaga, Ntsike & Ntuli, 2014; Maele, Nesamvuni, Tshikolomo, Afful & Norris, 2015; Oladipo-Adekeye & Tabit, 2021; Osei Mensah et al., 2018; Perez, Khayat & Villanueva, 2019; WIEGO, 2014, 2020).

In a study by Louw, Emongor, & Kirsten, (2004), informal small businesses in the Tshwane market contributed 27-29% of monthly household income. In Johannesburg, this was about 50%. In the Western Cape, studies showed that small general dealers' spaza shops and street vendors are the primary food sources for local communities (Crush & Riley, 2019; Mchiza & Steyn, 2014; Tawodzera, 2019; Tawodzera & Crush, 2019). Street food vending provides relatively cheap, ready-made meals and employment in rural and urban public areas (Alimi, 2016). However, these businesses' nature and lack of volume make their economic importance poorly recognised. While most street vending enterprises sell on the streets (on pavements or in taxi ranks), they allow women to meet their children's basic

needs, such as food, water, health, and education (Ngomane, 2020). Furthermore, in the Mbombela District, Ngomane (2020) has shown the importance of street vending to the formal economy as women source goods from formal enterprises. Monga and Dzivhimbo (2019) and Mkhize, Dube, and Skinner (2013) also highlighted that street vendors are so crucial that most formal enterprises dealing with commodities would collapse without them.

Studies conducted in Limpopo (Chauke, Munzhelele & Maiwashe, 2015; Garg & Phaahla, 2018; Louis & Mathew, 2020), including in the Vhembe District (Mathaulula, Francis & Mwale, 2015, 2016), indicated that small-scale food vending contributes to the livelihoods of the poor. At the same time, Martins (2006) maintained that in a developing country with fewer opportunities, such as South Africa, poor people should be allowed to earn their livelihood through an 'easy-to-enter' business like street food vending when hygiene standards are acceptable. Chauke et al. (2015) note the dominance of unemployed and less skilled individuals in informal trading, supporting their families. Almost all (98%) of the participating street vendors were women responsible for caring for their households. Mathaulula et al. (2015) reported that most street food vendors (83%) reported that their businesses created jobs for themselves and others. At the same time, a considerable number of street food vendors (81%) reported raising rental fees to pay for storage facilities for their stoves, tables, and chairs. Moreover, money generated by street food vendors is used to pay education fees and skills development for children (Mafunzwaini, 2013; Mathaulula et al., 2015).

Despite these reported findings, informal businesses in South Africa have no set standards in place to regulate their businesses (Arias, 2019; Mathaulula et al., 2016; Mkhize et al., 2013; Roever, 2014). Large and established food producers have laws and regulations to meet the Food and Agricultural Organisation (FAO) standard of food production for human consumption (FAO 2016; WHO, 2019). However, street food vendors do not influence policies developed for managing their operations (Hill, Mchiza, Puoane & Steyn, 2019; Recchi, 2020; Roever, 2014; Roever & Skinner, 2016). The previous legal framework on street vending in South Africa and many parts of the world is arguably hostile and discriminatory towards street vendors since it focusses more on policing and evictions (Ngomane, 2020).

Although the importance and contribution of street food enterprises have been noted, very few studies have been conducted on the value chain of this sector in South Africa (Senyolo, Wale & Ortmann, 2018). No analysis has been conducted on the value chain of the street food enterprise using Porter's Diamond Model of Competitiveness (PMC). The value chain

approach embraces all key actors and activity interventions within an industry having the potential to propel sustainable competitive advantage (Porter, 1990).

This study attempts to compensate for the lack of research literature on street food enterprises by examining businesses in the rural towns in the Vhembe District on a large scale and examining the characteristics of street food vending enterprises in terms of the socio-economic, operational, and operational constraints of the sector. Moreover, we explored the perceptions of street food vendors on the competitiveness of their enterprises. The study further assessed the value chain of street food enterprises from the supplier of the product to the final consumer's plate (street food). We have designed strategies to propel the development and dissemination of improved interrelation and innovation benefits for all chain actors. Lastly, the study looked at the South African street vending policies to guide the development of an agricultural food model used by the street food enterprises in the Vhembe District.

1.2 Rationale

Street foods contribute significantly to people's energy and protein intake in developing countries. Very few studies have been conducted on the relationship between the informal food industry and food security (Mkhize et al., 2013; Mramba, 2015; Roever and Skinner, 2016; Skinner, 2019). Research has focused on the farm, and low-level research has focused on the value chain beyond the farm gate and before consumption (Senyolo et al., 2018). No model guides the informal food enterprises and the intersection between the food chain and food security and nutrition in the Limpopo province, and there is little research conducted to understand the intersection of the South African economy and food security (Crush & Riley, 2019; Mkhize et al., 2013; Skinner, 2019). Moreover, Roever and Skinner (2016) have also noted the absence of accurate information relative to the size and composition of street vending in South Africa, especially in rural areas such as Limpopo.

Since few academic studies employed the value chain approach to studying the informal food business enterprises in the rural towns of Limpopo, especially in the Vhembe District, there should be linkages to inclusive development. Porter's (1990) Diamond Model termed the primary activities of value chains using the informal business enterprise sectors as empirical areas of study. The rural towns in Vhembe District are booming, and there has not been a comprehensive investigation on the number and distribution of street food vendors.

Hence, the current study used Porter's Value Chain Analysis and Porter's Diamond Model to develop an agricultural food enterprise model in the rural towns in the Vhembe District. There is a need to employ the value chain approach to informal food business enterprises'

economic inclusion through inter-sectoral linkages in the Vhembe District rural towns. Value chain analysis has significant advantages for food-based approaches to undernutrition as it will highlight points that actors, activities, and markets can leverage to address barriers.

1.3 Problem statement

In South Africa, there has been growing evidence of a more vulnerable population falling into poverty (Statistics South Africa, 2017). Among the poor, children younger than 17 and females living in the Eastern Cape and Limpopo provinces comprise this population. Poverty is attributed to the high unemployment rate in South Africa, especially in rural provinces such as Limpopo (Louis & Mathew, 2020). A study by Ashenafi (2016) noted that children and women are primarily involved in farming activities as collectors, processors, wholesalers, retailers, and consumers of the value chain in the food industry. Studies have reported that street food vending is another significant source of informal employment in the cities and towns in developing countries and contributes to total household income (Doibale, Mohite, Sawase & Pagadal, 2019; Edeme & Nkalu, 2018; Sousa et al., 2019). Thus, informal trading, such as food vending, contributes to the global economy (Bouafou, Carenne Beugré, Amani & Bouafou, 2021; Skinner, 2016). However, Ngomane (2020) showed that most female street vendors lack formal schooling and the skills to diversify their commodities, grow their businesses, and create more jobs.

Small food producers face distinct difficulties entering food value chains (Kinlocke & Thomas-Hope, 2019). In countries such as South Africa, studies have noted the challenges faced by small businesses, with small food business producers in many developing countries lacking support or regulations in local towns and cities (Arias, 2019; Hill et al., 2019; Lekhanya, 2016; Petersen & Charman, 2018). Tuffa (2016) noted that this lack of support weakens products and information flow between supply and value chain actors. Earlier, Markelova et al. (2009) and FAO (2014) indicated that necessities such as weak regulatory institutions, poorly designed and implemented sanitary regulations, inadequate transportation, power and water infrastructure, and the absence of critical value chain actors are part of the threat to the small food business producer's value chain. Montalbano and Nenci (2022) also argue that small and medium-sized producers in developing countries usually face low productivity, poor product quality, lack of standards compliance, high transaction costs, and limited scale. These hindrances to competitiveness are difficult for smallholders to overcome as they face significant constraints. As mentioned earlier, street food vending plays a vital role in the South African economy. Therefore, there is a profound need to apply new strategies that permit illegal street food vending activities to be reorganised and thus gain official recognition.

1.4 Aim of the study

This study aims to develop an agricultural food enterprise model in rural towns in the Vhembe District, Limpopo Province.

1.5 Study objectives

1. To determine the socio-economic characteristics of street food vending enterprises in the Vhembe District Municipalities, Limpopo, South Africa.
2. To characterise the operations of women's street food enterprises in the Vhembe District in terms of business profile, foods sold, inputs, pricing, record-keeping practices, and total costs.
3. To examine the dietary diversity and macronutrient content of street foods and their contribution to daily intake in the Vhembe District Municipalities, Limpopo Province, South Africa
4. To investigate street food vendors' perceptions of the determinants of their competitiveness in the Vhembe District Municipalities, Limpopo Province, South Africa
5. To analyse the value chain of the street food enterprises in the rural towns of Vhembe District, Limpopo province,
6. To investigate the perceived challenges and proposed solutions developed by street food vendors across the two secondary cities and border towns in South Africa.

1.6 Research questions

1.6.1 Primary Research Question

How will a model of the value chain of street food vendors in the Vhembe District based on the Porter Diamond Model contribute to the performance of the enterprise?

1.6.2 Secondary Research Question

1. How may the street food enterprise be described using the value chain approach?
2. How do the attributes of Porter's Diamond Model affect the enterprise of street food vendors?
3. What recommendations would contribute to the value of the street food vendors based on the attributes of Porter's Diamond Model?

1.7 Significance of the study

The study envisaged developing a model for the street food enterprise to guide policymakers. The study seeks to facilitate the development of informal businesses in rural towns, especially in the Vhembe District, Limpopo Province, to assist poor households who engage in day-to-day street food businesses. The study also presents strategies that support women and young adults in mitigating household food security and nutritional status risks. Skinner, Caroline & Haysom (2016) have emphasised that new upcoming small producers must meet strict standards to access the established value chain. Cortese, Veiros, Feldman & Cavalli (2016) indicated that value chain analysis is essential in determining the relationships and linkages between buyers, suppliers, and various market actors. Hence there is a need to analyse the value chain of food sold by street vendors, bakkie sellers, farmers, and local markets such as small food business producers to identify the absent relationship and linkages in street food enterprises in rural areas.

1.8 Conceptual framework informing the study.

A conceptual framework is necessary to explain and improve a phenomenon's natural progression, such as the value chain of street food enterprises (Camp, 2001). The current study employed two theoretical approaches: Value Chain analysis and (2) Porter's Diamond Model of Competitiveness. Porter's Diamond Model of Competitiveness (Porter, 1990) is a business management concept used to identify problems and opportunities facing different actors in a business (Porter, 1990). At the same time, the value chain categorises the generic value-adding activities of an organisation or industry where primary activities (line functions) and support activities (staff functions) are identified, and the cost and value drivers are determined for each value activity.

Porter's Diamond Model of Competitiveness first explains national competitiveness to answer why some countries are more successful than others. Porter argues that any company's ability to compete in the international arena is based mainly on an interrelated set of location advantages of specific industries in different nations. In this regard, street food vendors are regarded as informal and unregulated entities that encounter challenges such as a lack of support, high crime, and natural disasters. This model could assist in identifying other challenges and the strategies that street food vendors could use for the success of their businesses.

There are four central factors in Porter's Diamond Model of Competitiveness: firm strategies, structure, rivalry, and factor condition. Two additional components support these factors: demand conditions and related and supporting industries. In the context of competition and

fluctuations in market prices, Steel et al. (2016) and Jaishankar & Sujatha (2016) suggest that Porter's model has the potential to highlight insecure and irregular employment challenges that street food vendors face. Moreover, Porter maintains that additional components, such as the role of government and chance factors, are important and require investigation. Implementing favourable conditions would allow street food enterprises to innovate continually and upgrade their operations.

Furthermore, the value chain can outline competitive advantages and identify and develop the linkages and interrelationships between activities that create value. Moreover, various organisations have been indicated as failing because of different challenges. Street food vendors encounter social and economic problems such as poor infrastructure (Adeosun, Greene & Oosterveer, 2022; Chauke et al., 2015; Odundo, Okemo & Chege, 2018), poor interaction with the relevant authorities (Mathaulula et al., 2016), and lack of finances (Chauke, 2015; Lekhanya, 2016; Redzwan Habib, 2016). There is no or limited information on the street food value chain in the Vhembe District regarding these interrelationships. Thus, the current study employed the six-factor condition used in Porter's model to understand the factors affecting profitability in the street food enterprise.

The value chain analysis has been used as the operational tool to identify the actors and value-adds in street food enterprises. The various actors, their functions, and existing horizontal and vertical channels, as described by Jordaan and Grové (2014), across the value chain are explored to unpack the street food sector. Jordaan and Grové (2014) indicated that research on the value chain considered only actors directly involved with moving the physical product from suppliers to end consumers. An analysis of the input-output structure, the distribution of margins, return on investment and job creation along the chain, and the problems and opportunities facing different street food enterprise value chain actors were needed.

1.9 Outline of the thesis

This thesis is presented in a hybrid format and is divided into ten chapters.

CHAPTER ONE: This current chapter is introductory and presents: the background of the study, the rationale, the problem statement, the aim of the study, study objectives, research questions, the significance of the study, a conceptual framework of the study, outline of the thesis, the key contribution of the study, and lastly research outputs.

CHAPTER TWO: This chapter reviews the relevant literature and related frameworks. It details the characteristics of street food enterprises. It describes the street vending

experience in South Africa and from an international perspective and details the street food sector backgrounds. It analyses the nutritional aspects of food types and nutritional value highlights. Porter's Diamond Model of Competitiveness and the Value Chain framework are discussed as the primary theories that informed the study.

CHAPTER THREE: This chapter presents the methodology and methods used in the study.

CHAPTER FOUR: This chapter presents the articles published in the *Technium Social Science Journal*. This chapter also reports on the socio-economic characteristics of street food vendors in rural towns. The article is aligned with the study's Objective 1: Determining the socio-economic characteristics of street food vending enterprises in the Vhembe District, South Africa.

CHAPTER FIVE: This chapter presents an article published in the *Frontier Public Health Journal* titled "Operational characteristics of women street food vendors in rural South Africa". The article is aligned with Objective 2, which aims to characterise the operations of the street food enterprise in the Vhembe District, focusing on the business profile, sold foods, inputs, pricing, record-keeping practices, and total running cost.

CHAPTER SIX: This chapter presents a manuscript prepared for the *Nutrition Journal*, "Dietary diversity and macronutrient content of prepared street food and their contribution to dietary intake". This manuscript is in line with Objective 3: Examining the nutrient content of prepared street food sold on the street in the Vhembe District.

CHAPTER SEVEN: This chapter presents a manuscript accepted for publication in Open Access Book, Agricultural Chains-Some Selected Issue, edited by Prof. John Stanton, titled "Value chain analysis of the street food enterprises in the rural towns of Vhembe District, Limpopo province." The chapter is in line with Objective 5, which aims to analyse the value chain of foods sold on the street in the Vhembe District.

CHAPTER EIGHT: This chapter presents a manuscript prepared for the *African Journal of Food, Agriculture, Nutrition and Development* titled "Women street food vendors perceptions on the determinants of competitiveness of the street food enterprise in the rural towns of Vhembe District, Limpopo Province." The manuscript is in line with Objective 4: To investigate women's street food vendors' perceptions of their competitiveness.

CHAPTER NINE: This chapter presents a manuscript prepared for *BMC Public Health* titled "Perceived challenges and proposed solutions by the street food vendors across two secondary cities and border towns in South Africa." The manuscript is aligned with Objective

6: To investigate the perceived challenges and proposed solutions developed by the street food vendors across two secondary cities and border towns in South Africa.

CHAPTER TEN: This chapter presents the summary, discussion, conclusions, and recommendations of the main findings. The strength and limitations of the study are also outlined.

1.10 Key contribution of the study

The study assessed the dietary diversity of foods consumed by the consumer and their dietary contribution. Further, this was the first study to conduct a value chain analysis to identify challenges along the value chain of the street food vendors in the Vhembe District. The study developed an agricultural food enterprise model. The model highlights that for the enterprise to be competitive, four-factor conditions based on Porter's Diamond Model need to be considered; production condition, chance condition, the role of government, and related and supporting industries. Demand conditions and firm, strategy and rivalry were not perceived as necessary. Moreover, a SWOT analysis was conducted, and recommendations were also documented to assist the relevant stakeholder involved in the street food enterprise in the Vhembe District.

1.11 Research outputs

This thesis contains parts published in international journals or presented at international conferences and extracts from unpublished, ongoing work.

1.11.1 Journal articles

Mahopo, T.C., Nesamvuni, C.N., Nesamvuni, A.E., de Bruyn, M. and Van Niekerk, J., 2022. Socioeconomic characteristics of street food vending enterprises in the Vhembe District, Limpopo province. *Technium Social Sciences Journal*, 29, pp.419-437.

Mahopo, T. C., Nesamvuni, C. N., Nesamvuni, A. E., de Bryun, M., van Niekerk, J., & Ambikapathi, R. (2022). Operational Characteristics of Women Street Food Vendors in Rural South Africa. *Front. Public Health*, 10, 849059.

1.11.2 Conference articles

Tjale Cloupas Mahopo's presentation on "Operational characteristics of women street food vendors in rural South Africa" at FERN2021/INFORMAS Africa eSymposium 2021, organized by the Providing Measurement, Evaluation, Accountability and Leadership Support for Non-Communicable Diseases (MEALS4NCDs) Project.

Tjale Cloupas Mahopo's presentation on “Perceptions of Street Food Vendors on the determinants of competitiveness of the street food enterprise in the rural towns of Vhembe District, Limpopo Province” at Virtual Humanities conference Critical Food Studies, 17 November: South Africa and Beyond

1.11.3 Papers in progress:

Tjale C. Mahopo, Cebisa N. Nesamvuni, Azwihangwisi E. Nesamvuni and Johan van Niekerk. Dietary diversity and macronutrient content of prepared street food sold on the street in the Vhembe District, Limpopo province, South Africa, **Nutrition Journal**

Mahopo TC, Nesamvuni CN, Van Niekerk J, and Nesamvuni AE. Street food vendors perceptions on the determinants of competitiveness of the street food enterprise in the rural towns of Vhembe District, Limpopo Province. **African Journal of Food, Agriculture, Nutrition and Development**

Mahopo TC, Nesamvuni CN, Van Niekerk J and Nesamvuni AE. Perceived challenges and proposed solutions by the street food vendors across three secondary cities and border towns in South Africa. **BMC Public Health**.

Tjale C. Mahopo, Cebisa N. Nesamvuni, Edward A. Nesamvuni, Johan van Niekerk. Value chain analysis of the street food enterprises in the rural towns of Vhembe District, Limpopo province, **Intech Open Access Book**.

1.12 References for Chapter 1

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2 CHAPTER TWO: LITERATURE REVIEW

This chapter provides a review of the literature related to street food vending. The chapter details the characteristics of street food enterprises. It describes street vending from an international perspective in South Africa and the Vhembe District and outlines a detailed background of the street food enterprise. The nutritional aspects of foods that focus on types and nutritional value are also discussed. The conceptual framework of this study was based on Value chain analysis and Porter's Diamond Model of Competitiveness. The chapter summarises the interdependence of these theoretical frameworks and their joint contribution, which mitigates their weaknesses (Cortese, Veiros, Feldman, Cavalli, et al., 2016).

2.1 Characterisation of the street food enterprise

2.1.1 Definition of street food

Street foods are ready-to-eat foods and beverages that vendors or hawkers prepare and sell in the streets, on pavements, in marketplaces, and other similar places (Martins, 2006; Monga et al., 2019; World Health Organization (WHO), 2019). These foods represent a cultural, social, and economic phenomenon typical of urbanised areas (Williams & Gurtoo, 2012). Street foods are essential as they are accessible and inexpensive dietary sources for millions of consumers with low socio-economic statuses in urban areas (WHO, 2019).

2.1.2 Definition of street vendors

Street food vendors may do regular vending within a specific location, irregularly without a specific location, or have a mobile base in markets or other public spaces (Panwar & Garg, 2015). They typically operate in locations with a great flow of people within a city or maybe scattered across broader areas. As street vendors are self-employed or work for those who are self-employed, their work is defined as informal (Gamielien & van Niekerk, 2017; ILO, 2018). Statistics SA (2016) defines the informal sector as having employees working in establishments with fewer than five employees and no income tax deducted from their salaries or wages. Informal employment also includes sectors that involve own-account workers, and persons helping who usually are unpaid and sometimes part of their household business. There is a concern that most of these informal traders are unregistered for either income tax or value-added tax (WHO, 2019).

2.1.3 Profiles of street food vendors

Findings from most developing countries have shown that women dominate street food vending (Eliku, 2016; Laforteza et al., 2014; Perez, Khayat, & Villanueva, 2019; Skinner, 2016a). A study by Ukenna and Monanu (2012) highlighted the significant contribution of

women street food vendors and described how they had shifted their role from plain household managers to entrepreneurs and active economic players. Although most studies of street food vendors have found more women than men, Cortese, Veiros, Feldman, and Cavalli (2016) reported more males (58%) than females among the street food vendors they interviewed.

Regional data highlight the significant role of women in the informal economy, with informal employment a more significant source of non-agricultural employment for women than for men in three of six regions. The difference in women's and men's employment rates is highest in Sub-Saharan Africa, where 74% of women compared to 61% of men are in informal work (Skinner, 2016b). In South Africa, most studies report the dominance of females in the street food enterprise. Chauke, Munzhelele & Maiwashe (2015) reported female participation of 97% in the street food vending enterprise in the Vhembe District. Similar observations were made in a study by Hill, Mchiza, Puoane & Steyn (2019a) in Cape Town, where most street food vendors were females.

Street food vendors are poor (Redzwan Habib, 2016). They need to work long hours to earn a profit. On average, they spend nearly 10 hours daily in their businesses (Balasha Arsene et al., 2020; Panwar & Garg, 2015) and may take a further five hours per day on preparations, including visiting the wholesale markets to buy vegetables for later sorting and cleaning. Thus, considering both preparation and time for selling, a street vendor may spend up to 15 hours on their activities daily to earn a hundred or two hundred rupees (CUE Report, 2014). Vendors also face many problems from the public and police personnel during work. They are not protected from harmful weather conditions and do not have storage facilities.

2.1.4 The economic environment of street food vendors

The unemployment rate in northern Africa is about 12% and 4% in eastern Africa (ILO, 2020). However, unemployment rates in Southern Africa are higher. In 2019, more than a quarter of the population (25.5%) in Southern Africa was unemployed. Aging, a report by Statistics SA (2019), showed an estimated 28% unemployment in South Africa in the first quarter of 2019. South Africa's unemployment rate increased to 35.3% in the fourth quarter of 2021 from 34.9% in the third quarter (Statistics SA, 2021). Moreover, youth and women are the most unemployed in South Africa, with youth unemployment at 65.5%.

2.1.5 International perspective of street food vending

In many developing countries and most of Africa, the informal economy contributes significantly to employment (Willemse, 2012). Street food vending has increased

tremendously in African countries because of global socio-economic changes in unemployment (Doibale et al., 2019). In several studies in low- and middle-income countries, researchers maintain that self-employment in various informal sectors, such as street food vending, is the only option for the unemployed to earn an income (Abrahale et al., 2019; Resnick et al., 2019). Individuals who resort to street food vending have no choice but to establish some means of work to sustain their livelihood. Street foods offer a source of income for the informal sector, particularly women and other marginalised groups (Acho-Chi, 2002; Edeme & Nkalu, 2018; Husain, Yasmin, & Islam, 2015).

The results are brought about by urbanisation at the centre of informal trading in developed countries (Ncama et al., 2020; Petersen & Charman, 2018). A study by Tavonga (2014) noted that street foods provide inexpensive, convenient, and nutritious food. In other parts of African countries, foods sold in the street have attracted tourists, contributing to the area's local economy (Delclos, 2018; Moagi et al., 2021). Street food vending in African countries helps reduce poverty and ultimately improves livelihoods. It serves as a vehicle for creating additional employment permitting people to move out of poverty (Skinner, 2016b). It contributes to household income and provides a chance to meet basic needs and overall economic well-being (Adeosun, Greene, & Oosterveer, 2022; Dundery & Addo, 2016; Eliku, 2016). Studies in African countries such as Ghana (Mensah et al., 2002), Kinshasa (Iyenda 2001), Tanzania (Kirumirah & Munishi, 2021a), Harare (Tavonga, 2014), Kampala (Muyanja, Nayiga, Brenda, & Nasinyama, 2011), Nairobi (Kariuki, Waithera, & Stud, 2017), and Lesotho (Gadaga et al., 2014) have shown that food vending provides millions of people with livelihoods throughout Africa. Moreover, the increased access and availability of food groups for purchase in the cities has improved the dietary diversification of communities and individuals (Adeosun et al., 2022). Monga & Dzvimbo (2019) explored the significance of street vending in Harare as an example of a livelihood strategy that can enhance food security for citizens. They noted that informal vending contributed immensely as a livelihood and a source of employment and income for many urbanites. Accordingly, they recommended that laws and policies that prohibited street vending be revoked and legalized because of this enterprise's importance to livelihood.

2.1.6 Street food enterprise in South Africa

During South Africa's apartheid era, fines and confiscation of goods were aimed at preventing street trading in the cities (Roever & Skinner, 2016). However, bylaws have been established to regulate informal street trading, as street vending is commonplace for most urban and rural dwellers due to unemployment. Street food vending comprises the highest proportion of micro-enterprises in the street towns of South Africa (Charman,

Petersen, Piper, Liedeman, & Legg, 2017), with millions of street traders playing a role in providing a security net for the unemployed (Willemse, 2012).

Street foods are prepared on the street and ready to eat at home or consumed without further preparation (Kariuki, Ng'ang'a, & Wanzala, 2017). Street foods consist mainly of staple food served in various forms and combined with side dishes such as stews, gravies, and snacks such as meat, fish, and cereal-based ready-to-eat foods (Albuquerque et al., 2021; Perez et al., 2019; Steyn, Mchiza, et al., 2014; Swanepoel et al., 2019). Statistics South Africa (2020) reported that an estimated 18% of citizens work in the informal sector as their primary source of employment (Statistics South Africa, 2020). Arias (2019) estimated that there were one million street vendors in South Africa that year, 70% of whom sold food. In 2009 Wills (2009) estimated about 500,000 street vendors in 2007, with street food vendors more common than non-food-selling vendors, but such estimates are considered unclear (Roever & Skinner, 2016).

Literature available on street vending has focused mainly on major cities such as Johannesburg (Arias, 2019; Matjomane, 2013; Oladipo-Adekeye & Tabit, 2021; Petersen & Charman, 2018; Steyn, Labadarios, & Nel, 2011), Durban (Mkhize, Dube, & Skinner, 2013; Petersen & Charman, 2018; Roever, 2014), and Cape Town (Battersby, Marshak, & Mngqibisa, 2018; Hill, Mchiza, Fourie, Puoane, & Steyn, 2016; Hill, Mchiza, Puoane, & Steyn, 2019a; Mchiza, Hill, & Steyn, 2014; Petersen, Charman, & Kroll, 2018; Tawodzera, 2019; Tawodzera & Crush, 2019).

Street foods are a low-cost, accessible means of obtaining a nutritionally balanced meal away from home for many low-income people (Hill et al., 2016; Steyn et al., 2011; Steyn et al., 2016). The street food sector in South Africa has been regarded as an essential channel for food access for a food-insecure population, where it reflects a core aspect of low and middle-income countries, such as South Africa's poor and vulnerable population (Skinner, & Haysom, 2016). Even though its economic contribution may be overlooked (Kiran, 2019), the street food enterprise is the single most important employer in the informal sector due to its economic contribution (Statistics South Africa, 2020; von Holy & Makhoane, 2006). A study by Ngomane (2020) in Mpumalanga revealed that women trade on the street due to the country's high unemployment. The results also highlighted the support the street trading offers in the country's economy and neighbouring countries such as Mozambique and Eswatini by creating jobs for women.

2.1.7 Street food enterprise in the Vhembe District

Although street vending has received some research attention in South Africa, there is little research on the street vendors in the Vhembe District, particularly on street vendors of prepared or cooked foods. Information on the Vhembe District's Street food is based on a single town or unavailable. The trade sector has recorded high growth in the number of jobs created in the informal sector in the Vhembe District. The number of employed people in the informal economy in the Vhembe District in 2018 was estimated at approximately 98,800 people, more than twice the estimated 40,500 people employed there informally in 2008. The growth in the informal sector could be due to the barriers of capital and skills required to enter the formal sector (Vhembe District Municipality 2019).

Moreover, people in the area venture into informal trading because they lack the qualifications necessary to secure permanent employment (Chauke et al., 2015; Mathaulula et al., 2015). In 2019, approximately 789,000 people were living in poverty across Vhembe District compared to approximately 802,000 in 2009, based on the upper poverty line definition. By this indicator, poverty levels in the Vhembe District have remained relatively stable over the ten years or have even decreased marginally, possibly due to the growth of the informal sector in the area.

However, the growth of informal trading, including street food vending, has raised concerns among public officials as it requires the local authorities to introduce and effect by-laws and regulations to govern street food trading (Bureau for Economic Research, 2016). These by-laws and regulations ensure that informal town traders do not obstruct activities and do not increase congestion in the towns. A study by Mafunzwaini (2013) in the Thulamela Local Municipality noted that about 69% of street food vendors sell fruits and vegetables. This large number of vendors in the cities is because the Vhembe District is home to most agricultural production (Vhembe District Municipality, 2019), meaning that many street vendors sell along the roads and streets of the Vhembe District towns. Moreover, studies on the contribution of informal markets to poverty reduction highlighted that about 20% of informal traders sell cooked foods such as pap and meat (Mafunzwaini, 2013). The street food vendors, however, operate without proper documentation that would allow them to sell legally on the dirt roads and crowded places of the Vhembe District (Chauke et al., 2015; Mathaulula et al., 2015, 2016).

Street food vendors reported various challenges restricting the growth of their enterprises in the Vhembe District (Chauke et al., 2015; Mathaulula et al., 2016). In a study in the Thulamela Local Municipality of the Vhembe District on challenges faced by small-scale food vendors (Mathaulula et al., 2016), the street food vendors expressed challenges that

included issues of infrastructure, essential services, and legal and policy frameworks. The vendors noted that their operations were hindered as there was no governmental involvement in street food vending. Chauke et al. (2015) conducted a similar but larger study in the Vhembe District on factors impacting street sellers' ability to generate income above the poverty line. Their study noted similar challenges. These findings are not different from those of other studies conducted in other provinces where street food vendors noted poor government support, no financial assistance, and poor infrastructure development. However, other street food vendors selling fruits and vegetables in Tshakhuma in the Vhembe District have received improved infrastructure (Mpandeli & Maponya, 2014), as efforts have been made to build permanent structures to protect them from harsh conditions. This strategy should be implemented for all types of vendors selling on the street of the Vhembe District.

Street food vendors in other parts of the country have also reported no assistance from the government. Thus, their business operations may not meet the required standards (Marutha & Chelule, 2020; von Holy & Makhoane, 2006). Vendors' lack of finances has been reported in Thulamela Local Municipality and other parts of the country, such as Mbombela Local Municipality (Ngomane, 2020). Study findings indicated that street food vendors lack access to credit and training. As resources are important to the street food vending operation, lack of finance is a significant disadvantage. The lack of storage facilities is among the other challenges that street food vendors reported, with vendors having to store their inputs and equipment in unsafe places and risk stealing the wares (Ngomane, 2020).

Mathaulula et al. (2016) have suggested that municipal officials become involved in the allocation of selling stalls and formalising food vending by issuing operator licenses. The authorities also need to consider and adopt ways of supporting street food vending as part of the district's overall local economic strategy and development. Other studies suggest improvements in food handling education, government regulation, and infrastructure for street food vendors. Cortese, Veiros, Feldman, Cavalli, et al. (2016) suggested that support that could be provided to street food vendors should also focus on the common laws to be used and enacted at local and national levels, as currently there are few international regulations for these vendors. According to the report by Hill, Mchiza, et al. (2019a), street food vendors' working conditions require starting their business activities as early as 6 am to start their preparation. For safety, the vendors should close their businesses at a reasonable time of day for their safety, as they face challenges of crime and poor or no

basic facilities such as water and energy. Most studies around the country and elsewhere have reported on the unfavourable conditions street food vendors work under for survival.

2.2 Nutritional aspects of street foods

2.2.1 Types of street foods sold

Street foods consist mainly of staple food served in various forms, combined with side dishes such as stews and gravies and snacks such as meat, fish, and cereal-based ready-to-eat foods (Imathiu, 2017; Sousa et al., 2019). Studies have reported on food and beverages sold by street vendors in developed (Reddy, Ricart & Cadman, 2020) and developing countries (Mensah et al., 2002). Some of these studies report the percentages of street food vendors selling specific items. A desktop literature review of street foods sold in Ghana (FAO, 2016) reported that the beverages and cooked food sold on the streets in the central city of Accra were fried foods such as fried fish, fried chicken, and fried yam. These foods are mostly accompanied by *banku*, bread, and sausage. However, other studies in Ghana reported different menus, such as tomato stew and *banku*, as the most sold food, followed by rice, groundnut soup, fried plantain, fufu, and spaghetti/macaroni as staple foods. Both studies highlight a lack of fruit and vegetable inclusion in providing variety in street foods.

In South Africa, typical street food dishes consist of maize porridge, served with either chicken or beef pieces or stew, with tomato, onion gravy, or salad (Hill, Mchiza, et al., 2019; Steyn, Mchiza, et al., 2014). However, tea, bread, vetkoek (a type of dumpling), and eggs are also sold by vendors (Labadarios et al., 2005; Steyn et al., 2016). Fruit and vegetables, soft drinks, and savory snacks, such as potato crisps and biscuits, are popular items sold by vendors on the street (Steyn et al., 2011). Other studies in South Africa also noted that food sold in the street is high in starch, and meat, with few fruits and vegetables (Faber et al., 2016). In Cape Town, Mchiza, Hill, & Steyn (2014b) reported that the most sold foods were crisps, candies, cooked foods, fruits and vegetables, sweetened beverages or flavoured water (6%), and raw foods (4%). The least foods sold were teas.

2.2.2 Macronutrient contribution of street foods

In Central Asia, Bishkek in Kyrgyzstan, homemade foods sold in the street presented the highest energy per serving, with some traditional dishes and snacks high in saturated and trans-fatty acids (Albuquerque et al., 2020). In a review study by Steyn, Mchiza et al. (2014) in developing countries, it was reported that street foods contribute 13% to 50% of energy intake in adults and children. Research has highlighted that rural South Africa is undergoing rapid health, social, and nutrition transitions (Feeley, Kahn, Twine, & Norris, 2011; Patil et

al., 2015; Steyn et al., 2016; Vorster, Badham, & Venter, 2013). Street foods provide significant energy, contributing to people's daily diet in developing countries. In rural areas, studies have indicated that the commonly consumed meals are traditional diets that are low in fats, high in sugar, and high in carbohydrates, while in urban centres, there is a shift to adopting more Western diets (Steyn et al., 2016). Similarly, Feeley, Kahn, Twine, and Norris (2011) indicated limited variety in the street foods of informal vendors who sell mainly high-energy items such as vetkoek or fried chips which yielded 943-5,552 kJ and 11-64 g fat, on average.

Steyn et al. (2016) reported a lower protein intake from street food, compared to previous studies in the country (Labadarios et al., 2005; Labadarios, Steyn, & Nel, 2011). Socioeconomic factors may contribute to the poor dietary intake of South Africans due to the cost of protein-rich food, particularly animal sources and dairy products. Inadequate consumption of different meat groups could lead to low iron and vitamin B12 intakes in women. The low consumption of dairy products explains the low mean calcium and riboflavin values in these studies (van den Berg, van Rooyen, & Walsh, 2020). The portions of food groups consumed are also a reflection of the urbanisation of diet (Steyn et al., 2016).

2.2.3 Dietary diversity

The Dietary Diversity Score (DDS) is a simple count of food groups based on what an individual has consumed in a specified period. It provides information on the intake of food groups scored and compared to a cut-off value to determine low or adequate dietary diversity (FAO and FHI 360, 2016; Steyn, Nel, Nantel, Kennedy, & Labadarios, 2006; Steyn, Nel, Labadarios, Maunder, & Kruger, 2014). Dietary quality has become a significant health issue in rapid urbanisation. A diverse diet improves the chances of nutrient adequacy and reduces the chance of a deficiency or excess of a single nutrient (Ruel, 2003). South Africa is in the non-communicable diseases phase of the nutrition transition, with the urban poor being disproportionately affected (Drimie, 2016). At the national level, South Africa has an adequate food supply. However, a substantial proportion of households are at risk of hunger or are already experiencing hunger (Steyn et al., 2006).

Studies in developed and developing countries use various food and food-group classification systems, different numbers of foods and food groups, and varying lengths for reference periods. Dietary diversity has been used to operationalise a summing of foods or food groups over a given reference period (Ruel, 2003; WHO, 2019). Various studies conducted in developed and developing countries use different ways of employing their version of the score (Hoddinott & Yohannes, 2002). According to FAO & 360 (2016),

dietary diversity has been measured in research and programmatic contexts in various ways. Ruel (2003) and Steyn et al. (2014) have noted that dietary diversity is usually measured using a simple count of foods or groups over a given reference period in resource-poor settings. These include the Household Dietary Diversity Score (HDDS), the Medium Dietary Diversity (MDD), and the Women's Dietary Diversity Score (WDDS) (FAO and FHI 360, 2016).

The Minimum Dietary Diversity for Women (MDDW) is a validated indicator for assessing the micronutrient adequacy of diets in Woman of Reproductive Age (WRA) (FAO and FHI 360 2016). Like the traditional diet diversity scores, the MDDW is a dichotomous indicator of whether (WRA) has consumed food from at least 5 of 10 defined food groups in the last 24 hours. The ten food groups are: grains, white roots, tubers, and plantains; pulses such as beans, peas, and lentils; nuts and seeds; dairy; meat, poultry, and fish; eggs; dark green leafy vegetables; other vitamin A-rich fruits and vegetables; other vegetables; and other fruits. The scores of the ten food groups are summed to calculate the MDDW. A dietary diversity score of 5 or more indicates the achievement of MDDW and can be presented as a percentage of women more likely to have more adequate micronutrient intakes than women who have not achieved the minimum dietary diversity score (FAO and FHI 360, 2016; Jordaan et al., 2020).

In Botswana, Kasimba, Motswagole, Covic, & Claasen (2017) used a 12-food group dietary diversity score to assess the use of traditional and indigenous foods and their association with household food security in women. Their findings highlighted HDD scores of 6 out of 12, indicating adequate dietary diversity in that population. In South Africa, most studies have used dietary diversity among infants and young children (Faber et al., 2016; Steyn et al., 2006; Steyn, Nel, et al., 2014), with very few studies on the adult population (Acham et al., 2012; Drimie et al., 2013; Mbhenyane et al., 2017).

Our study used the Dietary Diversity Score (DDS) based on the nine food groups used by FAO 2011. These are: cereals, roots, and tubers; vitamin A-rich vegetables and fruit; vegetables other than vitamin A-rich; fruit other than vitamin A-rich; meat, poultry, and fish; eggs; legumes; dairy products; and fats or oils. Jordaan, van den Berg, van Rooyen, and Walsh (2020) conducted a study on women's dietary diversity scores in the Free State province. They considered scores of 3 or less as low dietary diversity and a score of 4-5 food groups as moderate. Fewer than half (45%) of women participants had low dietary diversity, and about 50% had moderate dietary diversity. However, in Fisher's (2021) study on the nutrient adequacy and dietary diversity of women in Gauteng and Eastern Cape

provinces using the MDDW, the mean dietary diversity score was 3.4, with only 25% of participants meeting the dietary diversity criterion.

In a cross-sectional survey conducted in Johannesburg on the dietary diversity of the informal and formal settlements, Drimie et al. (2013) found that two-thirds of the respondents living in informal settlements consumed a low-diversity diet versus 15% of those in formal settlements. They concluded that dietary diversity could be used as a proxy for nutrition insecurity in communities in Johannesburg's inner city informal urban periphery. People living in informal settlements are nutritionally vulnerable, requiring urgent interventions to improve nutrition security. Starchy cereal has been reported as the dominant food group contributing to high energy and less variety of food in the adult population. In the Limpopo province, Mbhatsani et al. (2021) studied food security and related health risk in adults. The study noted that 25% of the participants had low dietary diversity, with more than half consuming a daily diet rich in starch cereal.

2.3 Conceptual framework of the study: Value Chain

Value chain analysis and Porter's Diamond Model of Competitiveness were employed as the guiding framework for developing the model of this study, as detailed in the following sections. This section presents a discussion of the Value Chain. Porter's Diamond Model of Competitiveness is presented in the following section.

2.3.1 Definition of the value chain

The value chain is a range of activities required to bring a product or service from conception through the different phases of production, transformation, and delivery to final consumers (Kaplinsky et al., 2002). The United Nations Industrial Development Organisation (2009) defines the value chain as a range of activities to bring a product from the initial input supply stage through the various processing phases to its final market destination, including its disposal after use. Therefore, value chains encompass all the factors of production, including land, labour, capital, technology, and inputs, as well as all economic activities, including input supply, production, transformation, handling, transport, marketing, and distribution necessary to create, sell, and deliver a product to a particular destination (Cortese, Veiros, Feldman, Cavalli, et al., 2016; Donovan et al., 2015; Kaplinsky et al., 2002). Value chains essentially represent enterprises in which different producers and marketing companies work within their respective businesses to pursue one or more end markets (Donovan et al., 2015; Tallontire et al., 2011).

Many organisations fail due to different challenges along the value chain, the institutional arrangement governing the activities, actors, their relationship, the linkages, and market

prices in and out of each actor in the chain (Barr, 2019). Porter's value chain definition explains how identifying and developing linkages and interrelationships between activities create value and competitive advantages. In the case of SMEs, the value chain analysis approach has been identified as essential for identifying market opportunities and benefitting competitiveness by ensuring an enabling environment and increased access to necessary resources (Osei-Mensah et al., 2016).

Agricultural organisations face high barriers to entry into the market and their share in the value-add of the product (Parshukov *et al.*, conference proceeding, 2020). To develop appropriate policy interventions for raising overall value-chain efficiency, they need to assess the critical sources of cost efficiency, or the lack of it, along the commodity's value chain (Kinlocke & Thomas-Hope, 2019). Thus, value chain analysis has recently gained considerable popularity (Albuquerque et al., 2019; Alimi, 2016a; Jordaan & Grové, 2014; Mango et al., 2017; Sugri, Maalekuu, Gaveh, & Kusi, 2017; Tallontire et al., 2011). While large and established food producers have laws and regulations that meet the FAO standard of food production for human consumption (FAO/WHO, 2017), the informal sector is largely unregulated. Studies of the informal sector globally, regionally, and in South Africa have reported concerns about informal business operations, citing challenges of the competitiveness model for these informal businesses and the absence of regulatory standards (Mathualula et al., 2016).

Enterprises such as street food vending could use the systemic approach of value chains to integrate the critical levels within a value chain network of players, influencers, and supporters of the informal trading sector (Roduner, 2007). Cortese et al. (2016) described the street food value chain stages as comprising chain actors that transact a product as it moves through the value chain. Their value chain mapping shows the actors at the various stages of input supply of food items used in the enterprise, including purchasing and transportation, where various modes are used to transport food to and from input suppliers.

Given the demand for added foods in developing countries and the importance of quality and food safety standards, it is essential to present street food vending as a value chain to depict chain activities (Donovan et al., 2015; Jordaan & Grové, 2014; Roduner, 2007). In our study, we employed the value chain approach to analyse the street food vending enterprise and its viability in a rural town. The street food value chain stages are shown in **figure 1** from procurement of inputs, transportation, storage, processing or preparing, to serving, cleaning, and consumption at the point of sale.

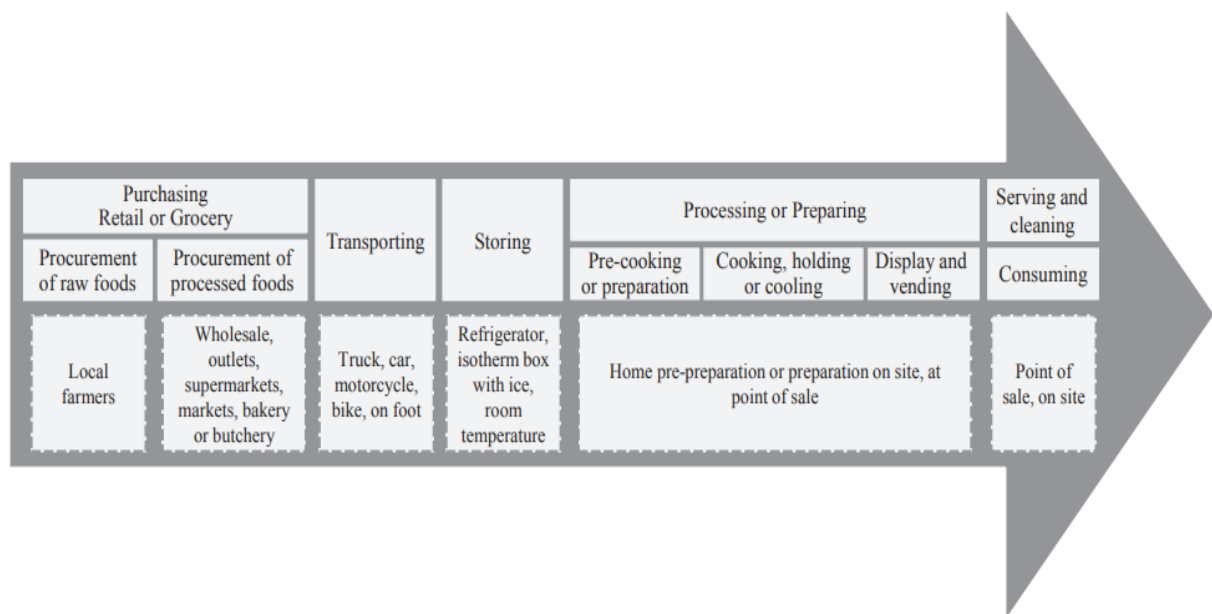


Figure 1: Stages of the street food value chain

2.3.2 Importance of value chain analysis

Value chain analysis is helpful in analysing policy, technical interventions, and industrial reorganisation. The analysis evaluates the flows of goods, information, and finance through the various stages of the chain to detect problems and to identify opportunities to improve the contribution of specific actors and the chain's overall performance (Akenbor & Okoye, 2011; Cavalli, et al., 2016; Cortese, Veiros, Feldman, Jordaan & Grové, 2014). Coordinating individual parts of the chain and identifying governance at each stage facilitate the formation and strengthening of value-added activities. This creates conditions to improve customer satisfaction, particularly cost-efficiency, quality, and delivery. A firm that performs the value chain activities more efficiently and at a lower cost than its competitors will gain a competitive advantage (Akenbor & Okoye, 2011; Drury, 2008).

Porter maintains that a value chain is appropriate for analysing a firm's business unit activities. Value chains are more complex in the real world and focus on systems and how inputs are changed into the outputs purchased by consumers (Kaplinsky *et al.*, 2002).

Value chain mapping is considered a standard research and analysis tool to explain and understand a product's processes before reaching the final consumer. One of the methods used to map a value chain is the flow chart (Akenbor & Okoye, 2011; Cortese, Veiros, Feldman, Cavalli, et al., 2016; Donovan et al., 2015; Jaligot et al., 2016; Kaplinsky et al., 2002). A flow chart is an accessible tool for demonstrating the stages in a product's value

chain until it reaches the final consumer. Cortese et al. (2016) have provided a theoretical framework of the value chain for explaining the formation of inter-company value chain relationships. Their study described street food vending activities encompassing purchasing, transportation, storing and the processing needed where service is rendered to the customers in the form of food on a plate.

While researchers have shown the importance of value chain analysis in recent years, Donovan et al. (2015) noted initiatives in which different producers and marketing businesses work within their businesses to pursue one or more end markets. The approach tests governments and civil society to look past individual actors, such as smallholders or cooperatives, when considering achieving development goals. By focusing on the value chain and the links between the actors spread along it, development interventions can identify common problems among actors in the chain and solutions that generate win-win outcomes. Improved chain relations and overall chain performance are expected to yield tangible benefits in terms of economic performance and, in some cases, poverty reduction (Donovan et al., 2015).

From a policy perspective, this heterogeneity suggests that a critical starting point in value chain analysis must be understanding the informal sector's nature and components. Moreover, the look into the value chain should consider numerous dimensions of informal-sector interactions, dynamics, and constraints (Skinner, 2019). In so doing, gaps become evident and form the basis for establishing priorities for action (Akenbor & Okoye, 2011). The potential to include medium and large-scale businesses as active partners in the value chain offers development agencies opportunities for achieving outcomes at a greater scale, with potentially increased impact and sustainability.

Studies (Alimi, 2016b; Cortese, Veiros, Feldman, Cavalli, et al., 2016; Donovan et al., 2015) have highlighted that street food trading solves major social and economic problems in developing countries by providing ready-made meals at relatively low prices and employment for teeming rural and urban populace along its value chain. Because of the nature of the street food enterprise and its informality, its activities are unregulated (Birgen et al., 2020; Harianto & Ardani, 2021; Imathiu, 2017). Moreover, Ukenna & Ayodele (2019) suggest that the street food market could be construed as the interaction between the vendor and consumer, meaning that there are two sides to the street food enterprise – the supplier-vendor-market side and the consumer. As the interlinkages of these role players in the street food enterprise are not well researched, studies have recommended using value chain analysis to assess the competitiveness (Cortese, Veiros, Feldman, & Cavalli, 2016),

and roles played (Donovan et al., 2015; Husain et al., 2015) by relevant players in the street food enterprise.

Various studies have been conducted on agriculture value chain analysis to help advance poor farmers' livelihoods (Kaplinsky and Morris, 2001; Trienekens, 2011). These studies have used Porter's Value Chain Analysis (1985, 1990) and Womack and Jones (1996). Again, Kaplinsky and Morris (2001) have noted that the value chain could highlight enterprise activities required to bring service from its initial phases through the different stages of production and delivery to final consumers. Using each step or linking of the value chain could highlight input sources, a process of value addition, and selling the material to the following link in the chain. Each step adds value to the product and often generates more revenue than the previous step.

The United Nations (UN) estimates that one-third of the food produced globally for human consumption is lost or wasted along the value and supply chain. While these numbers may be higher in Africa, it is prudent to note that food wastage is lower than in any other continent. Large and established food producers sometimes have laws and regulations to meet the FAO standard of food production for human consumption (FAO/WHO, 2017). Thus, the value chain approach has been identified as essential for market opportunity benefits for Medium and Small Enterprises (MSEs) by ensuring an enabling environment and increasing access to necessary resources (Osei-Mensah et al., 2016).

2.3.3 Value chain studies in South Africa

In South Africa, the value chain has been used widely in agriculture to improve the livelihoods of impoverished farmers (Barr, 2019; Grany, Senyolo, Wale & Gerald, & Ortmann, 2018; Jordaan, Grové, & Backeberg, 2014). Although national-level policies appear to be aligned, studies have shown the costs of edible food wastage throughout the food value chain, from agricultural production to household consumption (Nahman & de Lange, 2013), with Drimie (2016) pointing to the lack of coherence in several South African food and agriculture policies. Kroll (2016) has noted that prices and food convenience drive the population to source food from the informal channels in South Africa, suggesting that cheap food such as grain and chicken are sourced mainly from informal vendors. This has shaped the foodways of the poor in the country. By contrast, Oguttu, McCrindle, Makita, and Grace (2014) highlighted a weak link between the formal and the informal market. However, their study indicated that authorities had been involved in the value chain of informal trading between the two markets, something not available in other types of value chains (Oguttu et al., 2014).

In the Limpopo province, Senyolo, Wale, & Ortmann (2018) noted weak relationships between value chain actors in value chain analyses of African leafy vegetables. Their study showed that despite the challenges of smallholder farmers, such as lack of technical advice on production, packaging, and processing services, poor infrastructure, deficiency of contractual agreements between actors, and lack of access to finance, smallholder farmers nevertheless attained high gross margins. Masegela (2019) suggested that value chain analysts, policymakers, extension workers, and other stakeholders should assist in ensuring that food value chain relationships are established so that smallholder enterprises can create market opportunities. Furthermore, educational schools should be introduced in rural areas where agricultural practices are dominant. Small-scale farmers can be taught basic skills in agricultural production at these schools. Training should also be given to farmers on technology as it can potentially assist in making production more efficient.

Studies have identified substantial gains from intra-regional trade in agro-processing products. South Africa has been identified as a critical driver of regional value chains (Jensen and Sandrey, 2015). According to Petersen et al. (2018), street food enterprises in South Africa make an essential contribution toward local food demands serving their population. However, there are concerns regarding informal business operations, their model for competitiveness, and the absence of standards to regulate their businesses (Mathualula et al., 2016). At the same time, street food serves as a base for the pyramid of the market structure serving semi-urban consumers ready-to-eat food at an affordable price at their convenience (Cortese, Veiros, Feldman, & Cavalli, 2016).

Alimi (2016) has described the street food vendors' social and economic problems, such as poor infrastructure, interaction with relevant authorities, and lack of financial support. These challenges pressure governments and civil society to look beyond individual actors (Meshram & Meshram, 2010). To improve the performance of the street food enterprise, the focus should shift to the value chain and the links between the actors spread along it. Developing interventions can identify common problems among actors in the chain and generate better outcomes. Improved chain relations and overall chain performance are expected to yield tangible benefits in terms of economic performance while reducing the poverty rate (Albuquerque et al., 2019; Donovan et al., 2015).

2.3.4 Competitiveness

Companies with good results face increasing complexity and more complicated development conditions. These conditions include increased aggressiveness and so-called corporate unrest, dynamics of globalisation, new requirements, intense competition, and rapid technological progress (Kuzminski et al., 2020). For companies to be successful, they

need to use their real capital and finance and analyse their environment for better operation (Eskandari, Miri, Gholami, & Nia., 2015). Moreover, growing companies constantly evolve, adapting the organisation's functions, goals, tasks, and management methods to changing business conditions. Competitiveness is a specific local condition such as low wages, stable unit labour costs, a balanced budget, and a competitive exchange rate to support a current account surplus (Eskandari et al., 2015; Öz, 2019; Porter, 1990).

Competitiveness is defined as achieving a high standard of living through productivity growth in the new global environment where knowledge is critical (Lee & Karpova, 2018). A second definition (Barr, 2019) views competitiveness as the ability of the industry to sustain the business through trade amidst a changing agricultural, political, social, environmental, governance, and production landscape and an unpredictable exchange rate while consistently earning at least the opportunity cost of resources employed. These two definitions highlight the essence of a company's competitiveness, implying the ability to pursue its objectives efficiently in the competitive market. Thus, the competitiveness of an enterprise can be understood as a useful feature of the enterprise playing an essential role in formulating the enterprise development strategy.

According to Kuzminski et al. (2020), the key task of managing a company is to ensure it is competitive. Furthermore, to have the desired level of competitiveness in a company, company activities should be systematically planned, implemented accordingly, and have control measures. Ahmedova (2015) suggests that enterprise competitiveness should consist of the product's financial positioning and the organisation's efficiency and competitiveness in restructuring the sales and demands stimulations. Competitiveness underpins wealth creation and economic performance (Barr, 2019; Eskandari et al., 2015; Roever, 2014).

Competitiveness is driven by the need to understand an industry's positioning compared to its competitors and provides insight into growth trends (Barr 2019). Moreover, efforts should be made to study respondents' opinions around market forces and business prospects, suggesting the constraining and enhancing factors across the value chain and measures to improve performances. Porter's Diamond Model explains the competitive measures whereby six attributes could be used to explain the company's competitiveness. The model is a business management concept that identifies problems and opportunities facing different businesses (Porter, 1990a).

There is consensus that the industry's low entry costs and flexible hours make street food enterprises attractive to poor women (Bamhu, 2019). Studies by FAO (2003) have also

indicated that the street food enterprise often maintains the rural sector by providing informal food trade of raw materials at low cost. However, unstable conditions in the informal enterprise, and the lack of proper coordination as guided by policies, make it challenging for street vendors and authorities to be competitive. FAO (2003) highlighted that, given the importance of street food in society, a better understanding of street food vendors in different settings is necessary, especially regarding street food availability, nutritional value, and purchase and consumption patterns. To achieve the competitiveness of an enterprise, Porter's model suggests six attributes that could be used to improve enterprise performance (Figure 2).

2.4 Conceptual framework of the study: Porter's Diamond Model

Michael E. Porter, an American theorist, originated the Diamond Theory of national advantage in 1990 (Vlados, 2019). The aim of the Diamond Theory, also called Porter's Diamond, was to explain how a nation can achieve competitive advantage because of certain factors available to them and how governments can play a role in facilitating a country's improvement in the global competitive economic environment (Porter, 1990). The diamond of national competitiveness answers the question (Porter, 1990). According to Porter (1990), competitiveness lies in four broad criteria or attributes that shape the environment in which firms or industries compete. The model was built on the following four attributes: Factor conditions, Demand conditions, Firm strategy, structure, and rivalry, and Related and Supporting industries. Two factors were added to the Diamond Model: Chance and Government. Chance condition events have little to do with circumstances in a nation and are often outside the power or influence of an industry (or government).

We present the Porter Diamond Model in Figure , and detail its attributes in the following sections.

2.4.1 Factor condition

Factor conditions refer to the nation's position in production, the level of natural resources, and the production costs such as the price of variable inputs (labour, machinery, fuel), infrastructure, as well as knowledge resources. The Factors condition is regarded as a nation's position in factors of production, which highlights the need for skilled labour or infrastructure necessary to compete in each industry. Porter (1990) indicated that these critical factors of production are created, not inherited. The infrastructure component of factor production has been identified as an obstacle to the street food enterprise (Jaishankar & Sujatha, 2016). Street food vendors offer goods and services for sale but do not have permanent built-up structures to satisfy the demands of their customers.

The lack of the skilled labour component of factor production is a different inhibitor of the competitiveness of street food vendors. Although many street food vendors have completed elementary years of schooling or attained some level of secondary schooling (Cortese, Veiros, Feldman, & Cavalli, 2016), they have not received training in business and managerial skills. Higher education achievement has been associated with a positive effect on income generation. In South Africa, studies conducted in rural areas such as Limpopo noted that street food vendors with some high school educational achievement had shown better performance in their enterprises and showed improvements in managing their businesses. Although street food vendors with fewer education skills establish these enterprises, their businesses do not last as long as they have poor managerial skills (Chauke, Munzhelele, & Maiwashe, 2015; Mathaulula, Francis, & Mwale, 2015).

2.4.2 Demand condition

Demand conditions are based on the nature of domestic demand for an industry's product or service (Benzaghta et al., 2021). Such conditions involve the effects of domestic composition, demand size, growth patterns, and the interplay of demand conditions (Porter, 1990). The fact that markets demand high-quality products and proximity enables companies or industries to identify their customers' desires and wishes better.

2.4.3 Related and supporting industries

This attribute refers to the presence or absence of suppliers and related industries that are internationally competitive. Porter (1990) explains that a set of robust, related, and supporting industries is essential to the competitiveness of firms or industries. These industries include input and service suppliers and the level of skilled labour available to the industry. Porter supports the idea that the presence of related competitive industries can often create new ones. Related industries are those in which firms can coordinate or share activities in the value chain when competing or involve complementary products such as computers and applications software.

2.4.4 Firm strategy, structure, and rivalry

This attribute relates to the national conditions that lead to how companies and businesses are created and organised, and the nature of their domestic rivalry (Jafta, 2014). According to Porter (1990), it is based on the structure of firm management styles that vary among businesses. Some countries could be oriented toward a style of organisation. He claims that national circumstances affect the strategy and structure of domestic firms, how firms are managed, their goals, and how they choose to compete. He posits four distinct categories of goals: company goals, goals of individuals, the influence of national

prestige/priority on goals, and the goals of firms and individuals reflected, for example, in the pledge of capital and human resources to industry, firm, employees, or profession.

2.4.5 Chance factors

The Chance attribute is an additional factor influencing the diamond's four pillars (Mashabela, 2007). Porter argues that appropriate government responsibility should be an enabler to boost businesses to increase their targets and improve competitive performance (Porter 1990). As revealed by Porter's Diamond Model, chance includes new inventions and technologies such as biotechnology, shifts in the financial market, decisions of foreign governments, and wars. The industry's ability to respond to issues of chance depends on the status of the other parts of the competitive diamond.

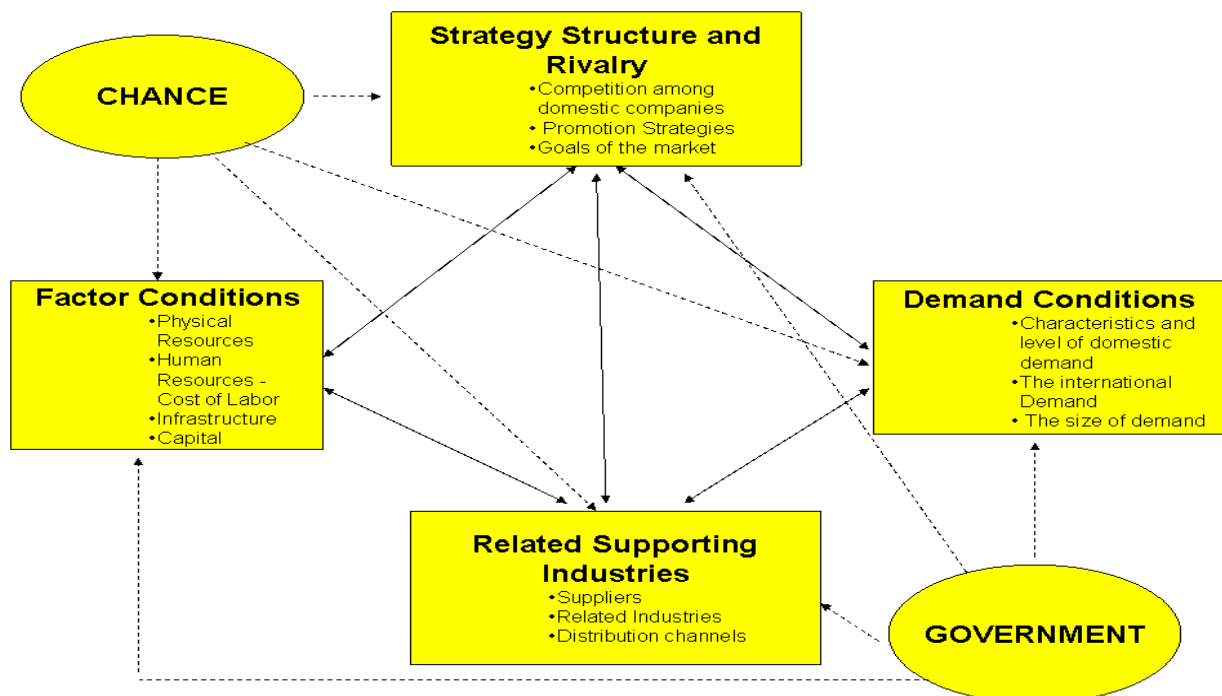


Figure 2: Porter's Diamond Model of Competitiveness (Porter, 1990)

2.4.6 Role of Government

The government is supposed to play a significant role in the international competitiveness of its country or industries. It can influence each of the above attributes or determinants, either positively or negatively, through its policies and operational capacity. The role of the government is to make sure that people live in a conducive environment and ensure economic stability (Garg & Phaahla, 2018; Porter, 1990a; Tallontire et al., 2011).

Although the government of South Africa can draw on rich evidence of street trading policy and regulations (Skinner, 2016b), unstable conditions and a lack of policies and guidelines make it difficult for the authorities to support informal enterprises (Hill et al., 2019b, Munyaradzi 2012; Resnick, 2019). Street food vendors without documentation are forced to relocate their selling sites due to the nature of their businesses. This suggests the use of exclusionary practices as evident in evictions of street food vendors in cities across the global South (WIEGO, 2009) and Africa, including in Cairo, Harare, Johannesburg, Lagos, and Luanda. Street food vendors' livelihood is threatened by their work's legal, physical, and environmental challenges. In some countries, street food vendors who operate without documentation face forced removal from the street and confiscation of their merchandise (Khairuzzaman, Chowdhury, Zaman, Al Mamun, & Bari, 2014).

Moreover, Porter (1990a) suggests that governments can affect factor conditions through subsidies, policies oriented toward capital markets and policies for education. Its role in shaping local demand conditions is usually more subtle. The government should identify and develop economies by building the necessary infrastructure and facilitating access to funding. The government acts as a helper in Porter's model, encouraging firms to become viable and creating an environment that empowers firms to increase productivity and become more competitive by improving the infrastructure and investing in specialised education and engineering (Kalaba & Henneberry, 2001).

The government's role has been viewed in terms of its impact on determinants of competitiveness other than independent determinants (Benzaghta et al., 2021). According to Porter's Diamond Model, the government's appropriate responsibility is to be an enabler, to boost businesses to increase their targets and improve competitive performance. The inherent measure of competitiveness belongs to entrepreneurs; government only provides the environment for businesses to thrive. Notably, national governments act as carriers that establish product standards at the local level or regulations that direct buyers' needs and may also be significant buyers of many products in a nation. In this context, a government can reshape the conditions under which related or supporting industries operate, such as control of advertising media or regulation of supporting services. Finally, governmental policy can affect the structure and strategy of firms through measures and mechanisms such as capital market regulations, tax policy, and antitrust laws.

2.4.7 Application of the Porter's Diamond Model

As previously described, Porter(1990) identified six competitiveness attributes and stated that competitive advantage is created and sustained through a highly localised process. Moreover, differences in a country, region, or industry's economic structures, values,

cultures and institutions affect its competitiveness and traditional notions of resource endowments and factor prices. Furthermore, theory suggests that it is critical to know which factors affect the competitive advantage of the firms within the industries. Porter's Diamond highlights the four "pillars" that determine the competitiveness of an industry or sector: Factor conditions, Firm structure and strategy, Demand conditions, and Related and supporting industries. Chance factors and the Government are auxiliary factors that influence the four pillars of the diamond (Ahmedova, 2015; Lee & Karpova, 2018). The Porter Model is illustrated in Figure 2.

Lee & Karpova (2018) and Vladoš (2019) have criticised Porter for some of the judgments of what is important for competitiveness. However, the diamond remains a widely used framework for analysing the resources and constraints that influence industry competitiveness. Porter (1998) proposed that the diamond must be considered a system in which all corners interact. Competitive advantage cannot be obtained if only one corner of the diamond is favourable and the others do not enhance this source of competitive advantage. Similarly, the two external factors affect each of the diamond's four determinants differently. Consequently, when using the framework, it is necessary to analyse the effect of the determinants and consider their interactions with the other corners and the external factors.

A fundamental assumption within Porter's framework is that growth and relative productivity will determine an industry's long-term sustainability (Ndou, 2012). Each point on the diamond, and the diamond as a system, affects essential ingredients for achieving international competitive success (Barr, 2019). Such ingredients include the following: First, resources and skills necessary for competitive advantage in an industry; second, information that forms the opportunities that companies perceive; third, directions in which companies position their resources and skills; fourth, goals of the owners, managers, and individuals in companies; and fifth, pressure on companies to invest and innovate. Porter's Diamond Model (Porter, 1990b) has been widely used in South Africa (Garg & Phaahla, 2018; Jafta, 2014; Mbatha & Mastamet-Mason, 2015; Perez et al., 2019; Roever, 2014), including in the Vhembe District (Maele et al., 2015; Meshram & Meshram, 2010; Nesamvuni et al., 2014, 2017). However, attention has been focused on developing commercial plans for large firms, small and medium businesses, and small businesses, providing little, if any, attention to the competitive advantages of micro-businesses (Meshram & Meshram, 2010), such as street food vending.

2.5 Summary

This chapter presented the definition of street food and street vendors and outlined the street vendors' profiles. Moreover, the chapter provided an overview of the international and local street food enterprise and outlined nutritional contributions with a focus on the types of food sold on the street, macronutrients, and the dietary diversity of foods sold on the street. Furthermore, the conceptual framework used in the study outlining the Value chain and Porter's Diamond Model of Competitiveness were discussed.

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3.1 Introduction

The aim of this study was to develop an agricultural food enterprise model for rural towns in the Vhembe District, Limpopo Province. This chapter introduces the methodology used to develop the model. It includes the study design, study area and population, measurements, data collection procedures and management, pilot study, statistical analysis, and ethical considerations.

3.2 Study design

A cross-sectional design using a mixed methods approach was applied, where both quantitative and qualitative methods were used. The mixed method approach was chosen to better understand the research phenomena than when only one research approach is used (Creswell, 2005). The limitations of one method are effectively complemented by the strengths of the other method (Creswell & Creswell, 2018; McKim, 2017; Fetters, Curry, & Creswell, 2013; O'Cathain et al., 2010; Creswell & Clarke, 2007). The synergy between these two methods was obtained by adopting the post-positivist and constructivist paradigms from the four prominent paradigms described by Guba in 1994.

The positivist position is grounded in the theoretical belief that an objective reality can be known if correct methods are used and applied correctly. Typically, post-positivism guides the quantitative research approach and underlies the natural-scientific method in human behavioural research (Gorard, 2015). The researcher opted for this paradigm as the methods, techniques, and procedures used in the natural sciences offer the best framework for investigating the social world (Chilisa & Kawulich, 2012). However, this approach limits research to what we can observe and measure objectively independently of the feelings and opinions of individuals (Welman *et al.*, 2005). By contrast, the constructivist paradigm guided the qualitative approach in this study. Constructivists view reality as being socially constructed and hold that there are multiple realities. In this approach, knowledge is independent and idiographic, and the truth depends on context (Creswell & Creswell, 2018). This paradigm is value-laden and emphasises that values influence how we think and behave and what we find necessary. Therefore, this approach assisted in exploring the participants' thinking and behaviour to understand their underlying reasons, opinions, and motivations.

The mixed method design was convergent parallel, where quantitative and qualitative data collection and analyses were done simultaneously (Bowen et al., 2017; Creswell et al., 2004) and merged (Creswell, 2015; Fetters et al., 2013). The quantitative data were collected using a survey research design. A descriptive design was chosen to observe and analyze data with no intention of immediate action (Creswell & Creswell, 2018). Characteristics of the street food enterprise in rural towns in the Vhembe District using Porter's Model of Competitiveness to determine the competitiveness of the street food enterprise. On the other hand, the qualitative data were collected using in-depth interviews. Quantitative research was further used to quantify the qualitative data of the street food vendors, their opinions, behaviors, and other defined variables by generating numerical data that was transformed into usable statistics (Creswell & Creswell, 2018).

3.3 Study area and population

The area of study was the Vhembe District in the Limpopo province of South Africa. The Limpopo province has the highest number of street food vendors, mainly concentrated in the Vhembe District. The Vhembe District consists of four local municipalities: Makhado, Thulamela, Musina, and Collins Chabane (Figure 3.1). Botswana in the west, Zimbabwe in the north, and Mozambique share the borders. The district covers an area of 21,402 square kilometres of mostly rural land. The province is the former homeland. Hence, its large proportion are the rural settlements. About a third of South Africans live in rural settlements (Stats SA, 2020). However, there are also cities and towns in the region, where poverty and hunger challenges have led many people to the cooked street foods enterprises.

The Vhembe District draws special attention in the province because of a high increase in cooked street foods enterprises (Chauke et al., 2015; Mchiza et al., 2014; Mushaisano Agnes Mathaulula, 2020). The informal sector in South Africa contributes 8% of the country's GDP and supports 27% of all working people. Most street food vendors are found in public places such as taxi ranks and the road (Louis & Mathew, 2020; Mathaulula et al., 2015). Due to the high level of unemployment and poverty, inhabitants of the district have developed survival strategies, including the street food vending enterprise at major trading points within the local municipalities of the towns of Makhado, Thohoyandou, and Musina. The district has an estimated population of 1.2 million. About 48% of the Vhembe District population resides in the Thulamela municipality, with women contributing 55% of the population compared to Musina and Makhado (Stats SA, 2020).

The study population was street food vendors in three cities: Makhado, Musina and Thohoyandou. The study was conducted from July to September 2019 in the rural towns of the Vhembe District, the northern-most district of Limpopo Province in South Africa.

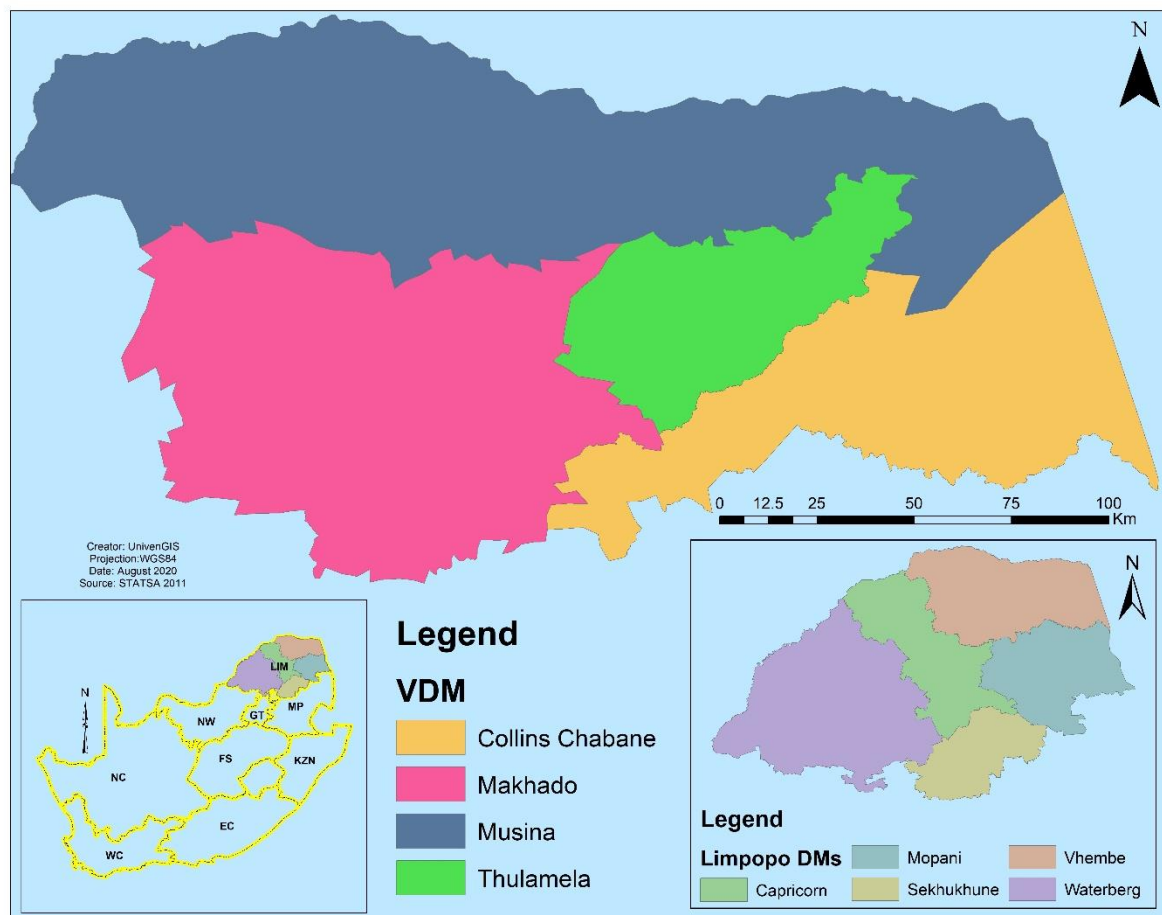


Figure 3.1 Map showing the location of the study area

3.4 Quantitative research approach

The following sections will discuss quantitative methods used in this study. The section will discuss the sampling technique used, inclusion and exclusion criteria followed, development of the research instrument, training of the field workers, data collection and management, pilot study, validity and reliability, and statistical data analysis.

3.4.1 Sampling technique

Due to the lack of records of street vendors from the municipalities in the Makhado, Musina, and Thohoyandou towns, it became impossible to generate a sampling frame of street food vendors. Hence, the sample size was determined based on Yamane's formula of the year 1969 [42]. The formula states that at the significance level of 90%, the minimum sample size

for the unknown population is 100. Thus, the researcher used a non-probability convenience approach to recruit 528 street food vendors for interviews. However, due to attrition, 511 was considered for this study. The street food vendors were reached from the taxi ranks, along the main roads, industrial areas, malls, schools, and between streets in the residential areas. The researcher established and maintained a complete list of the primary unit component from the Vhembe District's municipalities.

3.4.2 Inclusion and exclusion criteria

Street food vendors eligible for inclusion in the study were 18 years old and above. The street vendors selling raw food, such as fruits and vegetables, were stakeholders/suppliers and, therefore, excluded from the study.

3.4.3 Development of the research instrument

A questionnaire (Appendix 1) was developed guided by the objectives of the study and the related literature comprised the following sections: Section A on socio-demographic characteristics; Section B on operational characteristics and information of the enterprise; Section C on business input information; Section D on nutritional contribution and reverse analysis of the street food; Section E on enterprise infrastructure; Section F on multistakeholder information; Section G on street food vendors' perceptions of enterprise competitiveness using a five-point Likert-type scale; and Section H on the street food vendors' perceived challenges and proposed solutions for the enterprise.

3.4.4 Training of research assistants

Nine trained research assistants assisted in administering the questionnaires using the local languages of Tshivenda, and English, where necessary. Training of research assistants was conducted over two days. The researcher prepared a questionnaire and arranged for the two-day training. During the training, research assistants were provided with a question to follow when discussing how to ask and administer. Research assistants were given a chance to interview each other during the training and day of the training researcher had a chance to observe each research assistant interview one vendor not part of the pilot and the main study.

3.4.5 Data collection and management

The trained fieldworkers administered the questionnaire. For quality assurance, the researcher reviewed questionnaires for inconsistencies, missing information, and wording of the open-ended information upon receipt of the data from the field. The questionnaires were

completed daily and stored in the researcher's office in a locker accessible by the researcher only. Data were verified for completeness and sent to the University of the Free State for analysis. A statistician created a common spreadsheet for data capturing, cleaning, and analysis. Upon completion of data entry, cleaned data were transferred to SPSS version 27 for analysis.

3.4.6 Pilot study

A pilot study refers to the first step of the entire research protocol and is often a smaller-sized study assisting in planning and modifying the main study (Fraser et al., 2018). The pilot study was conducted in Sibasa town 5 kilometers from Thohoyandou. The data collection instrument was piloted using 50 street food vendors before it was administered to the bigger population. The instrument was adjusted based on the answers to the questionnaire in the pilot study. Questions were simplified to avoid ambiguity.

3.4.7 Validity and reliability

Validity is the extent to which a test measures what it is intended to measure. It is the extent to which the research findings accurately represent what is happening in the situation (Robert et al., 2009). As there were no established measuring instruments on the constructs of the study, the researcher ensured the validity of the questionnaires constructed for the study as follows: the content and face validity of the quantitative research instrument was addressed by consulting the research literature for guidance, by seeking expert input, and by conducting pilot testing. Local languages were used for data collection and interviews to ease understanding and minimize errors. The pilot study was used to test the instrument and determine foods sold mainly by street vendors in the local area. Furthermore, a research proposal was presented to the Centre for Sustainable Agriculture at the Free State University for expert opinion.

Anorlde et al. (2012) determine reliability as the extent to which a technique repeatedly applied to the same object will yield the same results each time. Thus, reliability tests the extent to which the results of an instrument are consistent over time, accurately represent the actual situation under study, and can be reproduced under the same circumstances (Golafshani, 2003). In the study, the participants were repeatedly asked questions to test their understanding of what the questions required. The questions were clear, short, precise, and open-ended. Furthermore, several questions were used in the study to increase the reliability. The researcher aimed at a high number of participants as the high response of the study sample increases the study's reliability. Finally, the study was conducted in different areas of the Vhembe District to increase the study's credibility.

3.4.8 Statistical data analysis

Two trained data capturers were tasked with capturing the data into an Excel spreadsheet. The researcher double-checked the entries before the data analysis. Statistical Package for Social Sciences (SPSS) version 27 was used to analyse the data and summarize the findings. Open-ended questions forming part of the quantitative phase of the study were converted into categorical variables. Where appropriate, categories containing similar variables were collapsed to reduce the number of variables related to each open-ended question. The mean of observations falling within each response category was calculated to determine factors. The data were summarised and discussed based on objective interpretations.

Means and standard deviations were computed for continuous variables such as participant age, income, and years working as a street vendor, hours spent working, cost and quantities of inputs, plate prices, and total profit of the business. Pearson's correlations were used for the associations between continuous variables. Frequency distributions were calculated for categorical variables and Chi-square tests were used to determine the relationship between categorical variables.

In the case of skewed data, the median and interquartile range were calculated. The test of the four a priori hypothesis was assessed to characterise the operations of the street food vendors in terms of their background characteristics. Chi-square tests were conducted between four categorical variables (gender, age, marital status, and citizenship) and operational characteristics. P-values were considered significant at $p < 0.05$. However, a Bonferroni adjustment decreased the significant value to $p < 0.013$.

We identified six food plates sold in the Vhembe District and analysed their macronutrient composition. The six dishes' median energy and macronutrient content were compared to the Recommended Daily Allowance (RDA) (Wolmarans et al., 2010). The comparison (testing for static differences) was between each plate and the pooled macronutrient across all six plates (i.e., one plate compared to an 'average' plate). The comparisons are based on a non-parametric Wilcoxon test. Statistical significance was set at $p < 0.05$. Analysis was performed using the R software package version (R Foundation for Statistical Computing, 2021) and SPSS statistics version 27 software package.

3.5 Qualitative research approach

This study used the qualitative approach to answer Objective 4 (vendors' perceptions of competitiveness) and Objective 6 (perceived challenges and proposed solutions). Objective 6 intended to determine the value chain linkages and relationships of the role players in the street food value chain. In-depth interviews were used to collect the data. The information on the vendors' motivation for establishing the street food enterprise reported elsewhere was also collected. Below is a discussion of the sampling technique and establishing trustworthiness in qualitative research.

3.5.1 Sampling technique

Convenience sampling was used to select the 55 street food vendors from the 511 participants in the quantitative sampling between July and September 2019. Selected street food vendors were distributed as Musina ($n=16$, 29%), Thohoyandou ($n=22$; 40%), and Makhado ($n=17$, 31%). Data were collected at the site while street food vendors were busy with their business activities. When customers needed assistance, street food vendors were given a chance to assist them so that our data collection would not disturb their business operation.

3.5.2 Establishing trustworthiness in a qualitative study

Nowell et al. (2017) recommend that for a qualitative study to be valid and reliable, the following concepts of trustworthiness should be considered: credibility, transferability, dependability, and conformability. The trustworthiness criteria are explained in the context of the current study to ensure the validity and reliability of the scores of the measures.

3.5.2.1 Credibility

Credibility is how confident the qualitative researcher is in the truth of the research study's findings (Busetto et al., 2020). To ensure credibility, the researcher described and explained

the setting, the participants, and the themes of the study in detail. Face-to-face interviews were used to collect information from the participants. Moreover, probing was done to ensure quality responses and to stimulate discussion between the interviewer and the participant. Triangulation of data also ensured the credibility of the findings. Quantitative data on perception was also confirmed with qualitative data collected on perceived challenges.

3.5.2.2 Transferability

Transferability refers to how the qualitative researcher demonstrates that the research study's findings apply to other contexts, for example, similar situations, populations, and phenomena. Street food vendors in the appropriate locations in different towns were approached and interviewed. We described the sampling methods of the current study to explain how participants were selected. Moreover, Lincoln and Guba (1985) indicated that transferability is external validity, and the findings described in one study apply to theory, practice, and future research findings in other contexts. In-depth interviews with several participants were employed, and a large sample size was used to improve transferability. In addition, a mixed-methods approach was used. Transferability was strengthened by providing a clear and detailed description of the context and culture, participants' selection and characteristics, and data collection and analysis (Creswell & Creswell, 2018).

3.5.2.3 Dependability

The study's dependability is the extent to which other researchers could repeat the study with consistent findings. In the current study, the researcher established an audit inquiry from proposal development at the beginning of the investigation. External researchers ensured an inquiry audit and frequent meetings with supervisors and colleagues in the Department of Nutrition for professional contribution to this study. The research proposal was presented at the Center for Sustainable Agriculture of the University of Free State and the University of Venda. The research protocols were submitted to various committees of the University of the Free State to ensure that all procedures for research were followed. The literature sources helped to build a strong reference for the study. Moreover, the promoters, statisticians, fieldworkers, and fellow researchers reviewed and examined the research process and data analysis to ensure that the findings were consistent and of good quality. Participants were asked questions more than once to ensure they understood them correctly.

3.5.2.4 Confirmability

Confirmability is the degree of neutrality in the research study's findings (Busetto et al., 2020). The research findings were based on the participants' interview responses and the views of the researcher or the research assistant. The researchers established an audit trail at the beginning of the research study. We used an audit trail to assist in the documentation of necessary steps during the data analysis to provide the rationale for the decisions to be made in the study. In this way, the findings of the study were portrayed accurately.

3.5.1 Qualitative data collection

The data collection section will be discussed in terms of the instrument used and the procedure followed.

3.5.1.1 The instrument

Data was collected using a semi-structured interview guide (Turner, 2010) (Appendix 2). The interview guide consisted of demographic information (age, gender, race/ethnicity, and country of birth) and two main open-ended questions, which were,

- (i) "What do you think are the challenges affecting your business?" and
- (ii) "What do you think are the possible solutions to your identified problems?"

After that, the guide was developed in English and translated into the local language (Tshivenda) to use both languages anticipating low literacy amongst the nationals and foreign language-speaking participants. Back translation was done by two different people independent of the researcher to ensure that the meaning was retained.

3.5.1.2 The procedure

The researcher and research assistants conducted the interviews. The interviews were conducted using the Tshivenda and English for Tshivenda-speaking and foreign-language-speaking participants, respectively. The researcher asked the questions and did the probing. The participants were encouraged to voice out solutions or insights to the problems they raised (Fetters et al., 2013). Two research assistants made notes of responses using respective open-ended checklists in the Tshivenda and English languages. The duration of the interviews per participant was approximately 30 minutes.

3.5.1.3 Qualitative data analysis

The data from the interviews went through an inductive thematic analysis process, whereby key initial themes were identified, and a preliminary codebook was developed in Excel

(Busetto et al., 2020). The codes were developed from the narrative of the participant. The researcher open-coded the transcript based on the initial codebook to identify common responses to the study research question. Based on extensive discussions among the researchers, initial codes were refined and applied to the data. The codes that emerged from the data were continually added to the codebook for the iterative coding process (Creswell & Creswell, 2018). To ensure transparency and consistency in data analysis, the researcher invited an independent coder to select and check random sub-samples of the transcripts (Creswell & Creswell, 2018). After that, revisions and code queries were resolved in discussions among the team members. Multiple street food vendors informed the final themes and sub-themes, conveying similar sentiments and statements that informed data saturation (Busetto et al., 2020; Creswell & Creswell, 2018). This way, themes were narratively summarised and supported using illustrative quotes from selected street food vendors.

There are various ways of doing content analysis in qualitative research. In the current study, the six thematic phases of Braun & Clarke's (2006) were used to analyse the qualitative results of the study.

- First, the researcher engaged with the data to check the quality of the collected data from the field notes on the questionnaire. Documentation of thoughts was established from the beginning of in-depth interviews and marked the beginning of data analysis. Patterns were therefore established. This was the first phase of the analysis.
- Second, themes were organised to make sense of the findings systematically. Preliminary specific codes were identified that were later grouped to indicate the context of the conversation.
- Third, the researcher examined codes and checked their fit with identified themes. Relevant data extracts were sorted according to overarching themes. The researcher's thought process alluded to the relationship between codes, subthemes, and themes. In this phase, codes were organised into broader themes that described the research question.
- Fourth, a deeper review of identified themes followed where similar themes were combined and refined, creating new themes. The coherence of data within themes was checked for meaning and clarity. Again, we checked identifiable distinctions between themes in relation to extracted codes from phase 1 and phase 2. A thematic 'map' was therefore generated from this step.
- In the fifth phase, the researcher defined and named the themes to identify the essence of each theme (Braun & Clarke, 2006). Analysis continued to enhance the

identified themes further. The researcher provided theme names and clear working definitions that captured the essence of each theme in a concise and punchy manner. A unified data story emerged from the themes. Lastly, the researcher transformed the analysis into an interpretable work in the sixth phase. Vivid and compelling examples of themes, research questions, and literature were used.

- Finally, the researcher transformed the analysis into an interpretable piece of writing by using vivid and compelling examples relating to the themes, research questions, and literature. The themes were described and portrayed by presenting empirical evidence to support the analysis and answer the associated research question.

3.6 Model development

This section will discuss the method followed in developing the agricultural food enterprise model suitable for rural South African towns. A value chain analysis of the foods sold in the street of the Vhembe District towns was conducted. In this study, the value chain analysis commenced from the input suppliers to end-users. A detailed account of the value chain is contained in chapter 7. A six steps value chain analysis was used for the competitiveness of street food vendors (Kaplinksky et al., 2002) as follows:

- Step 1: Describe and define the product.
- Step 2: Identifying actors or players.
- Step 3: Mapping significant processing steps.
- Step 4: Mapping the value chain.
- Step 5: Analysing market margin share.

After step 5, the participants' perceptions on the street food vending enterprise competitiveness were determined using the PDM (chapter 8). The PDM has become a generally accepted and frequently used model for providing a systematic and disciplined perspective in the context of competition strategies, promoting the creation of a value chain on a sectorial basis, and supporting national competitiveness. This study adapted Porter's model to facilitate an understanding of street food enterprise and its competitiveness along the value chain and to evaluate the value chain activities. The model considers four determinants of national competitiveness: production conditions, demand conditions, related and supporting industries, and lastly, firm strategy, structure, and rivalry. In addition to the four drivers of enterprise competitiveness, government and chance affect the enterprise environment and indirectly impact the four key determinants of competitive advantages.

After analyzing the components of PDM, perceived challenges and proposed solutions were determined and analysed (chapter 9). From the steps mentioned above, a SWOT analysis of the PDM components was done in Chapter 10. Chapter 10 provides the development of the model. Lastly, the SWOT results were used as a basis for the study's recommendations.

3.6 Ethical consideration

The research received ethical approval from the Faculty of Natural and Agricultural Sciences Ethics Committee at the University of Free State (No UFS-HSD2019/0059:) and the Research Ethics Committees University of Venda (No: SHS/19/NUT03). Before the data collection, permission to conduct the study was obtained from each town's Vhembe District and street vendor committees. Participating street vendors signed the consent form after the study's aim, objectives, and procedures were explained to them.

The study was performed following the principles of the Declaration of Helsinki (2008) and the laws of South Africa. The study's purpose, objectives, and aims were explained to each participant before data collection. Written signed consent was obtained from the participant who agreed to participate in the study. No participant was forced to participate in the study, and participants were informed that participation was voluntary and that they could withdraw at any time during the study. Codes were used on the form instead of a name to ensure anonymity.

3.7 Summary

This chapter presented the research methods and designs. The research designs and data collection techniques ensured that the information collected was valid and reliable.

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4 CHAPTER FOUR: RESEARCH ARTICLE: SOCIOECONOMIC CHARACTERISTICS OF STREET FOOD VENDING ENTERPRISES IN THE VHEMBE DISTRICT, LIMPOPO PROVINCE

4.1 Introduction

This article was published in *Technium Social Science Journal* (March 2021) and outlined the Socioeconomic characteristics of street food vendors in rural towns in this study.

Name of journal: *Technium Social Science Journal*

Publisher: TechniumScience

URL: <https://techniumscience.com/>

Reference: Mahopo, TC., Nesamvuni, CN., Nesamvuni, AE., de Bruyn, M. & van Niekerk, J., (2022). Socioeconomic characteristics of street food vending enterprises in the Vhembe District, Limpopo province. *Technium Soc. Sci. J.*, 29, 419.

4.2 Research Article

4.3 Abstract

The street food business is a crucial indirect driver of the economies of developing countries. It ought not to be ignored as most unemployed people turn to it as their primary means of earning a living to improve their lives. We studied the socioeconomic characteristics of the street food enterprises in the Vhembe District, South Africa. A cross-sectional survey of 511 street vendors (18-75 years old) was conducted. Vendors' socioeconomic characteristics in three Vhembe District towns were quantified. Data collected included age, gender, educational level, economic profile, factors influencing entry, foods sold, regulatory issues, and input suppliers. The results highlight the dominance (63.1%) of single middle-aged women (35-44 years old) with high school education and few young adults' participation (4.1%) in the street food enterprise. About 14% of participants migrated from Zimbabwe to seek employment. Many of them (11.4%) reside in Musina. Lack of opportunities (65%) and financial freedom (90.8%) was the primary motivation for entry into the enterprise. Street food enterprises contributed about 82% of the average household income of R6 042.66 made from the enterprise per month. About 50% of the street vendors are affiliated with a local organization. The most cooked foods sold were pap (97.1%) served with chicken (88.8%) or beef (68.3%), with others serving with different vegetables (75.3%). The study recommends the prioritization of the establishment of local representative organizations in collaboration with the authorities to serve as gatekeepers for the sector, such as health checks, enforcing enterprise certification, promoting association for lobbying power and internally settling disputes.

Keywords. socio-economic, street food enterprises, street vendors, South Africa

4.4 Introduction

Street food vending is an essential component of socioeconomic activities in low-and middle-income countries (Abrahale *et al.*, 2019; Hill *et al.*, 2016; Lekhanya, 2016; Mramba *et al.*, 2016). Food and Agricultural Organisation (2020) defined street food as ready-to-eat food and beverages prepared and sold by street vendors, especially in the streets and other places. In Sub-Saharan Africa, women are more exposed to informal employment than in Latin American countries and most other lower-middle-income countries (Edeme & Nkalu, 2018; Resnick *et al.*, 2019; Sambo, 2021). According to Dodson *et al.* (2012), the low job opportunities in the skilled economy and the discriminatory laws and regulations exclude women from male-dominated occupations. Skinner, Caroline, and Haysom (2016)

also highlighted women's marginalization and economic hardship, poverty, weak government support, and demand for low-cost products and services attributed to the continuous rise of the informal sector in Africa (Roever and Skinner, 2016). Studies highlighted that, despite all challenges, women are key personnel in food production for households and food-insecure households (Mkhize *et al.*, 2013; Roever and Skinner, 2016; Skinner, 2016).

In South Africa, street food vending and its significance can be measured by the volume of trade involved, including providing ready-made meals (Hill *et al.*, 2016) and employment (Chauke *et al.*, 2015; Karsavuran & Özdemir, 2017; Mathaulula *et al.*, 2015, 2016) along the business chain. The Informal economy statistics indicate that the sector employs about 13% of the labour force (about 2.4 million people), contributing to the livelihoods of about 4.4 million unemployed people and some 14.9 million adults categorised as economically inactive (Makwara, 2019). The street food vendors are in areas such as taxi ranks, schools and terminals where it is easily accessible for various urban dwellers and the rural poor than the supermarkets (Hill *et al.*, 2019; Bamhu, 2019; Hill *et al.*, 2016; Hill, Mchiza, *et al.*, 2019; Lekhanya, 2016; Mchiza *et al.*, 2014; Mramba *et al.*, 2016; Njaya, 2014; Roever and Skinner, 2016, 2016; Sambo, 2021). Street food has been recognized as critical as food that can be accessed for the nutritional needs of the poor (Martins, 2006; Mathaulula *et al.*, 2015; Matjomane, 2013; Petersen *et al.*, 2018; Statistics South Africa and StatsSA, 2020; Tamako and Thamaga-Chitja, 2017). Although street food enterprises operations are regarded as unregistered for tax, lack regulation, and do not offer employees any social benefits (Resnick *et al.*, 2019; Petersen, Charman, and Kroll, 2018; Karsavuran and Özdemir 2017; Milena and Ayure 2020).

While the informal industry has challenges, street vendors are not deterred by the challenges but focus on securing income for their livelihood (Williams and Gurtoo, 2012). However, Imathiu (2017) suggested that the challenges faced by street food vendors need attention to ensure the full potential of street food enterprises. Studies (Garg and Phaahla, 2018, 2018; Panwar and Garg, 2015) have highlighted that lack of financial support, the location of the enterprise, poor interactions with authorities and entrepreneurs' characteristics as the main contributing factors to the success of the street food enterprise. Entrepreneurs' characteristics such as personality, competence, attitude, and risk-taking capabilities are linked to the success of the informal enterprise, including street food vending (Garg and Phaahla, 2018). Hill *et al.* (2019) indicated that vendors acquire a practice license but are unaware of the procedures. In countries such as the Philippines (Perez and Khayat, 2020) and Cameroon (Cortese *et al.*, 2016), government authorities

ensure that vendors work in a good environment and offer license training to the relevant authorities. However, it is not the case in South Africa amid the fast-growing street food sector (Garg and Phaahla, 2018; von Holy and Makhoane, 2006; Jain *et al.*, 2020; Mchiza *et al.*, 2014; Roever and Skinner, 2016; Skinner, 2019; Tawodzera, 2019). Given the importance of street food for a large proportion of the world population, research is needed to achieve a better understanding of street foods in different settings, especially food availability, consumption of food types and nutritional value (Abrahale *et al.*, 2019; Birgen *et al.*, 2020; Doibale *et al.*, 2019). The value of micro-and informal entrepreneurs for their potential contribution to economic growth, resilience, and food security needs to be considered (Knox *et al.*, 2019). Ali and Amir (2013) also indicated a need to include informal trading in the local legislative treatment and ensure policy alignment across private and government institutions. This study attempts to compensate for the paucity of literature on the socioeconomic characteristics of street food enterprises. The study includes factors influencing entry to the establishment and the responsibilities and roles of the street vending organization in the Vhembe rural towns.

4.5 Methodology

4.5.1 Study setting

A cross-sectional survey was conducted from July to September 2019 in the rural towns of the Vhembe District, the northern-most district of Limpopo Province in South Africa. It covers an area of 21402 square kilometres of mostly rural land. About 32.65% of South Africans live in rural settlements (StatsSA, 2020). The Vhembe District has an estimated population of 1.2 million. About 47.7% of the Vhembe District population resides in the Thulamela municipality, with women (55%) in most of the population compared to Musina and Makhado (StatsSA, 2020). Due to unemployment and poverty, inhabitants of the district have ventured into informal trading, including the street food enterprise of major trading points within the local municipalities identified as Makhado, Thohoyandou, and Musina, respectively. The informal sector in South Africa contributes 8% of the country's GDP and supports 27% of all working people (Greve, 2017).

4.5.2 Sampling

A convenience sample was taken, given that the study population was unknown (Veal, 2011). The municipalities had no records in place of street vendors. Five hundred and twenty-seven were approached across three towns. A total of 511 street vendors from Musina (168), Makhado (36), and Thohoyandou (307) towns participated in the study.

Vendors were identified from taxi ranks, along the main roads, industrial areas, malls, schools, and lastly, between residences' streets, especially in Musina town. Although Thohoyandou and Makhado are regarded as prominent, relatively developed and economically vibrant towns, Musina remains underdeveloped with a high incidence of shortage of employment and constant migration of some of its active labour force to the North Vhembe District serving at the border of Zimbabwe.

4.5.3 Data collection

The researchers surveyed street food enterprises, interviewing the business owner or the employee with complete information about the establishment. The business owner/employees were informed of the research objectives and interviews conducted to secure written consent. Information was obtained using a structured questionnaire of the socio-demographic characteristics, entrepreneurial motivation, enterprise characteristics, including the food sold, formality and regulations of the vendors. Trained fieldworkers (nine) under the study leader's supervision conducted the interviews using a structured questionnaire. Structured questions allowed the researchers to inquire without unintended influence.

4.5.4 Data analysis

Two trained data capturers did data entry, and the primary investigator did quality checks. Statistical Package for Social Sciences (SPSS version 27) was used. To summarize the demographic, descriptive statistics were used.

4.6 Results and Discussions

4.6.1 Socio-demographic characteristics

Table 1 in this chapter summarises the socio-demographic characteristics, gender, age, marital status, country of origin and educational status of vendors in the three Vhembe District rural towns of study. Most participants were from Thohoyandou (60.1%), followed by Musina (32.9%) and Makhado (7.0%). A total of 511, with a response rate of 97%, street-food vendors were interviewed from July to October 2019. with more females (n= 461; 90.2%) than males (n= 50; 9.8%). The data highlight that more women participate in street vending than men in South Africa (Chauke et al., 2015; Hill et al., 2019; Roever, 2014; Roever & Skinner, 2016; Mathaulula et al., 2015, 2016) and other low and middle-income countries such as Nigeria (Resnick et al. 2019) and Zimbabwe (Njaya, 2014), highlighting female-dominated informal traders.

About 44% of the street vendors were 35-44 years of age group. This highlights that the economically active age group participates in street food trading because of a lack of employment opportunities (Table 4 in this chapter). These findings are like those conducted nationally in South Africa (Roever, 2014; Roever & Skinner, 2016) and India (Doibale *et al.*, 2019), where street vendors are either active young adults or the working class due to poor employment opportunities (Imathiu, 2017). According to Tawodzera and Crush (2019) & Hill, Mchiza, *et al.* (2019), the unstable economic environment forces individuals to enter street food businesses as a form of self-employment. Statistics South Africa and StatsSA (2020) reported youth unemployment (46.3%) (15-34 years) with unemployed in the first quarter of 2021 in South Africa (StatsSA, 2021).

Thus, most of the vendors (63.6%) were below 45 years, the findings reported in the country (Hill, Mchiza, *et al.*, 2019; Maele *et al.*, 2015; Tawodzera and Crush, 2019). This age group is expected to be among the formally employed; however, due to the rising unemployment and economic stagnation in Tawodzera (2019), more people are likely to participate actively in the street food sector, as observed in the current study. These findings support studies in other African countries (Dodson *et al.*, 2012; Feeley *et al.*, 2011; Njaya, 2014; Roever, 2014) that though street food vending is regarded as illegal has helped reduce unemployment and enhance live hood of most households especially when denied access to formal employment. Hence, properly coordinating the street food sector is needed to create employment opportunities to reduce unemployment and account for the informal trading in small towns.

Table 1 further highlights that individuals who engage in street food enterprises were never married (44%), with 28% married and 23% cohabiting. Various studies highlighted the dominance of never-married vendors (Mathaulula *et al.*, 2016) to augment their financial lack and support other family members for their survival observed in this study. In other African countries, married or married individuals opt for street vending to support their families financially due to poor employment opportunities (Eliku 2016; Knox *et al.*, 2019). Although the number of migrants (15%) in the current study was small compared to Tawodzera and Crush (2019) and Hill, Mchiza *et al.* (2019) in Cape Town observed patterns of foreign vendors suggesting that foreign nationals travel to South Africa searching for better living due to their unstable economy and political issues (Eliku, 2016; Imathiu, 2017; Resnick *et al.* 2019). Thus, migrants do not follow the South African regulation to register their businesses, increasing the number of vendors operating without licenses. Therefore, operating illegally in the street corners in town is a concern to the local

authorities to manage the street vending operation, as highlighted in Johannesburg (Arias, 2019).

Very few (3.7%) street vendors ever went to school, with many food vendors who attained high school education (79.3%) and tertiary (5.9%). Due to a lack of job opportunities, individuals enter the market to be in the informal food sector. Contrary to the other findings in other countries (Nyoni and Bonga, 2019a, 2019b; Okojie and Isah, 2014)), the findings highlight more years of schooling of the participants, reflecting opportunities to the literate individuals in the formal sector. It was also found (Table 2) that being a street vendor is independent of education level (Chauke, 2015; Garg & Phaahla, 2018; Hill et al., 2016, 2019; Legodi et al., 2016; Mchiza et al., 2014; Roevers, 2014; Tawodzera, 2019; Mathaulula et al., 2016; Nkosi, 2020). The move to informal trading was not only for the low education level, but individuals with more education also participated in the street food vending sectors to increase their sources of household income. However, individuals are without any financial resources.

As reported in a comparative study in both developed and developing countries, Recchi (2020) highlighted that immigrants move from their countries to neighbouring countries, searching for a better life. As such, the unskilled carry activities such as street vending. Contrary to the current study's findings, the un/skilled were engaged in the informal food sector, becoming an essential income source even for a well-educated individual. It is no longer the case in South Africa, as Chauke et al. (2015) highlighted that attaining moderate achievement in street vendors could inspire new innovative ideas such as using technology. Although previous studies (Doibale et al., 2019; Njaya, 2014; Recchi, 2020; Sambo, 2021) highlight that street food enterprise is still considered for those with limited formal education and skills because only those with fewer years of education engage in the informal business in their cities. The current study reports that most South African participants had some high school (48,6%), compared to 3,9% who were not schooled. Most other citizens who participated had some high school (61,3%), compared to 2,7% who were not schooled. Thus, street food vending is independent of the educational level. Individuals with low educational attainment could be trained to provide remedial education appropriate to the sector strengthening to avoid any health hazard caused by selling food in the street.

Table 1. Demographic characteristics, number (N) and associated percentages of street food vendors in the Vhembe district

Vhembe districts	Musina		Thohoyandou		Makhado		Total	
Gender	N (168)	Percentage (32.9)	N (307)	Percentage (60.1)	N (36)	Percentage (7.0)	N (511)	Percentage (100)
Male	9	1.8	40	7.8	1	0.2	50	9.8
Female	159	31.1	267	52.3	35	6.8	461	90.2
Age (Years)								
18-24	10	2	10	2	1	0.2	21	4.1%
25-34	33	6.5	46	9.0	2	0.4	81	15.9%
35-44	75	14.7	125	24.5	23	4.5	223	43.6%
45-54	33	6.5	90	17.6	9	1.8	132	25.8%
55-64	11	2.2	35	6.8	1	0.2	47	9.2%
65-74	3	0.6	1	0.2	0	0.0	4	0.8%
75 and more	3	0.6	0	0	0	0.0	3	0.6%
Marital status								
Never married	83	16.2	135	26.4	5	1.0	223	43.6
Married	50	9.8	84	16.4	9	1.8	143	28.0
Co-habiting	29	5.7	68	13.3	20	3.9	117	22.9
Single	1	0.2	10	2.0	0	0.0	11	2.2
Widowed	5	2	10	2.0	2	0.4	17	3.3
Citizenship								
South Africa	110	21.5	304	59.5	22	4.3	436	85.3
Zimbabwe	58	11.4	3	0.6	14	2.7	75	14.7
Educational status								
No Schooling	10	2.0	8	1.6	1	0.2	19	3.7
Primary	26	5.1	136	27.0	1	0.2	30	5.9
Some high school	101	19.8	138	27.0	19	3.7	258	50.8
Matric	29	5.7	104	20.4	14	2.7	147	28.8
Diploma	2	0.4	23	4.5	1	0.2	26	5.1
Degree	0	0	4	0.8	0	0	4	0.8

4.6.2 Distribution of educational level by country of origin

Table 2 reports the distribution of educational level by country of origin. South African participants had some high school (48,6%), compared to 3,9% who were not schooled. Migrants in the current study also from Zimbabwe had some high school (61,3%), compared to 2,7% who have not schooled observations made by Njaya (2014) and Nyoni and Bonga (2019) amongst the vendors in Zimbabwe, highlighting that about 66% of the vendors are without formal (66) education and women dominated.

Table 2. Frequency distribution and associated percentages of educational level by country of origin

Country of origin		Frequency	Per cent
South African	Primary Education	52	11.9
	Some high school	212	48.6
	Matric	126	28.9
	Diploma	25	5.7
	Degree	4	0.9
	No schooling	17	3.9
	Total	436	100.0
Other (Zimbabwe)	Primary Education	5	6.7
	Some high school	46	61.3
	Matric	21	28.0
	Diploma	1	1.3
	No schooling	2	2.7
	Total	75	100.0

4.6.3 The economic status of the street food vendors

Figure 1 and Table 3 of this chapter summarise the economic profile of the street food vendor's households. The mean household income per month was R7 406.63 $\pm$ R6991.51, with a minimum of R1000 and a maximum of R80 000 (USD 511.49 $\pm$ 482.79). The mean household income from the enterprise per month was R6 042.66 $\pm$ R10 375.41 with a minimum of R200 and a maximum of R200 000. Tawodzera (2019) also indicated that half of the household income of the vendors is derived from the enterprise profit, highlighting the vital contribution the street food enterprises made to the livelihood of the households involved.

Similar to the current study's findings, Perez & Khayat resonates that street food enterprise contributes to half (31.6%) of the family's monthly income to those involved in the business without extra income or social relief. Wills (2009) also indicated that the informal trading contribution to total incomes is 11.1% of the informal sector's estimated contribution.

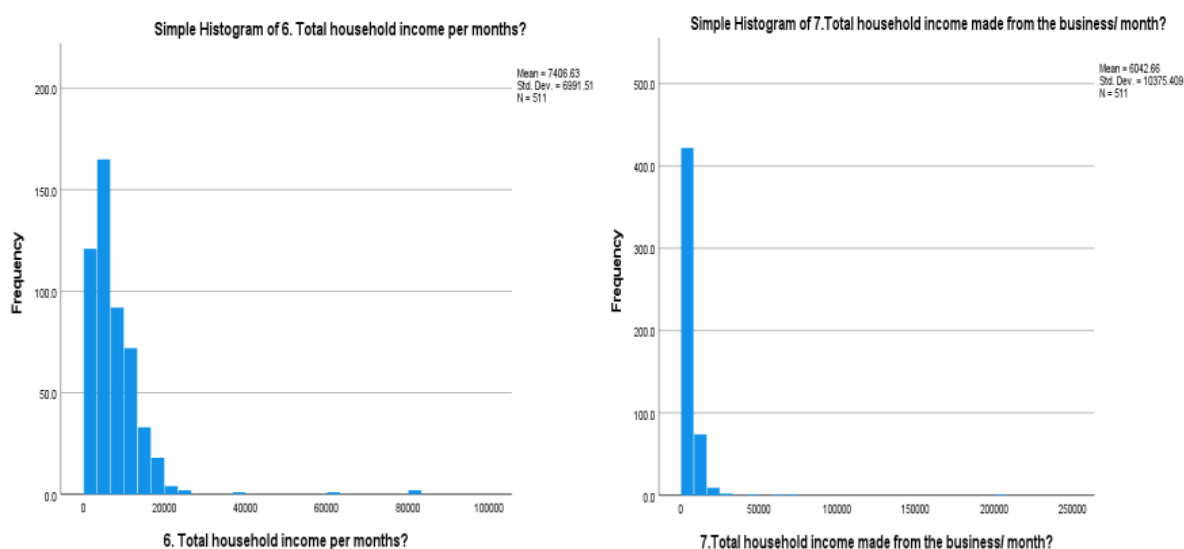


Figure 1: The economic profile of the street food vendor's households.

On average, two female dependents were reported in the current study compared to one for males (Table 3). The role of street food vending has been shown in several studies, including Tawodzera (2019), where 4.9% of dependence (4.9%) on business profit was observed. It was revealed that street food vending is used to augment incomes earned to contribute to the monthly income of most vendors' households. Besides the enterprise, more than 50% of the street vendors depended mainly on social grants (51.3%), and very few (22.7%) reported spouses (Table 3), indicating that income is an essential motivation (Table 4) for the establishment and endeavor the hardships of the enterprise.

Table 3. Frequency of dependents, sources of income and associated percentages

Variable	Statistic	Measure
Dependent on business	Mean	Standard
Male	1.96	1.09
Female	2.33	1.27
Sources of income	N	%
Social grants		
Yes	262	51.3
No	249	48.7
Spouse		
Yes	116	22.7
No	395	77.7
Other businesses		
Yes	24	4.7
No	487	95.3
Other (Not specified)		
Yes	27	5.3
No	484	94.7

4.6.4 Uses of money made from the business.

The perceived role of street food vending in the area is reported in Table 4. The results highlight that providing for the family (92.6%), meeting the daily basic needs of families (food, school fees, clothes, shelter), buying business inputs paying for merry go round-Stockvel (19.4%), and savings are the most roles acknowledged by the street food vendors in the Vhembe District. Our findings agree with several studies conducted in other developing countries concluding that street food vending allows most of the marginalised people from urban and rural areas to support their families and improve their social and economic situation (Arias, 2019; Balasha Arsene *et al.*, 2020; Karondo and Tumaini, 2021). de Groot *et al.* (2017) also indicated that street food vendors' income contributes to food, shelter, and children's education and plays a key role as food-energy support instruments (Knox *et al.*, 2019) landscapes like the current study findings. However, street food vending is criticised for its illegality and no clear regulations governing the street business (Roever and Skinner, 2016).

Table 4. Frequency of participants and associated percentages (%) on the uses of money made from the Business (N = 511)

Variable	Frequency	Participants (%)
Support my family	473	92.6
Food	179	35.0
School fees/ uniform	98	19.2
Clothes	22	4.3
Build a house/ shelter	16	3.1
Business inputs	120	23.5
Stokvel	99	19.4
Savings	67	13.1
Electricity	55	10.8
Transport	46	9.0
Pay labour	13	2.5

4.6.5 Motivations into an entry to the establishment of the enterprise

The motivations to entry to establish the street food enterprises in the Vhembe District are outlined in Table 5. The current study reports the lack of income (90.8%) as the primary motivation for establishing the street food enterprise. In addition, the lack of income was mainly due to unemployment/ lack of jobs (60.5%) and poverty (20.7%) in the Vhembe District. As Tawodzera and Crush (2019) highlight, the current study also indicates that entry into the enterprise is based on survival, opportunism, and the inability to fulfill the formal sector's requirements (Doibale *et al.*, 2019). At the same time, the Government of the Republic of South Africa (2015) highlights that the dominance of women in the street food sectors is due to the low opportunities for occupation in the skilled economy and the

discriminatory laws and regulations, exclusion from male-dominated occupations (Dodson *et al.*, 2012).

In 2020 only about 20% of the 40% of active unemployment in South Africa increased intensively, leaving people with no other income sources but relying on the government for social relief (StatsSA, 2020; WIEGO, 2020). Roever & Skinner (2016) highlighted that street food vending reduces poverty by generating household income, and less capital is required for their establishment. Although street vending is still encountering challenges such as poor governmental support, research (Kinlocke & Thomas-Hope, 2019) suggests that street food vending requires ways to support the retailers' resilience to provide greater access to financial support through the opportunities for obtaining start-up capital. About 7.6% of the vendors indicated that entry to the enterprise was because of a passion for business and cooking.

Table 5. Frequency and associated percentages on the motivations to establish the street food enterprise (N=511)

Motivation	Frequency	(%)
Lack of income	464	90.8
Unemployment/ lack of jobs	309	60.5
Poverty	106	20.7
Passion for business/ cooking	39	7.6
Keep busy	5	1.0
Inheritance	2	0.4
Getting out of crime	1	0.2
Self-empowerment	1	0.2

4.6.6 Roles and responsibilities of the organisations

As reported in Table 6, vendors report three prominent associations known by the vendors. The current study highlighted that at least 10.5% of the participants were part of a local or national association. Most participants whose business was represented by an association were represented by the Vendor Association (34%), followed by the Beitbridge taxi rank association (23%). Although 11.3%% of the vendors had affiliated with an organisation, they could not tell the association's name. Roever & Skinner (2016) and Tavonga (2014) highlighted the importance of vendors being part of street vendors' local organisations to help overcome any possible challenges in the informal enterprise. The current study highlighted that a few were part of a local business association.

In Ghana, Roever (2014) highlighted that it is crucial for street vendors to have a sense of belonging to host meetings of local associations regarding vendors' training needs and requirements. One of the Women's roles in Informal Employment (WIEGO) is to assist the

informal trading in training, formalizing the sector and policies (WIEGO, 2014). However, in the Vhembe District, no formal institution like WIEGO can assist the informal street food vendor's competitiveness.

Moreover, WIEGO (2020) indicated that vendors should form their organisations in their locality because the availability of the membership-based organisation help vendors to navigate their relationship with authorities, build commonality and solve problems amongst each vendor. The role played by most associations were problem-solving (35.2%) and helping in coordinating (24.1%) street vending activities. Street vendors also reported that the associations assist in the provision of advice (14.8%) and maintaining the environmental hygiene (14.8%) of the area to avoid outbreaks (Table 6). Amongst vendors, this calls for better coordination to constitute themselves into well-organized associations to develop a code of practice for their businesses or constitute a forum for interaction with the authorities. All vendors were to abide by regulations within their local affiliates to ensure the cleanliness of the environment to avoid any health problems from foods cooked from the street. Njaya (2014) reported that local authorities do not recognise vendors because of their unorganized structures. Mathaulula *et al.* (2016) and Garg and Phaahla (2018) also highlighted the lack of coordination among authorities' vendors, as observed in the current study. Well-structured guidelines and regulations specifically for this vendor's sector are needed. This will help street vendors operate and build relationships with relevant stakeholders for better service, such as local municipalities (Arias, 2019).

The ill-treatment of vendors was common in other parts of the country (Arias, 2019; Mkhize *et al.*, 2013; Roever, 2014) and other developing countries by Roever and Skinner (2016) and Resnick *et al.* (2019), where police confiscate street vendor goods and equipment if found without license or permission to sell on the street. However, it was not the case in the current study because vendors continued to work without certification like the Zimbabweans without police abuse. The study observed the weakness of the interaction between the organizations and vendors.

Table 6. Frequency and associated percentages on the role and responsibilities of the organisation affiliated

Organisations and Their roles	Frequency	Percent (%)
Organisational representation	511	100
Yes	53	10.5
No	451	89.5
Names of organisations	53	(100)
Not specified Organisations	7	13.0
Vendor association	18	34.0
Beitbridge taxi rank	12	23.0
Musina street vendors	3	5.7
Do not know	6	11.3
Other	7	13.0
Roles of the business associations	54	100
Provide advice	8	14.8
Problem-solving	19	35.2
Build a restaurant	1	1.8
Co-ordination of vendors	13	24.1
Hygiene	8	14.8
Provide title deeds	4	7.4
Water and electricity	1	1.8

4.6.7 Formality and regulation of street food vending

It was observed that 39.7% of vendors surveyed had their business unregistered (Table 7) and 56.5% had permit, lease (2.2%), and concession (1.6%). The lack of government control that puts the quality of food produced in the street because of the unregistered business that lack recognition has been shown in various towns in South Africa (Roever, 2014; Roever and Skinner, 2016) and other countries (Nyoni and Bonga, 2019a; Okojie and Isah, 2014). Furthermore, Skinner (2005) indicated that the Health Act 61 of 2003 requires that the Health Department of a city issues a certificate of acceptability to a person trading foodstuff. However, informal traders have considered this process complex and costly (Nkrumah-Abebrese and Schachtebeck, 2017; Hills et al., 2019). This observation resonates well with the current study that only 47.6% of the vendors could secure the certificate of acceptability from the Department of Health per Health Act 61 of 2003.

According to Nkosi (2020), the local government's lack of resources has been a problem that influences poor interaction with street food vending enterprises. Hence, vendors operate freely without any fear of authorities confiscating the resources. Furthermore, in Thohoyandou, Selepe (2017) noted that vendors find it challenging to obtain the necessary documentation to operate their businesses, indicating a lack of rigor and enforcement of

regulations from their local authorities. Most local government decisions regarding development in the local authorities in South Africa are not shared with the relevant groups (Garg and Phaahla, 2018; Mathaulula *et al.*, 2016), such as the vendors. Similar findings were also reported in Nigeria (Resnick *et al.*, 2019) and other countries (Roever, 2014; Roever and Skinner, 2016) vendors where minimal or no interactions with the authorities was highlighting officials claimed to ensure compliance of the vendors while no effort is put in place to support the vendors. Moreover, street vendors also reported being in the sector but were unaware (39%), an observation made by van Nieuwenhuyzen *et al.* (2011).

Peterson *et al.* (2018) highlighted that enterprises' daily challenges, such as the illegal nature of the operation and the power imbalance faced by their formal sector suppliers, make it difficult for any intervention by stakeholders. Resnick *et al.* (2019) reported that while street vendors find it difficult to obtain documents to operate legally, most vendors in the study could operate for 4-6 years without governmental support and interactions using permits and leases. In addition, Nkosi (2020) indicated that infrequent to find authorities conducting monitoring amongst the vendors in South Africa. This requires an investment in a mechanism of outreach and engagement by several stakeholders to better the street food vending operation (Resnick *et al.*, 2019).

Table 7. Frequency and associated percentages on the formality and regulation of street food vending

Variables	Number	Percentages
Have permits/concessions or lease to sell	511	100
Permits	289	56.5
Concessions	8	1.6
Lease	11	2.2
None	115	22.5
No response	88	17.2
Certification to sell street food by DOH	494	100
Yes	235	47.6
No	259	52.4
Year of Certification by DOH	235	100
Less than a year	3	1.3
A year	21	8.9
2-3 years	46	19.6
4-6 years	50	21.3
7-9 years	11	4.7
10-15 years	36	15.3
More than 15 years	23	9.8
Not specified	45	19.1
% Reason for No certificate	259	100
Lack of information	101	39
No organization	2	0.8
Did not register	10	3.9
Insufficient funds	6	2.3
No time to register	2	0.8
Pay rent	4	1.5
Sell at school	2	0.8
Sell at home	5	1.9
I am a foreigner	1	0.4
No reason	4	1.5

4.6.7 Foods cooked and sold by street vendors in the Vhembe District.

Table 8 presents the number and main food items categories sold in the Vhembe District. Food sold by the vendors in the Vhembe District includes home-cooked foods such as meat (98.8%), starch-maize meal porridge (97.5%), vegetables (75.3%), gravy (34.8%) and chakalaka (8.2%). The food items sold are mostly grouped into a few categories (pap, meat gravy, vegetable, or chakalaka). Foods sold in the current study are no different from other developing countries nutritionally (Alimi, 2016; Okojie and Isah, 2014). While the current study focused on cooked food, Imathlu, (2017) highlighted that food sold in Burkina Faso consists of foods such as cereals (48.5%) and meat (33.9%) less than in the current study. Differences could include the diversity of foods sold depending on the location, and most foods are based on a combination of starch staples. In South Africa, Steyn et al. (2016)

reported that cereal and meat sold on the street contribute 13-50% of adults' daily energy intake and around half of their daily protein intake.

The increasing consumption of ready-to-eat foods is attributed to their significant role in food security and nutrition for millions of practitioners along the food chain (Imathiu, 2017; Steyn *et al.*, 2011). Like the findings by Petersen *et al.* (2018), street foods sold in South African towns are cheap and play a vital role in meeting daily food demands for township residents. While other studies on foods sold in the street, especially in Durban (Mkhize *et al.*, 2013), Johannesburg (Martins, 2006), and Cape Town (Hill, Mchiza, *et al.*, 2019; Mchiza *et al.*, 2014) found that food sold in these cities are high in calories value, and their content is unfavorable and has low benefits of general health. Sambo (2021) attests that customers find street food less inconvenient to access. The working class in town does not find time to prepare meals to take to work, and street vending in their vicinities, such as public transport spaces, is convenient (Hill, Mchiza, *et al.*, 2019; Mkhize *et al.*, 2013).

Table 8 also highlights that the main protein-rich foods sold in the study were chicken (88.8%) and beef (68.3%), most served with pap (97.1%) as the main starchy staple. Although vendors did not sell much fish in this study because of the challenges, as also observed by Hill *et al.* (2019), indicating commonly sold food types were chicken or beef (38.5%), and rice with beef or chicken (28.1%). While rice (1.4%), pork (2.2%) and fish (1.4%) were not typical. Vendors do not have refrigerators to store fresh fish and pork to keep them safe from spoilage (Tawodzera, 2019; Peterson *et al.*, 2018; Hill *et al.*, 2019), as reported in the current study.

The street food offered varies across countries and cultures, with different ingredients and preparation and cooking methods, thus differing in nutritional value (Abrahale *et al.*, 2019; Hill, Mchiza, *et al.*, 2019; Hill, Mchiza, *et al.*, 2019). In the current study, the vendors sold plates as a meal with a combination of foods served as pap/rice with meat, gravy/chakalaka, sometimes with leafy green vegetables (60.1%) or with few selling beans in the Musina town (1.8%) together with gravy sauce (34.8%) or chakalaka (8.21%). Gravy sauce is a simple sauce made to serve as a topping for pap/rice made of onion and tomatoes as the main ingredients. At the same time, chakalaka sauce is a spicy dish of onions, tomatoes, and beans. Chakalaka has been the main side sauce for generations of black South Africans and is the most used condiment at South African braais or barbecues.

Table 8. Frequency and associated percentages of participants on the list of cooked items sold by the street food vendors in the Vhembe District (N=511)

Foods cooked/sold	Frequency	Percentage	Mean	Std.deviation
Meat				
Beef/ ox	349	68.3		
Wors	28	5.5		
Pork	11	2.2		
Offal (Magulu)	73	14.3		
Poultry				
Chicken	454	88.8		
Fish	7	1,4		
Starch	498	97,5		
Pap	496	97,1		
Rice	7	1,4		
Vegetables	385	75.3		
Beans	9	1.8		
Green leafy vegetables	307	60.1		
Carrots	1	0.2		
Gravy	178	34.8		
Chakalaka	42	8.2		
Plate pricing				
Beef (Full plate)	346	68.0	44.22	7.70
Beef (Half plate)	264	52.0	32.44	5.45
Chicken (Full plate)	422	83.0	43.03	16.88
Chicken (Half plate)	317	62.0	30.91	8.71

4.6.9 Street food vendors and their inputs suppliers

Vendors' inputs were sourced mainly from supermarkets, grocery stores, butchery, local farmers, and the informal street market (Table 9). The top four suppliers included commercial stores, Spar (62%), Boxer (41.1%), Shoprite (30.1%) and unspecified local supermarkets (30.1%). Butcheries used by the vendors for their meat purchase were OBC (34.6%), CY Frozen (22.3%) and lastly Roots (15.1%). Vendors did not have access to a wholesaler due to the location and hence, dependence on the supermarket. Similar observations were made by Hill, Mchiza, *et al.* (2019) that supermarkets primarily used and could reduce the profit from vendors than bulk purchases from the wholesalers.

Table 9. Frequency and associated percentages of participants on the supplier of the inputs used by the street food vendors in the rural towns (N=511)

Places	Classification	Frequency	%
Spar		322	63.0
Boxer		210	41.1
Supermarkets (Unspecified)	grocer	201	39.3
Shoprite	Supermarket	154	30.1
Limpopo	store	7	1.4
U-Save	retailer	7	1.4
Fruit & Veg	and	6	1.2
Minaz		5	1.0
OBC	Butcher	177	35.0
CY frozen food	cheese	114	22.3
Roots	ry	77	15.1
Newco		14	1.2
Makhoma			2.7
Butcher		11	2.2
Meat & Chicken		9	1.8
Farmer	Local farmers	68	13.3
Market		59	11.5
Street Vendors/Bakkie	Local street vendors market	36	7.0

In the Vhembe District, street vendors had more access to butchery wholesalers selling meat (beef, chicken, pork) and meat products (chicken feet) in bulk to save money. NkrumahAbebrese and Schachtebeck (2017) also highlighted that informal traders are not used, and vendors rely only on formal business purchase inputs. Vendors use other producers, such as local farmers (13%) and informal local markets (11.5%), including the bakkie sellers (7%), as reliance on supermarkets and butchery. The current study's wholesalers were not used because street vendors are primarily from rural villages and have no access to bulk purchases to maximize profit.

4.7 Conclusions

The paper used an original survey of vendors to understand their characteristics. The purpose was to characterise the street food enterprises in the Vhembe rural town on a large scale. The current study confirms that street food vending contributes more to total employment among single women. Although available studies showed that street vending was for the poor and uneducated, the study has revealed a completely different picture.

The study highlights that never-married women participate in informal street vending Vhembe District, especially in Thohoyandou town. The study revealed that street food vending contributes significantly to household income (82%). The unavailability of opportunities in the formal sector and lack of income were reasons for the vendors to establish the street food enterprise to augment their financial lack and support family members for survival. Street food enterprise is not only for the low-educated individual but also for individuals with more years also engage in informal trading.

The study also highlights that foreign nationals migrate to South Africa to seek better living from their home countries, despite all people having legal documentation following the South African regulation to register their businesses. Authorities should implement guidelines and regulations for all people anticipating engaging in street food vending. The establishment of local representatives should prioritize the vendors in collaboration with the authorities to serve as gatekeepers for the sector, such as health checks, enforcing enterprise certification, promoting association for lobbying power, and internally and internally settling disputes.

The vendors' food was home-cooked meat, starch-maize meal porridge, vegetables, gravy, and chakalaka. Although the current study could not determine nutritional intake, a study on the nutritional contribution of street food is recommended to understand the nutrient quality of foods sold in the Vhembe District. Vendors' inputs were sourced mainly from four chain stores (supermarkets), grocery stores, butchery, local farmers, and the informal street market. Vendors should be aware of the benefits of bulk buying inputs from nearby wholesalers to make more profit. Although, accessibility to the wholesalers will be a challenge because of the locality of the street food enterprise in disadvantaged towns. Other suppliers used by the vendors included local farmers, the informal local market and bakkie sellers available in the vicinity to maximize profit. To advance vendors' position, we need to strengthen their capacities and skills through training, credit, information, and infrastructure to enhance their competitiveness and productivity. There is a need for further research to describe the nature of street vending. The local government should provide greater access to financial support through opportunities for obtaining start-up capital.

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5 CHAPTER FIVE: RESEARCH ARTICLE: OPERATIONAL CHARACTERISTICS OF WOMEN STREET FOOD VENDORS IN RURAL SOUTH AFRICA

5.1 Introduction

This article was published in Public Health, Sec, Public Health and Nutrition (13 July 2022) and outlined the Operational Characteristics of Women's Street Food Vendors in Rural South Africa. We characterised the operations of the street food enterprise in the Vhembe District, focusing on business profile, sold foods, inputs, pricing, record-keeping practices, and total running cost.

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5.2 Research Article



Operational Characteristics of Women Street Food Vendors in Rural South Africa

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Objective: To characterize the operations of the street food enterprise in the Vhembe district, focusing on business profile, sold foods, inputs, pricing, record-keeping practices and total running cost.

Methods: A descriptive cross-sectional face-to-face study of 511 vendors was done using a structured researcher-administered questionnaire comprising demographic and operational characteristics. Convenience sampling was used to choose the vending sites. Chi-square tests were conducted between four categorical variables (gender, age, marital status and citizenship) and operational characteristics. *P*-values were considered significant at $p < 0.05$. However, a Bonferroni adjustment decreased the significant value to $p < 0.013$.

Results: The findings highlight the dominance of single middle-aged (35–44) women (63.1%) with some high school education. About 14% migrated from Zimbabwe. Most vendors were owners (86.1%), with 70.0% in business for at least 1–10 years. Food sold included mielie pap (stiff porridge) served with beef or chicken, sometimes with vegetables. Plate prices were R40.00 (2.6 USD) for a full plate and R30.00 (2 USD) for half a plate. The typical street food consumers were government officials, middlemen, and schoolchildren. Social media such as Whatsapp were used to communicate between the street food vendors and customers. The results highlight poor managerial skills as only 15.5% kept records, most of which were sales records (59.5%). On average, street vendors made a monthly profit of R3200.00 (213 USD) while spending R1800.00 (120 USD) on daily running expenses. There were statistically significant variations in some operational characteristics of vendor variables and gender, age, marital status, and citizenship.

Conclusions: There is a need for capital and management for small businesses and food training for rural street food vendors. Therefore, government officials, policymakers, and NGOs could target street vendors to offer training and microfinance to improve their business skills while promoting food safety and consumption of nutritious foods.

Keywords: operational characteristics, street food enterprises, street vendors, South Africa, women's employment

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INTRODUCTION

Foods sold on the street have become a common source of food consumption in many urban towns and cities. Street foods are foods prepared on the street and ready to eat at home or consumed on the street without further preparation (1). Street foods mainly consist of staple food served in various forms and combined with side dishes such as stews, gravies and snacks such as meat, fish, and cereal-based ready-to-eat foods (2, 3). Statistics South Africa and StatsSA (2020) reported that an estimated 18% of citizens to work in the informal sector as the main source of employment (4). Studies highlight an estimated one million street vendors in South Africa, of which over 70% sold food (5).

Street foods are less costly and an accessible means of obtaining a nutritionally balanced meal away from home for many low-income people (3, 6, 7). The street food sector in South Africa has been regarded as an essential channel for food access for a food-insecure population where it reflects a core aspect of low and middle-income countries, including South Africa's poor and vulnerable population (7). Even though its economic contribution goes overlooked on many occasions (8), street food enterprise is the single most significant employers in the informal sector due to its economic contribution (4, 9).

Informal enterprises' success depends on finance, the entrepreneur's characteristics, the business's location, and government support (10). Moreover, the government has established the Ministry of Small Business Development to develop Small and Medium Enterprises (SMEs). However, much support has been focused on the formal business economy and private franchises, leaving the informal sector, such as street food vending (11, 12). A previous study has reported that informal vending is not recognized because the economic activities that operate outside accepted norms of society are not regulated or registered with the government and are non-taxable (12). However, informal businesses in Gauteng are prioritized over other province (5).

The South African government recognizes the informal economy as a viable and essential form of employment and enabler of fiscal mobility for the poor (13). Studies in South Africa (6, 10, 14) and other countries (15, 16) indicated that women entrepreneurs engage in this sector for their entire working years because of a lack of opportunities in the formal sectors. Informal workers are overwhelmingly poor, dominated by young females (16), and have no support for their informal businesses to succeed (17). Moreover, the lack of formality due to poor governmental support contributes to the failure of the informal sector (18–20). This trend has also been documented in most African countries where street food vending is the leading source of income for the poor and vulnerable population, including women (16, 21, 22).

Studies conducted in the Limpopo Province (10, 14, 22) indicated that small-scale food vending contributes significantly to the livelihoods of the poor. Despite recognizing that street food vending forms most of the informal employment sector, the lack of formality means little is known of its operation. The lack of formality could be because no consultation of the street food vendors on any policies developed and implemented for managing their operation (23–25). Street food vending as an

enterprise is often overlooked during policy formulation and disregarded in business strategy too easily (13). Nevertheless, these studies also indicate that regulations and by-laws governing street vending operations in South Africa are in place, although with a lack of enforcement by officials (25–29). Given the importance of street food in society, a better understanding of street food vendors in different settings is necessary to characterize its operation.

Limpopo province has the highest number of street food vendors, mainly concentrated in the Vhembe district. Hence the Vhembe district was selected for this study. Most street food vendors are found in public places such as taxi ranks and the road (22, 30, 31). The Vhembe district draws special attention in the province because of a high increase in cooked street foods (2, 14, 28, 31). This paper was the third phase of the main study, whose objective was to develop a model for street food vendors selling ready-to-eat foods in the Vhembe District. In phase one, Poter's competitiveness model investigates street food vendors' perception of vending competitiveness. Street food vendors perceived three main factors that determine the street food vending enterprise's competitiveness: chance, production, and government role factor conditions as determinants of enterprise competitiveness (Mahopo et al. forthcoming). In phase two, we reported that lack of opportunities and financial freedom as the main motivations for entry into the enterprise. We noted a need to establish local representative organizations with health authorities and enforce regulations by various stakeholders to assist street food vendors and their enterprises (32). Hence the current paper highlights the characterization of the street food vendors, focusing on business profile, employment, working hours, foods sold, inputs, pricing, record-keeping practices, total running cost and profit.

MATERIALS AND METHODS

Study Design and Recruitment

The study was a cross-sectional survey that used well-structured close/open-ended questions and a convenience sampling technique to select 527 participating street food vendors during a transect walk-through. All available and willing street vendors selling cooked food were considered for the study. Due to the unavailability of the street food vendors' records, street food vendors were recruited in all towns. The consensus, therefore, deemed the sampling strategy to be used. However, only 511 street food vendors were considered for this study due to incomplete and missing information during data analysis. Data were collected on weekdays during busy times. Before the interviews, the study purpose, aims, and procedures were explained to the street food vendor. The street food vendors obtained informed, written consent, and confidentiality and anonymity were observed.

Study Area

The study was conducted in the Vhembe district in the three towns: Makhado, Thohoyandou, and Musina. Vhembe district has an estimated population of 1.2 million (4). Most of the residents are women, and Thulamela has the highest population

(females 55%) compared to Musina (52%) and Makhado (33). It covers an area of 21,402 square kilometers of mostly rural land. Due to the high level of unemployment (41.1%) (34), residents of the district have developed several survival strategies, including the street food enterprise at major trading points within the local municipalities. Thohoyandou and Makhado are big cities, relatively developed and economically vibrant cities (4). Musina remains relatively under-developed with a high incidence of shortage and constant migration of some of its active labor force to the North Vhembe district at the border of Zimbabwe.

Inclusion and Exclusion

The researchers approached street food vendors selling cooked food. The sample frame included all street food vendors selling cooked foods in the Vhembe district. We excluded street food vendors younger than 18 years and those who provided incomplete information.

Study Duration

The study period was 3 months, from July to September 2019.

Sample Size Determination and Sampling

The municipalities had no records indicating the locations of street food vendors. Hence a non-probability sampling strategy was used as the research population is unknown (35). In the Vhembe district, there are four main towns, of which three of the most populated town were selected (Thohoyandou, Musina and Makhado). The estimated population size of these three towns was that Thohoyandou had 69,000 Musina 43,000, and Makhado population size 23,000. Convenience sampling was used to select study participants from all towns and three towns. The researcher established and maintained a complete list of the primary unit component from the Vhembe district's municipalities. All vendors encountered were approached subject to eligibility criteria.

TABLE 1 | Demographic information of street food vendors.

Variables	Musina frequency (%)	Makhado frequency (%)	Thohoyandou frequency (%)	Total frequency (%)
Sample size	168 (32.9%)	36 (7.0%)	307 (60.1%)	511 (100%)
Gender				
Male	9 (1.8%)	1 (0.2%)	40 (7.8%)	50 (9.8%)
Females	159 (31.1%)	35 (6.8%)	267 (52.3%)	461 (90.2%)
Marital status				
Single	83 (16.2%)	5 (1.0%)	135 (26.4%)	223 (43.6%)
Married	50 (9.6%)	9 (1.8%)	84 (16.4%)	143 (28.0%)
Living with partner	29 (5.7%)	20 (3.9%)	68 (13.3%)	117 (22.9%)
Divorced	1 (0.2%)	0 (0.0%)	10 (2.0%)	11 (2.2%)
Widowed	5 (1.0%)	2 (0.4%)	10 (2.0%)	17 (3.3%)
Age categories				
18–24 years	10 (2.0%)	1 (0.2%)	10 (2.0%)	21 (4.1%)
25–34 years	33 (6.5%)	2 (0.4%)	46 (9.0%)	81 (15.9%)
35–44 years	75 (14.7%)	23 (4.5%)	125 (24.5%)	223 (43.6%)
45–54 years	33 (6.5%)	9 (1.8%)	90 (17.6%)	132 (25.8%)
55–64 years	11 (2.2%)	1 (0.2%)	35 (6.8%)	47 (9.2%)
65–74 years	3 (0.6%)	0 (0.0%)	1 (0.2%)	4 (0.8%)
75 and above	3 (0.6%)	0 (0.0%)	0 (0.0%)	3 (0.6%)
Educational status				
No formal schooling	10 (2.0%)	1 (0.2%)	8 (1.6%)	19 (3.6%)
Primary education	26 (5.1%)	1 (0.2%)	30 (5.9%)	57 (11.2%)
Some high school	101 (19.8%)	19 (3.7%)	138 (27.0%)	258 (50.5%)
Matric	29 (5.7%)	14 (2.7%)	104 (20.4%)	147 (28.8%)
Diploma	2 (0.4%)	1 (0.2%)	23 (4.5%)	26 (5.1%)
Degree	0 (0.0%)	0 (0.0%)	4 (0.8%)	4 (0.8%)
Ownership				
Full owner	129 (25.2%)	25 (4.9%)	286 (56.0%)	440 (86.1%)
Co-owner	34 (6.7%)	8 (1.6%)	18 (3.5%)	60 (11.7%)
Employees	5 (1.0%)	3 (0.6%)	3 (0.6%)	11 (2.2%)
Citizenship				
South Africa	110 (21.5%)	22 (4.3%)	304 (59.5%)	436 (85.3%)
Zimbabwe	58 (11.4%)	14 (2.7%)	3 (0.6%)	75 (14.7%)

Data Collection Tools

An adapted questionnaire was used to collect data on street food vendors' demographic and operational characteristics (see study tools below). The study instrument was piloted among 20 selected street food vendors operating in Sibasa, approximately 6 kilometers outside Thohoyandou.

Demographic Variables

Four demographic variables, gender, age, marital status, and citizenship, were used to characterize the operations of the food vendors.

Operational Characteristics

The operational variables assessed were (1) business profile, (2) foods sold and sources of inputs, (3) food per plate pricing, (4) target market, (5) enterprise record-keeping practices, and lastly, (6) total cost and profit.

Data Analysis

All analyses were carried out using the Statistical Package for Social Sciences (SPSS version 26). The median and IQR were calculated because the data were skewed for most variables. The test of four *a priori* hypotheses were assessed to characterize the operations of the street food vendors in terms of their background characteristics. Chi-square tests were conducted between four categorical variables (gender, age, marital status, and citizenship) and operational characteristics. *P*-values were considered significant at $p < 0.05$. However, a Bonferroni adjustment decreased the significant value to $p < 0.013$.

RESULTS

Demographic Information

Table 1 reports the street food vendors' demographic information based on the town's location. Among the 511 street food vendors participating in the study, 90.2% were women, and 43.6% were single aged 35–44 years (43.6%). At the same time, those aged 45 years were 3.8 and 32.7% of males and females, respectively. A few young adults (4.1%) participated in the study. Thohoyandou (60.1%) had the most street food vendors, followed by Musina (32.9%) and Makhado (7.0%). Most of the street vendors were never married (43.6%), with just over a quarter of the participants married (28.0%), and a few were widowed (3.3%). Most of the single (26.0%) and married (16.0%) participants were from Thohoyandou. Regarding educational status, more than half (50.5%) of the participants had some high school education, while 28.8% obtained a matric certificate, and only a very few (3.7%) never attended formal education. Most street vendors were owners (86.1%) of their businesses and only 2.2% were employees. Less than 15% (14.0%) of the migrants were of Zimbabwean citizenship, with the majority (85.7%) of the street vendors from South Africa.

Business Profile of the Street Food Vendors

As shown in Table 2, 70.1% of the participants were in the business for 1–10 years, indicating that most street food

TABLE 2 | Business profile of the street food vendors.

Variable description	Frequency (%)	Median (IQR)
Age in the business		
Less than a year	51 (10.0%)	
1–10 years	360 (70.1%)	
11–20 years	79 (15.5%)	
21–30 years	18 (3.5%)	
More than 30 years	3 (0.9%)	
Average income from stall/week (R)		1,300 (1,900)
Average household income (R)		4,000 (4,900)
Financial assistance		
Bank loan	4 (0.8%)	
Moneylenders (loan sharks)	5 (1.0%)	
Savings	332 (65.0%)	
Other (not specified)	7 (1.4%)	
Storage of money		
In a till	8 (1.60%)	
In a box	65 (12.7%)	
Pocket	408 (97.1%)	
Bank	26 (5.10%)	
Other (unspecified)	1 (0.20%)	

enterprises are relatively well-established. Only 10.0% were still new in the street food business. The median weekly money made from the business was R1300.00 (86 USD). The monthly income from the street food vendor's household income was R4000.00 (266 USD). For an average street food vendor in need of financial assistance, most participants (65.0%) indicated getting money from their savings to start up, while very few indicated money lenders (1.0%), banks (0.8%), and others (1.4%) sources. These results highlight the lack of financial support from commercial banks and street food vendors. The results also show that street vendors save money physically in their pocket (97.1%) and a box (12.7%) to keep money safe while working. At the same time, very few used tills (1.6%). Only 5.1% of the vendors reported saving money in the banks (5.1%).

Employment and Operational Hours of the Street Food Vendors

Table 3 reports the street food vendors' employment and hours worked. The enterprise had at least one permanent person working. Although there was no difference between the number of days worked, the median hours worked by the unskilled was 11 h compared to 9 h of the skilled street food vendors on weekdays and Saturdays, respectively. There was no difference in days worked between the skilled and unskilled, as shown by a median of 300 days yearly. The median amount paid for unskilled labor was R1470.00 (98 USD), while skilled laborers were paid a median of R1400.00 (93 USD) per month.

Food Sold and Sources of Inputs Profiling

Table 4 reports the foods and sources of input. Street food vendors predominantly cooked meat (98.8%) and Millie pap

TABLE 3 | Employment status and operational hours of street food vendors.

Variables	*Skilled (<i>N</i> = 33) Median (IQR)	Unskilled (<i>N</i> = 144) Median (IQR)
Permanent employment status	1 (0)	1 (0)
Total days worked	6 (1)	6 (1)
Weekday hours	9 (3)	11 (3)
Saturday	9 (3)	11 (2)
Sunday	0 (8)	0 (12)
Holidays	9 (3)	9 (5)
Days worked per year	300 (0)	300 (50)
^Salary bill (R)	1,400.00 (0)	1,470.00 (975.00)

*Skilled, received some unofficial training; unskilled, never had any training. ^currency: 1USD = R15.00.

(stiff porridge) (97.1%), a South African staple food. Three quarters (75.3%) of the vendor's cooked vegetables and 34% were served as gravy and chakalaka (8.2%). The various meats cooked by the street vendor were chicken (88.8%), beef (68.3%), beef offal/magulu (14.3%), and beef sausage (5.5%), with very few street vendors selling fish (1.4%) or pork (2.2%). The median cost of meat was R400.00 (27 USD). The street food vendors cooked and sold two main starchy foods, mielie pap (97.1%) and rice (14.1%), at R70.00 (5 USD) daily. Although vegetables formed part of the plate, only 60.1% sold green vegetables as part of the menu, with others serving gravy (34.8%) and chakalaka (8.2%) as supplements. The median cost of vegetables used for cooking was R 40.00 (3 USD). Food was mainly cooked on-site (93.3%), with owners (74.5%) as the prominent people cooking food and very few assisted by the employees (23.9%) or spouses (1.6%). Most street food vendors (86.3%) took left-overs home to eat with family members, while 0.2% reported selling leftovers.

Street Food Plate Pricing

Table 5 reports street food plate pricing. The median price for a full plate of chicken was R40.00 (2.7 USD), with a minimum of R20.00 (1.3 USD) and a maximum of R140.00 (9.3 USD). The median price of a full plate of beef was R40.00 (2.7 USD), with a minimum of R25.00 (1.7 USD) and a maximum of R75.00 (5 USD). Moreover, a median price of a half-plate was R30.00 (2 USD).

Target Market

Table 6 reports the target markets of the street food vendors. Most participants reported rural consumers (81.2%) as their primary customers, while 52.3 and 58.7% reported middlemen and government officials. Moreover, 40.9% reported school children as their target market. Most participants (72.0%) highlighted using personal visits/face-to-face, whereas 62.4% used phone calls/WhatsApp to retain customers. Some street vendors indicated that word of mouth (2.7%) and posters (0.6%) communicate

TABLE 4 | Inputs and inputs supplier profiling.

Variable description	Frequency (%)	Median (IQR)
Foods mostly cooked (ready-to-eat foods)		
Meat (R)		400.00 (240.00)
Chicken	454 (88.8%)	
Beef/ox	349 (68.3%)	
Wors	28 (5.5%)	
Pork	11 (2.2%)	
Beef Offal	73 (14.3%)	
Fish	7 (1.4%)	
Starch		70.00 (60.00)
Pap (R)	496 (97.1%)	
Rice	7 (1.4%)	
Vegetables (R)		40.00 (50.00)
Beans	9 (1.8%)	
Green leafy vegetables	307 (60.1%)	
Carrots	1 (0.2%)	
Gravy	178 (34.8%)	
Chakalaka	42 (8.2%)	
Cooking place		
At the site	477 (93.3%)	
Home	38 (7.4%)	
Person responsible for cooking		
Spouses	8 (1.6%)	
Employee	122 (23.9%)	
Self	381 (74.5%)	
Preservation of leftovers		
Take home to eat	441 (86.3%)	
Sell next day	1 (0.2%)	
Sell at a lesser price	25 (4.9%)	
Throw it away	22 (4.3%)	

TABLE 5 | Street food plate pricing.

Variable items	Median (IQR)	Min	Max
Plate prices			
Beef/pork full plate	R40.00 (R10.00)	R25.00	R76.00
Beef/pork half plate	R30.00 (R5.00)	R15.00	R55.00
Chicken full plate	R40.00 (R10.00)	R20.00	R140.00
Chicken half plate	R30.00 (R10.00)	R15.00	R70.00

*Full plate consists of 4 or more servings of meat. ^bHalf a plate consists of 2-3 servings of meat; *Currency: 1USD = R15.00.

with their customers about their services and food sold.

Record Keeping

Table 7 highlights that all street food vendors keep similar records. However, some participants (15.5%) could only keep business records. Most records were sales (59.5%), and 46.8% could keep production records. More than a quarter of the participants (36.7%) kept marketing records. Most of the street

TABLE 6 | Street food vending target market.

Variables	Frequency*(%)
Target market	
Rural customers	415 (82.2%)
School children	209 (41.5%)
Government employees	300 (59.5%)
Middlemen	267 (53.0%)
Other	9 (1.8%)
Mode of communication	
Personal visits	368 (72.0%)
Phone call/WhatsApp	319 (62.4%)
Recruit professionally	22 (4.3%)
Word of mouth	14 (2.7%)
Posters	3 (0.6%)
Nothing	7 (1.5%)

*Number of responses.

TABLE 7 | Street food vendor's record-keeping practices.

Variables	Frequency*(%)
Keep records	
Yes	79 (15.5%)
No	432 (85.6%)
Production	
Production	37 (46.8%)
Marketing	
Sales	29 (36.7%)
Yes	47 (59.5%)
No	357 (89.9%)
Home	
Home	154 (30.1%)
Stall	
Stall	97 (27.4%)
Stall	
Stall	75 (21.2%)
Storeroom	
Storeroom	108 (30.5%)
Rented room	
Rented room	70 (19.8%)
Other	
Other	4 (1.1%)
Yes	
Yes	54 (11.2%)
No	
No	427 (88.8%)

*Number of responses.

vendors indicated that due to lack of infrastructure, they sometimes keep stock (69.9%) in their storeroom (30.3%), homes (27.2%) and stalls (21.0%). Some street vendors reported using rented rooms (19.6%) in the vicinity to keep their stock safe. The practice of stock inventory was not typical because only 11.2% of street vendors could do so.

Total Running Cost and Profit

Table 8 shows that the daily median total running cost was R1800.00 (120 USD). Monthly street food vendors could make a median monthly profit of R3200.00 (213 USD). Only 32% had employees with a monthly expenditure of R1400.00 (93 USD). Street food vendors spent R430.00 (29 USD) and R340.00 (23 USD) on gas and transportation. Other business expenditures

TABLE 8 | Total running cost and profit.

Variable description	Frequency (%)	Median (R)	IQR (R)
Total running cost/day	494 (97.0%)	1,800.00	2,200.00
Total profit	473 (93.0%)	3,200.00	3,900.00
Monthly expenditure			
Electricity	191 (37.4%)	200.00	150.00
Gas	402 (79.0%)	430.00	241.00
Employees	162 (32.0%)	1,400.00	1,000.00
Transportation	339 (66.3%)	340.00	250.00
Water	380 (74.4%)	100.00	100.00
Cell phones	329 (64.4%)	100.00	70.00
Bank charges	21 (4.1%)	50.00	86.00

Rand (R), Currency; IQR, Interquartile range.

were electricity (R100.00) (7 USD), water (R100.00) (7 USD), cell phone (R100.00) (7 USD) and bank charges (R50.00) (3 USD).

Association Between Operational Characteristics With the Four Demographic Characteristics of the Street Food Vendors

Table 9 reports the association between the operational variables with the four demographic characteristics of the street food vendors. The test of four a priori hypothesis was assessed using four independent categories. Chi-square associations were determined with a Bonferroni adjusted alpha level of 0.013. The street vendors in the four categories differed in gender, age, marital status, and citizenship level. There was no significant difference in gender, age, or marital status regarding the days worked. However, there was a statistical difference in the number of days worked and nationality. South Africans (76.6%) worked 6–7 days a week compared to 94.7% of Zimbabweans ($p < 0.001$).

Total hours worked on a Sunday were not statistically different based on gender or marital status. However, there was a statistical difference in the hours worked on a Sunday based on age, with 50.0% of 65–74-year-olds working more than 8 h on a Sunday compared to lower percentages in the younger age groups ($p < 0.001$). Similarly, there was a statistical difference in hours worked on a Sunday based on citizenship, with 6.4% of South Africans working more than 8 h on a Sunday compared to 45.3% of Zimbabweans ($p < 0.001$). Moreover, a significant difference was observed between marital status and the preservation of leftovers, with the separated (100%), married (92.3%), and single (88.3%). Street food vendors take food for home consumption while 4.2 and 36% of married and single throw food.

Ownership had no statistical difference with age, gender, or marital status. However, a significant difference was observed between citizenship and full-ownership ($p < 0.001$), with 91.5% of South Africans as full-owners compared to 54.7% of Zimbabweans who own the businesses. Similarly, a statistical difference in age and number of employees had statistical significance ($p = 0.012$), as more than 50% of the vendors aged 65 years and above have at least 1–3 employees.

TABLE 9 | Operational variables for which there was a significant difference in the characteristics of the respondents using Bonferroni adjusted level.

Variables	Gender	Age	Marital status	Citizenship
Operational working day				
Total hours worked on a weekday				<0.001
Total days worked				<0.001
Total days on a Sunday		<0.001		<0.001
Total days worked Sunday				<0.001
Types of food sold				
Meat	a	a	a	a
Pap	a	a	a	a
Vegetables	a	a	a	a
Sell same food always				<0.001
The site where food is sold				
Preservation of leftovers			<0.001	
Ownership				<0.001
Number of employees		0.012		
Inputs cost				
The average cost of meat			0.004	
The average cost of milie pap		<0.001	0.002	0.003
Total running cost			0.004	
Total profit	0.008			0.008
Expenditure				
Amount spent on employees		0.004		<0.001
Transportation		0.003	<0.001	<0.001
Cell phones		<0.001		0.001
Water			<0.001	<0.001
Plate pricing				
Chicken full	<0.001			
Chicken half	<0.001			<0.001

a-refers to the same food type that are sold throughout the year.

There was no significant difference between gender, age, or citizenship status and the cost of meat. However, a significant difference was observed between marital status and the cost of meat, with single (6.7%) vendors who could purchase meat for more than R1,000 compared to married (3.5%), living with partners (1.7%) and the separated (9.1%). Most participants could afford to buy meat at a price ranging from R100–R500. A significant difference was also observed between the cost of milie pap and age ($p < 0.001$). Compared to all marital statuses, vendors living with their partners (70.1%) could afford milie pap ranging from R51 to R100 ($p = 0.002$).

Citizenship and selling price of milie pap (stiff porridge) differed with most Zimbabweans (73.7%) selling at R51–R100 of milie pap than 54.6% of South African. There was also a significant difference between total running costs with marital status ($p < 0.004$), where single (10.8%) as compared to married (5.6%) and living with partners (8.5%) could spend more than R5,000 on the total cost for the business. Furthermore, significant differences were observed regarding profit made in gender ($p = 0.008$) and citizenship ($p = 0.008$). Males (42%) in the study profited more than females (23.2%) and could

make a monthly profit of more than R5,000. Moreover, only South Africans (26.4%) could make enough profit compared to Zimbabweans (17.3%).

Expenditure had differences as shown by the p -value of electricity ($p = 0.004$), the amount spent on employees ($p < 0.001$), transportation ($p < 0.001$), cell phone use ($p < 0.001$), and water ($p < 0.001$). Most of the time, South African street food vendors (11.9%) were the most to price the plate at more than R50 compared to the non-South Africans. The difference was only observed with half chicken plate pricing on meal pricing ($p < 0.001$).

DISCUSSION

This survey aimed to characterize the operations of the street food vendors in the Vhembe district. Previous street food vending studies have not characterized street enterprise availability and distribution across the Vhembe district towns. The predominance of women aged 34–44 in the present study is not surprising, although men were available. Lower than the monthly earnings of the informal sector employees reported nationally in 2016 (36). The reason for women dominating the street food vending in the study could be that the business is focused only on cooked meals where women are commonly involved in preparing and serving food. In South Africa, studies have reported women's dominance in street food enterprise (19, 31, 37) who depend on the business for social relief (4, 20, 38). A lack of employable skills, insufficient work experience, and inadequate financial resources are among the factors contributing to women's dominance in the sectors (28). Similar trends were observed in other African countries (15, 18, 20).

Food vending activities enhance income for some households to meet their additional financial needs (39). In the current study, most street food vendors were never married, which may be attributed to the declining marriage in South Africa amongst youth (40). However, in Uganda, single street food vendors engage in street food vending as their only source of income (41). It is documented that marital status is one reason for establishing the household's livelihood strategies for the consumers and vendors (42). Even though the current study highlights that the proportion of married street vendors was significant, married street food vendors could be engaging in the business as an additional financial resource (41).

Education is essential for the design of appropriate training interventions. In South Africa, studies have shown that most street food vendors are educated, with most having achieved secondary education or post-secondary/tertiary qualification (43). The Vhembe district reported a decrease of 1.8% in people without schooling (33). The current study also shows that most street food vendors are educated, contrary to other studies in part of the African countries (15, 16, 21). A highlight is that if vendors are trained adequately in business establishments, their business skills could improve while promoting food safety and consumption of nutritious foods. Even though it is documented in South Africa that educated vendors venture into the business because of a lack of employment opportunities in the formal

market (44–47). Hence the need to acknowledge that many people engage in street food vending to survive and meet their basic needs due to poverty and unemployment and that it is not by choice, but the country's employment status forces them (48).

The vendors' business profile highlights that most worked long hours with the sole employer. Significant differences were observed between operational working hours and citizenship, where foreign nationals worked fewer hours than South Africans. According to the Basic Employment Conditions Act of 1997, an employee who works more than 5 days a week should work 8 h daily (49). Nevertheless, street food vendors worked more hours and days, contrary to the Basic Employment Conditions Act of 1997. Similar findings were also observed in Cape Town, where street food vendors worked more than the average population (2, 23). Although business hours tend to vary per enterprise, meal types are prepared and served because enterprise locations are influenced primarily by the specific days of the week, and it was not the case in the current study as the same foods were sold (50). Furthermore, males worked for longer hours on weekdays and weekends, especially Sundays, which could be attributed to female street food vendors having other responsibilities after work, such as taking care of families.

Similar to other studies (9, 20, 27, 28, 31, 51), this study showed that street food vending could reduce unemployment as 9.0% of the enterprises had employees. However, challenges such as lack of access to capital, with only 0.8% of the street food vendor who had access to financial assistance, could make it difficult for street food enterprises to thrive (52). Street food enterprises' survival was based on vendors' savings and, at times, getting some financial assistance from the "loan sharks," where they are expected to return the money with a certain percentage that could hinder profit. The current study's findings are not different from those of other studies (20, 53) that street food vendors source initial money from their savings to establish and sustain the enterprise. Furthermore, street food vendors borrow money from money lenders (loan sharks) for continued food business operation, although it comes at a cost (54).

Further attributes that need to be considered are expenditure and business record-keeping practices. A study in Ghana highlighted a need for policy interventions to improve the street food sector regarding managerial constraints (55). As reported in other studies (20), the current study highlighted that vendors spend more money on business expenses, including buying inputs, with little monthly profit. These results are consistent with a study in Ghana (55) that was a constraint to the growth of micro and small scale enterprises where increased inputs and business expenses were identified as a constraint to street food enterprise growth.

Street food is consumed mainly by working-class people who use public transport (3, 6, 19, 31). In Mexico, it is reported that those who commute long distances or lack time to prepare food at home consume most food outside their homes (56). This street food vendor location was also observed in other parts of the country (5, 10, 29) and Africa, although their location is sometimes illegal (57–60). Plate costs in the study remained affordable and attractive to the poor groups compared to the expensive meal of R70–R300 (5–20 USD)

from a restaurant (<https://www.numbeo.com/cost-of-living/in/Polokwane>). With the association's help, street food vendors determined the standard price needed in the same vicinity. There is a need to strengthen this partnership amongst the street food vendors with the formal institution and train them in business management. Training will help street food vendors produce and circulate goods and services within the informal food vending, expanding job opportunities in the absence of formal employment.

Food sold in the current study included traditionally cooked starches such as pap and rice served with chicken/beef/pork, and very few vendors served fish. However, green leafy vegetables were uncommon. These foods were not different from food reported in other studies selling cooked street food (3, 23, 61) and highlight that if healthy food items are made available and affordable, people are more likely to consume them (56, 62). The limitation observed was that cooked food was not individually identified, and due to the nature of the study, portion sizes were also not being calculated. Other research (3) in the country highlighted the nutritional contribution of street food, citing its importance in providing energy and micronutrients to supplement the home meal. Street food vendors should be encouraged on the types of foods sold to customers to improve the nutritional quality of foods sold on the street.

Although there was no significant difference between gender and place food is cooked, the use of leftovers in the current study highlighted across all marital status that street food vendors take along their leftovers to use at home. All street food vendors could be encouraged to save on food and use food profitably rather than throwing and reselling, posing health issues. Like our findings, consuming leftovers is common among street food vendors (17). Although 56% of street food vendors indicated using the leftovers for the next day in Zimbabwe, posing health risks to customers (15), many (44%) still use the leftovers for home consumption. This indicates that the street food vending enterprise contributes to the food vendor's mass and family. In addition, studies conducted in South Africa highlighted that traditionally cooked street food microbial safety was surprisingly better than expected (9, 23). It is reported that the less availability of the microbial concerns in the cooked food could be because street vendors should ensure that the environment they are operating from is always kept clean (60). Such practices must be encouraged to all vendors selling cooked foods to avoid loss in the business and contribute to the family diet. Therefore, public health professionals should better engage the street food vendors by selling cooked food and keeping them safe for consumption to contribute to the household's nutritional wellbeing.

CONCLUSIONS

The majority of our sample were women, who were single with some school education. The study also highlighted the presence of migrants working as street food vendors in the Vhembe district. Most vendors owned the business and have been

operating for 1–10 years. Males comprised 10% of our sample, and indicated higher working hours than females. Food sold in the study were commonly consumed foods such as mielie pap, beef, chicken, and seasonal vegetables. The street vendors encountered many constraints, such as a lack of essential services, including water, financial assistance from the formal institution, energy, and transportation.

Moreover, street vendors portray poor managerial skills. However, street vending has shown that street food enterprise contributes to the local economy by offering employment. There is an urgent need for an intensive capital provision for street food vendors' businesses and a management food training that will equip these entrepreneurs, mainly in the grassroots communities of the Vhembe district of South Africa. Therefore, government officials, policymakers, and NGOs could target street vendors to offer training and microfinance to improve their business skills while promoting food safety and consumption of nutritious foods.

STUDY STRENGTH AND LIMITATIONS

This is the first study to evaluate women's street food vendor business operational characteristics on a larger scale in the Vhembe district, Limpopo province. The study's findings can help customize supporting policies for different street food vendors to improve the country's economic status, informal business equity, food safety and nutrition security. Furthermore, our measurement tools were piloted, resulting in their increased reliability. However, this study had some weaknesses. First, the cross-sectional nature of the study design prevented us from making any causal conclusions between variables. Second, some explanatory variables relied on participants' self-reported data, prone to recall and social desirability biases. To minimize this bias, study participants were allowed adequate time to recall previous information as best as possible.

DATA AVAILABILITY STATEMENT

The data sets used or analysed during the current study are available upon reasonable request from the corresponding author.

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ETHICS STATEMENT

Ethical approval was obtained from the University of Venda (project No: SHS/19/NUT03) and the University of the Free State (project No UFS-HSD2019/0059). The researcher obtained approval from the Vhembe district municipalities and the street food committee to conduct the study. The researchers surveyed street food enterprises, interviewing street food vendors available and knowledgeable about the business. The business owner/employees were informed of the research objectives and conducted interviews to secure consent. The participants were informed of the purpose of the investigation before participating in the study. Furthermore, participants were given assurance of privacy, confidentiality, and anonymity regarding the information provided. Street vendors signed the consent form after explaining the study's aim and objectives.

AUTHOR CONTRIBUTIONS

TM, CN, and AN contributed to the conception and design of the study. JN, MB, and RA contributed to the manuscript writing. All authors reviewed the manuscript and approved the submitted version.

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6 CHAPTER SIX: DIETARY DIVERSITY AND MACRONUTRIENT CONTENT OF PREPARED STREET FOOD SOLD IN THE VHEMBE DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA

6.1 Introduction

The manuscript examined the dietary diversity and macronutrient content of prepared street food sold in the Vhembe District, Limpopo province, South Africa. The manuscript was written according to Nutrition Journal author guidelines.

Name of journal: *Nutrition Journal*

Publisher: BioMed Central

URL: <http://www.nutritionj.com>

6.2 Manuscript

6.3 ABSTRACT

Background: There has been increased street food and fast-food consumption in recent years in South Africa. The study examined the dietary diversity and macronutrient content of street food and the contribution of fast food to daily intake in the Vhembe District.

Methods: A cross-sectional survey was used to sample 511 street food vendors during a transect walk-through. A closed-ended questionnaire was used to capture the types and quantities of food the street food vendors sold. The food group diversity and menu settings/stockings were obtained using a food-type logbook. Diversity, diversity food groups and the Dietary Diversity Score (DDS) were assessed. Six mostly sold plate combinations were analysed for their macronutrient composition. A food composition table was used for nutrient analysis. Statistical computations and graphics were performed using the R and IBM SPSS Statistics 27 software. The non-parametric Wilcox test was used to compare the macronutrients of the six dishes, with statistical significance set at the 5% level.

Results: Of the 511 street food vendors enrolled, 90% were females. Starchy staples were the most common food group sold, followed by meat, fish, and other fruits and vegetables such as onion, tomatoes, and cabbage. Overall, 70% of the street food vendors prepared fewer than five food groups. No vendors sold dairy products or eggs. About six plate combinations were mainly prepared. However, no statistical differences were observed between the median carbohydrates of the six meals in terms of macronutrients (median 76.3 g, IQR 36.6 - 151.7 g). Chicken feet and cabbage dish had the lowest fat content (median 5.0 g, IQR 1.7 - 7.9 g, $p < 0.001$), while chicken, cabbage, and carrot dish had the highest (median 12.3 g, IQR 5.0 - 21.4 g, $p < 0.001$), macronutrients contribution is carbohydrates in males and females with 56%, followed by daily fat intake for females ranging from 5 - 17% of street food.

Conclusions: Street food provides essential macronutrients for both male and female adults in rural towns. However, staple foods sold were high in starchy content with low diversity of food groups. Street food vendors should develop strategies such as using fortified products to supplement foods with low micronutrients.

Keywords: Street Foods, Food groups, Dietary Diversity Score, Macronutrient

INTRODUCTION

Street foods are a common source of food eaten outside the home in low-income settings (Adeosun, Greene, & Oosterveer, 2022; Al Mamun & Turin, 2016; Edeme & Nkalu, 2018; Osei-Mensah, Ohene-Yankyera, & Aidoo, 2016; Roever & Skinner, 2016). In recent years, there has been an increase in street food and fast-food consumption in South Africa as many people purchase fast foods and street foods. Street-vended foods support the dietary diversity of most people in the informal sector because they provide easy access to inexpensive, affordable food items (Alimi, 2016). However, studies (Feeley, Kahn, Twine, & Norris, 2011; Hill, Mchiza, Puoane, & Steyn, 2019; Steyn, Labadarios, & Nel, 2011; Steyn et al., 2014) noted some concerns given the high prevalence of soft drinks, high fat, and energy-dense foods consumed in the street. Furthermore, despite its universality, the contribution of street food to daily nutrient intake has not been addressed adequately in dietary assessment research (Steyn et al., 2014).

National studies have indicated that undernutrition and overnutrition are problems in South Africa. Data from the National Food Consumption Survey in South Africa showed that dietary diversity and food variety play vital roles in improving individuals' dietary adequacy, including children and adults (Labadarios et al., 2005a). The informal food sector, of which street vendors are one of the most significant sales sectors (Hill, Mchiza, Puoane, & Steyn, 2019; Steyn et al., 2014), makes it an essential component of nutritional security in South Africa. Vendors often provide items at lower prices than other retailers since they have no or lower rent and because ingredients are bought in large quantities, typically from the cheapest markets (Adeosun et al., 2022; Drimie, Faber, Vearey, & Nunez, 2013).

In other parts of the world, food primarily consists of staples. In Ghana, (Marras & AgBendeche, 2016), food sold in the street provides a variety of foods. As noted by Hiamey et al. (2015), there seemed to be a desire for carbohydrate staples over other types of foods sold on the streets in Ghana, mainly because of their low cost, availability, and ease of preparation. In Kampala (Sseguya, Matovu, Swann, & Draper, 2020), street food contributed considerably to the daily intake of fat (49.1%). A review by Steyn et al. (2013) also found that the daily energy intake from street foods in adults contributes about 13 - 50% of total food energy and 13% to 40% in children, making a significant contribution to daily energy intake.

A Kampala study reported street food's energy contribution (Sseguya et al., 2020). This study noted that about 30% of the daily intake comes from street food. Moreover, street food contributes protein and micronutrients such as iron and vitamin intake. The highest contribution by street food to micronutrients was observed in sodium (38.4%) and calcium

(36.5%) and the least towards the daily intake of vitamin A (11.3%) (Sseguya et al., 2020). Given the significant role of street foods in consumers' diets, vendors should be encouraged to sell fruits and vegetables or add them to cooked dishes. This is important, given the results of previous work that showed South Africans consume less than the recommended daily servings of fruits and vegetables (Mchiza, Hill, & Steyn, 2014).

The diversity of foods is essential because it could increase the nutrient adequacy and diversity scores where the number of food groups consumed over a reference period is scored (Sawadogo et al., 2006). However, the National Food Consumption Survey (Labadarios et al., 2005b; Mchiza, Hill, & Steyn, 2014; Steyn et al., 2014) indicated that maize meal porridge is the most common starchy food with very few fruits and vegetables, and it is common in foods that are not diverse and those with low nutrient densities (Drimie et al., 2013; Steyn et al., 2011). Studies in the Limpopo province (Mchiza et al., 2014; Steyn et al., 2011) noted the high availability of street food in the Limpopo province. However, there is a paucity of information on food types sold by street food vendors and their contribution to the daily intake of individuals in Limpopo province.

The current study examines street foods' dietary diversity and macronutrient content in the Vhembe District, Limpopo province. In this study, street food vendors were surveyed in three populous locations and the dietary quality of their produce was analysed. Little is known about the types of cooked food and their contribution to the daily intake of the adult population in the Vhembe District.

Methods

Study population and design

The study was a cross-sectional survey that used well-structured close- and open-ended questions and a non-probabilistic sample of 511 street food vendors during a transect walk-through. All available and willing street vendors over 18 years old selling cooked food were considered eligible for the study. Because the location of street food vendors is often not formally recorded and the total population size is unknown, the transects focused on towns. Sixteen vendors were excluded from analyses because of incomplete information. Data were collected on weekdays during busy times. Before the interviews, the study purpose, aims, and procedures were explained to the street food vendors, and informed, written consent was obtained.

Study area

From July to September 2019, the study was conducted in three towns in the Vhembe District: Makhado, Thohoyandou, and Musina. Vhembe District has an estimated population of 1.2 million (4), with a little over 50% women (Stats SA, 2019). It covers an area of 21402 km² most of which is rural land. Due to the high level of unemployment (41%) (Limpopo Provincial department, 2021), a poorer population might rely more on cheaper street foods. Thohoyandou and Makhado are big (populations of 69,000 and 23,000, respectively), regarded as the most developed, and with the most economic activities in the cities (StatsSA, 2020). Musina (43000 people) remains relatively under-developed with a high shortage of job opportunities and constant migration across the border to Zimbabwe.

Data collections

The details of the types of food, the food group diversity, and menu settings/stockings were obtained using a food logbook. A list of all foods prepared by an individual food vendor was recorded. Foods were grouped according to the types (i.e., starch staples, vegetables, and meats) of dishes primarily provisioned by the street food vendors and the nutrient content of each dish. The following grouping of six dishes was determined based on dishes prepared in the study area: [(1); Chicken, pap, cabbage, carrot, and stew; (2) Chicken, pap, *Mutshaeni*, and stew; (3) Chicken feet, pap, and stew; (4) Beef, pap, *Mutshaeni* and stew; (5) Beef, pap, cabbage, and stew and lastly (6) Tripe, pap, cabbage, and stew)]. We used the Condensed Food Composition Tables (FCT) for South Africa (Wolmarans, Danster, & South African Medical Research Council., 2010). The macronutrient content of six commonly provisioned dishes' median energy and macronutrient content was compared to the Recommended Daily Allowance (RDA).

We focused on the food diversity of street food providers rather than the consumers because they determine the composition of the menus available to out-of-home consumers. Food diversity was based on ten different food groups derived from the groupings of ready-to-eat food vending. The Minimum Dietary Diversity for Women of reproductive age (MDD-W) indicator was calculated following the guidelines for assessing the MDD-W (FAO and FHI 360 2016). The MDD-W is a dichotomous indicator of the diversity of food groups provided by street food vendors, with a distinction drawn between a count of 0 to 4 food groups and at least 5 out of 10. Each specific food item was included in 1 of 10 selected food groups (FAO and FHI 360, 2016). A count below five food groups would indicate poor dietary diversity, while counts of 5 and above would represent a very varied diet. Each food group was only counted once when calculating dietary diversity scores, even if there might be multiple foods within any one group. The ten food groups are (1) grains, white roots and tubers; (2) pulses:

beans, peas and lentils; (3) nuts and seeds; (4) dairy; (5) meat, poultry and fish; (6) eggs; (7) dark green leafy vegetables; (8) other Vitamin A-rich fruits and vegetables; (9) other vegetables and (10) other fruits. The DDS was descriptively analysed based on two discrete categories: low diversity (< 5), and high diversity ≥ 5 (FAO and FHI 360, 2016; Fisher, 2021; Jordaan, van den Berg, van Rooyen, & Walsh, 2020).

Statistical Analyses

Food items sold by female or male street vendors were compared using a test of proportions. Categorical variables were compared using chi-square analyses and the Pearson correlation coefficient was used to assess the relationship between continuous variables. The macronutrient composition of the most sold dishes was compared to the pooled average using the Wilcoxon signed rank tests. Six different mostly sold plate combinations were analysed for their macronutrient composition. Statistical significance was set at the 5% level. Analysis was performed using the R software 4.1.0 (R Foundation for Statistical Computing, 2021) and the SPSS Statistics 27 software package (IBM Corporation, 2020).

RESULTS

Food sold by street food vendors

Figure 1 of this chapter shows the 17 most common food products sold by street vendors by gender and location, with foods significantly different between male and female vendors highlighted in grey. Of the 511 street food vendors enrolled, 90% were females. Chicken and beef were significantly more available from female street food vendors in Musina town. In comparison, the most common food items, such as *dust chicken* (barbeque chicken meat) and pork, are sold by males ($p \leq .05$). Traditional, *Mopani worms* and *Thebe* (*Amaranth*, also known as pigweed), were only sold in Thohoyandou. Commonly provisioned items to both males and females were food such as Maize meal porridge, chicken, beef, and

Qwengwelele (a local gravy made of onion, tomato, and soups) was not served in isolation. Female street food vendors in all towns sold at least one meat dish, including chicken or beef, while most also sold *Mutshaeni* (Swiss chard) and cabbage

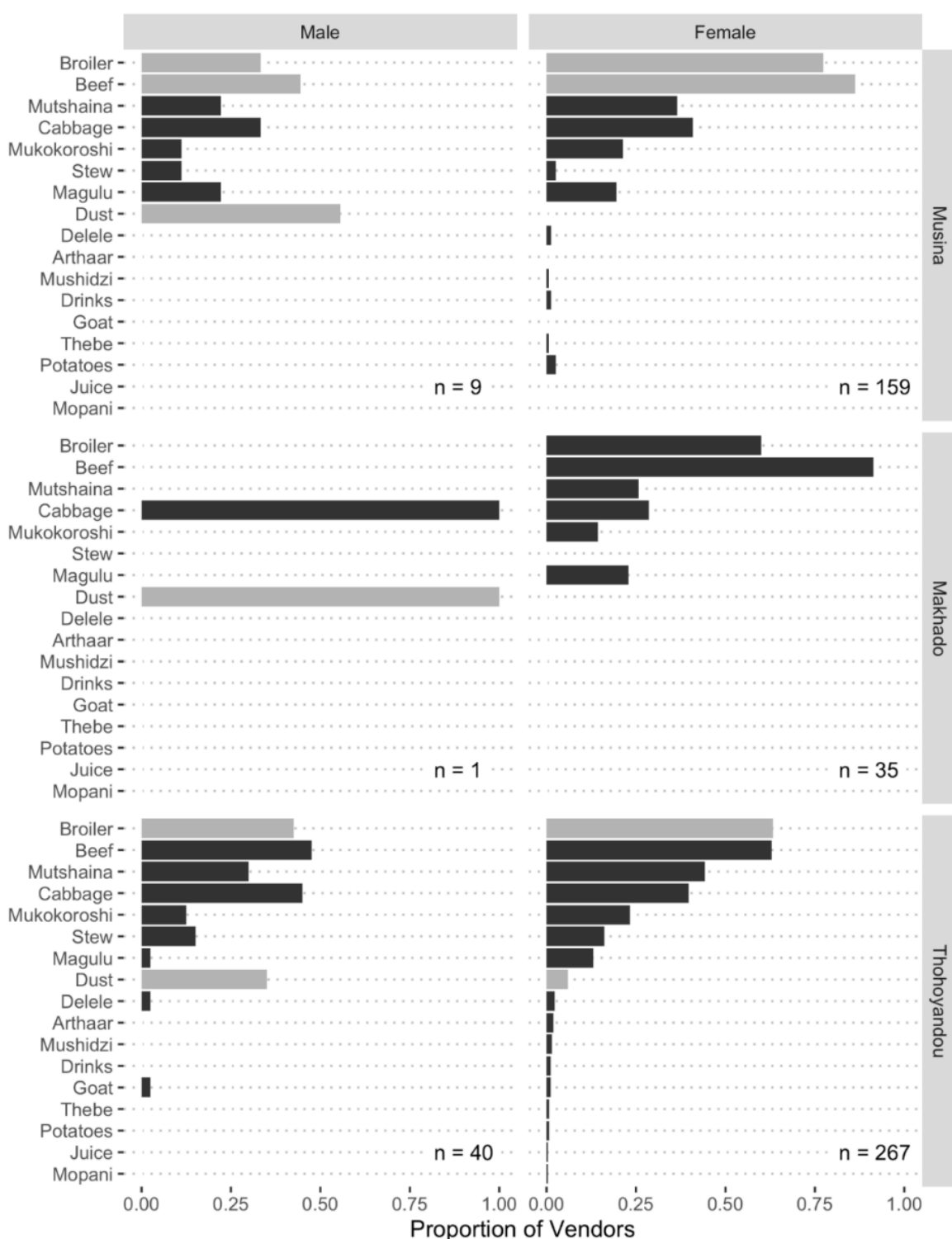


Figure 1: Proportion of street food vendors selling common products by gender and location.

As an example of how foods are served in combination, Figure 2 of this chapter depicts typical street portioning using the example of chicken meat served with cabbage *Qwenqwelele* (onion and tomato gravy) and a large amount of maize meal porridge (Stiff pap).



Figure 2: Chicken plate served with pap, cabbage, and *Gwengwelele* (tomato and onion stew)

Percentage MDD and dietary diversity of food groups prepared by street food vendors.

Table 7 reports the percentage of street food vendors preparing food with adequate dietary diversity ($MDD-W \geq 5$) and poor dietary diversity ($MDD-W < 5$), and the percentage of street food vendors who prepared food from each of the specific food groups. Overall, almost three-quarters (70%) of the street food vendors prepared food from fewer than five food groups. Therefore, consumers who regularly buy from street food vendors might achieve medium dietary diversity. Most vendors who prepared (more than five food groups) were from Thohoyandou, with 22% of vendors who could assist consumers in consuming more than five food groups with a medium dietary diversity. In all towns, starchy staples were the most common food group. More street food vendors from Musina town prepared pulses (beans and lentils), while more street food vendors from Thohoyandou prepared dark green leafy vegetables, other Vitamin A-rich fruits and vegetables, other vegetables, and other fruit food groups. All street food vendors in the study prepared grains, white roots, tubers, and meat, poultry, and fish food groups. There were no street food vendors preparing foods from the nuts and seeds, dairy, and eggs food groups in any of the towns.

Table 7 Percentage of street food vendors preparing food with adequate dietary diversity (MDD-W ≥ 5) and poor dietary diversity (MDD-W < 5), from each food group

	Study sample	Musina	Makhado	Thohoyandou	¹ p-value
Medium Dietary Diversity (MDD)	N (%)	N (%)	N (%)	N (%)	
MDD < 5	355 (69.5)	130 (25.4)	29 (5.7)	196 (38.4)	
MDD ≥ 5	156 (30.5)	38 (7.4)	7 (1.4)	111 (21.7)	
Percentage of street vendors preparing each food group					¹ p-value
	N (%)	N (%)	N (%)	N (%)	
Grains, white roots and tubers	511 (100)	168 (32.9)	36 (7.0)	307 (60.1)	0.002
Pulses: beans, peas, and lentils	8 (1.6)	7 (1.4)	1 (0.2)	0 (0.0)	
Nuts and seeds	0	0	0	0	
Dairy	0	0	0	0	
Meat, poultry and fish	511 (100)	168 (32.9)	36 (7.0)	307 (60.1)	
Eggs	0	0	0	0	
Dark green leafy vegetables	205 (40.1)	60 (11.7)	9 (1.8)	136 (26.6)	0.030
Other Vit-A rich fruit and vegetables	33 (6.5)	12 (2.3)	0	21 (4.1)	0.261
Other Vegetables	394 (77.1)	116 (22.7)	23 (4.5)	255 (49.9)	< 0.001
Other Fruits	312 (61.1)	83 (16.2)	15 (2.9)	196 (38.4)	

Note: Bolded *p*-values are statistically significant; $p < 0.05$;¹Chi-square test for categorical data

Macronutrient composition of the six most served dishes

The macronutrient content of the six most frequently served dishes are reported in Figure 5 of this chapter. There were no statistical differences between the median carbohydrates for the six meals analysed for macronutrients (median 76.3 g, IQR 36.6 - 151.7 g) because street food vendors tended to serve pap (Maize meal porridge) as a common carbohydrate-heavy addition. The median energy values of dishes served with chicken were as follows; chicken, cabbage and carrot (median 2707 kJ per serving, IQR 1353 - 3821 g, $p = .01$), and chicken feet and cabbage (1716 kJ per serving, IQR 768 - 3219 g, $p = .002$). The beef and *Mutshaeni* dish were statistically indistinguishable from the pooled average fat content (median 7.4 g, IQR 3.4 - 14.6 g, $p = .052$), whereas all other dishes deviated significantly from it. For example, chicken feet and cabbage had the lowest fat content (median 5.0, IQR 1.7 - 7.9 g, $p < .001$), and chicken, cabbage and carrot had the highest (median 12.3, IQR 5.0 - 21.4 g, $p < .001$).

Fibre was consistent for four of the dishes (median 5.4 g, IQR 2.9 - 9.3 g) but was significantly lower in the chicken feet and cabbage dish (5.0 g, IQR 2.0 - 9.0 g, $p = .028$), and significantly higher in the beef and *Mutshaeni* dish ($p < .001$). This could be because green leafy vegetables such as *Mutshaeni* have high fiber content compared to other vegetables such as cabbage. Vegetables primarily provisioned in the study, as shown in Figure 1 and Table 7, mainly were green leafy vegetables such as *Mutshaeni* and *Thepe* (*Amaranthus Spinosus*). Protein was highly variable between the six dishes. Except for chicken feet, all chicken meat dishes had higher than average protein.

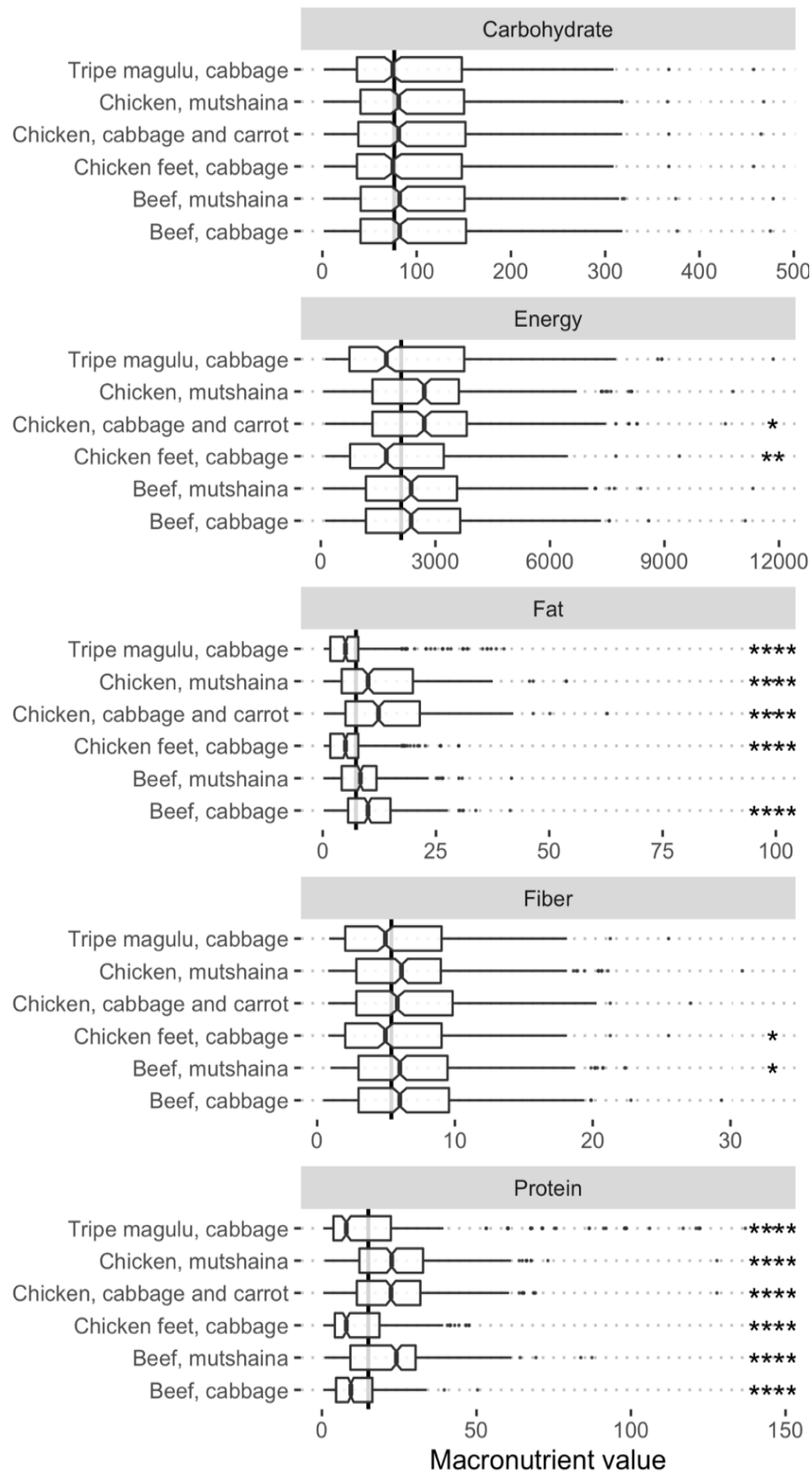


Figure 3: Macronutrient content of six mostly served street food dishes.

* $p < .05$, ** $p < .01$, *** $p < .001$ for the Wilcox signed rank test comparing individual plates and pooled macronutrient values. Unit measures of energy (kj); protein, fat fiber and CHO (g)

Energy and macronutrient contribution to recommended daily intake.

The macronutrient contribution of street foods compared to recommended daily intake (RDA) is presented in Table 2. Carbohydrates are the best provisioned at 56% of the RDA, followed by daily fat intake for females ranging from 17 - 49% of street food. The lowest daily contribution was in fat in males (11 - 33%), which was still a lot. Protein content contribution was higher in females (16 - 40.4%) than in males (13 - 33%). At the same time, the percentage contribution from dietary for men and between 16 - 20% for women. Overall, the energy intake of street foods contributes between 13 - 18% of males and 17 - 23% of female's daily nutrient intake.

Table 8 Contribution of macronutrients to daily intakes adult consumers according to rural/urban DRI (N=511)

	Food combinat ion	Compari son	RDA	Chicken (pap, cabbage, carrot, stew)	Chicken (pap, <i>Mutshaeni</i> , stew)	Chicken feet (pap and stew)	Beef (pap, <i>Mutshaeni</i> , stew)	Beef (pap, cabbage, stew)	Tripe (Pap, cabbage, stew)
Mean Dietary Diversity				4	3	5	4	4	4
Energy	Median (KJ ²)			1956	1954	1502	1565	1716	1502
		Male	10900 KJ/day	17.9	17.9	13.7	14.4	15.7	17.9
	% Contribution	Female	8700 KJ/day	23	23	17	18	20	17
Carbohydrate	Median(g)			73.2	73.2	73.2	73.2	73.2	73.2
		Male	130g/day=RDA ³	56.3	56.3	56.3	56.3	56.3	56.3
	% Contribution	Female	130g/day=RDA ³	56.3	56.3	56.3	56.3	56.3	56.3
Protein	Median (g)			18.6	18.6	7.4	16	8	7.4
		Male	56g/day=RDA ³	33	33	13	29	14	13
	% Contribution	Female	46g/day=RDA ³	40.4	40.4	16	35	30.4	16
Fat	Median (g)			9.1	9.8	3.4	5.8	7.4	3.4
		Male	30g	30.3	33	11.3	19.3	25	11.3
	% Contribution	Female	20g	46	49	17	29	37	17
Fiber	Median (g)			4.4	4.8	4	5	4.5	4
		Male	38g/day=AI ⁴	12.5	12.6	11	13.2	12	11
	% Contribution	Female	25g/day=AI ⁴	17.6	19.2	16	20	18	16

National Library of Medicine. 1989. "Energy - Recommended Dietary Allowances - NCBI Bookshelf."

<https://www.ncbi.nlm.nih.gov/books/NBK234938/>¹Dietary reference intake; Gram;²Kilojoules; ³Recommended dietary allowance; ⁴Adequate intake

Discussion

In this study, we investigated the dietary diversity and macronutrients of prepared street foods and their contribution to the dietary intake of the adult population in the peri-urban Vhembe towns in Limpopo, South Africa. The study showed that female vendors dominated the sector. The street food vendors tended to provide low dietary diversity options for the six most common dishes. The findings of this study confirmed earlier work (Feeley et al., 2011; Steyn et al., 2014), which reported less variety and no diversity in the foods sold on the streets in South Africa. The study also highlighted that street food vendors provisioned food mainly cooked in homes, similar to other African countries (Adeosun et al., 2022; Mensah, Yeboah-Manu, Owusu-Darko, & Ablordey, 2002; Nyoni & Bonga, 2019).

Street food offers a wide range of foods with different names, depending on their place and country (Bouafou, Beugré, Amani, & Bouafou, 2021). A study by Albuquerque et al. (2020) noted that the availability of urban street food in Bishkek, Nigeria is broad and diverse, including various traditional foods. Their study noted that this food contributed a high variability in energy content, macronutrient, and lipid profile values among the most commonly available foods. Like many other studies, meals sold in African countries are high in starchy staples and protein, with few fruits and vegetables. Even though most studies reported on other food (Hill, Mchiza, Fourie, Puoane, & Steyn, 2016; Hill, Mchiza, et al., 2019; Mchiza et al., 2014; Steyn et al., 2016; Steyn et al., 2014), this study looked at cooked food sold in rural towns. We reported on traditional and home-cooked food such as maize meal porridge, *Thepe*, *Mukokoroshi* (homegrown chickens), and beef meat. Similar findings were also reported in studies conducted regionally and nationally, where they reported that most food consumed in South Africa is from starchy staples high in energy (Labadarios et al., 2005b; Steyn et al., 2016; Steyn et al., 2014). Generally, vendors sell more than one kind of product, although some specialize in one type only, such as stiff porridge and one type of meat. This study also highlighted that foods prepared in the street of Vhembe town are foods primarily considered in the food value chain in many developing countries (Bouafou et al., 2021; Kaptso, Tchabo, Chebelem, Asoba, 2021; Lemessa, Watabaji, Yismaw, & Tadesse, 2021; Osei Mensah, Ohene-Yankyera, & Aidoo, 2018; Sousa et al., 2019).

Diversity of outside-of-home prepared foods

The current study used DDS to evaluate meals out of home meals to get a snapshot of food groups sold by street food vendors. In terms of a period, it is limited to a per-meal basis.

According to the guidelines for MDD-W, street food vendors did not meet the cut-off of dietary diversity score of more than five food groups, which indicates poor dietary diversity. Moreover, this is low and only part of an overall diet. However, these dishes are typically traditional foods and reflect the sorts of culturally acceptable meals eaten at and out of the home. Therefore, the low DDS may raise concern over the overall diet diversity of these populations and additional work would be needed to assess in-home DDS. Almost 70% of the street food vendors prepared food from less than five food groups, similar to other studies (Fisher, 2021; Jordaan et al., 2020; Steyn et al., 2016). Compared to street food vendors in Thohoyandou, street food vendors who buy food frequently from Musina have limited options and possibly have lower dietary diversity scores. Poor dietary diversity has been reported, as has been reported in other South African rural areas (Fisher, 2021; Mchiza et al., 2014; Steyn et al., 2014). However, this finding is in contrast to the findings noted by Alimi (2016), who maintains that street food could support the dietary diversity of most people. Various studies have examined the increasing diet variety of the adult population (Drimie et al., 2013). These studies noted the importance of consuming various foods in the South African food-based dietary guidelines “Enjoy a variety of foods” However, insufficient resources make it impossible for populations to obtain a variety of foods (Drimie et al., 2013).

A substantial proportion of vendors were able to provide five food groups an indication of locally available products that could be incorporated into daily meals of customers out of the home. Moreover, the adult diet has lower dietary diversity in the lower living standard measure groups in South Africa (Drimie et al., 2013). Another study highlighted that Limpopo province has the lowest dietary diversity amongst the adult population, with 62% poor dietary diversity scores reported, a reflection of consuming a diet low in dietary variety (Labadarios, Steyn, & Nel, 2011). Again, a study (Faber, Laubscher, & Berti, 2016) reflected poor people’s ability to access various foods.

The current study highlights that if this food could be encouraged in the street rather than unhealthy food such as confectionary and other high-energy food, they could improve food choices outside home-prepared meals. However, if street food vendors increase the number of food groups on their plates, vendors also need to consider increasing the price of a plate which could also affect customers' affordability. Thus, there is a need to educate and encourage street food vendors on the inclusion of a variety of food as recommended by the South Africa Food-based dietary guidelines considering the disadvantages to the business's profitability. More emphasis must be put on the importance of including fruits and vegetables

in their enterprise as it will also encourage customers who buy a meal to buy the available fruits, thus increasing the dietary diversity of the adult population in the country. To increase the DDS, vendors would benefit from training and both vendors and perhaps customers would need to be educated about modifications to regular meals to add additional food groups.

Unlike other studies (Mbhatsani et al., 2021; Steyn et al., 2011; Steyn et al., 2014) that could not document the types of cooked food on the street, the current study highlights that foods sold were traditionally consumed in a family setting. We note that if consumers regularly consume these foods and continue eating the same food at home, there would be a risk of nutrient deficiencies due to a monotonous diet of street foods typical of in-home meals. Consumers continuously consume the same food items at home and out of home because their low cost, availability, and ease of preparation contribute to this practice (Hiamey, Amuquandoh, & Boison, 2013). Moreover, foods primarily consumed in the study are traditionally the main food crops that provide carbohydrates. However, this raises a concern for health professionals, such as nutritionists, to assist street food vendors with education regarding increasing sales of essential food groups that could be incorporated into their enterprise to improve customers' food choices. In this context, increasing the number of food groups significantly affects the nutrient intake of individual foods in the diet. Therefore, street food should be seriously investigated from a policy perspective regarding its potential impact on food and nutrition security (Steyn et al., 2011).

Food groups such as nuts and seeds, dairy, and eggs were not part of this study's prepared foods on the street. Although this food contains rich micronutrients such as iron, insufficient resources could make it challenging to prepare this food (Drimie et al., 2013). The current study highlights that if this food could be encouraged in the street rather than unhealthy food such as confectionaries and other high-energy food, they could improve the prepared food choices for the customers. Thus, increasing the dietary diversity of the adult population in the country.

Energy and macronutrient intakes

Street food contributes significantly to macronutrients and food groups consumed (Steyn et al., 2014). Moreover, it must be recognised that the energy from street foods should be added to that from regular meals taken at home. There may be an increase in energy intake, which in the long run will impact detrimentally on weight status. This study highlights that those dishes sold in the street of the Vhembe District contribute almost a fifth of total energy for males and females, respectively. In Kampala, Sseguya et al. (2020) reported higher

energy levels (30%). Thus, some traditional homemade dishes and snacks have a high content of saturated and trans fatty acids, reaching 30.2 g per serving and 2.9 g per serving, respectively (Bouafou et al., 2021). Again, while most street food studies have noted that males are the primary consumers of street food, our results suggest a significant contribution to the energy intakes of females too.

High energy intake is a risk for overweight and obesity (Havelaar et al., 2015). The current study indicates that energy and macronutrient intake among street food consumers is similar to other African countries (Hill et al., 2019; Sousa et al., 2019). Our findings highlight that vendors serve large amounts of carbohydrates between the dishes, contributing significantly to daily energy intake. Steyn et al. (2014) noted that energy supplied by street foods usually replaces home meals. In this study, we used adult males and females as a reference (daily energy requirements are around 10 000 KJ, of which less than 30% of energy should be derived from fat (approximately 92g per day). A street food dish of chicken with pap, cabbage, and carrot would contribute between 17.9% and 23%, respectively, of male and female total energy. A beef plate with pap, cabbage, and stew contributed 20% of total energy compared to 15.7% of males. A significant difference was seen between the energy provisioned from the chicken, cabbage, and carrot ($p < .05$) and chicken, feet, and cabbage ($p < .01$) dishes.

Fat and carbohydrate intake from street food contributes to the total fat and sugar intake. A review study of street food in developing countries reported a high contribution of fat – more than 40% – to total energy from street food (Steyn et al., 2014). In most cases, high consumption of street foods has been observed among males, who find it quicker and more economical than going home for meals (Hiamey et al., 2013). While earlier studies (Sseguya et al., 2020; Steyn et al., 2014) argue that men need to be cautious about energy intake from street food, the current study highlights the opposite: food served to female counterparts had more energy than that served to males. The current study reported that food prepared in the street contributes between 17 - 50% of fat intake for females, compared to 11 - 33% for males. We could therefore highlight that all individuals who are regular street food buyers be cautious when choosing the types of food eaten. Because street food vendors prepare without removing any visible fat on poultry skin, white beef meat is regarded as adding more taste to the food. The South African data highlights that the more available starch food could also contribute to high energy (Mchiza et al., 2014a; Steyn, Nel, Nantel, Kennedy, & Labadarios, 2006; Steyn et al., 2011). The higher fat intake from street food recorded in men than women may also be attributed to the high frequency of street foods observed among men than women in the current study (Sseguya et al., 2020).

The strength of this study is that it incorporates nutrition-based analyses of prepared street food contributions to consumers' daily diets to dietary diversity and macronutrients, which have not been well studied in the region. Moreover, using more than one town could improve the generalizability of our study findings because the Vhembe District is composed of a vast population from different areas that consume prepared street food. In addition, the study presents results from a usual street food consuming population, given that our rural towns are increasingly adopting prepared street food as a significant and accessible food source, which we believe could impact nutritional status.

This study is not without limitations. This study was cross-sectional, so we could not infer a causal relationship. The assessment of dietary diversity was based on food prepared outside the home, not on the standard food frequency questionnaire (FFQ), which may limit the generalization of our result. At the same time, previous research has shown that, for measurement purposes, food group diversity is an appropriate method because of its simplicity (FAO and FHI 360, 2016).

Conclusions

Street food provides essential macronutrients for both male and female adults in the population. Female street food vendors dominated the sale of street food, selling more vegetables than males. We highlighted that food served in the streets of the Vhembe District is high in energy from carbohydrate sources, such as maize meal porridge served in large amounts, followed by foods high in fat. Furthermore, the current study observed low diversity of food groups provisioned in the street of the Vhembe District, where street food consumers would have fewer choices when frequently eating on the street. There is, however, concern over the low dietary supply of micronutrients from street-food choices of this consuming rural population, which could increase the micronutrient deficiencies already observed in the area amongst the adult population. Specific interventions must be put in place to improve the nutritional value of street food, for example, adopting strategies such as more frequent use of fortified products such as maize meal flour and oil to supplement low micronutrient content. Including more vegetables and fruits could also assist in improving the micronutrient intake and the dietary diversity of the population.

Abbreviations

DDS: Dietary Diversity Score

DOH: Department of Health

SF: Street foods

SFV: Street food vendor

RDA: Recommended Daily Allowance

RDI: Recommended Daily Intake

MDD-W Medium Dietary Diversity for Women

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Authors' contributions

TCM, CNN, and AEN contributed to the conception and design of the study. BJJM assisted with data analysis, and JV contributed to the manuscript writing. All authors reviewed the manuscript and approved the submitted version.

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Declarations

Ethics approval and consent to participate.

Ethical approval was obtained from the University of Venda (project No: SHS/19/NUT03) and the University of the Free State (project No UFS-HSD2019/0059). The researcher obtained approval from the Vhembe District municipalities and the street food committee to conduct the study. Informed, written consent was obtained from all participants.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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7 CHAPTER SEVEN: MANUSCRIPT: CHAPTER SEVEN: VALUE CHAIN ANALYSIS OF THE STREET FOOD ENTERPRISES IN THE RURAL TOWNS OF VHEMBE DISTRICT, LIMPOPO PROVINCE

7.1 Introduction

The manuscript details the value chain analysis of the street food enterprises in the rural towns of the Vhembe District in the Limpopo province. The manuscript has been accepted for publication. The book chapter will appear in the Open Access book Agricultural Chains-Some Selected Issues, edited by Prof. John Stanton

Name of journal: Intech Open

Publisher: Intech Open Limited

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7.2 Manuscript

7.3 Abstract

Introduction: This study sought to analyse the value chain of foods sold by street food vendors in the Vhembe District towns of Limpopo province. The study identified the prominent value chain actors, mapped significant steps (channels) and analysed the profit margin share of the enterprise using two different types of plate sold.

Methods: The study was conducted in three rural towns to characterise the production operations and identify opportunities to propel the street food value chains in the Vhembe District in South Africa. Data were collected using mixed methods, including structured questionnaires administered via face-to-face interviews. Analyses of the value chain activities and actors were conducted among the stages of street food production. The distribution of profit margin was determined using four cost variables.

Results: Overall, the enterprise sold mostly commonly consumed street foods such as porridge, chicken, beef, and local vegetables, targeting government employees, school children, and daily town visitors. The value chain analysis showed that street food activity in the Vhembe District included purchasing, storage, production, and consumption. The main actors involved in the value activities of the street food enterprise were inputs suppliers, formal and informal traders, transporters, local authorities, and customers. The profit margin calculation highlighted that street food vendors purchasing inputs from informal vendors without any added expense could make more profit than formal traders. The institutional actors need to network with the primary actors to operate with a collective profit motive.

Discussion and Conclusions: Future policy interventions should promote value addition along the food sold in the street, providing cold storage facilities closer to street vendors' stalls in the towns to encourage continued and safe production. The most prioritised production constraints should be addressed, such as access to finance, government support, and managerial skills.

7.4 Introduction

The street food trade is an ancient practice (Draper 1996; Martins 2006) common in several countries (WHO, 1996) as a source of income. It provides inexpensive meals accessible to the population and represents the culture of typical and local food (von Holy and Makhoane 2006). The World Health Organization (1996) defines street food as foods and beverages prepared and sold by vendors on streets and other public places for immediate consumption. This definition emphasizes the retail location on the street, with foods sold from pushcarts, bicycles, baskets or balance poles, or stalls that do not have permanent walls (Abrahale et al. 2019). Millions of people depend on a wide variety of ready-to-eat foods and beverages sold and sometimes prepared in the street or public places. Charman et al. (2017) conducted a microenterprise census of five working-class township settlements, demonstrating its solid economic basis in food, takeaways, and drink trade.

Moreover, informal micro-enterprises could address South Africa's unemployment challenges and stimulate economic growth in marginalized areas. Hence, it was noted that Maloney (2004) could contribute through the business generation and transfer of skills and experience to informal workers. Despite some critical research on this topic, there remain significant knowledge gaps, especially on the value chain of street food that could create employment and transfer skills. Nevertheless, the increasingly recognised role of informal food services for food security, especially for poor urban dwellers (Cohen & Garret, 2010), understanding activities, mechanisms, and the trade environment within urban townships remains limited (Even-Zahav & Kelly, 2016).

Thus, street foods have important implications for consumers who enjoy these foods and street food handlers who handle and serve these foods (Poojara 2021). However, increasing population, migration from rural to urban areas, an increase in the number of women engaging in gainful employment, inflation, and the breakdown of the joint family system have supported the growth of the street food sector. Long distances to commute between workplace and home often compel individuals to eat food from commercial outlets. The significance of street foods in contributing to the food and nutrition security of workers residing away from home in small towns and cities is widely recognised.

Literature has noted a paucity of data on how the street food chain system is organized and operated for market nodes, governance, challenges, and food safety issues. Such information is

crucial for understanding the sector, identifying growth opportunities, and supporting informal economy policies and programs. Along the street food value chain, problems such as poor infrastructure and lack of financial assistance hinder the possible benefits that the value chain actors should have attained. Therefore, there is a need to employ a Value Chain Analysis (VAC) framework to understand the value chain of street foods in the Vhembe District. The value chain is a range of activities required to bring a product or service from conception through the different phases of production, transformation, and delivery to final consumers (Kaplinsky, Morris, and Readman 2002). Then VCA seeks to understand how chain activities are organized, costs incurred, and benefits shared among chain participants. Its management is to add value and segment the market with differentiated products designed to increase profitability at all stages in the chain (Donovan et al., 2015; Cortese, Veiros, Feldman, Cavalli, et al., 2016; Bwalya and Kalinda, 2014; Kaplinsky, Morris, and Readman 2002). The value chain also deals with the institutional arrangement governing the activities, actors, their relationships, the linkages, and market prices in and out of each actor in the chain (Barr, 2019).

Porter (1998) highlights that a firm's activities business unit is appropriate for constructing a value chain. Value chains are more complex in the real world and focus on systems and how inputs are changed into the outputs purchased by consumers (Kaplinsky *et al.*, 2002). In this study, we used the stages of street food used by Cortese *et al.* (2016) (Figure 1), highlighting that a typical agricultural or food value chain consists of chain actors that transact a product as it moves through the value chain. These actors include input suppliers, farmers, traders, processors, transporters, wholesalers, retailers, and final consumers (Cortese *et al.*, 2016).

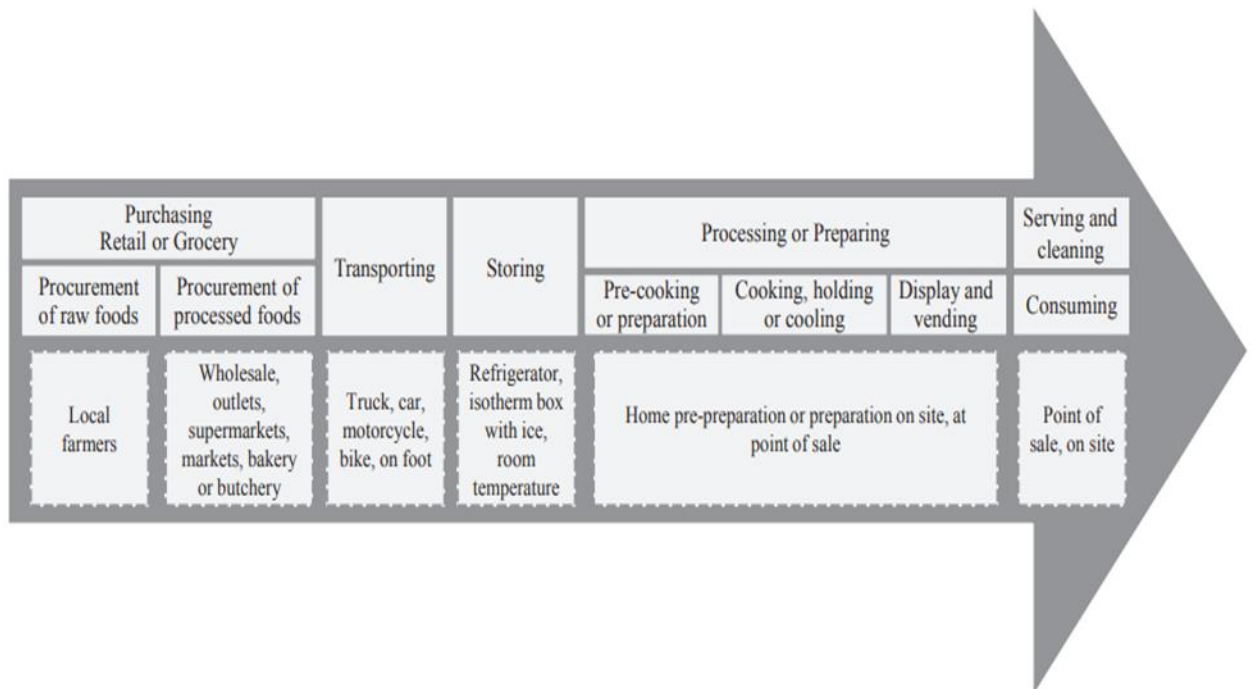


Figure 3 Stages of the street food value chain (source; Cortese, Veiros, Feldman, & Cavalli, 2016)

Limpopo province has the highest number of street food vendors, mainly concentrated in the Vhembe District (Mchiza, Hill, and Steyn 2014; Mathaulula 2020). For this reason, the Vhembe District was selected for this study to contribute to the body of knowledge on street food enterprise in the Vhembe District. Most street food vendors are found in public places such as taxi ranks and the road (Mathaulula, Francis, and Mwale 2015; Louis and Mathew 2020). The Vhembe District draws special attention in the province because of a high increase in cooked street foods (Chauke, Munzhelele, and Maiwashe 2015; Mchiza, Hill, and Steyn 2014; Mathaulula 2020). The main objective of this study was to map and analyse the value chain of street foods in the Vhembe District. The study seeks to identify the major players and the linkages in street food vendors' value chain. Moreover, we determined the chain's value-added and associated costs from purchasing to consumption of street food vendors.

To achieve this, we used the six-steps value chain analysis process by Porter (1998) to explain the value chain activities of street food enterprises. The following steps were used in this study to conduct a value chain analysis of the street food vendors in the Vhembe District rural towns: firstly, in our previous work (Mahopo et al. 2022), we described and defined the product sold by the street food vendors in the Vhembe District looking at the operational characteristics of the

street food vendors (Step 1). This study sought to analyse the value chain of foods sold by street food vendors in the Vhembe District town of the Limpopo province. This was done by identifying the prominent value chain actors, mapping significant steps (Channels), and analysing the profit margin share of the enterprise using four different types of plate sold.

7.5 Material and methods

7.5.1 Study Area

The Vhembe District consists of four local municipalities: Makhado, Thulamela, Musina, and Collins Chabane. Botswana in the west, Zimbabwe in the north, and Mozambique share the borders. It covers an area of 21402 square kilometres of mostly rural land. About 32.65% of South Africans live in rural settlements (Wills, 2009). Due to the high level of unemployment and poverty, inhabitants of the district have developed several survival strategies, including the street food enterprise of major trading points within the local municipalities identified in the towns of Makhado, Thohoyandou, and Musina, respectively. The informal sector in South Africa contributes 8% of the country's GDP and supports 27% of all working people. The Vhembe District has a population of 1 402 779 people, increasing from 1 294 722 in 2011. According to Community Survey, in 2016, most of these people resided in Thulamela (497 237), followed by Makhado (416 728), Collins Chabane (347 974) and Musina (32 009). Thulamela LM is the most populated Municipality in the district, while Musina LM is the least populated Municipality (Limpopo Provincial Department 2021).

7.5.2 Field Survey: Sampling

The field survey was conducted in Makhado, Musina, and Thohoyandou in the Vhembe District of Limpopo province. The type of sampling used in this study was non-probability sampling, as the research population is unknown (Veal, 2011). We used convenience sampling to select 511 street food vendor enterprises in different regions of the Vhembe District, Limpopo Province of South Africa. The researcher established and maintained a complete list of the primary unit component from the Vhembe District's municipalities. However, the municipalities had no records in place of street vendors. From the intended population of street vendors, the sample size was determined based on Yamane's formula of the year 1969 (Alvi, 2016; Yamane, 1967). The formula states that at the significance level of 90%, the minimum sample size for the unknown population is 100 (Alvi, 2016; Yamane, 1967).

A total of 511 street vendors from Musina (168), Makhado (36), and Thohoyandou (306) towns participated in the study. Only street food vendors selling ready-to-eat or cooked food participated in the study. A convenient sampling technique was used considering street vendors' work. Street food vendors were obtained from taxi ranks, along the main roads, industrial areas, malls, schools, and lastly, between residences' streets, especially in Musina town.

7.5.3 Data Collection

Data were collected by trained enumerators led by the research team using a structured questionnaire through face-to-face interviews. The questionnaire captured socio-demographic characteristics, including age, gender, and education. The quantitative data was collected from the street food vendors by asking them to estimate the proportion of value flow. Additional information was captured on production, input sources, storage, transportation mode, institutional support, and distribution of profit margin. Where possible, figures were obtained through consensus by achieving a majority. Qualitative data was collected by employing interviews with 54 street food vendors who were available. Additional information generated was stakeholders and their roles, mapping the stages of street food production. During the sessions, we explored why street food vendors could not affiliate with an association.

7.6 Results

7.6.1 Introduction

The purpose of value chain analysis seeks to understand how chain activities are organised, the cost incurred, and the benefits shared among chain participants. This section of the paper reports on the activities conducted to determine the value chain of the street food enterprises in the rural towns of the Vhembe District. A step-by-step method was used to analyse the street food enterprise. The following activities were conducted (1) identification of the marketing channels, (2) Mapping the value chain activities, (3) identification of the chain actors, (4) identifying value chain linkages, and lastly, (5) Determining the profit margin of street food vendors. The street food production chain activities in the Vhembe District are highlighted in Figure 2.

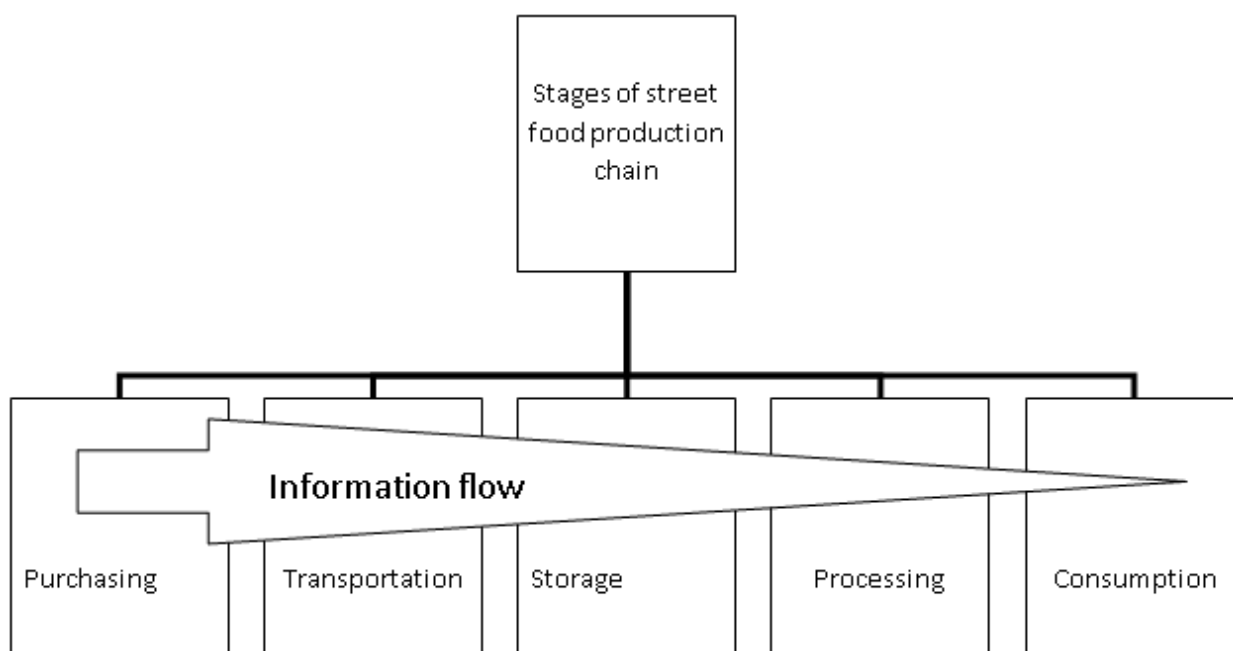


Figure 4 Street food vendors' food production chain activities

7.6.2 Description of the street food value chains.

7.6.2.1 Marketing channels

Figure 2 shows the value chain channels identified amongst the street food vendors in the Vhembe District. The value chain activities of the street food vendors in the Vhembe District are undeveloped and straightforward, with no infrastructure. The main marketing channels identified are the input suppliers, transportation, storage, production, and consumption. The channels highlight that street food vendors have various food storage and processing places, from input suppliers to transportation to consumption. These highlights that the final product market of street food is consumers (government employees, school children).

7.6.3 Value chain analysis

7.6.3.1 Mapping the value chain activities

The value chain activities of the street food vendors start from purchasing, transportation, storage, processing, and lastly, consumption, depicting the flow value chain activities of street food vendors.

The street food vendors' value chain activities are explained in subsections 7.6.3.1.1 to 3.3.1.1 to 3.3.1.5.

7.6.3.1.1 Purchasing

Purchasing is the first stage of street food enterprises. During this stage, street food vendors purchase inputs from informal and formal stakeholders. The data showed that street food vendors purchase raw and processed products from informal traders such as bakkies/farmers/formal supermarkets. Raw products were reported to be mainly meat category; chicken – dressed cull layers constituted (88.8 %) of the meat product purchased. The beef was reported at 68.3 percent, with its associated Beef Offal at (14.3 %). From the vegetable category, the main raw product was Green Leafy Vegetables (60.1%) purchased from hawkers using informal supply contracts. Maize meal by far was the most predominant raw product purchased (97.1%) from retailers because it happens to be a staple food in the towns, districts, provinces, and the country at large.

Culled layers and beef offal give street vendors a competitive advantage since these products are a by-product sold from major poultry and beef processing facilities (Mahopo et al., 2022b). The same applies to green leafy vegetables purchased from bakkies or produced by street vendors in their backyards. Based on convenience, the purchased maize meal is augmented by by-products from maize processing facilities to create varieties, delicacies, and flavors (sour versus normal) of pap cooked the indigenous way. Also, these products mimic the indigenous and cultural meals that the customers, mainly rural (82.2%), government employees (59.5%), and school children (41.5%) demand due to taste and value for money (Mahopo et al., 2020b).

Inputs Supplier	Maize Porridge Supermakerts	Vegetables Supermarkets Hawkers Famers Own Production
Beef Supermakerts Famers Butcherries	Chicken Supermarkets Hawkers Famers Butcherries	Pork Famers

Figure 5: Main food items purchased by street food vendors from their suppliers.

7.6.3.1.1.1 Cost of inputs

The average monthly running cost of the inputs used to produce a plate of at least R45/30 of chicken or beef was estimated at R1800. On average, their daily cost of vegetables purchased from street food vendors or hawkers was R21.65, while vegetables from supermarkets cost R18.75 to R51.00. Other food items purchased from the smallholder farmers included live chicken broilers with an estimated R 180.83 daily. Street food vendors reported challenges such as a lack of continuous supply from street vendors/farmers and bakkie sellers; hence some of the inputs were purchased from retailers. On average, the cost of meat (per kg) was between R188.00 to R279.00 from retail or supermarkets. Mahopo et al. (2022a) indicated the list of input suppliers used by street vendors in the study.

7.6.3.1.2 Transportation of ingredients and pre-prepared food

The second stage of street food value chain activities identified is transportation. The mode of transport, distance, and time spent acquiring inputs by the street vendors from suppliers are reported in Table . The average monthly transport cost for all street vendors who used any transport was estimated at R340.00. More than half of the street food vendors (54.6%) walk to get their input suppliers, while public transport, such as taxis and buses, was used by 33.3% and 8.4%, respectively. Only 1.6% of street food vendors reported that suppliers deliver inputs. Very few street food vendors used private cars (4.1%). The longest distance traveled was more than 10 km (4.5%). However, most reported walking less than one kilometre (6.5%) and taking close to 10 minutes (31.8%) to suppliers.

Table 1. Frequencies and associated percentages of the mode of transportation and distance to inputs suppliers of ingredients and pre-prepared food for Street Food Vendors

	Frequency (n=11)	% of participants	Median
Amount paid for transportation (R)			340.00
Mode of transportation of food			
Walk	279	54.6%	
Taxi	170	33.3%	
Bus	43	8.4%	
Car	21	4.1%	
Suppliers' delivery	8	1.6%	
Distance to inputs suppliers			
Less than 1km	33	6.5%	
1-5 km	11	2.2%	
6-10 km	11	2.2%	
More than 10km	23	4.5%	
Time to walk			
less than 10 min walk	163	31.8%	
11-20 min walk	93	18.2%	
21 and more minute walk	25	4.9%	
Time to drive			
5-10 min drive	30	5.9%	
11-20 min drive	30	5.9%	
More than 20 min drive	75	14.7%	

7.6.3.1.3 Storage

Table 2 presents the frequency and associated percentages of street food vendors' storage practices. The primary purpose of the storage is to extend the product availability over a more extended period than if it were sold immediately after harvest. In this study, most street food vendors reported having a place to store their business materials, including inputs (70%). Of those who reported having a place to store their enterprise material and inputs, 27.4% indicated that they stored them at home, while 30.5% had rented rooms close to their stalls. Less than ten percent had access to storage facilities like freezers (3.5%) and refrigerators (5.3%) when selling at the stall. Less than 10% of the street food vendors had access to a freezer/refrigerator to store processed foods close to their enterprise, which risked food safety. An indictment to the local authority was that 91 % had no access to on-site storage and no facility for safe refrigerators and freezers. This is mainly because the street vending business is not regulated nor managed within local authorities' development plans.

Table 2. Frequencies and associated percentages of Street food vendor's storage practices

Variables	Frequency	Percentage (%)
Availability of storage	N=511	
Yes	357	70.0
No	154	30.0
Storage of stock	N=357	
Home	97	27.4
Stall	75	21.2
Storeroom	108	30.5
Rented room	70	19.8
Other	4	1.1
Availability of access to on-site storage of processed food	(511)	
No	465	91.0
Refrigeration/freezer	46	9.0

7.6.3.1.4 *Production/ processing*

Food processing is a critical stage in the street food value chain. It entails pre-preparation and preparation of different food items, as shown in Figure 2. Pre-preparation is vital because different foods need to be prepared in different ways. In this stage, meat and vegetables should be prepared in different utensils to avoid cross-contamination. Only 3.7% in preparing foods from home and transported the ready-to-eat foods to the market. Pre-preparation refers to a stage during which street food vendors purchase food, and some activities are conducted at home. Food is transported to the site for the final stage of cooking or heating before serving.

In our previous work (Mahopo et al. 2022a), we reported that vendors (93.3%) prepared food at the vending site. Three-quarters of the owners (74.5%) were prominent people cooking food, and very few were assisted by the employees (23.9%) or spouses (1.6%). Processing activities can be an important source of jobs and income for women. Hence, it is essential to note the street food enterprise's role. On average, SFV could at least be able to pay R1400 employees monthly. At the same time, others reported spending more money on things such as electricity (R200) and gas (R430) weekly to produce food.

Predominantly cooked food was meat (98.8%) and Millie pap (stiff porridge) (97.1%), a South African staple food. Three-quarters (75.3%) of the vendor's cooked vegetables and 34% served as gravy and chakalaka (8.2%). The various types of meat cooked by the vendors were chicken (88.8%), beef (68.3%), beef tripe/*magulu* (14.3%), and beef sausage (5.5%), with very few street vendors selling fish (1.4%) or pork (2.2%). The median daily cost of meat was R400. The street food vendors cooked and sold two main starchy foods, mielie pap (97.1%) and rice (14.1%), at R70 daily.

7.6.3.1.5 *Consumption/Point of sale*

Table 3 shows the frequencies and associated percentages relating to the street vending target market and mode of marketing. The main street food consumers were mainly government officials and children attending nearby schools. Villagers who visit the town and spend some time in town also buy from street food vendors. Foods were either served at the stall or sold as takeaways. The study assessed the mechanisms street food vendors employ to sell their street foods. The results showed that 51 percent of the respondents sold their products to rural customers (82.2%) and school children (41.5%). Some street vendors reported their customers as government employees (59.9%) and middlemen (53.0%). The technologies used to market

were call/WhatsApp (62.4%). Most street food vendors reported relying on face-to-face customer visits to sell their foods. This method proved effective, as per the saying, “the proof of the pudding is in the eating”. Personal visits validate the taste, flavors, look and eating experience customers prefer.

Table 3. Frequencies and associated percentages of street food vending target market and mode of marketing

Variables	Frequency*	Percentage (%)
Target market		
#Villagers	415	82.2%
School children	209	41.5%
Government employees	300	59.5%
Middlemen	267	53.0%
Other	9	1.8%
Mode of marketing		
Personal visits	368	72.0%
Phone call/WhatsApp	319	62.4%
Recruit professionally	22	4.3%
Word of mouth	14	2.7%
Posters	3	0.6%
Nothing	7	1.5%

*Number of responses

#Villagers refer to people from the villages visiting town to buy necessities.

7.6.4 Value chain stakeholders and their role along the value chain

Table 4 presents the major stakeholders and their specific roles. Firstly, we identified critical functions. Secondly, the actors involved then their roles were also outlined. As highlighted earlier, one of the critical functions during purchasing was providing supplier input to the vendors. In this study, various actors identified as inputs suppliers (Supermarkets, farmers, butcheries, hawkers) were the most dominant among the identified inputs suppliers. The second important function noted was processing, where street food vendors were the actors in the chain activities involved in processing foods either at home or at the stall. The other stakeholders identified in the study were the regulations and quality assurance role players such as the local Municipality and the Department of Health. Lastly, customers are also identified as role players

because they are the consumers of the final product of street food.

Table 4. Major stakeholders involved in street food and their roles.

Step I	Step II	Step III
Critical function	Current/potential actor	Role
Inputs suppliers (Purchasing)	Main supermarket (Spar, Boxer, Shoprite, OBC)	Supply raw and processed foods
	Farmers	Vegetables and Meat suppliers (Pork and Broilers)
	Butchers	Supply all types of meat
	Street vendors/hawkers	Broiler and vegetable suppliers
Processing	Street food vendor	Production, cleaning, marketing, and selling
Consumption	Customers	Buy products
Regulations and quality assurance management	Local government or Municipality Department of Health	Provision of the following services: • Area management and placement • Collect waste/ clean and issuing of permits/licenses. • Policy amendments
Other stakeholders	Media	Advertise business on social media platforms such as WhatsApp and Facebook

7.6.5 Business Enabling Environment (BEE)

7.6.5.1 Institutional supports

Table 5 presents the types of institutions available along the street vendor's chain. To improve the competitiveness of the street food value chain, every actor or stakeholder has a vital role to play. The current study explored the institutions available that provided support services to ascertain which institutions were present and accessible amongst the street food vendors to provide various forms of support to the value chain actors. There is a relationship amongst the value chain actors, which was established based on spot markets (actors negotiate on price, quantities, and other requirements directly at the market).

Table 5. Frequencies and associated percentages on the types of institutions available along the street vendors' value chain.

Institutions	N	%
Formal lenders (Banks)	4	1
Informal lenders	5	1
NGO	8	2
Associations	45	9
Local Municipality	202	38
Department of Health	235	46
Inputs suppliers	17	3

7.6.5.2 Financial institution

The current study highlighted a poorly developed street food enterprise financial system. Although formal and informal institutions were available to assist street food vendors financially. Street food vendors could only get assistance in the form of loans from money lenders (1.0%) and very few banks (0.8%). Input suppliers (street food vendors/bakkie sellers) (3.3%) could also provide street food vendors with credits for a later return. Those who borrowed money from the informal money lenders (loan) sharks highlighted conditions including paying money later with interest, while some indicated paying back the money the same day without interest.

7.6.5.3 Regulations and quality assurance management

7.6.5.3.1 Street food vending associations

About nine percent of the street food vendors were members of associations or unions. Most of the representatives were from the street food vendor's associations at a local level. The in-depth interviews explored why street food vendors have not been affiliated or part of the street food association. Among the identified reasons, street food vendors were unaware of any association (6.9%). In contrast, others had no reason why they were not part of the association (27.5%). Street vendors who were not members of any representations provided the following reasons: *"I am a foreigner,"* while others indicated that *"Associations only represent taxi drivers."* Others highlighted that they were not aware of available associations of street food vendors. At the same time, most (64.1%) did not have reasons why they were not part of an association. The low participation rate of SFVs in associations is because these latter ones often lack clear organizational goals.

Regarding the street food vendors who were members of an association (8.5%), most street food vendors could not tell the role played by the associations, while some indicated that associations provide them with business advice and assist with solving problems. Street food vendors indicated that the street food vending association needs assistance to improve service delivery for their businesses to be competitive. Amongst the recommendations, the street food vendors include training, assistance in building better markets, and provision of adequate space for business operations. The street food vendors recommended access to quality infrastructure as the primary service improvement intervention for improving street food enterprises.

7.6.5.3.2 Local government

Based on the in-depth interviews conducted regarding the roles of the available stakeholders. Street food vendors highlighted that the primary role of the local government (Municipalities) (38.3%) was to provide services such as allocation of placement or vending sites and management of vending spots. Local municipalities' role also included issuing permits or selling licenses at an allocated premise. However, not all street food vendors had licenses, as others had no interaction with officials except the suppliers and the customers. The local Municipality's role was to clean and collect waste daily. Other stakeholders who played a role in street food sometimes the Department of Health (46.0%). They provided certificates of acceptance to sell cooked foods to street food vendors. However, not all vendors reported interacting with them to obtain the acceptance certificate to sell street food. Few vendors noted that NGOs indicated that they sometimes provide training from the

NGOs.

7.7 Distribution of profit margins along with inputs to suppliers of street food vendors

7.7.1 Cost, output, and revenue

Error! Reference source not found. Table 6 shows the estimated profit margins and street food vendors' inputs suppliers.

7.7.1.1 Computation of Cost, output, and revenue

We computed profit margin and ratio to determine if street food enterprise production was profitable in the study area. Four different types of plate production (chicken and beef meat) were used to compute the cost of production. Profit Margin (P) was calculated as the difference between the cost of production (R) and selling price OR revenue (R) (expressed as $P=R-C$). The Percentage profit margin (G) was computed as the profit (P) divided by selling price OR revenue (R) (expressed as Net Sale-Cost of goods)/Net Sale. Generally, street foods are sourced from the supermarkets and informal markets such as bakkies sellers/street vendors and farmers. The description of the activities done by the value chain actors, from the suppliers of the inputs to consumption (sales), was used to estimate the variable costs and returns.

Computations were performed per type of plate sold from different street food vendors daily. A typical plate sold by the street food vendor consists of meat, pap, and green leafy vegetables served with a stew of tomato/onion. We used the two most cooked meat in this study to determine the profit margin, as shown in Table 6—the distribution used for daily production of chicken and beef plate profit margins from supermarkets and informal traders.

To determine the street food vendors' profit margin, we used the formula: Formula; Profit=Price of plate X Total plate sold/Expenditure. Therefore, it was calculated as follows, profit Margin (PM)= Net Income (NI)/sales.

- (a) Where net income = sales (Total plate sold x Price of a plate)-expenses (Inputs cost from supermarkets + cost of transport +labour).
- (b) Formal markets referred to street food vendors purchasing inputs from the supermarket.

7.7.1.2 Profit Margins in The Four-Scenario Mapped

Four scenarios/channels were used to estimate profit margin from purchasing inputs from the formal and informal markets cost. Considering the difference between the price of chicken and beef sold in the informal markets and supermarkets, all street food vendors

made a profit even though the profit margins differed.

- a) **Scenario 1:** The findings of marketing Scenario 1 highlight that when purchasing inputs from supermarkets and no labour is required for the production, street food vendors could make 78.0% of the profit on a beef-based plate considering the expenses and sales of the day.
- b) **Scenario 2:** If Street food vendors purchase their inputs from the supermarket and require labor for daily production, the vendor's profit margin could be 76.0% for beef-based plates considering the expenses and sales of the day street food vendors. This highlights that even if street food vendors purchase their inputs from supermarkets, they make enough profit with or without the extra service labor.
- c) **In Scenarios 3 and 4,** street food vendors purchased inputs from informal traders. The difference was that in Scenario 4, street vendors have at least one assistant paid. However, the two scenarios highlighted that street food vendors purchasing their inputs for daily production could still make enough profit on a chicken-based plate which was 76% for scenario 3 and 72 % for scenario 4, respectively.

Table 6: Estimates of street vending profit margins.

Product inputs suppliers	Production and marketing cost	R/Unit	Total (R)	* Profit margin
Scenario 1: Inputs from formal traders (supermarkets/butcheries) with no labor required	Inputs production variable cost (veg, beef and maize meal) (IPVC)	49+279+ 70	398	
	Expenses (transport) (E)	11.3	11.3	78%
	Sales (Selling price x total produced/day) (S)	43 x44	1892	
	Net Income = S-E	1892-(398+11.3)	1482.7	
	Profit margin= NI/S	1482.7/1892	0.78	
Scenario 2: Inputs from formal traders (supermarkets/butcheries) with labor	Inputs production variable cost (veg, beef and maize meal) (IPVC)	49+279+ 70	398	76%
	Expenses (transport, labor/day)	11.3 +47	58.3	
	Sales (selling price x total produced/day) (S)	43 x44	1892	
	Net Income (NI)=S-E	1892- (398+58.3)	1435.7	
	Profit margin= NI/S	1435.7/1892	0.76	
Scenario 3: Inputs from informal traders (bakkies sellers/street vendors/farmers) with no labour required	Inputs production variable cost (veg, live chicken and maize meal) (IPVC)	21+180.83+70	271.83	76%
	Expenses (E)(Transport)	11.3	11.3	
	Sales (S) (Selling price x total produced/day)	40 x 30	1200	
	Net Income (NI)=S-E	1200(271.83+11.3)	916.87	
	Profit Margin= NI/S	916.87/1200	0.76	
Scenario 4: Inputs from informal traders (bakkies sellers/street vendors/farmers) with labor	Inputs production variable cost (veg, live chicken and maize meal) (IPVC)	21+180.83+70	271.83	72%
	Expenses (transport, labor/day)	11.3 + 47	58.3	
	Sales (Selling price x total produced/day)	40 x 30	1200	
	Net Income (NI) = S-E	1200 - (271.83+58.3)	869.87	
	Profit Margin (PM) = NI/S	869.87/1200	0.72	

* Profit margin: Sale-Expenses/ Sales x 100

Informal input suppliers are when street food vendors buy their inputs from local farmers/street vendors/bakkie sellers.

7.8 Discussions

7.8.1 Structure of the current street food value chain in the Vhembe District

This study aims to analyze the value chain of foods sold by street food vendors in the Vhembe District town of Limpopo province. This was done by identifying the prominent value chain actors, institutions governing the chain, and key factors and challenges affecting the success or failure of the value chains for street foods. The street food value chain faces several constraints (Haleegoah et al. 2020; Osei-Mensah, Ohene-Yankyera, and Aidoo 2016; Resnick et al. 2019), and this study confirms such findings. The value chain of food sold on the street is short, with no infrastructure. Complete value chain actors are linked in the chain processes necessary for transforming and transporting raw materials from suppliers to consumers. The activities during this period included purchasing, transportation, storage, production, and consumption. These activities of the food production chain in the current study were similar to a study by Cortese, Veiros, Feldman, and Cavalli (2016), where they highlighted that in street food enterprises, the chain of activities starts from the acquisition of raw materials to service to the consumer a step which was earlier proposed by Barro et al. (2007), as Figure. 1 illustrates.

7.8.2 Market channel

The first marketing channel was from the informal traders (i.e., street vendors/hawkers) to street food vendors traders. The other marketing channel was formal traders (i.e., supermarkets/wholesalers) and street food vendors. The end market of street food is domestic consumption. Like other studies in South Africa and developing countries, street food vendors purchase their inputs from other vendors. Adeosun, Greene, and Oosterveer (2022) also noted that most vendors stock their raw food materials to prevent going to the market daily. Street food vendors also buy copious quantities to prepare for a day until their stock gets finished as a coping mechanism to deal with waste and food safety. This was corroborated by other studies conducted in India (Choudhury et al. 2011; Reddy, Ricart, and Cadman 2020); Ghana (Dun-dery and Addo 2016) and Sabbithi *et al.* (2014) in India. It was also established that Street Food Vendors relied on local food value networks with both formal and informal upstream value chains (Petersen *et al.*, 2018). The current study noted a dualist position whereby street food vendors' inputs were sourced from direct sources such as bakkie/street vendors and the local supermarket.

7.9 Value chain activities

7.9.1 Value chain actors

Value chain analysis of street food enterprises in the Vhembe District is simple and undeveloped, with little infrastructure. The main actors in the value chain were input

suppliers (smallholder farmers, traders/retailers, street vendors/hawkers) and consumers. The current study showed that while street food enterprise is embedded into informality, selling cooked foods in rural towns highly relies on inputs from formal sector enterprises in the form of agricultural producers, wholesalers, and retailers (Figure 4).

7.9.1.1 Inputs Suppliers

Among the current study's chain actors were the inputs' suppliers. Input suppliers bring together a range of products and present them in a way that is convenient to customers. According to Porter (1998), these are related and supporting industries. Suitable suppliers of inputs are crucial for sustainable production and where traceability, environmental concerns, and quality assurance are involved (DAFF, 2012). Moreover, in other developing countries, there is a dualistic relationship between the formal and informal food sectors in exchange for inputs supplies (Bouafou et al., 2021). Street food vendors currently have a direct relationship with supermarkets because food cooked by street food vendors are commonly sold, indicating guaranteed and increasing demand for street food in the Limpopo Province. Tawodzera and Crush (2019) study found that location informed purchase for 49%, followed by price (42%) and quality (9%). However, Senyolo *et al.* (2018), some informal traders in the Limpopo province have established relations with some supermarkets (such as SPAR, Boxer, Pick & Pay and OBC, Shoprite) selling cooked food mainly by street food vendors, including green leafy vegetables. These findings collaborate with other studies in the country (Skinner, Caroline and Haysom 2016).

Moreover, Tawodzera and Crush (2019) noted that 22% of households rely on the agricultural production of their products. Contrary to the current study, few street food vendors highlighted using their produce for vending and instead relied on others for their enterprises. The informal traders in the study supplied green leafy vegetables and live chickens to the street food vendors at a reasonable price to the formal traders for better profit margins.

7.9.1.2 Consumers

According to a survey by FAO (2001), approximately 2.5 million people across the globe consume street foods every day. Most consumers are between the ages of 26- 35 years, out of which most are single males away from home. Moreover, Other essential categories of consumers include children, students, and office workers (Poojara 2021). Charman *et al.* (2017) also noted that residential micro-enterprises such as street vendors serve immediate resident consumer demands, primarily for essential fast food. Like the current study, street food enterprises' main customers mainly traveled to rural towns searching for work and

school children during lunch breaks. This study also noted that street food vendors generated demand for services provided by formal sector public and private actors, including transportation and formal shops, as reported by Roever and Skinner (2016). In Cape Town Hill *et al.*(2016), most street food consumers are single black males with some high-school education and matriculation. Moreover, the patterns of consumption of street food daily and 2-3 times a week by 38% and 43.3%, respectively.

7.10 Stakeholders' relationship in the street food chain (institutional support)

Nguyen Thi Thuy *et al.* (2020) stated that the availability of various stakeholders in a value chain, such as intermediaries and traders, adds value to the value chain of a product. As the small scale of value chain linkages is prominent in the cities. The current study highlighted a relationship between the suppliers of formal and informal inputs. However, street food vendors were the primary buyer of inputs from these different suppliers. The formal and informal street food input suppliers could establish a relationship that would benefit the enterprise by stabilizing input prices (Senyolo, Wale, and Ortmann 2018). Thus, contributing to the distribution of the product in a geographic term.

7.10.1 Financial institutions

Food vendors also introduced innovations to improve the food supply in the urban area. Haleegoah *et al.* (2020) indicated that if street food vendors are given an opportunity for financial assistance, there could come up with innovative improvements in the daily operations of their enterprises. In the current study, street food vendors were limited due to a lack of financial support from recognised institutions such as banks and the government. Osei-Mensah *et al.* (2016) found that inadequate managerial skills and financial constraints negatively affected the gross margin ratio. This shows the extent to which a lack of support and cooperatives is given to street food vendors in the Vhembe District.

Government legislation, regulations and policies can constrain value chain upgrading, amongst other ways, by setting trade barriers for production materials and production technology, limiting the flow of information, national and international, by imposing unfavorable taxes and denying infrastructural investments that would benefit value chains.

Even though street food vendors noted concerns that inputs from the formal traders are expensive compared to the informal traders. In the current study, we observed poor institutional support for street food vendors along the value chain of street food. In a previous publication (Mahopo *et al.*, 2022a & b), we highlight that street food vendors have agreements amongst those selling vegetables whereby they take inputs on credits to pay

after the sale, something absent from the formal retailer as street food vendors is not allowed to make any credits from the formal institutions. The study highlighted the support of the informal sectors, such as transport, because most street food vendors used public transport to fare the input to their stalls (Petersen, Charman, and Kroll 2018).

7.11 Regulatory and quality assurance institution

7.11.1 Street Food Vending organizations

The inability to sustain associations has been identified as a challenge to food vending (Haleegoah et al. 2020), which our findings corroborate. This has prompted the establishment of innovation platforms in the street food enterprise for which studies and other training could be carried out. Table 4 reports the roles and functions of the available affiliated associations. However, in-depth interviews explored why street food vendors have not been affiliated or part of the street food association. Among the identified reasons, street food vendors were unaware of any association (6.9%). Studies have shown that only a few vendors were known to be part of an association (Haleegoah et al. 2020; Osei-Mensah, Ohene-Yankyera, and Aidoo 2016). Moreover, Wills (2009) states that the absence of organisational goals could be the main reason these associations do not thrive among food vendors. As a first step towards recognition, street food vendors should constitute themselves into -organized associations that would enable them to develop a code of practice for their businesses or constitute a forum for interaction with the relevant authorities.

7.11.2 Local government

The most common problem with street vending is issues with local authorities (Haleegoah et al. 2020; Tshikhudo and Manenzhe 2021; Resnick et al. 2019; Osei-Mensah, Ohene-Yankyera, and Aidoo 2016; Edeme and Nkalu 2018). In the current study, we observed non-compliance by street food vendors to obtain necessary documentation before operation. While on the other site, street food vendors highlighted that there is neither support nor interaction between street food vendors and the local authorities to ensure proper street food value operations.

A collaboration between the street food vendors and the relevant stakeholders, such as the local Municipality, should be strengthened. Haleegoah *et al.* (2020) also indicated that this poor interaction between the authorities and the street food vendors creates conflict among the stakeholders; thus, city planners should designate appropriate areas within the towns for local food vending could enhance compliance with safe and environmental regulations.

7.11.3 Regulations and quality assurance management

Although Roever and Skinner (2016) indicated the importance of policies, laws, standards, regulations, and institutional support services forming the chain environment in the street food value chain for better performance, street food vendors do not consider obtaining specific requirements, including certification before vending and obtaining a certificate of acceptance for selling foods to the public. This practice is common in other African countries, such as Ghana, a street food vendor requires medical screening and certification before vending (Dun-dery and Addo 2016). However, this health demand seems unsuccessful, as it is noted in Ghana and South Africa that street food vendors are unaware of their requirements before establishing an enterprise.

Like the current study, only 38.3% and 46.0 of the street food vendors were aware that they needed to engage with the local Municipality and the department of health to obtain a license to operate as street food vendors in the Vhembe District. In line with this, other studies (Nkosi and Tabit, 2014) have shared similar views, where most of the food vendors interviewed had no health certificates but operated as vendors. Therefore, vendors must adhere to high hygiene standards when dealing with food.

7.12 Profit margin and value shares

The current study highlighted that street food vendors purchase inputs from formal and informal traders. A higher profit margin was obtained in purchasing goods from the formal retailers on a beef-based plate at a 78% profit margin and 76% with extra labour. However, the profit margin percentage, made at the current production cost purchases from the informal traders, was 76% profit margin and 72% with extra labour. According to Poojara (2021), street food vendors have a minimal profit margin and are incentivized to keep expenses low by utilizing low-quality ingredients and disregarding costly hygienic practices. Factors such as the cost of labor and other expenses contributed to the distribution of different profit margins of various plates sold. Vendors with no added costs, such as labor costs, make more profit than those with labor. Similar trends were also observed by Sugri et al. (2017), where it was indicated that additional attributes and climatic conditions could increase the input cost from the suppliers and those purchases might have a lower return.

7.13 Conclusion and recommendation

The profit margin percentage analyses revealed that street food vending enterprise productions were profitable. The profit margins were 72-78%, depending on the costliest meat product on the plate. Beef-based scenarios seem to fetch better profit margins (76 – 78%) based on the higher prices and increased number of plates sold. The chicken-based

profit margins were in the range of 72 – 76 %. The price per plate was lower with a smaller number of plates sold. There should be improved linkages between the local authorities, street food organizations, formal (formal and informal), and financial institutions to the street food vending enterprise with a collective profit motive.

In addition, measures should be put in place to solve the street food vending constraint affecting their operation, such as lack of access to finance, poor infrastructure and lack of managerial skills, and the cost of inputs. If street food vending enterprises could be organized and aligned with the roles of various actors, this could minimize the risk of failure in the street food enterprises sector. Due to the high demand for street food and its affordability in rural towns, authorities such as the department of health should assist street food vendors to minimize the risk to food safety along the chain. For rural and peri-urban communities, street food vending could improve the population's nutritional status and reduce hunger.

Abbreviations

NGO : Non-Governmental Organisations

SFV : Street Food Vendors

SPSS : Statistics Package for Social Sciences

VCA : Value Chain Analysis

VC : Value Chain

SWOT : Strength Weaknesses Opportunities Threats

Disclosure

The authors take full responsibility for any errors.

Conflict of interest

The authors declare that there are no conflicts of interest in the publication of this research paper.

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ANNEXURE 1

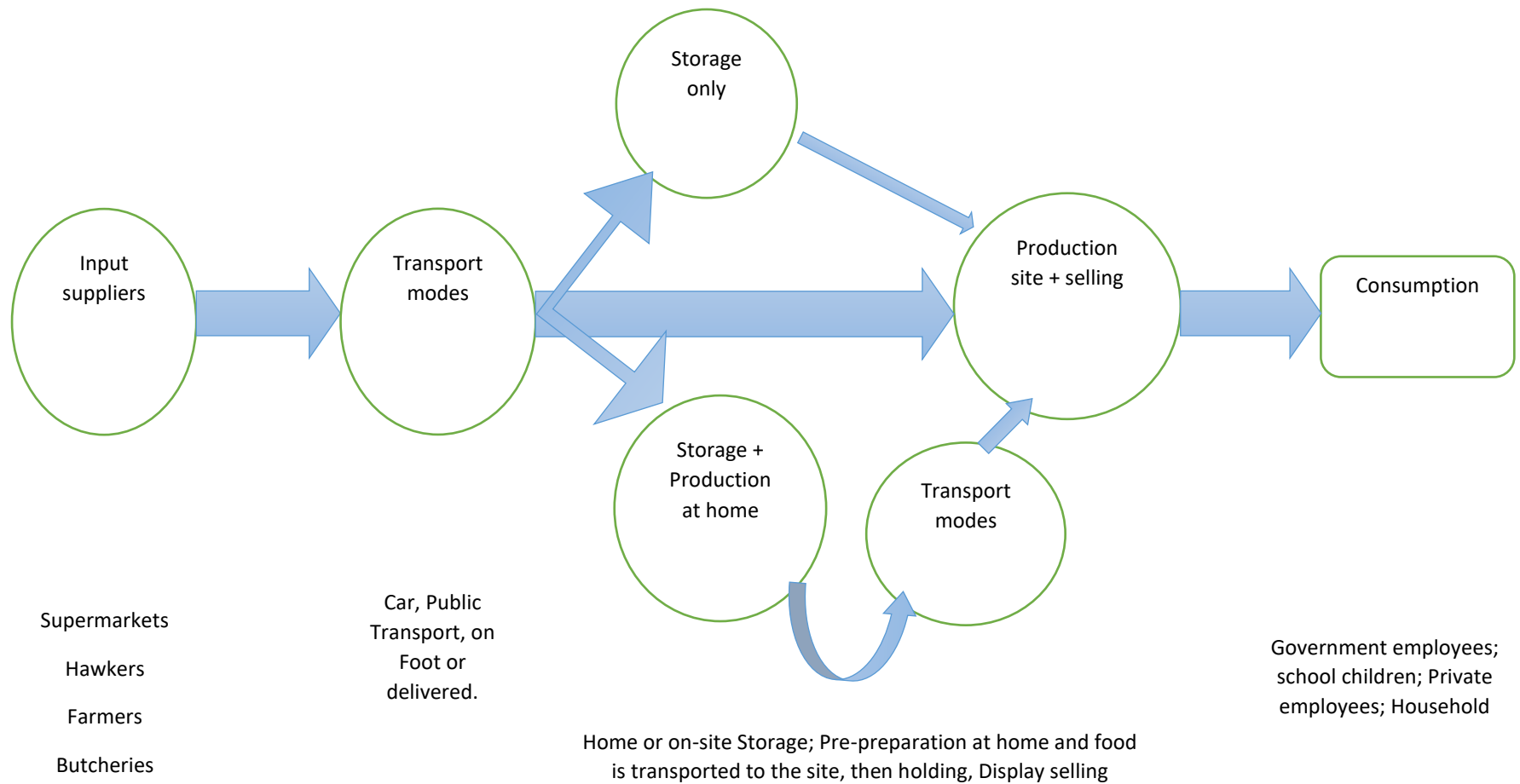


Figure 4: Presentation of the street food chain activities identified.

Note: Supporting services are municipalities, financial services and NGOs, and training institutions for research

8 CHAPTER EIGHT: MANUSCRIPT: STREET FOOD VENDORS' PERCEPTIONS OF THE DETERMINANTS OF COMPETITIVENESS OF THE STREET FOOD ENTERPRISE IN THE RURAL TOWNS OF VHEMBE DISTRICT MUNICIPALITIES, LIMPOPO PROVINCE, SOUTH AFRICA

8.1 Introduction

The manuscript determined the Street Food Vendors' Perceptions of the Determinants of Competitiveness of the Street Food Enterprise in the Rural Towns of Vhembe District, Municipalities, Limpopo Province, South Africa. The manuscript is written according to the African Journal of Food, Agriculture, Nutrition and Development author guidelines.

Name of Journal: African Journal of Food, Agriculture, Nutrition and Development

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8.2 Manuscript

8.3 Abstract

The study investigated street food vendors' perceptions of the determinants of their competitiveness in the Vhembe District, Municipalities, Limpopo Province, South Africa, using Porter's Diamond Model as a framework for analysis. Using convenience sampling, we conducted a cross-sectional survey of 511 street vendors selling ready-to-eat foods in Vhembe District towns. Most of the vendors were women (91%). They were 18-75 years old and most were aged 35-54. Half the respondents had some high school education, and half were married or cohabiting. We collected business-related details such as the location and ownership of their street vending, their income and use of social safety nets, and information on cost, labour, quality, technology, water use, infrastructure, capital, resilience against natural factors, distance to market and access to market information, and stability and health security. Descriptive analysis was used to summarise the results. We measured the participants' perceptions of the determinants of competitive performance using the factor conditions, components, and sub-components of the Porter Diamond Model. The factor conditions of Production, Chance, and Government support received the highest overall mean ratings of competitive performance. More detailed results showed poor Government support, the cost of water, and costly finance as critical. This study further emphasizes the need to value the informal sector and to recognise and build on its mode of operation and critical contributions to society. Although good policies already exist, there is a need for improved strategies in the implementation and monitoring, and evaluation by government authorities at the local level to help provide space and facilities for street vendors through town planning, empowerment programs for street vendors, and safety nets.

Keywords: Perceptions, Street food, Competitiveness, Women Enterprises,

8.4 Introduction

Street food vending contributes to employment, household revenue, and food security in developing countries [1, 2, 3], including South Africa [4, 5, 6]. Street food vending is a preferred strategy for individuals from low socio-economic backgrounds to support their households [7], especially women for whom illiteracy, lack of education and skills are significant obstacles to having regular jobs [8, 9, 10]. The vendors are a vulnerable population, unprotected by the government, labour unions, and labour law [11], with a lack of institutional and infrastructural support leading to an environmentally insensitive and energy-conscious enterprise [3]. Research [11, 9] has shown that street vendors always suffer competition due to market prices and insecure and irregular employment.

Several studies on informal trading and street food enterprise have indicated that the role of the street food enterprise in the economy, although essential, is poorly defined [8, 12, 13], poorly measured, and consequently not considered in food security policy [14]. Although research [15] has indicated that the informal sector contributes 8% to the country's Gross Domestic Product (GDP) and supports 27% of all working people, its increasing importance in local economic policies, regulations, services, and infrastructure facilities are overlooked [16, 17, 11, 18].

In South Africa, skilled individuals' resort to street food businesses due to few job opportunities [19, 20, 21]. Although earlier results [21] indicated that street food vending should be considered a role player in the local economy, local authorities do not give informal trading critical attention despite the unfavourable conditions in which the vendors operate. Challenges to controlling the street vending sector effectively arise in rural South Africa (Mpumalanga and Northwest) and in some urban towns in Gauteng, where informal traders require a certification of recognition in operation [21]. Successfully promoting and improving street food vending operations can be done by obtaining health and local authorities [22].

At an individual level, women's street vendors' success and economic advancement require more financial and infrastructural resources in the marketplace [17]. Some literature suggests that female business owners are even more survivalist-oriented than men, though it may be based on gendered stereotypes of males and females [18]. However, some studies have shown that institutional access and the power to benefit from economic activities require complete control in decision-making to make a profit [23], making it difficult for street food vendors to be competitive with the challenges of informal enterprises.

Nevertheless, street vendors based in Dhaka, Bangladesh, perceive business operations, knowledge, and production as critical for business competitiveness, despite their myriad challenges [24].

There is a consensus that the industry's low entry costs and flexible hours make street food enterprises attractive to poor women [25]. Studies [26] also indicated that the street food enterprise often sustains the rural sector by providing informal food trade of raw materials at a low cost. However, due to unstable conditions in the informal enterprise, the lack of proper coordination guided by conducive policies makes it challenging for street vendors and authorities to be competitive [21]. Studies [27] have also highlighted the importance of understanding street food vending in different settings, given the importance of street food in society, its availability, nutritional value, purchase, consumption patterns, and competitiveness.

This study adopted Porter's Diamond Model [28] of Competitiveness as a guiding framework. In South Africa, the model has been widely used [30,31,32,33,34,35], including in the Vhembe District [36, 37, 38]. However, attention has been focused on developing commercial plans for large firms, small and medium businesses, and small businesses, providing little, if any, attention to the competitive advantages of micro-businesses [39]. In addition, no studies have examined the competitiveness of street food vendors in the Vhembe District using Porter's Diamond Model. This paper uses Porter's Diamond Model to investigate street food vendors' perceptions of the determinants of street food enterprise competitiveness in the Vhembe District, Limpopo province.

8.5 Material and Methods

8.5.1 Description of the study area

The study was conducted from July to September 2019 in the rural towns of the Vhembe District, the northern-most district of Limpopo Province in South Africa. The Vhembe District consists of four local municipalities: Makhado, Thulamela, Musina, and Collins Chabane. It is surrounded by Botswana in the west, Zimbabwe in the north, and Mozambique share the borders. It covers an area of 21,402 square kilometers of mostly rural land. About 33% of South Africans live in rural settlements [40]. Due to the high level of unemployment and poverty, inhabitants of the district have developed several survival strategies, including the street food enterprise of major trading points within the local municipalities identified as the towns of Makhado, Thohoyandou, Mutale, and Musina, respectively. The informal sector in South Africa contributes 8% to the country's GDP and supports 27% of all working people [15]. Vhembe District has an estimated population of 1.2 million. About 48% of the Vhembe

District population resides in the Thulamela municipality, with women comprising 55% of the population compared to Musina and Makhado [40].

8.5.2 Sampling

Non-probability sampling was used in this study as the research population was unknown [41]. We used convenience sampling to select 511 street food vendor enterprises in the towns of Makhado, Musina, and Thohoyandou in the Vhembe District of Limpopo Province, South Africa. As there were no records of street vendors in place at the municipalities of the Vhembe District, the researcher established and maintained a complete list of the primary unit. The sample size was determined using Yamane's 1969 formula [42]. The formula states that at the significance level of 90%, the minimum sample size for the unknown population is 100 [43]. A total of 511 street vendors from Musina (168), Makhado (36), and Thohoyandou (307) towns selling ready-to-eat food or cooked food participated in the study. Given the challenging nature of street vendors' work, a convenient sampling technique was used. Street food vendors were recruited at taxi ranks, along the main roads, in industrial areas, malls, schools, and lastly, between residents' streets, especially in Musina town.

8.5.3 Data collection procedures

Under the study leader's supervision, nine trained fieldworkers conducted the interviews. They used a structured questionnaire comprising demographic characteristics (age, gender, location, marital status, country of origin, educational status, and business ownership) and an economic profile (total household income, members dependent on household income, and sources of income). The questionnaires comprised indicators of the six attributes of Porter's Diamond Model of Competitiveness [28] commonly used as prospective determinants of competitiveness: Production; Markets; Related and supporting industries; Government support; Firm strategy, structure, and rival; and Chance. A 5-point Likert-type scale (1: strongly disagree; 2: disagree; 3: neutral; 4: agree; 5: strongly agree) was used to measure the perceptions of the vendors on the competitiveness of their enterprises.

8.5.4 Data preparation and analysis

Two trained data capturers entered the data into an Excel spreadsheet, with quality checks by the primary investigator. The data were exported to the Statistical Package for Social Sciences (SPSS version 27) for analysis [44]. Descriptive statistics were computed to summarise the data, with frequencies and percentages for categorical data, and means or medians, and standard deviations or interquartile ranges computed for continuous data, dependent on the skewness of the data.

8.6 Results

8.6.1 Socio-economic characteristics of street food vendors

Error! Reference source not found. provides the socio-demographic characteristics of street food vendors. Based on the location of the towns, most participants were from Thohoyandou (60%), followed by Musina (33%) and Makhado (7%). Most (85%) street vendors were South Africans, and 15% were Zimbabwean foreign nationals. Half of the vendors were single, either never having married (44%), single (2%), or widowed (3%). Their highest education levels were degree or diploma (6%), matriculation (29%), some high school (51%), and primary or no schooling (15%). Most vendors were full owners of their enterprises.

Table 1: Demographic characteristics of the street food vendors (N=511)

Location		
Musina	168	32.9
Makhado	36	7.0
Thohoyandou	307	60.1
Marital status		
Never married	223	43.6
Married	143	28.0
Co-habiting	117	22.9
Single	11	2.2
Widowed	17	3.3
Country of origin		
South Africa	436	85.3
Zimbabwe	75	14.7
Educational status		
No schooling	19	3.7
Primary	57	11.2
Some high school	258	50.5
Matriculation	147	28.8
Diploma	26	5.1
Degree	4	0.8
Business ownership		
Full owner	440	86.1
Co-owner	60	11.7
Employee	11	2.2

8.6.2 Age and sex profiles

The age and sex distributions are provided in **Error! Reference source not found.** Almost all the respondents (90%) were females. Most respondents (60%) were 25-44 years old, 26% were 45-54, and 11% were older.

Table 2: Age and sex distribution of the street food vendors (N=511)

Age categories (years)	Males		Females		Total	
	n	%	n	%	n	%
18-24	1	0.2	20	3.9	21	4.1
25-34	10	2.0	71	13.9	81	15.9
35-44	20	3.9	203	39.7	223	43.6
45-54	8	1.6	124	24.3	132	25.8
55-64	8	1.6	39	7.6	47	9.2
65-74	0	0.0	4	0.8	4	0.8
75+	3	0.6	0	0.0	3	0.6
Total	50	9.8	461	90.2	511	100

8.6.3 Economic profile

The median monthly household income of the vendors was declared as R6,000, with minimum and maximum amounts of R1,000 and R8,000, respectively, and an interquartile range of R3,420-R10,000. The vendors' median monthly income from their businesses was declared R4,000, with minimum and maximum amounts of R200 and R200,000, respectively, and an interquartile range of R2,100-R7,000.

8.6.4 Sources of income

Almost a quarter (23%) of the vendors indicated no additional income sources, 71% indicated one additional source, and 6% indicated two or three additional sources. Although foreign nationals did not receive South African grants for social support, the results indicate that approximately half (51%) of the street food vendors received grant income besides their current business income, while others indicated spousal income (23%). A few street food vendors (5%) indicated other businesses as a source of income. Only 5% indicated another source of income, but none specified the kind of business that provided such.

8.6.5 Porter's Diamond Model of Competitiveness

8.6.5.1 Factor conditions

The perceptions of the street food vendors of each factor condition of Porter's Diamond Model of Competitiveness are provided in **Error! Reference source not found.** for describing their perceived determinants of competitiveness for the street food enterprise. The factor conditions are ranked from highest to lowest competitiveness based on the mean ratings of the components of each factor.

Table 3: Perceived competitiveness of Porter's factor conditions, ranked on their mean ratings (N=511)

Factor condition	Mean	SD	Ranked mean
Production conditions	3.62	0.76	1
Markets conditions	3.26	1.34	5
Related and supporting industries	3.34	1.11	4
Government support	3.49	1.23	3
Firm strategy, structure, and rival	3.22	1.27	6
Chance	3.60	1.23	2

Note. 1= Strongly disagree 2= Disagree 3= Not Sure 4= Agree 5= Strongly agree

Based on these mean ratings, the Production factor condition is perceived as the main determinant of competitiveness (3.62), closely followed by Chance conditions (3.60), and then by Government support (3.49). The other factor conditions are perceived as less competitive. These high-level aggregated mean scores are examined further in **Error! Reference source not found.**4, which displays the components of each factor condition, and their means ranked within each and across all factor conditions. After that, the ratings of the top 12 components are presented in **Error! Reference source not found.**5.

Table 4: Perceived competitiveness of the components of Porter's Factor Conditions, with rankings of mean ratings (N=511)

		Mean	SD	The rank of mean within Factor Condition	The rank of mean relative to all components
Production conditions	1. Cost of production	3.58	1.13	4	8
	2. Water	3.91	1.06	1	2
	3. Infrastructure	3.46	1.13	5	14
	4. Capital/ Finance	3.87	1.09	2	4
	5. Knowledge of production	3.60	1.31	3	7
	6. Technology	3.45	1.29	6	15
	7. Natural Factors	3.49	0.77	7	17
Markets conditions	8. Distance to the market	3.27	1.34	2	22
	9. Market information	3.34	1.24	1	20
	10. Quality of products	3.19	1.44	4	30
	11. Products market availability	3.25	1.44	3	25
Related and supporting industries	12. Financial institutions	3.51	1.55	2	13
	13. Research institutions	3.26	1.37	4	23
	14. Inputs suppliers	3.55	1.38	1	10
	15. Suppliers of packing materials	3.11	1.46	5	32
	16. Electricity suppliers	3.28	1.30	3	21
Government support	17. Interaction with beneficiaries	3.68	1.35	2	6
	18. Beneficiary support	3.97	1.36	1	1
	19. Indirect support	3.34	1.55	3	18
	20. Labor policy	3.22	1.53	5	27
	21. Transformation policy	3.25	1.52	4	24
Firm strategy, structure, and rival	22. Adaptability	3.21	1.43	3	28
	23. Culture	3.20	1.41	4	29
	24. Structure	3.23	1.41	2	26
	25. Flexibility	3.12	1.34	5	31
	26. Pricing strategy	3.34	1.33	1	19
Chance	27. Economic stability	3.58	1.45	3	8
	28. Oil and fuel	3.53	1.48	5	12
	29. Aids	3.36	1.48	6	16
	30. Political stability	3.55	1.46	4	11
	31. Price stability	3.69	1.41	2	5
	32. Crime	3.88	1.27	1	3

Note. 1= Strongly disagree 2= Disagree 3= Not Sure 4= Agree 5= Strongly agree

Table 5: Top 12 components ranked on mean ratings (N=511)

Factor condition	Component	Mean	SD	The rank of the mean within Factor Condition	The rank of mean relative to all components
Government support	Poor support	3.97	1.36	1	1
Production conditions	Water	3.91	1.06	1	2
Chance	Crime	3.88	1.27	1	3
Production conditions	Capital/ Finance	3.87	1.09	2	4
Chance	Price stability	3.69	1.41	2	5
Government support	Interaction	3.68	1.35	2	6
Production conditions	Knowledge of production	3.60	1.31	3	7
Production conditions	Cost of production	3.58	1.13	4	8
Chance	Economic stability	3.58	1.45	3	8
Related and supporting industries	Inputs suppliers	3.55	1.38	1	10
Chance	Political stability	3.55	1.46	4	11
Chance	Oil and fuel	3.53	1.48	5	12

Note. 1= Strongly disagree 2= Disagree 3= Not Sure 4= Agree 5= Strongly agree

The 12-factor condition components rated as the most competitive are in **Error! Reference source not found..** They derive mainly from Production factor conditions and Chance factor conditions. This ranking is consistent with Production and Market factor conditions, which are also the highest (Table 3). The noteworthy exception, however, is that the factor

condition component rated the most competitive of all is the Poor support component of the Government support factor condition (3.97). Another factor condition component of the Government support factor condition rated within the top 12 components is Poor interaction, rated in sixth place (3.38).

The factor condition components of Water, Crime, and Capital/ Finance are other highly rated determinants of competitiveness. The factor condition component of Inputs suppliers from the Related and supporting industries factor condition is rated 10th in competitiveness (3.55). Finally, the ratings of the sub-components of the Production factor condition components are presented in **Error! Reference source not found..**

Table 6: Perceptions of Production factor conditions as determinants of competitiveness of agricultural food enterprise (N=511)

Production conditions components	Mean	SD
Cost of production	3.58	1.13
labour cost	3.25	1.45
inputs cost	3.91	1.21
Water	3.91	1.06
Sufficiency of water source	3.76	1.35
cost of water	4.07	1.08
Infrastructure	3.46	1.13
Infrastructure quality	3.41	1.52
Infrastructure availability	3.30	1.53
Type	3.35	1.52
Transportation	3.78	1.14
Communication systems	3.31	1.43
Electricity	3.59	1.21
Capital/ Finance	3.87	1.09
Cost of capital	3.99	1.17
Capital availability	3.75	1.41
Lack of knowledge of production	3.60	1.31
Lack of technology	3.45	1.29
Natural Factors	3.49	0.77
climatic conditions	3.99	1.16
disasters	3.81	1.25
diseases	3.50	0.74

Note. 1= Strongly disagree 2= Disagree 3= Not Sure 4= Agree 5= Strongly agree

The Production factor condition component of water, rated as the second highest of all the factors, comprises 'insufficient source of water and 'cost of water, with mean ratings of 3.76 and 4.07, respectively. Thus, water insufficiency and cost are perceived as highly competitive sources for the street food vending enterprise, with the cost aspect particularly competitive. The cost of water is perceived as the most competitive source of all sources, with a mean rating of 4.1.

The component of Capital/ Finance is the second of the Production factor condition rated in the top 12 and the fourth highest of all the factor components. It comprises 'costly' and 'lack of availability aspects of capital, with mean ratings of 3.99 and 3.75, respectively. Again, the cost factor of the resource is perceived as a more competitive source than its availability, although both are highly competitive. Finally, the cost of production component of the Production factor condition comprises 'labour' and 'input' aspects of production costs, with mean ratings of 3.25 and 3.91, respectively. Thus, production input costs are perceived as a highly competitive source for the enterprise, with labour costs relatively uncompetitive.

8.7 DISCUSSION

Using Porter's Diamond Model, this study investigated street vendors' perceptions of the determinants of competitiveness in their enterprises in the Vhembe District.

8.7.1 Socio-economic characteristics of street food vendors

Most of the street vendors in our study were South Africans, with 15% of Zimbabwean foreign nationals. They were mostly 35-54 years old, with 20% younger and 10% older. Half of the participants had some high school education, and a third had matriculation or higher, 6% of whom had a tertiary qualification. Half the participants were single, most of whom had never been married.

This characterisation is typical of reports of related studies [5, 7] highlighting that small-scale participants aged 30 and 34 likely understand the issues involved in small enterprises. Therefore, they are armed with necessary information regarding climate change adaptation strategies that can be well achieved and adhered to. It has been noted that better education might be associated with improved adaptive capacity and adverse effects of climate change and variability [45]. However, different from the finding in the current study, whereby street food vendors experienced challenges regardless of educational level. This could be because vendors generally do not receive any form of recognition or support from formal institutions.

Most of the vendors had complete ownership of their business. Their median monthly household income was R6,000, with the median monthly income from their businesses declared R4,000. A study [33] notes the importance of street food vending as women are economically empowered. The study indicated that street food vendors earn a living from the enterprise of 25% to 100% of their capital despite little capital. Moreover, about 90% of the study population were females. Similar observations were made in Cape Town studies [21] and Limpopo [4]. Female vendors dominated street food vending in low- and middle-income countries such as Nigeria [55] and Zimbabwe [53].

8.7.2 Attributes of Porter's Diamond Model of Competitiveness

The street food enterprise's competitiveness model has shown that chance, production factor conditions, the role of government, and related and supporting industries received the most rated determinants. Moreover, demand conditions and firm strategy are minor constraints in this street food enterprise. According to Porter's Diamond Model, factor conditions are essential for any industry [28]. Production factor conditions give industries a competitive advantage, as indicated by studies on small-scale farms and the wine industry [46, 36]. According to [47], PDM divides production factors into primary ones based on natural resources and advanced production factors dominated by historical culture, humans, and technology. In the current study, street vendors regarded climate conditions and disasters such as heavy rains or rainy seasons as crucial factors for the street food enterprise. Vhembe District is warmer and drier with increased droughts, changes in rain timing, observed trends, temperature, and precipitation [48]. Harsh weather conditions have been reported to significantly influence the competitiveness of the street food vendor [49, 52, 50].

The operations of the enterprise are impacted severely. Although climatic variability and change affect every societal sector [49], it needs urgent attention, including the street food sector in the Limpopo Province [4, 49, 51, 5]. Poor infrastructure is among the contributing factors to the enterprise competitiveness in the country that worsens the weather condition. Street vendors sell their food in open spaces, whereby most fail to run their businesses during harsh weather conditions. Several studies in South Africa [21, 5, 52, 53, 4, 54] and other African countries [3, 55, 56] confirm that street food vendors have poor infrastructure that hinders the enterprise's progress. Moreover, [57] highlighted that climate conditions drive South Africa towards a warmer and drier future, with predictions of more prolonged and extreme droughts and more intense floods. Enterprises face various problems, such as decreased demand, supply chain disruptions, cancellation of export orders, raw material shortage, and transportation disruptions [58].

Furthermore, COVID-19 and other health-related conditions impact financial and business operations [59]. South Africa has the highest prevalence rate of HIV /AIDS in low and middle-income countries, followed by Tanzania and Kenya. The World Health Organisation expects non-communicable diseases to overtake Africa's other causes of death by 2030 [60].

It was not surprising that the street vendors in our study perceived capital/finance as an important determinant of the competitiveness of their enterprises, with costly capital and lack of availability perceived as contributing to failure. As reported earlier, women mostly face structural challenges for small businesses in South Africa, including lack of access to capital/finance compromises their enterprise sustainability, and only 2% of new firms in South Africa have access to bank loans [61]. It is well established that informal traders, including South African traders, are not afforded the opportunity for the micro-loan or government finance to establish or maintain their businesses [63, 10, 46, 64]. A study by [65] indicated that firms' unavailability of financial assistance is considered the second most crucial factor in the firm's success. Just above 50% of the participant had some high school education. A highlight that participants in this study can read and write is that they could comprehend if proper training is directed to them.

Street food vendors agreed on the production cost of inputs as another important determinant of the competitiveness of the street food enterprise. This is probably because street vendors depend daily on their sales to buy their inputs for the next day, regardless of profit. However, street vendors could have their gardens and produce vegetables for input, such as vegetables, unlike buying all the inputs to spend less and gain more. Porter also indicated that factor conditions should be upgraded by developing skills and new knowledge creation [28].

Although the current study reports that half the street vendors with some form of high school education seemed not to maximise profit for their enterprise. Street vendors could be encouraged to maximise profit by producing their input rather than constantly buying all inputs used for the business. In this study, almost all street vendors are self-employed rather than employees working for someone else or as business co-owner. Similar findings were observed in similar studies in South Africa [56, 21, 2], highlighting that informal trading offers opportunities to all who cannot find employment in the legal industry, irrespective of their level of education.

Most (85%) of our study participants had some high school, matriculation, or tertiary education., indicating that they could read and write if needed. Also, South Africa reported

high numbers of individuals achieving secondary education who occupy informal employment [41]. With rising unemployment, the current study highlights that individuals of all education levels could impact informal economic growth. However, low education levels with no special skills are reported between 18 and 24 years [24].

In South Africa, the unstable economy forces people to look for other means of informal self-employment, such as street food vending [64]. In Cape Town, young, single individuals are most likely to populate the informal street food enterprise because of low education and poor skills [21]. In Cameroon, business operations, knowledge, and poor production contributes to competitiveness strategies for improving food enterprise to focus on Porter's four attributes [28] Diamond Model of Competitiveness [24].

There has been a decline in the quantity and quality of water in South Africa [57]. About two-thirds of South Africa is urbanised, causing a massive resource demand. Water is especially limited in rural towns where there is an increase in the population [4]. Water scarcity has been a problem in the Vhembe District [48, 36, 57] and is a critical strategic area for enhancing competitive performance in the street food enterprise as it is used in all activities such as cooking and cleaning [57, 67, 2, 51, 68]. Our study participants reported costly and unavailable water sources as crucial factors for competitiveness. The street vendors lack adequate water sources, and high-water prices affect business profitability and competitiveness. The street vendors buy water from local shops, and some bring it from their locations as they have limited access to water sources in their business location, mainly along dusty roads [19, 63, 14, 64, 21]. Moreover, the location of the street food vendors is a problem for the competitiveness of street vending enterprises in capital cities such as Johannesburg. During the "clean sweep" operation, all informal traders, including the 70% selling street food, were cited for improper use of space and dysfunctional operations of the towns [70].

While our findings indicated that a permanent built-in structure was not considered a problem for the success of enterprises, longer-term investment in supportive infrastructure is essential to ensure food security and for more equitable local economic and social development amongst the street vendors. Improvements to the working environment would also reduce the spread of infections, even in times such as COVID-19 [69]. Poor infrastructure, accompanied by a lack of governmental support, has made it difficult for street food enterprises to offer affordable services for sale to satisfy urban poor and urban youth [11, 21, 66]. The government's role is to ensure that people live in a conducive environment and that their economic status is always stable. The current study highlights that strategies and policy development should focus more on the informal enterprise's support as perceived

in the study. A lack of proper coordination as guided by policies due to unstable conditions in the informal enterprise is a cause of concern in many countries, including South Africa [21,71].

Similarly, studies [18, 72, 46, 20, 56] indicated that a lack of policies and guidelines makes it difficult for authorities to support informal enterprises fully due to inadequate regulation and simplified administrative procedures [26]. In the current study, street vendors indicated no interaction with authorities that could make them an essential part of the local plans. A lack of communication between government authorities and street food vendors has been observed in studies in other parts of the province [7], with no support for small and medium enterprises, especially street food traders [35]. There is consensus, however, that good governance and effective prioritisation of street food enterprises in South Africa should be considered because it plays a vital role in the economy [70].

The South African government's failure to provide reliable support services might be due to the lack of technical skills, institutional capacity, and funding to operate, maintain and manage available resources [57]. Street vendors in Cape Town, South Africa, have noted that overseers come to their locations asking for a food certificate but do not always explain the authorisation process. [21]. In other countries, such as Cameroon, the authorities have made street food vendors an essential part of the local plan amid the fast-growing street food sector. According to Porter's Diamond Model [28], the Chance factor condition is a determinant of the competitive advantage of a firm or industry. The current study perceived crime as a chance factor harmful to the competitiveness of the street food enterprises in the Vhembe District Municipalities. Informal businesses suffer high rates of theft and crime, and the security of the traders is a concern for the competitiveness of the street vending enterprise [73, 55, 2, 11]. Our study showed that 90% of the street food vendors were women. The high rate of gender-based violence in South Africa presents an additional challenge to their safety [12].

8.8 CONCLUSIONS

Investment in the street food enterprise in the Vhembe District should be based on its competitiveness. The current study confirms that Porter's Diamond Model factor conditions of Production, Chance, and Government support overall were perceived by the street food vendors as the determinants of street food enterprise competitiveness. The Poor support component of the Government support factor condition was perceived as the most critical component for competitiveness, with the cost of water sub-component of the Production factor condition and the cost and availability of capital all critically important. Improving these

critical attributes has the potential to develop the competitiveness of the street food vending enterprise in the Vhembe District. Improved water, financial, and governmental support strategies for street food vendors could increase the competitiveness of their enterprises.

This study further emphasises the need for new valuing of the informal sector to recognise and build on its mode of operation and critical contributions to society. An active engagement of the government authorities and the different stakeholders in the informal street food vendors should help improve the operation of the street food enterprise through proper policy implementation guidelines, monitoring and evaluation to accommodate and provide space and facilities for street vendors in town planning, empowerment programs for street vendors and safety nets.

Abbreviations

AIDS: Acquired immunodeficiency syndrome; FAO: Food and Agriculture Organization of the United Nations; GDP: Gross Domestic Product; HIV: Human immunodeficiency virus; PDM: Porter's Diamond Model; SPSS: Statistical Package for Social Sciences.

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Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

As part of the Ethics approval and consent to participate:

The researchers submitted documents and obtained ethical clearance from the Faculty of Natural and Agricultural Sciences of the University of Free State (No UFS-HSD2019/0059:) and the Ethics Committees of the University of Venda (No: SHS/19/NUT03). Before data collection, the researcher obtained approval from the Vhembe District and street vendor committees to conduct the study.

The participants were fully informed of the purpose of the study before participation in the study. Furthermore, participants were given assurance of privacy, confidentiality, and anonymity regarding the information provided. Street vendors signed the consent form after explaining the study's aims and objectives.

Competing interests

The authors declare that they have no competing interests.

References for chapter 8

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9 CHAPTER NINE: MANUSCRIPT: CHALLENGES PERCEIVED AND SOLUTIONS PROPOSED BY STREET FOOD VENDORS ACROSS THREE SECONDARY CITIES AND BORDER TOWNS IN SOUTH AFRICA

9.1 Introduction

The manuscript outlines the perceived challenges and solutions of the street food vendor across the two secondary cities and border towns in South Africa. The manuscript was written according to the BMC public health author guideline.

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9.2 Manuscript

9.3 Abstract

Background: Street food vending has grown alarmingly in South Africa due to few job opportunities and high employment. The sector for selling ready-to-eat food is overwhelmed by challenges and under-researched. This paper investigates the challenges experienced by street food vendors in the Vhembe District. It provides information essential for future town planners to accommodate the street food vending enterprise in municipal spatial planning and to improve the competitiveness of street food enterprises. We conducted a qualitative study of the challenges perceived and the solutions proposed by the street food vendors across three secondary cities and border towns in South Africa.

Methods: The study employed a qualitative approach with 55 street food vendors purposively sampled and recruited from three towns in the Vhembe District.

Results: The vendors perceived six broad challenges, including poor infrastructure, food health safety issues, security, personal challenges, and climatic conditions. Street food vendors proposed five solutions to their challenges. The street food vendors proposed improving infrastructure, including proper water and sanitation facilities, access to funding, and improved skills through training. They also appealed to the municipality, local structures and other relevant authorities to improve the enforcement of rules and regulations.

Conclusions: While the street food vending enterprise is characterised by poor infrastructure, lack of access to funding and training, and climatic conditions during day-to-day operations, efforts to improve the vendors' operations need to consider the interventions that the vendors propose as solutions to their challenges.

Keywords: Street food, Vendors, Operational Challenges, Context-Specific Solutions, South Africa

9.4 Background

Since the 1990s, food systems have been transitioning in South Africa with increasing supermarket densities. This secondary economy is a legacy of apartheid, mostly prevalent in rural towns created not as economic hubs but as dormitories for cheap unskilled laborers' unemployment in the formal economy (Moagi, Ivanovic, & Adinolfi, 2021). A regional study by Vanek et al. (2014) found that informal employment accounts for an estimated 33% in South Africa and 44% in Namibia, while Tanzania and Mali contribute 76% and 82%, respectively. In Kenya, street vending provides employment and income to about 70% of the population in the urban area (Odundo, Okemo, & Chege, 2018).

About 74% of women in Sub-Saharan Africa are in informal work compared to 61% of men. In South Africa, women make up most street traders, with about 70% of the street vendors estimated to be women (Roever, 2014). Similarly, about 80% of street food vendors in Uganda are women, although men participate (Muyanja et al. 2011). While street food vending may be part of African culture, food preparation is the responsibility of women, with poor women selling wholly prepared food as a coping strategy to acquire income (Petersen et al., 2018).

In economies with high unemployment, street food vending continues to increase as an option for many citizens, for example, in Africa (Knox et al., 2019; Resnick et al., 2019; Sousa et al., 2019), and in South Africa (Marutha & Chelule, 2020; Skinner, 2016; von Holy & Makhoane, 2006). South Africa's relatively stable unemployment rate of around 33,9% in the second and third quarters of 2022 (Statistics South Africa, 2022) has generally influenced business growth in the informal sector, particularly vending. Even though it is argued that vending attracts those with limited opportunities for formal employment, it minimizes their chances of social exclusion and marginalization. It may, however, reduce their opportunities for formal employment.

The informal food retail sector is an essential component of urban food systems and plays a vital role in ensuring access to food by the urban poor (Skinner, 2016; Battersby et al., 2016). Even though it is still regarded as an illegal and non-taxpaying industry (Alimi, 2016; Panwar & Garg, 2015; Tavonga, 2014), street food vending reduces unemployment significantly, increases vendors' incomes, and provides urban dwellers with inexpensive, varied, and nutritious indigenous meals (Ekobi, 2019). Evidence shows that the informal sector is a normal business function in developing countries' economies, motivated by the supply and demand of products (Kaptso, Tchabo, Chebelem & Asoba, 2021; von Holy &

Makhoane, 2006). Hence studies in low and middle-income countries noted that governments of developing countries should develop a mechanism to provide support for the informal sectors by building the necessary infrastructure and facilities to access funding (Birgen et al., 2020; Infosan, 2010; Skinner, 2016; Tavonga, 2014; Redzwan Habib, 2016; Resnick et al., 2019).

Although traders are vital to a country's social and economic life in the informal sector, street food vendors experience social challenges (Redzwan Habib, 2016; Resnick et al., 2019). The research literature shows difficult trading conditions for informal operators who seldom have access to water, toilets, shelter, and electricity (Skinner, 2016). Challenges of street food vendors selling ready-to-eat food included inadequate water, minimal waste sewages, financial exclusion, and congested public space. These challenges were also common among street food vendors in various parts of South Africa (Lucan et al., 2013; Redzwan Habib, 2016; Resnick et al., 2019).

Furthermore, despite the increasing importance of street vending in the real economy, the vendors' business environment is unsuitable for vendors' health and well-being, as policies, regulations, services, infrastructure facilities, and institutional support programs are lacking (Jaishankar & Sujatha, 2016). Our previous work reported the operational and socio-demographic characteristics of street food vendors. These two papers (Mahopo et al., 2022) highlighted that street food vendors are driven to vending by a lack of opportunities in the formal industry. We further reported on the competitiveness of the street food vending enterprise in the Vhembe District. This sample population of vendors reported high labour and water costs, climate conditions, and lack of government support as significant barriers to their vending (Mahopo et al., 2022). Based on these findings, the current study used a qualitative approach to investigate the challenges and possible solutions the street food vendors experienced and the solutions they perceived could mitigate their challenging situation.

9.5 Methods

9.5.1 Study design

The current study was part of a broader research project (UFS-HSD2019/0059) focused on developing a model for agricultural enterprises. This paper focuses on the challenges and solutions proposed by street food vendors. Our findings on the socio-economic characteristics of street food vendors in the rural towns of the Vhembe District are published elsewhere (Mahopo et al., 2022). The qualitative study design was used to explore the

challenges perceived by street food vendors and possible solutions. Semi-structured interviews with open-ended questions and sub-questions were re-defined during analysis as an interview guide to explore broad areas of interest (Busetto, Wick, & Gumbinger, 2020). The interviews prompted responses to the demographic characteristics of the vendors, their primary challenges, and perceived solutions. The motivation for establishing the street food enterprise was reported elsewhere (Mahopo et al., 2022). Street food vendors were purposively selected or recruited based on age, location, and mode of engagement in the informal retail enterprise. The sample was selected across the cities of Musina, Thohoyandou, and Makhado on main roads, and in communities around the towns.

9.5.2 Eligibility

Study eligibility criteria included individuals aged 18 years or older who were street vendors selling cooked food and could answer questions on the operation of the business.

9.5.3 Recruitment and consent

The lead researcher submitted letters to the Vhembe District office to request permission to conduct the study. After approval and before the commencement of the data collection, meetings with the street food vendors in various towns were held to inform them about the study's aim, purpose, and procedures. Street food vendors were also made aware that participation in the study was voluntary and information collected would be kept confidential. The researchers obtained their written consent, and consent forms were kept in a safe locker in the lead researcher's office. The interviewer used the semi-structured questionnaire to collect data from street food vendors willing to participate. Data were collected at the site while street food vendors were busy with their business activities. When customers needed assistance, the vendors were given a chance to assist their customers so that the data collection would not disturb their business operation.

9.5.4 Setting

The Vhembe District consists of four local municipalities: Makhado, Thulamela, Musina, and Collins Chabane. Botswana in the west, Zimbabwe in the north, and Mozambique share the borders. It covers an area of 21,402 square kilometers of mostly rural land. About 33% of South Africans live in rural settlements (Statistics South Africa, 2020). Due to the high level of unemployment and poverty, inhabitants of the district have developed survival strategies, including the street food enterprise at major trading points of the local municipalities identified as the towns of Makhado, Thohoyandou, Mutale, and Musina, respectively. The

informal sector in South Africa contributes 8% of the country's GDP and supports 27% of all working people (Greve, 2017). Vhembe District has an estimated population of 1.2 million. Almost half (48%) of the Vhembe District population resides in the Thulamela municipality, with women contributing 55% of the population compared to Musina and Makhado (Statistics South Africa, 2020).

9.5.5 Participants

Between July and September 2019, 55 street food vendors participated in the in-depth interview discussions in Musina (n=16, 29%), Thohoyandou (n=22; 40%), and Makhado (n=17, 31%). There were two male vendors and 53 females. Their ages ranged from 18-75 years, with most single women aged 35-44. Approximately two-thirds of street food vendors had some years of secondary education (65%), and two participants (4%) had no formal education. About a quarter (n=13, 24%) of the street food vendors were migrants from Zimbabwe, mostly from Musina (n=7, 10%) and Makhado towns (n=6, 10%).

9.5.6 Data collection and analysis

The study was conducted from July to September 2019 in the rural towns of the Vhembe District, the northern-most district of Limpopo Province in South Africa. The researcher and research assistants conducted in-depth interviews in consultation with the lead researcher, an experienced qualitative researcher. The lead researcher conducted in-depth interviews in the local language. The interviews took about 30 minutes but could last longer when vendors were engaged in activities during the interview. The responses were recorded. The fieldworker assistants took notes of the interviews in each session using an open-ended checklist in the Tshivenda and English languages. A bilingual qualitative researcher later translated the responses into English.

The semi-structured interview guide comprised demographic information such as age, gender, race/ethnicity, and country of birth. The semi-structured interview had two main open-ended questions: The first question was: "What do you think are the challenges affecting the operation of your business?", with a follow-up question about the main challenges affecting their business. The second question asked the street food vendors to provide possible solutions to their identified problems.

We analysed the qualitative interview data using an inductive thematic analysis process. We identified key initial themes and developed a preliminary codebook in an Excel spreadsheet (Busetto et al., 2020). The researcher open-coded the transcripts based on the initial

codebook to identify common responses to the study's research question. Based on extensive discussions among the researchers, initial codes were refined and applied to the data. The codes emerging from the data were continuously added to the codebook for the iterative coding process (Creswell & Creswell, 2018). To ensure transparency and consistency in data analysis, the research team invited an independent coder who randomly selected sub-samples of the transcript (Creswell & Creswell, 2018). After that, the team discussed code queries and revised the codes through consensus. Multiple street food vendors informed final themes and sub-themes, conveying similar sentiments and statements that informed data saturation (Busetto et al., 2020; Creswell & Creswell, 2018). Themes were narratively summarized and illustrated by food vendors' supportive quotes.

9.5.7 Ethics

The Ethics Committee approved the study procedures of the Faculty of Natural and Agricultural Sciences of the University of Free State (No UFS-HSD2019/0059:) and the Ethics Committees University of Venda (No: SHS/19/NUT03).

9.6 Results

9.6.1 Perceived challenges

A summary of six broad challenges and five comprehensive proposed solutions are outlined in Table 1 and Table 2 in this chapter. The six broad key challenges described by the street food vendors comprised poor infrastructure, food safety issues, security, personal challenges, and climatic conditions. The four solutions that the street food vendors proposed to their challenges highlighted the need to provide resources (funding, improved infrastructure, e.g., water and shelter), training, and enforcement of rules and regulations by the relevant authorities, e.g., municipality and local structures.

The key findings on the perceived challenges identified within each theme and sub-theme are presented and summarized in Table 1 in this chapter. After that, the key findings of the proposed solutions are presented and summarised in Table 2 in this chapter.

Theme 1: Poor infrastructure

References to poor infrastructures refer to the unavailability of proper shelter and lack of water and toilet facilities for street food vendors during their operations. Inadequate infrastructure, storage, access, and water availability were the main physical work

environment challenges in all three major towns. The street food vendors voiced poor infrastructure as an ongoing concern in unsustainable businesses due to insufficient profit. These factors could be linked to food safety concerns in South Africa.

Sub-theme 1.1 Appropriate shelter

The need for reliable infrastructure to shelter street food vendors from bad weather and protect their goods is a familiar challenge in the Vhembe District. As expressed by a street food vendor in Musina (MU): *“it is difficult to operate during the rainy seasons because we do not have tents. We only use umbrellas.”* (MU02)

Another street food vendor from Thohoyandou (TH) stated that: *heavy rainfall affects me because I do not cook or have proper tents* (TH06). Thus, their working hours are reduced when it rains as they must protect themselves from exposure to health risks during severe weather conditions.

The street food vendors had inadequate infrastructure. They reported not having storage facilities as another infrastructural constraint for keeping their stock. They also did not have a proper or standard kitchen in which to cook. Maintaining a good standard of hygiene and securing their items were key challenges. One street food vendor in Thohoyandou indicated that:

“There is no place to store our items due to poor infrastructure and calls for thieves to steal their business items, forcing them to keep buying new items for their business operations.” (TH06)

Street food vendors from all towns reported concerns over the unavailability of a standard operational kitchen. Vendors were concerned about inadequate infrastructure, such as a lack of storage facilities. This makes it impossible for their operations as they are exposed to weather elements that harm their operations. One street food vendor in the Thohoyandou claimed:

“Heavy rainfall affects me because I do not cook or have proper tents.” (TH06).

While others noted various issues that challenged their business operation, street food vendors in Makhado Town reiterated that:

“During rainy seasons, business is slow because we cook in an open space, we are not protected from rain, and customers do not have a place to eat; hence customers go to those with proper shelter. This will then make me lose profit for that particular day”. (MA06)

In addition, street food vendors noted a challenge regarding storage facilities where they need to put their equipment and supplies. Others were concerned that:

“There is no place to store their items due to poor infrastructure, and this calls for thieves to steal our business items, forcing us to buy new items to operate.” (MU05)

Most street food vendors reported that they could not operate due to inadequate infrastructure and exposure to bad weather elements. One street food vendor in Thohoyandou said:

“We must have shelters to be covered when it rains.” (TH01)

Sub-theme 1.2: Source of water and supply

Most street food vendors specified water access and availability in all towns as the main issue that hinders their business operations. Other street vendors indicated that they sometimes re-use water for other business activities. This could be dangerous as pathogens could be introduced when unclean water is used for washing utensils used for serving customers. Most of the street food vendors cited that:

“Water is expensive and at the time, we re-use water for cleaning.” (All)

For those street food vendors who had access to water, distance to the water facilities was also a concern. To access this water, they must travel long distances and pay for accessing enough water to operate the business. An example of such an expression was:

“It is most difficult to access water: During the windy season, water availability is a problem because I get it from very far. Again, finance or lack of funding makes it challenging to get enough water for business operations (TH04).”

Difficulties operating were not only during the rainy season. The infrastructure challenges were noted as the main issues that could hinder the operation and growth of street food vendors in the Vhembe District towns. There is a need for assistance for street food vendors.

Theme 2: Food health safety

Street food vendors identified several food health safety concerns, including lack of waste removal, no standard kitchen with cold storage, and no running water. They acknowledged a general lack of facilities.

Sub-theme 2.1: Lack of rubbish collection or waste removal

Most noted that many local food authorities need to improve street food safety. Most of these street food vendors do not practise good hygiene as they were reliant primarily on the

government to maintain hygiene at their different stalls. They were not satisfied with waste disposal authorities. Street vendor (MU01) in Thohoyandou noted that:

“At times, there are no people who collect rubbish that we dispose of next to our selling place, and this is a concern as a smell and flies surround our selling place.

This is not good for our health and that of the customer.” (MU01)

Some of the vendors interviewed operate in unstable infrastructure with no facilities to purify water or use a kitchen, making it impossible to ensure water, food safety, and hygiene. Thus, the vendors associate the lack of standard kitchens with low production because they do not have a proper place to cook enough food for their production. A street food vendor noted that:

“Lack of proper storage facilities is the biggest challenge I face because I cannot buy enough food to last for some time. After cooking food, we need to make sure that all foods cooked for that time are sold out because if they stay for longer, they will get spoiled, and this is a problem because our area is too hot.”

Sub-theme 2.2: Lack of standard kitchen or storeroom with cold storage or storeroom

Kitchens should have water, as most street food vendors highlighted water is one of the most significant issues slowing production. According to the WHO, five keys to safer food guidelines encourage washing utensils using running water with soap or detergent, yet none of the street food vendors interviewed were found to practise or know about this. Most street food vendors noted an example of these challenges regarding standard kitchens with access to water and its sources, a serious issue that could affect hygiene and business operation in general. One street food vendor indicated that:

“We re-use water in our area because water is expensive, and I need to travel for a distance to get enough and adequate water to use for cooking and cleaning in my business.” (TH13)

Another street food vendor highlighted that:

“Water used for cooking is sometimes accessed from our nearby toilets, and we do not have any choice because it is expensive, and we sometimes get water far.” (TH05)

Another street vendor in Thohoyandou also mentioned this, indicating that distance, lack of financial support, and accessibility to resources when it rains are among the most considerable constraints to the operation of the street food vending operation in the Vhembe District.

Theme 3: Security

Street food vendors also discussed concerns over the safety of their properties and increased risks of violence and vandalism occurring in their areas.

Sub-theme 3.1: Increased risk of crime, violence and vandalism during the protest

Street food vendors in Musina reported increased crime and vandalism:

“Crime is very high in our area. At times, and we put our equipment’s in places that are not safe and when you come to work the following day, you find that there is nothing and are stolen.” (MU11)

Others were also concerned about the fighting and vandalism that sometimes occurred in the area and regarded this as part of the crime that could affect business operations.

“Due to fights and shootings between taxi drivers, when this happens, we sometimes do not sell. Again, you will find that as it happens, our properties are vandalized, and we run for our safety.” (MU07)

Some street food vendors in Musina associated crime with working hours as:

“Crime affects how we handle our businesses; we are afraid if we work until it is dark, we will be attacked, and thieves will take our monies.” (TH114)

Theme 4: Legislation and government support: Governance and Regulation

Governance themes were related to legislation and government support. In many cases, street food vendors highlighted that there is no enforcement of rules and regulations by the government official responsible for street food vending in the three towns. Some indicated that they do not know how to obtain the required permits and that it is the government's responsibility to assist in obtaining such documentation.

Sub-theme 4.1: Lack of enforcement of rules and regulation

Due to the poor enforcement of rules and regulations, foreign nationals can engage in informal trading in the town, increasing competition between those with and without licenses. In all three towns, the lack of compliance of foreign nationals operating without licenses and permits was an issue of concern. One street food vendor expressed that:

“foreign national operate without a permit.” (MA02)

This study also observed that vendors were struggling to make a profit to stay in business. Thus, a culture of competition was also evident in many neighbourhoods, including rivalry for

pupils' lunchtime business. Another street food vendor also noted that this lack of compliance and non-enforcement of laws by the government increased the number of foreign nationals in the industry, creating competition for locals:

"Foreign national without permit makes it difficult for us to sell as they compete with our customers." (TH19)

Street food vendors acknowledge the need to have a permit in order for them to operate and have the security of their sites. However, some indicated that even though they know they need documentation, they should be permitted to operate due to their inconvenience.

Sub-theme 4.2: Poor municipal interactions

The vendors were also concerned that there was no support for vendors from the police and environmental officials, and others noted their absence during their operation. An example of their concerns was that:

"Ever since I started this business, I have never seen any government official assisting street food vendors. We want to see them and assist with permits. I do not know where to get those permits." (MU09)

Sub-theme 4.3: Poor governmental support

All street food vendors agree that government financial support is lacking. This may be because most street food vendors operating in the Vhembe District are regarded as informal and not registered for either business or individual income tax. This exacerbates the problem of access to funding from private funding institutions such as banks, as street food vendors do not have formal registration or certification of their business and lack resources to use as collateral. Therefore, increasing resources such as petrol has more impact on the street food vendors, as expressed by a vendors in the Thohoyandou town:

"Water and food increases affect my operation and the profit I make daily because the government is not supporting us. When inputs prices increase, we do not get any subsidies and end up not making enough profit. Nevertheless, I continued working in this difficult situation because of my love of my work." (TH12)

Cost and profitability were significant concerns among food vendors. Price plays a central role in purchasing water and food items to choose from, and most vendors cited it as the key factor in their own decisions about which products to purchase for their shop and from which suppliers. They described a constant struggle to cope with the economic pressure of rising food costs and tightening profit margins. Many vendors also cited difficulty finding the right

balance between increasing menu prices and keeping their customers. One street food vendor expressed that:

“Higher prices of buying water and foods were occasioned by the increases in the cost of production further aggravated by the increases of petrol price and economic instability that forces us to increase the prices of our plate and our customers always complain as we increase the price of the plate.” (TH20)

Theme 5: Personal challenges

Street food vendors noted a need to provide information and specific training to sustain their businesses.

Sub-theme 5.1: Lack of information and training

Most street food vendors acknowledged a lack of information and training in small enterprise operations. As an example, a Musina vendor expressed:

“Lack of training and poor business skills development programs is a challenge because some of my business operations require specific skills that we do not have.” (MU05)

Others noted that they are not trained and do not even have any sources of information. Access to information could assist them. One street food vendor claimed that:

“Lack of information in the vending industry, we do not know much about the operation and lack of money to improve the vending business.” (MU07)

Sub-theme 5.2: Poor working conditions/long working hours.

Street food vendors do not receive health benefits regarding informal work and are often hired temporarily. Their work hours are not guaranteed, meaning they may work on different weekdays depending on the customers served. Due to the nature of the business, they are forced to work longer than expected to make a profit to sustain their families and business. They noted that this affects their health, and they end up exhausted from the long hours spent in the business.

One street food vendor expressed that:

“I work more hours. I do not rest, which is unhealthy.” (MU01)

Other street food vendors expressed the same concern:

“I do not rest because of long working hours to make enough profit. This is not healthy for my health, but I do not have any choice.” (TH11)

Another street food vendor In the Thohoyandou also highlighted safety concerns regarding working the late hours necessary to increase their income:

“Due to working hours, I sometimes work late hours, and my environment is not safe as a woman in the industry.” (TH16)

Theme 6: Climatic conditions

The Vhembe District is among the warmest and wettest areas in the Limpopo province, South Africa. Musina is situated at the border between SA and ZA. The temperatures in this area are at times higher than the annual temperature of 33°C, which could affect many activities. Accordingly, in this study, street food vendors raised concerns about environmental challenges such as high temperatures in unprotected structures or structures that make it possible for harsh conditions to affect their operations.

One street food vendor expressed:

“Higher temperature is a big challenge that affects the operation of my business because customers do not come when it is too hot.” (MU05)

Street food vendors in Makhado (MA06) responded similarly and reported that:

“During rainy seasons, business is slow because we cook in an open space, we are not protected from rain, customers do not have a place to eat; hence customers go to those with proper shelter. This will then make me lose profit for that particular day” (MA06).

These themes and sub-themes are summarised in Table 1 below:

Table 1: Summary of themes and sub-themes that the vendors' challenges experienced in the operation of street food enterprises in the three cities (n=55)

Themes	Sub-themes	<i>Illustrative quote</i>
1. Poor infrastructure	1.1 Sources of water and supply	- All town's street food vendors highlighted that: <i>Water is expensive.</i> <i>Water availability is a problem during the windy season because I get it from very far, and finance/lack of funding is a constraint. (TH04)</i>
	1.2 Appropriate stall or selling site	<i>All vendors mentioned a lack of storage facilities as infrastructure in the three towns. One street food vendor (TH06) indicated that there is no place to store their items due to poor infrastructure and calls for thieves to steal their business items, forcing them to keep buying new items for their business operations.</i> <i>Heavy rainfall affects me because if there is heavy rainfall, I do not cook and don't have a proper tent.</i> <i>Operating during the rainy season is difficult because we do not have tents. We only use an umbrella (Musina).</i> <i>Another street food vendor in Makhado (MA06) reiterated that: during rainy seasons, business is slow because we cook in an open space, we are not protected from rain, and customers do not have a place to eat; hence customers go to those with proper shelter. This will then make me lose profit for that particular day.</i>
2. Food safety	2.1 Poor waste management system	<i>At times, there are no people who collect rubbish that we dispose of next to our selling place, and this is a concern as a smell and flies surround our selling place. This is not good for our health and the customer. (MU01)</i>
	2.2 Lack of cold storage or storeroom	<i>Lack of proper storage facilities is the biggest challenge I face because I cannot buy many stocks because of storage (Musina).</i>
	2.3 Lack of running water	<i>The unavailability of water makes cooking and cleaning of utensils very difficult as water obtained is expensive and we get less water not to spend much so that I do not use all my business profit on water. I instead use less water to get more profit. (MA14)</i>

Themes	Sub-themes	Illustrative quote
3. Security (Increased crime and violence)	3.1 Lack of storerooms for inputs (safety)	• <i>Crime is very high in our area. At times, we put our equipment's in places that are not safe, and when you come to work the following day, you find that there is nothing and are stolen (Musina).</i>
	3.2 Risk of violence and vandalism during strikes	• <i>Due to fights and shootings between taxi drivers, we sometimes do not sell when this happens. Again, you will find that our properties are vandalized as it happens, and we run for our safety (Musina).</i>
4. Governance	4.1 Enforcement of rules and regulations Compliance (Obtain and renew licenses)	• <i>In all towns, compliance regarding street food vendors without permits was raised. One response noted that: foreign nationals operate without a permit. (MA02)</i>
	4.2 Poor municipal interactions	• <i>Since starting this business, no government official has assisted street food vendors. We want to see them and assist with permits. I don't know where to get those permits. (MU09)</i>
	4.3 Foreign nationals without permits	• <i>Foreign national without permit makes it difficult for us to sell as they compete with us with our customers. source</i>
	4.4 Higher prices of buying water and food	• <i>Water and food increases affect my operation and the profit I make daily.</i> • <i>Higher prices of buying water and food were occasioned by the increases in the cost of production further aggravated by the increase in petrol price and economic instability that forces us to increase the prices of our plate and our customers always complain as we increase the price of the plate. source</i>
5. Personal challenges	5.1 Long working on how to make a profit	• <i>I work more hours and do not rest, which is unhealthy (Musina).</i> • <i>I do not rest because of long working hours to make enough profit. This is not healthy for my health, but I do not have any choice. (TH11)</i>
	5.2 Unavailability of skills training for street food vendors.	• <i>Lack of information in the vending industry means we do not know much about the operation and lack money to improve the vending business (Musina).</i>
	5.3 Lack of information	• <i>Lack of training and poor business skills development programs is a challenge because some of the things in my business operation-specific skills (MU05)</i>
	5.4 Financial assistance -no financial	• <i>Lack of funds for infrastructure makes my business not operate well and (Musina).</i>

Themes	Sub-themes	Illustrative quote
	assistance to the establishment and running of the enterprise.	<i>Lack of funds and unavailability of water affect my business operation. (MA16)</i>
6. Climatic condition	6.1 Poor working conditions due to harsh weather conditions	<i>Higher temperature is a big challenge affecting my business's operation because customers do not come when it is too hot. (MU05)</i>

9.6.2 Solutions proposed by street food vendors

the street food vendors proposed several solutions for developing Vhembe District towns. These included improved infrastructure, financial assistance, training, government involvement in their business, and a formal street food vendor organization. Their businesses could be improved and sustainable.

Table 2 summarizes the themes and sub-themes indicating the vendors' solutions proposed for the operation of street food enterprises in the three cities.

Theme 1: Improved working conditions

Street food vendors noted the need for government officials to collaborate and improve the conditions of the trading sites. Again, they highlighted their need for quality and affordable sites such as storerooms to keep their goods safe and proper stalls to protect them from harsh weather conditions. They were also concerned about the amount of time they spent working in their businesses and the effect of the inadequate working conditions on their well-being.

One street food vendor in the Makhado noted that:

"If we could be provided with shelter, it would be better for us."

Some street food vendors proposed that the government build them working sites for which they would need to pay monthly or weekly fees. This could contribute to the municipal economy as each street food vendor would pay for the site. Street food vendors in Thohoyandou town expressed that:

"A solution to the government regarding infrastructure is that government should build us a rental kitchen where we could at least pay even if it is R50 per month. That could be better." (TH08)

These facilities should have water to apply the proper food handling practices to avoid food hazards.

Theme 2: Resources

Sub-theme 2.1: Financial assistance and Training (How to access funds)

Street food vendors maintained that a cash injection to their businesses from the government or relevant organization would assist them in improving their infrastructure without relying on the government to build them infrastructure. One street food vendor expressed their motivation to build restaurants if this support could be given to them.

One street food vendor expressed that: *“If the government can help us by providing funds, this can help me build a proper supermarket and provide resources to grow my business.”* (TH15)

Sub-theme 2.2: Improved shelter/storerooms

Street food vendors in the three towns noted that shelter is the most critical resource they need for operating their businesses. They get water from various places that are far, and water is expensive, as one street food vendor noted:

“If we could be provided with shelter, it would be better for us.” (MA06)

Other vendors noted the need for municipal intervention:

“Municipality can assist us by building us storerooms with access to free water.” (TH20)

Furthermore, another vendor suggested the following:

“a solution could be for the government to build us a rental kitchen where we could at least pay even if it R50 per month, that could be better.” (TH08)

Moreover, another vendor in the Thohoyandou indicated:

“I want to build myself a kitchen with access to free water.” (TH05)

These comments show that street food vendors are ready for any assistance from the government, even at a fee. They are ready to pay.

Sub-theme 2.3: Provision of training

As highlighted, most street food vendors either have a low level of education or some high school education without any training. They claim that they need training on various issues to improve their enterprises. They wish to be trained in preparing healthy foods safely.

They noted that such training would allow their businesses to expand, build good customer service, and improve managing the business working conditions and general health. Many of the vendors expressed this view, for example:

“We would be happy if we could be trained in business, such as how one can acquire loans from the bank and have access to a free water supply.” (MA17)

A vendor in Thohoyandou town expressed a similar view:

“Training and educational opportunities will allow street traders to improve their entrepreneurial abilities, enabling enhanced business growth and opportunity recognition”. (TH)

One vendor suggested that training institutions could offer this training:

“There should be training offered to us by a proper organization and workshops that can help increase the standard of the business operation.” (MU05)

Theme 3: Improved working conditions

Sub-theme 1: Reduced working hours

In all towns, street food vendors were so concerned about the working hours. Among the solutions proposed regarding working hours was reducing hours spent in their business.

One vendor also noted that: “this kind of business makes me work more hours and have little time to rest” (MU12)

Other vendors suggested, “I need to reduce my working hours to have enough time to rest.” (TH11).

Theme 4: Enforcement of rules and regulations

Sub-theme 1: Permit to operate as street food vendors.

Most street food vendors noted poor interaction between the street food vendors and government officials. They suggested that there should be improved visibility of government authorities who would assist them with the processes and procedures involved in obtaining a permit so that they could operate freely without fear of confiscating their goods. They also

proposed having a stable and principled street food vendor organization that could help coordinate and communicate between traders and government officials. They claimed that such an organization would assist in enforcing rules and regulations, such as dealing with the vendors operating without proper documentation, which increased competition in the industry. Enforcement should also include awareness of policies and by-laws affecting street food vendors. Lastly, street food vendors indicated that police visibility in their respective areas would assist in controlling the illegal traders in the area. One street food vendor expressed that:

“Government should take actions regarding street food vendors operating without documentation. Such people should be removed from the site permanently.” (MA02)

Other vendors noted, "All people should have permits to operate. People without permits (Foreign nationals) should be removed". (MA02)

Table 2: Summary of themes and sub-themes of solutions proposed by street food vendors to the operation of street food enterprises (n=55).

Themes	Sub-themes	Illustrative code
1. Availability of customers	a. A place with more customers	I want to relocate to a place where many customers are always moving around (a busy environment). (MA03)
2. Resources	b. Provision of funding Training (How to access funds)	- We would be very glad if we could be trained in business, such as acquiring loans from the bank and having access to the free water supply. (MA17) - If the government can help us by providing funds, this can help me build a proper supermarket and provide resources to grow my business. (TH15) - Training and educational opportunities will improve street traders' entrepreneurial abilities, enabling enhanced business growth and opportunity recognition. (TH10) - There should be training offered to us by a proper organisation and workshops that can help increase the standard of the business operation. (MU05)
	c. Improved shelter (storeroom/restaurant)	- It would be better for us if we could be provided with shelter. (MA06) - In Thohoyandou, some vendors suggested that: a solution could be for the government to build us a rental kitchen where we could at least pay, even if it were R50 per month. That could be better. (TH08) - Another vendor in Thohoyandou suggested that it is difficult to operate a proper place such as a building during rainy seasons, meaning if I can have a building, I would work without any limitations. (TH17)

Themes	Sub-themes	Illustrative code
	d. Provision of accessible free water	<i>I want to build a kitchen with free water (TH05) access. Another vendor in Thohoyandou indicated that Municipality could assist us by building storerooms with access to free water. (TH20)</i>
3. Improved working conditions	e. Reduced working hours	<i>This kind of business makes me work more hours and have little time to rest. (MU12)</i>
	f. Enough time to rest	<i>I need to reduce my working hours to have enough time to rest. (TH11)</i>
4. Enforcement of rules and regulations	g. Permit to operate as street food vendors	<i>All people should have permits to operate. People without permits (Foreign nationals) should be removed. (MA02)</i> <i>The government should help us by providing shelter and permitting us to secure our sites so that we can operate freely. (TH18)</i>

9.7 Discussion

Challenges

Street food vendors provide valuable services to the urban masses while living with limited resources through their enterprise and labour. However, research indicated that street food vendors are also vulnerable to the challenges of their day-to-day operations (Kirumirah & Munishi, 2021; Mramba et al., 2016; Redzwan Habib, 2016; Resnick et al., 2019; Telila, 2017). Street food vendors are neither protected by the government, labour unions, nor the law (Kirumirah & Munishi, 2021; Legodi & Kanjere, 2015; Moagi et al., 2021; Ngomane, 2020), and these observations have been noted in both low-income and middle-income countries (Nkosi & Tabit, 2014; Panwar & Garg, 2015; Sousa et al., 2019). Findings based on the in-depth interviews in the current study provide insight into the challenges of the street food vendors in the Vhembe District and the proposed solutions. This fills a gap in existing literature as most studies have reported challenges facing street food vendors in general, while this study focuses specifically on vendors selling cooked foods.

The challenges affecting the operation of the street food vendors in this study highlight poor infrastructure, risks to food safety, and security, lack of governance, long working conditions, and unfavourable weather conditions during their day-to-day operations. A South African study conducted among the art and craft street vendors noted similar challenges of poor infrastructure affecting the daily operations of the vendors (Moagi et al., 2021). While street food vendors require resources to operate, the literature indicates that these vendors are far from reaching this goal. In a study conducted in Kenya, Oloo & Nabiswa (2019) indicated that almost all (96%) surveyed street food vendors lack the infrastructure to operate their

businesses. Street vendors do not have access to storage space, shelter, water, sanitation, or electricity to enable them to stimulate local economic growth.

Similarly, in South Africa, studies (Mkhize et al., 2013; Ngomane, 2020) report that street food vendors operate in dilapidated shelters that are not maintained. Lack of proper infrastructures such as shelter, refrigeration and cold room storage facilities, and water access and availability were the main challenges affecting the street food vendors in the Vhembe District. These findings align with those from other countries (Kirumirah & Munishi, 2021; Tavonga, 2014), including South Africa, where townships remained underdeveloped (Legodi & Kanjere, 2015; Ngomane, 2020; Petersen & Charman, 2018).

However, weak township infrastructure and lack of opportunities lead to the growth of informal businesses, with street vending an essential source of income for many communities (Petersen & Charman, 2018). Kirumirah & Munishi (2021) note that because street vending acts as a sponge for the available trends of unemployment, responsible authorities need to ensure that it is fully legitimized and that financial institutions recognize vendors.

Food safety

As noted in several studies, most street food vendors experience poor hygiene (Cortese, Veiros, Feldman, & Cavalli, 2016; Kirumirah & Munishi, 2021). Street food vendors in the current study also described how the unavailability of access to clean and safe water forces them to overlook proper hygienic practices. Street food vendors reuse water to wash their utensils because water is expensive, and they travel long distances to get water, if available. Studies in other African countries also reported that food safety issues are due to the unavailability of resources such as water (Eliku, 2016; Marutha & Chelule, 2020). Water is a basic human need for everyone, but individuals still have challenges accessing water for their basic needs. In this regard, it could be that the government does not consider allocating resources to street food vendors because they are regarded as non-taxpayers and illegal. Recently, in Johannesburg, a motion to regulate this industry has made progress in formalizing the informal street traders, including street food vendors. This will therefore assist this industry and allocate resources to them.

In most low- and middle-income countries, street food vendors operate informally, and no monitoring system has been implemented (Al Mamun & Turin, 2016). In South Africa, street food vending is neither under any regulation nor any organized monitoring system. Thus, the vendors operate their businesses informally and haphazardly. Due to this informal

organization and absence of monitoring of the street food vendors, the vendors receive no formal training, which challenges their potential to improve their operation and offer better customer services. Street food vendors in the current study highlighted the need for government interaction and an organized representative to establish proper working conditions and relations among the stakeholders in street food vending.

According to the study conducted by Cortese et al. (2016) on the street food production chain, street food vendors need stainless steel working tables, refrigerators, and a clean water supply. These resources are regarded as the most important part of the street food vendors during their day-to-day operations. While in Bangladesh, most street food vendors had poor hygiene practices (Kundu et al., 2021), the current study highlighted that street food vendors were also concerned about poor waste management practices by the municipality, an indication of great concerns with the contamination that could occur because of poor waste management in their environment.

Security

A study in Cambodia indicated that street food vendors face personal safety risks in their commute to wholesale markets early in the morning due to theft and robbery. Our findings are consistent. Vendors reported the risk of violence and theft of their material, while others also noted that their business operations are suspended during community protests due to safety concerns. Moagi et al. (2021) also noted that a lack of safety due to high levels of congestion and crime affects the daily trade of informal enterprises.

Other studies noted that long working hours and poor workplaces pose health risks among female street vendors (Ko et al., 2020). A study conducted in four developing countries found that informal traders work long hours in high-intensity work, increasing their risk of experiencing poor work-related health outcomes (Tipple, 2006). One street food vendor reiterated, *“I do not rest because of long working hours to make enough profit. This is not healthy for my health, but I do not have any choice”*. Thus, the unavailability of opportunities and the nature of their work, vendors are forced to work under challenging situations to earn money and disregard their well-being. Exposure to such working conditions could impact the reproductive health of female street vendors. A study conducted in the Limpopo province in Giyani reported that some street food vendors trade for 24 hours with candlelight in places without electricity to deliver demand-driven services (Legodi & Kanjere, 2015).

Legislation

Although street vending contributes to the population's economic and social well-being, it lacks government support. In this study, street food vendors stressed the important role of government in regulating and monitoring the street food enterprise. Other studies (Jaishankar & Sujatha, 2016) reported the lack of government support for street food vendors. Street food vendors are mostly in markets, streets, and highways, and policymakers often overlook vendors in informal settlements (Oloo & Nabiswa, 2020). In countries like India, vendors sell their products in unregulated and competitive markets without observing any fixed hours for vending. Very often, vending is illegal, contrary to government regulations.

Moreover, street food vending does not depend upon formal financial institutions for its credit needs (Panwar & Garg, 2015). This finding was also observed in the current study, where vendors highlighted little or no financial assistance from the government. The government should facilitate access to funds for street food vendors as one mechanism of growing and supporting the informal sectors. Street food vendors maintain that this would enable the government to regulate the sectors through relevant municipalities. Only non-governmental organizations assist street vendors in combatting their challenges and 'voice' the problems they face to relevant authorities in the hope of getting assistance (Moagi et al., 2021).

Proposed solutions.

This study identified possible interventions to improve the day-to-day operation of the street food enterprises in the Vhembe District. Some of these suggestions may apply to other informal traders in their contexts. First, providing better infrastructure could promote a safer and healthier work environment for informal traders, including street food vendors. Essential services such as clean water, sanitation and storage facilities, proper drainage, and waste disposal systems would improve the operation of street food vendors. Studies in other parts of the world (Ceyhun Sezgin & Şanlıer, 2016) have indicated that street food vendors have been relocated from their normal working environment, disrupting their day-to-day operations. Vendors propose that the environment in which they are operating should be improved rather than that they are relocated. As noted by von Holy & Makhoane (2006), the success of street food vending in South Africa could only be ensured by food control authorities and other stakeholders such as municipalities. Similar findings were also noted by Ceyhun Sezgin & Şanlıer (2016). The absence of policies noted no legal arrangement for food safety and application or the sale of street food. Street food vendors shared the same sentiments that governmental interventions should be from different levels of authority, such as municipalities, and other entities, including academic structures that work with them.

These entities could collaborate to improve the sector, with all stakeholders clearly understanding their roles and responsibilities.

9.8 Conclusions

- The current study confirms that street food vending involves more women than men. Vendors have several individual differences, including a range of education levels. This study also noted differences in the types of challenges that affect street food vendors, even those working on the same street. Therefore, there is a need for context-specific solutions and/or interventions.
- Appropriate policies to assist street food vendors should include comprehensive and targeted support in terms of proper infrastructure, including access and availability of clean and safe water.
- Support should be provided through relevant legislation to the street food vendors to improve safety and security and by relevant mandated institutions.
- As most street food vendors struggle to access credit for business expansion, support for accessing financial institutions that offer credit or financial boosters should be offered. Access to financial institutions could facilitate partnerships for informal traders. Noteworthy, affordable (or low-cost), and blended finance is imperative.
- It is recommended that there be tailor-made training to enhance capacity building for street food vendors so that it will not take vendors away from their business sites and jeopardize their income.

Abbreviations

SFV: Street food vendor; TH: Thohoyandou Town; MU: Musina Town; MA: Makhado Town

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Authors contributions

TC and CN conceived the study. TC conducted the fieldwork, coded the interviews and notes, and drafted the manuscript. CNN, AE, and JN supervised TC's work and guided study design, data collection, analysis, and manuscript preparation. All authors read and approved the final manuscript.

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Availability of data and material

Data will be made available upon request.

Ethics approval and consent to participate.

The researchers submitted documents and obtained ethical clearance from the Faculty of Natural and Agricultural Sciences of the University of Free State (No UFS-HSD2019/0059:) and the Ethics Committees of the University of Venda (No: SHS/19/NUT03). Before data collection, the researcher obtained approval from the Vhembe District and street vendor committees to conduct the study.

The participants were fully informed of the purpose of the study before participation in the study. Furthermore, participants were given assurance of privacy, confidentiality, and anonymity regarding the information provided. Street vendors signed the consent form after explaining the study's aims and objectives.

Consent for publications

Not applicable

Competing interest

The authors declare that they have no competing interests.

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10.1 Introduction

The findings presented in this chapter follow the steps of the value chain analysis approach described in Chapter 3 and build on the definition of competitiveness in Chapter 2. The chapter integrates the answers to the primary research questions developed in the previous chapters (4-9) to develop the model and answer the main research question. For clarity, the primary and secondary research questions in Chapter 1 are restated here.

Primary research question:

How will a model of the value chain of street food vendors in the Vhembe District based on the Porter Diamond Model contribute to the performance of the enterprise?

The secondary research questions are:

1. How may the street food enterprise be described using the value chain approach?
2. How do the attributes of Porter's Diamond Model affect the enterprises of street food vendors?
3. What recommendations would contribute to the value of the street food vendors based on the attributes of Porter's Diamond Model?

Table 1 maps the six objectives of the study onto the thesis chapters for model development. The findings related to these objectives inform the primary research aim of developing an agricultural food enterprise model in the rural towns of Limpopo's Vhembe District. The first four of the study objectives contribute to the analysis of the value chain aspects of the model, while the fifth and sixth objectives contribute to the aspects of the model related to Porter's Diamond Model.

Table 1 Research Objectives and related chapter contribution to the thesis

Research objective		How the thesis addresses the objective	Contribution to model development
1.	To determine the Socioeconomic characteristics of street food enterprises	Chapter 4: Socioeconomic characteristic of street food vending enterprises in the Vhembe District, Limpopo province, published article, in Technium Social Sciences Journal Vol. 29, 419-437, March 2022 ISSN: 2668-7798	Value chain
2.	To characterise the operations of the women's street food enterprise in the Vhembe District, focusing on business profile, sold foods, inputs, pricing, record-keeping practices and total running cost.	Chapter 5: Operational Characteristics of Women Street Food Vendors in Rural South Africa, published article , in Front. Public Health 10:849059. doi: 10.3389/fpubh.2022.849059	Inputs (purchasing) of Value Chain
3.	To investigate the street foods and their contribution to the daily intakes of the adult population in the Vhembe District.	Chapter 6: unpublished article , Dietary diversity, and macronutrient content of prepared street food sold in the Vhembe District, Limpopo province, South Africa	Consumption stage of the Value Chain
4.	To analyse the value chain of foods sold by the street food vendors in the Vhembe District town of the Limpopo province.	Chapter 7: unpublished article , Value Chain Analysis of The Street Food Enterprises In The Rural Towns of Vhembe District, Limpopo Province	Value chain
5.	The study investigated street food vendors' perception of socio-economic attributes as determinants of their competitiveness in the Vhembe District of Limpopo Province, South Africa.	Chapter 8: unpublished article , Perceptions of Women Street Food Vendors on The Determinants of Competitiveness Of The Street Food Enterprise In The Rural Towns of Vhembe District, Limpopo Province	Porter's Diamond Model
6.	To conduct a qualitative study to investigate the perceived challenges and proposed solutions by the street food vendors across two secondary cities and border towns in South Africa.	Chapter 9: unpublished article , Perceived challenges, and proposed solutions by the street food vendors across three secondary cities and border towns in South Africa.	Porter's Diamond Model

10.2 Value chain analysis of the street food enterprises

The study's main research question was addressed using a six-step value chain analysis process (Kaplinsky et al., 2002) to explain the activities of street food enterprises. As outlined in Chapter 3, the study described and analysed the value chain as follows: first, the street food enterprise and products; second, the marketing channels or value chain activities; third, the actors and role players along the value chain; fourth, enablers of the street food enterprises; and the profit margin share based on the most frequently prepared meals.

The value chain analysis steps are discussed in the following sections.

10.2.1 Description of the street food enterprise (Step 1)

The first step of a value chain analysis is to describe and define the product. Chapters four and five are dedicated to this step, addressing Objectives 1 and 2 of the study, respectively.

First, we determined the socio-economic characteristics of street food vendors, thereby addressing the study's first objective. We presented our quantitative study of the 511 street food vendors selling cooked foods in the rural towns of the Vhembe District as Chapter four of the thesis. This chapter was published as an article in *Technium Social Science Journal* under the title: "Socio-economic characteristics of street food vending enterprises in the Vhembe District, Limpopo province." thus addressed the first objective of the study. Second, we characterised the operations of the 511 street food enterprises in the Vhembe District by focusing on their business profiles, sold foods, inputs, pricing, record-keeping practices, and total running costs as the second part of Step 1 of the value chain analysis. By doing so, we addressed the second objective of the study. We presented our analysis as Chapter 5 of the thesis. This chapter was published as an article in *Front. Public Health*, under the title: "Operations of the street food enterprises district, focusing on business profile, sold foods, inputs, pricing, record-keeping practices, and total running cost in the Vhembe District towns".

10.2.1.1 Socio-economic characteristics of street food vendors

Almost two-thirds (64%) of the street food vendors participating in our study were women younger than 45. About half of our participants had never been married, single, or widowed. These demographics are consistent with the statistics of the formally employed South Africa (Hill, Mchiza, et al., 2019a; Maele et al., 2015; Tawodzera & Crush, 2019). However, in our study, we found that most vendors were women who participated actively in the street food sector because of rising unemployment (Statistics South Africa, 2021) and economic

stagnation. According to BusinessTech (2016), informal businesses in South Africa are predominantly run by black Africans, persons aged 35-44, and those with lower levels of education, not dissimilar to our findings. At the global level, however, most people in informal employment are aged between 15-24 years (Bonnet & Vanek, 2019).

The International Labour Organization (2018) has estimated that more than 60% of employed men and women earn their livelihoods in the global informal economy. Our finding of the dominance of women in the street vending enterprise of cooked food could be because women are more often involved in cooking meals. Other studies cite the reasons for women's dominance in the enterprise in South Africa as dependence and social relief, lack of employable skills, and insufficient work experience (Resnick et al., 2019; StatsSA, 2020; Tavonga, 2014). These reasons are consistent with the findings of studies in other African countries (Dodson et al., 2012; Osei Mensah et al., 2018; Roever & Skinner, 2016; Tavonga, 2014) where street food vending, although illegal, helps to reduce unemployment. Studies in other parts of the continent have reported similarly (Edeme & Nkalu, 2018; Nyoni & Bonga, 2019a; Resnick et al., 2019). Moreover, in Sub-Saharan Africa and in East and Southeast Asia, more women than men are engaged in own-account employment, with 60% of women engaged in informal employment in Sub-Saharan Africa (Vanek et al., 2014).

Unlike in studies of street food vendors in other African countries (Nyoni & Bonga, 2019; Okojie & Isah, 2014; Osei Mensah et al., 2018), we found very few street vendors (4%) had no schooling. Most of our vendors had attained some high school education (79%), and 6% had a tertiary qualification. To some extent, our findings may be due to sampling bias as we included only those vendors with knowledge of the business. Nevertheless, our participants' relatively high education levels highlight employment opportunities in the street vending for literate and highly educated individuals who cannot find employment in the formal sector. Although other studies in South Africa have noted low level of education informal street trading (Chauke et al., 2015; Garg & Phaahla, 2018; Hill et al., 2016; Legodi & Kanjere, 2015; Mathaulula et al., 2016; Nkosi, 2020; Tawodzera, 2019). The current statistics show that most street food vendors are educated, with most achieving secondary or post-secondary qualifications (Statistics South Africa, 2020), as observed in the current study.

The current statistic in South Africa shows that most street food vendors are educated, with most achieving secondary or post-secondary/tertiary qualifications (Statistics South Africa, 2020). These findings were similar to other studies conducted in the country, highlighting that vendors who engage in informal enterprises have more years of schooling, with most having achieved secondary education or post-secondary/tertiary qualification (Prinsloo, 2019). The Vhembe District reported a decrease of 1.8% in people without schooling

(Statistics South Africa, 2021). At the same time, vendors in this study had more years of schooling. Other studies in part of African countries (Skinner, 2019) also noted similar findings.

Moreover, BusinessTech (2016) indicated income as the driver of initiating an informal business, with almost 70% of people who start an informal business doing so because they were unemployed with no alternative source of income. Similarly, Nkrumah-Abebrese and Schachtebeck (2017) indicated that factors driving street trading to establish the enterprise in Tshwane included unemployment and poverty, migration and urbanisation, survivalist entrepreneurship, and entrepreneurial intentions. Poverty and lack of employment opportunities are the main factors for initiating street food enterprises in other African countries. Street vendors in the current study contributed approximately R6,000-R10,000 per month to the household's average monthly income. Other studies (Perez & Khayat, 2020; Tawodzera & Crush, 2019) have highlighted the street food enterprise's vital contribution to the household's livelihood, with street food vending profits contributing between a third to a third half of the household income. Thus, vendors were primarily motivated to establish their street food enterprises to earn additional income for survival and family support in an environment with few opportunities in formal sectors. Chapter 5 highlighted the importance of education for the design of appropriate training interventions. It was noted that if street food vendors could receive training in business establishments, their business skills could improve while promoting food safety and the consumption of nutritious foods.

10.2.2 Operations of the street food enterprise

We found that most vendors (86%) were owners. They were relatively well-established, with 70% having spent one to ten years in the business. A study by Nkrumah-Abebrese and Schachtebeck (2017) also indicated that street vendors with no experience have been in street trading for more than ten years in South Africa. Moreover, a global study indicated that most people working in informal employment are self-employed (Bonnet & Vanek, 2019; Muzaffar et al., 2009) and stay in their street vending enterprise for at least ten years.

Although most vendors have been in the business for some time, they are not covered by any labor laws and regulations. Notably, the vendors had no means of financial assistance. Most established their enterprises from savings (Husain et al., 2015; Tawodzera, 2019). Only 1% of the vendors in our study had access to financial assistance from a bank. Despite these challenges, street food contributed to their livelihoods, proving that street food vending could employ at least one person, thus reducing unemployment in the country. In Zimbabwe, studies (Nyoni & Bonga, 2019b; Tavonga, 2014) have noted the contributions of street food

vending enterprises to livelihood and family support. Similar findings have been observed in other African countries (Edeme & Nkalu, 2018; Resnick et al., 2019), including South Africa (Mathaulula et al., 2015).

The street food vendors in our study worked longer hours than recommended by the Basic Employment Conditions Act of 1997. The Act states that employees who work more than five days a week should work eight hours per day (South African Department of Labour, 1997). Significant differences were observed between operational working hours and citizenship, where foreign nationals worked fewer hours than South Africans. However, our street food vendors worked longer hours and more days than legislated. Similarly, street food vendors in Cape Town were found to work long hours (Hill, Mchiza et al., 2019a; Hill, Mchiza, et al., 2019a; Mchiza et al., 2014). Although business hours tend to vary per enterprise, meal types are prepared and served because enterprise locations are influenced primarily by the specific days of the week, and it was not the case in the current study, as the same foods were sold (Petersen et al., 2018). Furthermore, males worked longer hours on weekdays and weekends, especially Sundays, which could be attributed.

The primary inputs purchased in our study included food items such as mielie pap (stiff porridge) served with beef or chicken, sometimes with vegetables. Plate prices were R40.00 (2.6 USD) for a full plate and R30.00 (2 USD) for half a plate. The typical street food consumers were government officials, middlemen, and schoolchildren. In a national study in South Africa (Steyn & Labadarios, 2011), 11% of South Africans were found to consume street foods, with most customers being Black South Africans. A study of consumption patterns of street food in Cape Town found that most consumers were black, male, single, and had either some high school education or at least matriculation (Hill et al., 2016). This was also the case in our study. Furthermore, the vendors reported consumers of all ages. Studies in other African countries have found that most consumers are men, often because of their type of work (Sseguya et al., 2020).

Very few vendors in our study showed good record-keeping practices, with only 15% indicating they had a place to keep business information and safe documents. Records that were kept mainly were of sales (59%). The results thus highlighted poor managerial skills as street food vendors could not keep business records. Our findings and other studies highlight a need for capital and management for small businesses and food training for rural street food vendors. Therefore, government officials, policymakers, and NGOs could target street vendors to offer training and microfinance to improve their business skills while promoting food safety and the consumption of nutritious foods.

10.2.3 Actors or players along the value chain (Step 2)

Chapter 4 of the thesis reported the percentage of street food participants (Table 9). In chapter 9, these role players were classified accordingly. The study noted that the value chain of street food enterprises in the Vhembe District is simple and undeveloped, with little infrastructure. The players or actors identified in the value chain include inputs suppliers (smallholder farmers, traders/retailers, street vendors/hawkers), institutions (local government, financial institutions, local organisations), and consumers. It was noted that role players have no interaction or support given to the street food vendors. We showed that while the street food enterprise is informal, selling cooked foods in rural towns relies heavily on inputs from formal sector enterprises such as agricultural producers, wholesalers, and retailers.

10.2.3.1 Inputs suppliers

Suitable suppliers of inputs are crucial for sustainable production, environmental concerns, and quality assurance (DAFF, 2012). Moreover, in other developing countries, there is a dualistic relationship between the formal and informal food sectors in exchange for input supplies (Bouafou et al., 2021). In the current study, street food vendors had a direct relationship with supermarkets because food cooked by street foods is locally available food accessible. Thus, indicating guaranteed and increasing demand for street food in the Limpopo Province. Food vendors were close to the inputs' suppliers and walked to them without any transportation fee, even though some had to travel short distances to purchase their inputs. Tawodzera and Crush (2019) found that location informed purchase, followed by price and quality. However, Senyolo et al. (2018) indicated that some informal traders in the Limpopo province had established relations with some supermarkets (such as SPAR, Boxer, Pick and Pay, OBC, and Shoprite) selling cooked food mainly by street food vendors, including green leafy vegetables.

Similarly, other studies in South Africa have found that most street food vendors purchase staples in bulk from supermarkets and rely on the informal food economy for other foodstuffs (Skinner, Caroline & Haysom, 2016). Moreover, Tawodzera and Crush (2019) noted that 22% of households rely on the agricultural production of their products. Contrary to the current study, few street food vendors used their produce for vending and instead relied on others for their enterprises.

In our study, the informal traders supplied green leafy vegetables and live chickens at a reasonable price. In the Limpopo province, there are no studies on the value chain of food sold by street food vendors. However, a study by Senyolo et al. (2018) on the value chain of

African leafy vegetables indicated that food sold on the street for home consumption is sold fresh in the markets without any value-added cost. Hence most of the street food vendors in the study preferred to purchase the input from informal traders for a better profit margin.

10.2.3.2 Institution

The current study highlighted a relationship between the suppliers of formal and informal inputs. Nguyen. (2020) stated that the availability of various stakeholders in a value chain, such as middlemen and traders, adds value to the value chain of a product. However, street food vendors were the primary buyer of inputs from these different suppliers. The formal and informal street food input suppliers could establish a relationship that would benefit the street food enterprise by stabilising input prices (Senyolo et al., 2018). This would contribute to the distribution of the product geographically. There are also opportunities for institutions to contribute to street food vending in the Vhembe District.

Food vendors also introduced innovations that improved the food supply in the urban area. Given opportunities for financial assistance, street food vendors have the potential to innovate and improve the daily operations of their enterprises (Haleegoah et al., 2020). Our street food vendors were limited as they did not have financial support from banks, the government, and other recognised institutions. Few vendors indicated financial assistance from banks and loan sharks, and many mentioned their financial challenges. In Chapter 4, we reported that street food vendors had no access to credit. Interestingly, unlike in formal retail trading, vendors have agreements with those selling vegetables whereby they take input on credit to pay after the sale.

The inability to sustain relationships or associations has been identified as a challenge to food vending (Haleegoah et al., 2020). Our study corroborates this challenge. This has prompted the establishment of innovation platforms in the street food enterprise for which studies and other training could be carried out. Table 4 in Chapter 4 reports the roles and functions of the available affiliated associations. However, in-depth interviews explored why street food vendors have not been affiliated or part of the street food association. Among the reasons identified, some street food vendors were unaware of any association (7%). Studies have shown that only a few vendors were known to be part of an association (Haleegoah et al., 2020; Osei-Mensah et al., 2016). Moreover, Wills (2009) states that the absence of organisational goals could be the main reason these associations do not thrive among food vendors. As a first step towards recognition, street food vendors should organise themselves into associations to develop a code of practice for their businesses or constitute a forum for interaction with the relevant authorities.

10.2.3.3 Consumers

Most consumers are 26-35 years old, single males away from home. Other essential consumers include children, students, and office workers (Poojara, 2021). Charman *et al.* (2017) also noted that street vendors serve immediate resident consumer demands, primarily for essential fast food. Like the current study, the main customers of street food enterprises were travelers to rural towns searching for work and school children during their lunch breaks. Their study also noted that street food vendors generated demand for services in the formal public and private sectors, including transportation and formal shops, as reported by Roever and Skinner (2016). In Cape Town, most street food consumers are single black males with a high-school education and consume street food daily (38%) or 2-3 times a week (43%) (Hill *et al.*, 2016).

10.2.4 Marketing channels of the street food enterprise: (Step 3)

Chapter 9 outlined the main stages of street food vending activities. Our study identified five main stages of the street food vending enterprise: purchasing, transportation, storage, processing or pre-preparation, and consumption. As highlighted earlier, one of the critical functions during purchasing was providing supplier input to the vendors. In our study, various actors were identified as inputs suppliers, with supermarkets, farmers, butcheries, and hawker's dominant among the identified inputs suppliers. Thus, for food to reach the desired destination, vendors either walk or use transport to carry their input to the stalls or homes. The second important function noted was processing, where street food vendors were the actors in the chain activities involved in processing foods either at home or at the stall. Consumption was the last stage, where products were sold to consumers. More details of the four stages of street food value activities are discussed in Chapters 4-9. These channels were similar to those observed by Cortese *et al.* (2016), describing street food value chain stages as comprising chain actors that transact a product as it moves through the value chain. Their value chain mapping shows the actors at the various stages of input supply of food items used in the enterprise, including purchasing and transportation, where various modes are used to transport food to and from input suppliers.

10.2.4.1 Purchasing

The study highlighted that the main ingredient purchased were meat and maize meal porridge were purchased from retail shops. Raw and processed ingredients include vegetables (cabbage, carrots, and tomatoes) and staples. Suppliers of maize meal flour and beef meat were usually supermarkets, while informal traders were the main chicken suppliers. All vendors purchased maize meal porridge from retail shops. On average, meat costs from retail suppliers or supermarkets range from R188.00 to R279.00.

10.2.4.2 Transportation

In this study, only 9% of the vendors used transportation from inputs suppliers to stall or place of sale, indicating that most vendors walk to their stalls or place of sale.

10.2.4.3 Storage

Very few vendors had safe storage facilities near their selling places. Most transported their inputs and material from home or rented a place near their stall. Little or no refrigeration access increased their food's safety risks and endangered their customers. Our main concern regarding food storage is the potential for contamination and food poisoning among consumers buying food from street vendors. In the current study, the value chain activities highlighted that street food vendors prepare food long before it can be sold to customers. A study by Poojara (2021) noted the increase in contamination related to storage temperature when street food is prepared long before its consumption. Thus, street food preparation and vending conditions raise many concerns for consumer health (Muyanja et al., 2011b; von Holy & Makhoane, 2006). Studies conducted in South Africa (Kubheka et al., 2001; Mosupye & Von Holy, 2000) also observed that the food served by mobile street food vendors was prepared far in advance of serving and was stored under unfavourable conditions with no temperature controls to prevent microbial growth.

As noted in Chapter 9, the street food vendors in our study proposed that they be trained on the stages of the value chain identified in this study. Similarly, Khuluse & Deen (2020), in KwaZulu Natal, indicated that inadequate storage facilities resulted in stock overflowing to countertops and floors, while prepared food was exposed to dust and flying insects as vending structures were in the open air. Few vendors have vending or managerial skills, including proper food handling practices. Again, training focused on food safety could help vendors build the knowledge and skills to enhance food safety, with particular emphasis on preventing food contamination during preparation, packaging, transport, storage, display, and sale to consumption (Musembi Muendo et al., 2022). Training food vendors is the most effective way to increase food safety knowledge and enhance food-handling practices (Addo-Tham et al., 2020).

10.2.4.4 Processing: Pre-preparation

Chapters four and nine states that only 7% of the vendors transport their cooked food to be sold at the stall, while most of the vendors' enterprise activities are done at the stall. Thus, the processing stage of the street vendors can be regarded as a threat to food safety because food is transported from various places without proper storage. Furthermore, only a few street food vendors in the study could access proper storage facilities such as refrigerators close to their selling place. The current study confirms that street food vendors

still do not practice proper food handling due to the unavailability of infrastructure (Khuluse & Deen, 2020; Redzwan Habib, 2016; Skinner, 2016b).

10.2.4.5 Consumption

Chapters 4 and 5 reported on the foods sold mainly by street vendors. Table 6 in Chapter 5 reported on the target market of the street food vendors. Although customers are from all walks of life and various groups worldwide (Martins, 2006; Sousa et al., 2022; Thatchinamoorthy and Meenambigai, 2018), street food is purchased by working-class people who use public transport to commute. Consumers described in international studies were not different from the typical single black male consumers with high school education or matriculation in the Cape Town study (Hill et al., 2016) and from consumers in Mexico who travelled long distances or did not have time to prepare their meal and relied on street food (Rosales Chavez et al., 2021).

In Chapter 4 (Table 8), we highlighted the types of foods cooked and sold by the street food vendors in the Vhembe District. The foods included home-cooked meals with maize meal porridge as the main starchy staple. Significantly few vendors included a variety of vegetables or did not serve vegetables as part of the meal, while those who did, included gravy or chakalaka as a replacement for vegetables. The current study findings were like those conducted in other developing countries (Adeosun et al., 2022; Alimi, 2016; Okojie & Isah, 2014). Adeosun et al. (2022) found that street food vendors sold traditional, processed, and unprocessed foods. However, our vendors sold mostly traditional common foods than processed ones.

The foods sold in our study were no different in nutritional value from that of foods sold in other developing countries (Alimi, 2016; Okojie and Isah, 2014). However, the type of food in our study differed from other studies. For example, while we focused on cooked food, the street food sold in Burkina Faso comprised cereals (49%) with less meat (34%) than in our study (Imathlu, 2017). Other differences included the diversity of foods sold depending on the location, with most foods based on a combination of starch staples. In a study by Sousa et al. (2022), street food purchases comprised a diverse set of local and westernised foods and beverages. However, this varied by day and city location.

10.2.4.6 Nutritional contribution of street foods

We present our analysis of the nutritional contribution of the cooked food of our vendors in Chapter six in the form of an unpublished manuscript prepared following the BioMed Central (BMC) public health guidelines, under the title: “Dietary diversity and macronutrient content of prepared street food sold in the Vhembe District, Limpopo province, South Africa”. Our

analysis addressed Objective 3 of the study on examining the dietary diversity and macronutrients of street foods and their contributions to the daily intake of the adult population in the Vhembe District. We sampled 511 food vendors during a transect walk-through and gathered nutrition data using a questionnaire to capture the types and quantity of food sold. We assessed menu settings/stockings, food diversity, food group diversity, and the degree of dietary diversity using a food-type logbook. Furthermore, we compared the macronutrient composition of six different mostly sold plate combinations using food composition tables for the nutrient analysis. We used the nonparametric Wilcoxon signed-rank test to compare the macronutrients of the six dishes, with statistical significance set at the 5% level.

We detailed the findings of our analysis in Chapter 6. All our street food vendors sold starchy staples as the most common food group. These foods were high in energy from carbohydrate sources such as large amounts of maize meal porridge. Meat, fish, and other fruits and vegetables, such as onion, tomatoes, and cabbage, followed. Most vendors served foods high in fat. Overall, street food vendors in the study sold a total of 17 types of common street foods. As most of the street food consumers identified in our study were adults, we used the Minimum Dietary Diversity for Women of reproductive age (MDD-W) indicator and guidelines (FAO and FHI 360 2016) to assess the diversity of the food groups provided by our vendors. We categorised diversity based on counts of 0 to 4 food groups versus at least 5 out of 10. Most (70%) street food vendors prepared foods with fewer than the recommended five food groups (Fisher, 2021). Thus, the diversity of the food groups of our vendors was low and primarily based on a combination of starch staples. Usually, street food consumers had few choices, with variations in foods sold in different locations.

The typical South African diet comprises mainly bread and cereals with low diversity. The majority of South African spend most of their money buying meals that are mainly starch-based, from maize meal (11.4%), brown bread (8.4%), and rice (5.1%). Thus, the grain value chains represent a large share of the food expenditure of the poor, including production, storage, handling (and imports), milling, and baking. Poor and non-poor households spend similar amounts on bread and cereals (Kroll, 2016). Studies on foods sold in the street, especially in Durban (Mkhize et al., 2013), Johannesburg (Martins, 2006), and Cape Town (Hill, Mchiza et al., 2019; Mchiza et al., 2014), have unfavorable content and are high in calorie value.

Cereal and meat sold in the street contribute 13-50% of South African adults' daily energy intake and around half of their daily protein intake (Steyn et al., 2016). The increasing consumption of ready-to-eat foods is attributed to their significant role in food security and

nutrition for millions of practitioners along the food chain (Imathiu, 2017; Steyn et al., 2011). Street foods sold in South African towns are cheap and play a vital role in meeting daily food demands for township residents (Petersen et al., 2018). In Lesotho, Gadaga et al. (2014) reported that the most provisioned food was pap [thick maize meal porridge], boiled vegetables (*moroho*), roasted chicken, pork or beef, and beef stew. The vendors operated from makeshift structures and had no running water.

This paper concludes that consumers who regularly buy from the Vhembe District Street food vendors might achieve medium dietary diversity. However, the low dietary supply of micronutrients from street food choices is a concern as this could increase the micronutrient deficiencies already observed amongst the adult population in the area. Specific interventions must be implemented to improve street food's nutritional value. For example, introducing fortified products such as maize meal, flour and oil could supplement low micronutrient content. Including more vegetables and fruits is another suggestion for improving the micronutrient intake and the dietary diversity of the population.

10.2.5 Mapping the value chain (Step 4)

Figure 4 of Chapter 7 maps the information flow of the activities of the value chain. The value chain activities of street food vendors start from purchasing and progress through transportation, storage, processing, and consumption. Other studies (Jaligot et al., 2016; Nguyen Thi Thuy et al., 2020) have highlighted a complex value chain enmeshed with socioeconomic, cultural, and eco-systemic drivers in a complex set of local and non-local feedback loops. By contrast, the street food value chain in the Vhembe District is undeveloped and straightforward, with no infrastructure. The main actors involved in the value activities of the street food enterprise were inputs suppliers, formal and informal traders, transporters, local authorities, and customers. The profit margin calculation showed that street food vendors who purchased inputs from informal vendors without any added expense could profit more than formal traders. The institutional actors need to network with the primary actors to operate with a collective profit motive. These stages are, therefore, detailed and linked with the findings of the previous chapter as per the value chain analysis.

10.2.6 Analysing market margin share (Step 5)

In Chapter 7 (Table 7), the profit margin share of two plates of chicken and meat was used to compute the cost of production to determine the profit by street food vendors. Estimates of the vendors' profit margins and their inputs suppliers we provided. A typical plate sold by street food vendors consists of meat, pap, and stew (tomato/onion), served with either cabbage or *Mutshaeni*. As shown in Table 7, we used this study's two most cooked types of meat to determine the profit margins for daily chicken and beef plate production from

supermarkets and informal traders. A study in Mpumalanga also noted that street food vendors selling fruits and vegetables getting inputs from local suppliers make more profit (Tshikhudo & Manenzhe, 2021) is a highlight that while street food enterprise is profitable, it will boost the economic status of the local area and south Africa at large. At the same time, the street food enterprise will assist in poverty reduction and employ local individuals in the study location. The challenges highlighted in chapter 9 should be addressed to maintain street vendors' profitability. Moreover, vendors have proposed solutions on how profitability could be maintained. Among the other strategies that could be used to maintain profitability is the improved network between actors along the value chain to synergistically operate with a collective profit motive (Sugri et al., 2017).

10.3 Evaluation of street enterprise using Porter's Diamond Model of Competitiveness

The second RQ of the study was: How do the attributes of Porter's Diamond Model affect the enterprise of Street food vendors? This question corresponded to the fifth objective of our study. We answered this research question and addressed the fifth objective of the study jointly by conducting a cross-sectional survey of the 511 street food vendors using Porter's Diamond Model as a framework. We used the survey to measure the vendors' perceptions of socio-economic attributes as determinants of their competitive performance in the Vhembe District using the factor conditions, components, and sub-components of the Porter Diamond Model. We have presented our study and findings in Chapter seven of the thesis, as well as in the form of a manuscript for future publication, titled: "Women Street Food Vendors' Perceptions of the Determinants of Competitiveness of the Street Food Enterprise in the Rural Towns of Vhembe District, Limpopo Province."

10.2.2 Porter's Factor Conditions of Competitiveness

According to Porter (1990), competitiveness lies in broad attributes or criteria that shape a firm's or industry's competitive environment. These attributes provide the underlying platform, or factor conditions, for determining competitiveness. In his early work, Porter (1990a) recommended the following four attributes or conditions as the main determinants of competitiveness: Production factor condition, Demand condition, Related and supporting industries, and Firm structure and rivalry. He later added the factor conditions of the role of Government and Chance. However, as reported in Chapter 8, the street food vendors in the study had a different view of the determinants of their enterprise competitiveness.

As detailed in Chapter 8, each factor condition of Porter's Diamond model comprises various components. For example, the Production factor condition comprises seven components:

Cost of production, Water, Infrastructure, and Capital. The components of the Chance factor condition include Crime, Price stability, Economic stability, and Political stability (Table 4). These components, in their turn, may comprise sub-components. For example, the Cost of production component of the Production factor comprises the sub-components of labor costs and input costs, and the Water component comprises both the insufficiency of water and its cost. Our respondents provided their competitiveness ratings at this acceptable level of detail based on a 5-point Likert-type scale. Thus, while the highly aggregated means at the factor condition level provide an excellent overall picture of the perceptions of competitiveness, the ratings at the component and sub-component level provide valuable diagnostic insight. We have incorporated this level of granularity in our discussion of the ratings of the vendors in our study. Overall, the vendors perceived the production factor condition as the main factor inhibiting enterprise competitiveness, followed by Chance, Government role, and Related and supporting industries. Demand condition and Firm, structure and rivalry were ranked the lowest as determinants of enterprise competitiveness.

Production factor condition: The highly rated Production factor condition was largely influenced by the vendors' ratings of four of its seven components: Water, Capital, Cost of production, and the lack of Knowledge of production, all of which were rated as strong determinants of competitiveness. The street food vendors perceived these four components of the Production factor conditions as constraining their enterprise's competitiveness. Porter (1990b) considers factors such as skilled labor, capital, and infrastructure as specialised vital factors which lead to a competitive advantage. Furthermore, he sees these factors as created, not inherited, implying that much work must be done for an entity to be productive.

In our earlier sections, we reported that street food vendors have little or no access to resources such as water and financial assistance, and vendors operate without training. Street vendors lack training, entrepreneurial business skills and other skills, and industry information, and some vendors engage in self-training or obtain informal training from unreliable sources (Birgen et al., 2020; Nkrumah-Abebrese & Schachtebeck, 2017). As indicated in studies of small-scale farms in the Limpopo province (Nesamvuni et al., 2017; Senyolo et al., 2018), production factor conditions give industries a competitive advantage, and enterprises are threatened when these conditions are lacking (Chauke et al., 2015; Tavonga, 2014; Tawodzera & Crush, 2019; Tawodzera, 2019; WIEGO, 2020).

Water is a primary resource and an essential component of production. Studies of street food vendors have highlighted the unavailability of water as a significant challenge for food production and hygiene (Eliku, 2016; Muzaffar et al., 2009; Reddy et al., 2020). Although the vendors in our study cited water unavailability as a threat to their competitiveness, they

perceived the cost of water as an even greater challenge. Specifically, they rated the cost of water as the greatest threat to their enterprise competitiveness relative to all the other sub-components, components, and factor conditions of the Porter model. Its unavailability drives the costs of water.

Our vendors rated the cost of capital and finance as their second greatest challenge to competitiveness, again perceiving cost as more serious than unavailability. Only 1% of the 511 participants indicated they could access bank loans for financial assistance, and most vendors established their enterprises from savings. Inaccessible finance further complicates their tough conditions. Unsurprisingly, they also voiced concerns about cost and profitability in the qualitative part of the study. The absence of sponsorship and funding for individuals in the informal economy has created an opportunity cost of lost business and precludes individuals from purchasing products in bulk, thereby driving up product costs due to small quantity purchases (Nkrumah-Abebrese & Schachtebeck, 2017; Zogli et al., 2021). Our vendors described a constant struggle to cope with the economic pressures of rising food costs and tightening profit margins. Many also cited the difficulty of balancing increases in menu prices and keeping their customers satisfied. One street food vendor commented:

"Higher prices of buying water and foods were occasioned by the increases in the cost of production further aggravated by the increases of petrol price and economic instability that forces us to increase the prices of our plate and our customers always complain as we increase the price of the plate". (TH20)

Other studies in South Africa present similar findings. Zogli et al. (2021) reported on the production and resourcing challenges of street food vendors in Durban who lacked the funding to expand their businesses. Similarly, Nkrumah-Abebrese & Schachtebeck (2017) reported on the survival challenges, low incomes, and poor working conditions of street food vendors in Gauteng province. Tawodzera & Crush (2019) have suggested providing incentives and support to grow the individual enterprise, including introducing tailor-made micro-lending products to these small enterprises.

Chance factor condition: The components of the Chance factor condition presented as a significant determinant of street food vending competitiveness. Our vendors noted four main issues of chance influencing enterprise success along the value chain: Crime, Price stability, Political stability, and Oil and fuel as constraints. Chance factors are considered unavoidable issues (Mbatha & Mastamet-Mason, 2015; Skinner et al., 2016). Upgrading the industries and diversification of economic activity sometimes led to market failure. In this case, government support is needed to overcome issues beyond their control. However,

government support is lacking, as in the case of street food vendors and informal trading in South Africa.

Crime: The qualitative findings (Chapter 9) highlighted that street food vendors are concerned about the rate of crime in the area. One vendor in Musina reported that:

“Crime is remarkably high in our area. At times, we put our equipment’s in places that are not safe and when you come to work the following day you find that there is nothing and are stolen.” (MU11). Like many other studies in South Africa (Bureau for Economic Research, 2016; Moagi et al., 2021; Tshikhudo & Manenzhe, 2021) and elsewhere (Osei-Mensah et al., 2016; Resnick et al., 2019) street vendors are victims of crime. Moagi et al. (2021) in Soweto noted that security is an issue due to congestion in the area where street vendors operate.

Price stability. Inflation and the rising prices of inputs make it difficult for street food vendors to purchase the inputs they require to produce quality and adequate food for customers. With low-profit margins, increasing costs, and no financial support, they need to transport their inputs from inputs suppliers and pay for taxi fares, increasing their expenditure. (Chapter 4).

Economic stability- Economic stability allows people to access resources essential to life, including financial resources, quality housing and food, and jobs that provide a stable living wage. With the little profit they made from their businesses, the street food vendors spoke of supporting their families to be economically stable (Mafunzwaini, 2013; Mathaulula et al., 2015). However, economic instability is unpredictable and beyond their control, as in the SARS-CoV-2 pandemic.

Role of Government factor: Vendors noted poor interaction and lack of support from local and national governments along the street food value chain. They expressed similar grievances in the qualitative part of our study on Porter’s Diamond Model of Competitiveness (Chapter 9). Based on Porter’s model, our findings suggest that government could influence the country-specific determinants of competitiveness through actions such as subsidies, education, policy changes to capital market regulation, the establishment of local product standards and regulations of purchasing, goods and service tax law, and antitrust law. However, vendors generally find it challenging to understand municipal by-laws governing street trading time (Nkrumah-Abebrese & Schachtebeck, 2017). The vendors in our study were concerned about the lack of support from the police and environmental officials. Some commented that officials were not around during their business operations. An example of their concerns was that:

“Ever since I started this business, I have never seen any government official assisting street food vendors. We want to see them and assist with permits. I do not know where to get those permits.” (MU09)

In addition, vendors reported that there is no support from the government. The lack of financial support may be because most street food vendors operating in the Vhembe District are regarded as informal and not registered for either business or individual income tax. This exacerbates the problem of access to funding from private funding institutions such as banks, as street food vendors do not have formal registration or certification of their businesses and lack resources to use as collateral. Furthermore, increasing the prices of resources such as petrol has a severe impact on the street food vendors, as expressed by a vendor in Thohoyandou town:

“Water and food increases affect my operation and the profit I make daily because the government is not supporting us. When input prices increase, we do not get any subsidies and end up not making enough profit. Nevertheless, I continued working in this difficult situation because I love my work.” (TH12).

Significantly, the vendors in our study rated the poor support of the government as the most challenging of the 32 factors of Porter’s Diamond Model. Thus, the government’s improved interaction and support of street food vendors could be regarded as the most important aspects of the enterprise’s competitiveness. Porter (1990b) indicates that Government as a significant force is consistently effective in competition and intervention in different political, social, and economic rules and practices and even harms competitiveness. Additional policy instruments, such as improved access to markets and provision of credit facilities, are required for those who make their living through the informal sector (Juta & Olutade, 2021).

Related and supporting industries: This factor condition was ranked fourth in the overall ratings of Porter’s six-factor conditions. Within this category, Inputs suppliers were the most highly rated components. In chapter seven of the value chain, street food vendors highlighted purchasing their inputs from formal and informal inputs suppliers such as supermarkets and informal street food vendors. While street food vendors purchase their inputs primarily from formal businesses, others purchase their goods from other informal businesses (Nkrumah-Abebrese & Schachtebeck, 2017). Tawodzera & Crush (2019) indicated that street food vendors’ primary sources of their inputs derive mainly from wholesalers and other formal markets.

We have reported that street food vendors are primarily located where they can access inputs, even though very few use transportation to access their input suppliers. In this case, street food vendors do not spend much of their profit on transportation. This has been shown as a positive attribute for street food vendors. Interestingly the forms of many food items traded by street food vendors and their sources are the same as those of the formal market in South Africa (Petersen et al., 2018). Other formal food service inputs, such as green leafy vegetables, are sourced from street food vendors, where the informal vendors also buy their input supplies (Senyolo et al., 2018). This trade highlights a build-up network between the formal and informal trading in South African towns, especially in marginalised towns such as in the current study. By contrast, in a study in Cape Town, Petersen et al. (2018) found that inputs were sourced from traditional markets. However, most microenterprises conduct stock activities and input procurement, food preparation, and retailing from within the township environment and adjacent formal sector wholesalers. The informal economy linkages are apparent, with suppliers providing cultural niche items such as live chickens, vegetables, transportation, water, and labor, and occasional items such as condiments and firewood.

Demand conditions factor: According to Porter (1990), demand conditions are perceived as a source of competitive advantage for a country. In Chapter two, we highlighted that street foods have become a significant source of cooked food for most households and individuals in many developing countries, including South Africa, and contribute to the nutritional well-being of their populations. Although we reported that 70% of the street food vendors provisioned low dietary diversity (Chapter 6), the food consumed provided the energy and protein required for daily intake. While the street food vendors ranked this condition as relatively low, the market demand of the working class depends mainly on the food sold on the street while they are transiting in the towns.

Street vending offers affordable products and services to numerous poor and low-income earners, mainly rural dwellers (Mramba, 2015). Street vendors add value to city people beyond mere employment (Roever & Skinner, 2016). In the study, we observed that street food consumers varied, highlighting a demand for locally available food for local people, including those in the cities. They produce demand for a wide variety of services offered by the informal economy, including transportation, coffee vending, security services, and porters. Additionally, street vending stimulates the need and preferences for services offered by the formal economy, such as institutions, government parastatals, and the private sector (Mramba et al., 2016).

Firm strategy, structure, and rival: The vendors ranked the factor condition of Firm strategy, structure, and rivalry the lowest in determining competitiveness. Porter (1990) regarded Firm strategy structure and rivalry as crucial determinants of competitiveness and discussed how the national circumstance and context shape the way companies are created, organised, and managed, as well as the nature of the domestic rivalry. However, the street food vendors in our study did not consider having company goals or strategies as essential to their enterprises' success. This could be because vendors venture into the industry without any plan owing to unemployment.

Figure 1: Proposed revisions of Porter's Diamond Model for street food enterprises represent our revision of Porter's Diamond Model for contributing to the value chain of the street food vendors in the Vhembe District. The revisions are based on perceptions of the competitiveness of street food vendors, as detailed in Chapter 8 and section 10.3 in this chapter.

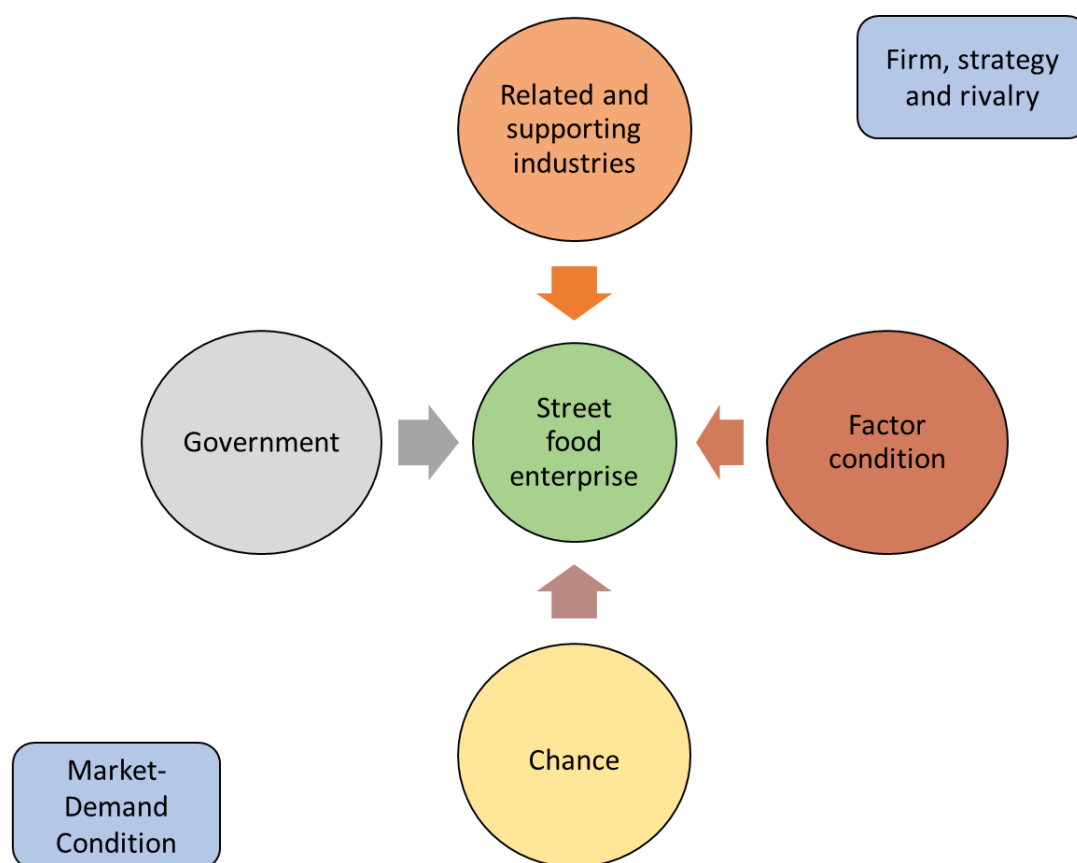


Figure 1: Proposed revisions of Porter's Diamond Model for street food enterprises

Therefore, the proposed revisions of Porter's Diamond Model for street food enterprises highlight that for the street food enterprise to be competitive, four main factors need to be considered, which are (1) Production factor condition, (2) Chance, (3) government role, (4)

related and supporting industries. The additional factors considered the least by the street food vendor were (5) Demand condition and (6) Firm, strategy, and rivalry. We have omitted arrows from the factor conditions of Firm, strategy, and rivalry and Demand conditions, as the vendors rated these as the least competitive. The arrow from factors highlights that direct influence plays a role in the street food enterprise and directly affects the enterprise's competitiveness.

10.4 SWOT analysis of the street food enterprise (Step 6)

This section synthesises the findings derived from the thesis for developing a model designed to facilitate the competitiveness of the street food enterprises in the Vhembe District. We used Porter's Diamond Model to analyse the competitiveness of the street food enterprises and SWOT analysis to identify the strengths, weaknesses, opportunities, and threats. In this way, we arrive at strategies suited to the street food enterprise in the Vhembe District. Thus, this chapter will answer the last of our research questions: What are the SWOT recommendations that would add value to the street food vendors based on the attributes of Porter's Diamond Model?

A SWOT analysis systematically identifies various factors to formulate a strategy for a company. The analysis is based on a logic that can maximise a company's strengths and opportunities while minimising weaknesses and threats (Benzaghta et al., 2021). These four factors can be organised as internal and external factors within the SWOT analysis (Gurel, 2017) for influencing the company's competitiveness and subsequent success. Figure 2 presents the SWOT analysis matrix structure for our study's vendors.

	Positive factors: Positively influence the business to achieve its goal. They can be manipulated	Negative factors: Negatively influence the business in achieving its goal. They should be overcome
Internal factors	Strengths	Weaknesses



Figure 2: SWOT Analysis matrix

10.2.3 Porter's component analysis of the Diamond Model is based on the SWOT analysis.

In this section, we analyse the components of Porter's Diamond Model based on the internal/ external factor categorisation and SWOT analysis. We use the analysis to identify the street food vendors' enterprises' strengths, weaknesses, opportunities, and threats. The analysis is based on the findings of the thesis on each component of Porter's Diamond Model and the supporting theoretical literature cited in previous chapters. The results of the analysis are outlined in Table 2, Table 3 and Table 4.

Table 2 outlines Porter's components analysis based on the SWOT analysis, while Table 3 ranks and organises the components of Porter's Diamond Model according to the strength, weaknesses, opportunities, and threats. We use our analysis to propose actions to be taken by responsible authorities (Table 4). Table 2 indicates no strength was identified from production and government role factors. Vendors identified most of the weaknesses from the production factor condition (capital/finance, lack of knowledge, unavailability of infrastructure) and government role (poor support and interaction, indirect support, unavailability of transformation and labor policies). The identified strength mainly was from the related and supporting industries (distance to the market), demand condition (availability of market for the product) and firm, strategy, and rivalry (adaptability, culture, quality of product, flexibility, availability of suppliers of the packaging materials).

The opportunities identified that could improve the enterprise competitiveness included that street vendors lack technology. Street food vendors noted the availability of financial and research institutions, electric suppliers, and changes in pricing strategies. Street food enterprises had more threats than strengths, weaknesses, and opportunities. Among the identified threats was a crime, cost of production inputs, price and economic stability and HIV and Aids. Lastly, unavailability of inputs suppliers.

Table 2: The Porter Component Analysis Diamond Model based on SWOT Internal and External Factors

Factor condition	Internal factors		External Factors	
	Strength	Weaknesses	Opportunity	Threats
Production condition		Capital/Finance Lack of knowledge Unavailability of infrastructure	Lack of technology	Water Cost of production Natural factors
Chance				Crime Price stability Economic stability Political stability Oil and fuel HIV and AIDS
Government Role		Poor support Poor interaction Indirect support Transformation policy Labour policy		
Related and supporting industries	Distance to the market		Financial institutions Research institutions Electricity suppliers	Inputs suppliers
Market-Demand Condition	Market for the product		Market information Pricing strategy	
Firm, strategy and rivalry	Adaptability Culture Quality of product Flexibility Suppliers of packaging material			

10.5 Internal and external components according to ranking

10.5.1 Internal factors: Strengths and Weaknesses of the street food enterprise

Internal factors are factors that are found within the enterprise which help the enterprise to either achieve or fail in its objective (Gurel, 2017). These factors influence enterprise operations positively or negatively. According to Benzaghta et al. (2021), internal factors should be considered as strengths and weaknesses of the enterprise. Moreover, these factors can be manipulated to achieve enterprise goals. Based on the analysis of the internal factors in Table 2, it can be concluded that the strength of the street food enterprise, using Porter's components, are the location of the enterprise, availability of customers for the product, flexible working hours, and product quality. These are the positive components of the central enterprises that assisted the enterprise in being competitive.

However, the findings of this study identified the absence or involvement of government as the main weakness of the competitiveness of street food enterprises. Although street food vendors worked independently in their enterprises, they noted that the government does not support street food enterprises at all. Moreover, the vendors highlighted that the unavailability of capital/finance was another critical weakness that blocked small enterprises from achieving their mandate. Furthermore, street food vendors commented that they had no interaction with government officials. In the qualitative findings in Chapter nine, street food vendors expressed that the government should assist them in enforcing rules and regulations to comply with the municipal by-laws.

Again, with the weaknesses identified, vendors proposed that the government build working sites for which they would pay a monthly or weekly fee. This suggestion could contribute to the municipal economy as each street food vendor would pay for their site. Street food vendors in Thohoyandou town expressed that:

"A solution to the government regarding infrastructure is that government should build us a rental kitchen where we could at least pay even if it is R50 per month. That could be better."
(TH08)

Officials do not visit those selling along the street. Hence, they are free to sell anywhere in the town, disturbing urban planning due to congestion in the town.

Table 3: The strengths and weaknesses of Street food enterprises per their ranking

Internal factors	Mean	Ranking
Strength		
Distance to the market	3.27	1
Availability of the market for the product	3.25	2
Adaptability	3.21	3
Culture	3.20	4
Quality of product	3.19	5
Flexible working hours	3.12	6
Availability of the suppliers of packaging material	3.11	7
Weaknesses		
Poor governmental support	3.97	1
Unavailability of Capital/Finance	3.87	2
Poor governmental interaction	3.68	3
Lack of business knowledge	3.60	4
Unavailability of infrastructure	3.46	5
Indirect support from the government	3.46	6
Transformation policy	3.25	7
Labour policy	3.22	8

10.5.2 External factors: Opportunities and threats of the street food enterprise in the Vhembe District.

Analysis of the external factors of the street food vendors included Related and supporting industries and the Demand condition of the Porter's Diamond Model, as outlined Table . External factors are the outside forces that are provisioned to assist the enterprise in being competitive. These factors include opportunities that relate to what could be advantageous to the enterprise, while threats are regarded as negatively affecting the enterprise (Benzaghta et al., 2021). The analysis produced several factors regarded as opportunities and threats to the street food enterprise in the Vhembe District. Based on the mean rankings, external opportunities occur outside the street food enterprise. If these external factors were to play a role in this industry, they could assist street food vending enterprises in achieving their mandate and being competitive. Opportunities identified include the availability and access of street food vendors to financial institutions. The findings of this study in Chapters four to nine have highlighted that only a few street food vendors could

access financial institutions to assist with loans to boost their enterprises. In Chapter nine, street food vendors proposed that financial institutions become involved to assist with business funding and running the enterprise. At times, the struggle to sustain the enterprise is due to the increased price of inputs.

Moreover, street food vendors could introduce technology to the market to communicate with their customers. Only a few vendors in Chapter five reported using WhatsApp or calls to communicate with their customers. Involvement of this institution could include training on business plans that infuse the use of technology among street food vendors. An institution such as higher education that focuses on research should invest in street food vending research to develop better strategies to improve street food vending in the Vhembe District.

One vendor suggested that training institutions could offer this training:

“There should be training offered to us by a proper organization and workshops that can help increase the standard of the business operation.” (MU05).

If this institution could be involved in the enterprise operation, an improvement could be identified, and competitiveness would likely be improved.

This study identified more threats than strengths, weaknesses, and opportunities from the SWOT analysis. The main threats to the street food vendors were the cost and unavailability of water for production, increased criminal activities in the area, input price (in)stability, and increased cost of production. Vendors were worried about the economic and political stability in the district. Among other threats were the availability of inputs supplier, prices of oil and fuel that affects the cost of their inputs, and general pricing of their sales. Although natural factors and HIV and AIDS were mentioned as threats, they were the least of the threats identified in the study.

Table 4: Opportunities and threats of Street food enterprises per their ranking

External factors	Mean	Ranking
Opportunities		
Financial institutions	3.51	1
Lack of technology	3.45	2
Market information	3.34	3
Pricing strategy	3.34	4
Electricity suppliers	3.28	5
Research institutions	3.26	6
Threats		
7. Water	3.91	1
8. Crime	3.88	2
9. Price stability	3.69	3
10. Cost of production	3.58	4
11. Economic stability	3.58	5
12. Political stability	3.55	6
13. Inputs suppliers	3.55	7
14. Oil and fuel	3.53	8
15. Natural factors	3.45	9
16. HIV and AIDS	3.36	10

10.6 SWOT Recommendations for improved street food enterprise

Table 5 reports on the SWOT recommendation of the street food enterprise. We followed the Based on the logic that can maximise a company's strengths and opportunities while minimising weaknesses and threats, as noted by Benzaghta et al. (2021). We developed actions according to the identified strengths, weaknesses, opportunities, and threats to build on strengths, overcome weaknesses, explore opportunities, and mitigate the threats.

Table 5: SWOT Recommendations

Building on strength	
Strength	Action
Distance to the market	✓ Allocation of the market stall should continue legally and be at strategic places where vendors will continue to have a market for the produce
Availability of the market for the product	✓ Teaching on the importance of consumption of healthy food such as cooked food should be enforced for street food customers ✓ Vendors should increase the diversity of food sold to their customers to increase access to and availability of healthy foods, thus increasing the food security of people in the cities
Culture	✓ Street food vendors should be encouraged to sell in their local areas so that they will sell food known to everyone
Quality of product	✓ First, the necessity to build the awareness that food should be of a certain quality ✓ Street food vendors should be encouraged to ensure food safety issues are considered neither on the producer nor the consumer side. ✓ Vendors do not compromise on the quality of the product because of profit margin. Selling products from local or informal suppliers has shown that vendors can make enough profit. ✓ Vendors should be encouraged to start relationships with most local producers rather than formal suppliers where prices are inflated. ✓ Street food vendors should be encouraged through teachings and workshops on the continuous purchase of fresh produce products for quality foods ✓ Vendors must be encouraged to Maintain a High Level of Supply Chain Visibility. ✓ The message of safe food preparation should focus on the “five keys to safer food.” The World Health Organisation proposes it. ✓ Department of Health, through policy development, should work together with street food vendors to develop a Food Safety Program according to rules and regulations of food safety along the value chain of the street food vendors

	✓ In addition to helping vendors run their businesses more efficiently and safely, cooperatives would also ease the authorities' work enforcing hygienic and business standards.
Flexible working hours	✓ Vendors should work hours good enough for their health ✓ Vendors should working hours that should not put them at risk of crime if working till its dark, especially women street food vendors
Availability of the suppliers of packaging material	✓ Strengthening the working relationship among the suppliers of the inputs with street food vendors

Overcoming weaknesses	
Weaknesses	Actions
Poor governmental support	✓ Policies, support ✓ Provision of financial assistance ✓ Policies that would allow the financial institution to assist street food vendors to acquire bank and access loans to improve their business operation ✓ Enhancing and strengthening the waste management system along the value chain ✓ Municipal authorities, in collaboration with street food vendors, to improve the condition of the trading side. Specifically, the provision of infrastructure that has better cold storage or storeroom facilities that will help to protect food from harm ✓ Improved water sources and supply closer to the stall
Unavailability of Capital/Finance	✓ Access to availability to loans, short, long term
Poor governmental interaction	✓ Street food vendors in all areas should have a representative committee that will identify issues of concern and can delegate the committee to talk with the relevant department of the moment, such as policing, department of health, or economic development. ✓ Build a relationship with the municipality ✓ Monitoring of the street food vending activities through the establishment of leaders, ✓ And the committee that would meet regularly ✓ fostering closer working relationships with municipal authorities such as the Department of economic development and Urban and Town Planners to enhance awareness of the policies ✓ ensure that street food vendors improve and assist with business and operation licenses

Lack of business knowledge	✓ Government and private institutions should offer training on: ○ Training of the street food vendors should focus on by-laws and awareness policies that enhance information regarding street trading ○ General food safety and cooking in the street food enterprise ○ Managerial and business skill ○ Encourage street food vendors to engage in activities that they assist in gaining knowledge ○ Learning and working together with other small businesses
Unavailability of infrastructure	✓ Support in infrastructure that included building facilities that will allow vendors to have clean and safe water, cooking facilities that encourage proper cooking practices

Exploring opportunities	
Opportunities	Action
Financial institutions	✓ Street food vendors should be encouraged to participate in awareness-raising programmes and given access to microcredit.
Lack of technology	✓ Street vendors could be trained on the use of record keeping using spreadsheets either on phone or computer ✓ Use their mobile phone to communicate with their customer, such as marketing their business product on social media (WhatsApp, Facebook etc.)
Research institutions	✓ Private and public institutions to establish engaged research with the street food vendor ✓ Established training on food safety, business management skills and improving nutrition and food security of the city people

Mitigating threats	
Threats	Action
Cost and unavailability of water	✓ Municipalities should provide vendors with appropriate infrastructures like access to clean water and sewage systems.
Increased crime	✓ Improvement of safety concerns raised should be through increased and visible policing. ✓ Provision of storage facilities by the municipalities for the vendors to keep their business materials in the safe storerooms to avoid being stolen.
Price stability	✓ With a relationship established with suppliers, vendors could be exempt for pricing by subsidies or not increase their prices.

Increased cost of production	✓ Vendors should be encouraged to make use of their food products, such as vegetables and meat, to sell in their enterprise, that way, they will buy less and make more profit from their farming.
Economic stability	✓ Encouraging investment to lessen the burden of economic instability when an interest rate hike. ✓ Government to consider providing vendors with subsidies and incentives
Political stability	✓ Establishment of local organisation could assist in stabilisation of politics in the local area.
Unavailability of Inputs suppliers	✓ Establishment of working relationships with formal and informal inputs suppliers such as wholesalers and farmers. Contracts could be drawn between the parties that will assist the street food vendors to have input on credit so they could pay after sales.
Increased Oil and fuel prices	✓ Government should establish schemes for street food vendors that need to subsidise prices for fuel and oil

10.7 Conclusions

This study aimed to develop an agricultural food enterprise model in rural towns in the Vhembe District, Limpopo Province. Value chain analysis and Porter's Diamond Model were used as guiding frameworks to develop the model. In this chapter, we used the six value chain steps to integrate Chapters four to nine findings and Porter's Diamond Model to determine enterprise competitiveness. The value chain of the street food vendors was simple, with poor linkages between the local authorities, street food organisations, formal and between financial institutions, and the street food vending enterprise.

We highlighted that food served in the streets of the Vhembe District is high in energy from carbohydrate sources, such as maize meal porridge served in large amounts, followed by foods high in fat. Furthermore, the current study observed low diversity of food groups provisioned in the street of the Vhembe District, where street food consumers had fewer food choices when frequently eating on the street.

The current study confirms that street food vendors perceived four of the six attributes that constitute Porter's Diamond Model as determinants of the competitiveness of their enterprises. These were Production factor condition, Chance, the role of Government and lastly, Related and supporting industries. Thus, improving these critical attributes may positively influence the competitiveness of the street food vendors' enterprises in the Vhembe District.

The component analysis of the Porter's Diamond Model was used to develop a model using SWOT analysis, which was the last step of the value chain. Street food vending enterprises are characterised by poor infrastructure, lack of access to funding and training, and climatic conditions during their day-to-day operations. Efforts to improve their operations must consider the vendors' proposed interventions to their challenges. In Chapter nine, street vendors proposed possible solutions to their enterprise challenges, and the SWOT analysis recommendations were also used to propose actions that various stakeholders along the value chain could take.

From the results of this study, the researchers identified the strengths and weaknesses within the street food enterprise that influenced the competitiveness of the vendors' enterprises. Likewise, we identified opportunities to contribute to the value chain of these enterprises and threats that constrained the enterprises through external influence. These actions were synthesised into a model to improve the street food enterprise in the Vhembe District. Recommendations and limitations of the study are now outlined.

10.8 Limitations of the study

The cross-sectional nature of the study design prevented the researcher from drawing any causal conclusions between variables. Furthermore, some explanatory variables relied on participants' self-reported data and may have been prone to recall and social desirability biases. Only food vendors were recruited as respondents. Environmental health/food hygiene inspectors and the local authorities were not included in the sampling. This delimitation in the sampling criteria of the study limited a comprehensive understanding of inputs to the value chain of the street food vendors and the possibility of triangulation to test the validity of the research findings. Another sampling delimitation is that the study covered only towns in the Vhembe District and not the whole region, thus limiting the possibility of generalising the study findings to the region. The researcher attempted to control the participants' communication and avoid biases in their responses. We also allowed participants adequate time to recall previous information to minimise recall bias. The researchers also took time to explain the questions accurately in the local language to the participants so that participants could provide accurate answers.

10.9 Recommendations

This study maintains that policy interventions should be framed according to street vendors' proposals. Street food vendors proposed improving infrastructure, including proper water and sanitation facilities, access to funding, and improved skills through training for their enterprises to be competitive. They also recommended that municipalities and other local authorities enforce existing rules and regulations.

The government should improve street food stall operating conditions and facilities, provide clean, protected structures, access to potable water, and efficient waste collection and disposal systems.

Future policy interventions should promote value along the foods sold in the street chain, providing cold storage facilities closer to street vendors' stalls in the towns to encourage continued production.

Production constraints such as access to finance, government support, and managerial skills should be addressed. Investment in the street food enterprise in the Vhembe District should be based on its competitiveness. Training should be tailored to the environment of the street food vendors so as not to disrupt business operations and jeopardise income.

Future research can contribute to efforts to improve the street food enterprise in the Vhembe District by highlighting areas of good practice and areas of concern and identifying policies, strategies and mechanisms that are likely to be effective in improving competitiveness.

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APPENDICES

Appendix 1: Editorial Letter

APPENDIX 1

Confirmation of Copywriting

Merle Werbeloff PhD (Wits)

Registered Industrial Psychologist

Practicing statistician

NUFFIC ACCREDITATION

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28th November 2022.

To Whom it May Concern

This note serves to confirm that I have copyedited Chapters 1, 2, 3, 7, 8, 9, and 10 of the PhD thesis by Mahopo Tjale Cloupas, titled: Development of an agricultural food enterprise model in rural towns in Vhembe District, Limpopo Province. I also assisted in the typesetting of the document.

Chapters 4, 5, and 6 are published journal articles and so did not require my editing.

Yours faithfully



Merle Werbeloff.

Appendix 2: Questionnaire



Development of an agricultural food enterprise model in rural towns in Limpopo, South Africa

PID NO														
Location (Please circle the name of the place you are interviewing from.)	1				M		U	S	I	N	A			
	2	M	A	K	H		A	D	O					
	3	T	H	O	H		O	Y	A	N	D			
Date					dd.....		mm.....							
Name of the Interviewer:														
Latitudes:						Longitudes:								
S:						E:								

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender	a. Male	b. Female	
2. How old are you?	a. Less than 18 years	1	
	b. 18-24 years	2	
	c. 25-34 years	3	
	d. 35-44 years	4	
	e. 45-54 years	5	
	f. 55-64 years	6	
	g. 65- 74 years	7	
	h. More than 75 years	8	
3. What is your marital status?	a. Single	1	
	b. Married	2	
	c. Living with a partner	3	
	d. Separated	4	
	e. Divorced	5	
	f. Widowed	6	
4. What is your country of origin	a. South Africa	1	
	b. Other (specify)	2	
5. What is your highest level of education?	a. Primary school	1	
	b. Some high school	2	
	c. Matric	3	
	d. Diploma	4	
	e. Degree	5	
	f. No schooling	6	
6. Total household income per months	R		
7. Total household income made from the business/month	R		
8. What are the sources of income (choose more than one source)	a. Social grant	1	
	b. Spouse	2	
	c. Other business	3	
	d. Other (e.g. stockvel)	4	
9. How many members of your household depends on the business		Number	
	a. Male	.....	
	b. Female	.....	

SECTION B: OPERATIONAL INFORMATION OF THE BUSINESS

10. Are you	a. The full owner of the stall?		1	
	b. A co-owner of the stall		2	
	c. Not the owner of the stall			
11. How long have you been in your business?	a. Duration in year/ months		..... .....	
12. What motivated the establishment of your business?	..... ..... ..... .....			
13. Do you keep records?	a. Yes		1	
	b. No		2	
14. If your answer is Yes to question 13, which records do you keep?	a. Production records		1	
	b. Marketing records		2	
	c. Sales records		3	
	d. Other specify		3	
15. Do you give a receipt when the customer is buying?	a. Yes,	b. No		
16. Which day (s) of the week do you work at the stall?	Monday		1	
	Tuesday		2	
	Wednesday		3	
	Thursday		4	
	Friday		5	
	Saturday		6	
	Sunday		7	
17. When is your stall open	Weekdays:.... To.....= hrs		.....	
	Saturday:.....to.....= hrs		.....	
	Sunday:.....to.....= hrs		.....	
	Holidays:.....to.....= hrs		.....	
18. What is the average income from the stall/week	Give in Rands		R.....	
19. How much (mark-up) do you add to the cost of your product?	Give in %		%	
20. How do you decide on the value to be added	..... .....			
21. What do you do with the money made from the business?	..... ..... ..... .....			
22. Where do you buy supplies for the stall?	..... ..... ..... ..... .....			
23. How do you get to the place/s where you buy supplies	a. Bus		1	
	b. Taxi		2	
	c. Car		3	
	d. Walk		4	
	e. Suppliers deliver		5	
24. How far away is the place where you buy your stock? If distance not known, please indicate time in minute spent traveling, e.g., min walk/10 min drive, etc	..... ..... .....			
25. Do you keep stock? If no, skip to question 27.	a. Yes	b.No o		
26. Where do you keep your stock?	a. Home		1	
	b. Stall		2	
	c. Storeroom		3	
	d. Rented room		4	
	e. Other specify		5	
27. Is there an inventory of stock?	a. Yes	b. No		
28. Where do you go if you loan/credit?	a. Loan bank		1	
	b. Loan sharks		2	
	c. Savings		3	
	d. Other (specify)		4	

29. Do you get credit from inputs suppliers? If the answer is yes, answer question 30. If no, answer question 31	a. Yes	b. No	
30. What are the terms.....			
31. Do you decide what to sell in the stall? If the answer to this question is No, answer question 32.	a. Yes	b. No	
32. Who decides what needs to be sold?			
33. Is your business sector represented by national or local business association? If so name them	a. Yes	b. No	
			
34. Are you a member? If not why	a. Yes	b. No	
35. What are the primary function and benefits of these associations			
36. What are the additional services that you think they should provide?			
37. How is your business money stored?	In a till	1	
	In a box/pouch	2	
	In the vendor's pocket	3	
	Other (specify)	4	

Labor usage

38. ns of labors.		Questio			
a)	employ permanent laborers in your business? Please indicate by a tick.	Did you	Yes	No	
b)	umber of labors	Skilled	Unskilled		
c)	ays per year				
d)	lease indicate the salary bill of the current labor/(or)				
e)	lease provide the list of labor with training and functions in the business				

SECTION C: INPUT

39. Do you sell the same items throughout the year in the stall?	a. Yes	b. No	
40. If no, which items changes?	.....	1	
	.....	2	
	.....	3	
	.....	4	
	.....	5	
	.....	6	
41. Do you sell cooked foods?	a. Yes	b. No	
(i) If yes, please list cooked items	.....	1	
	.....	2	
	.....	3	
	.....	4	
	.....	5	
	.....	6	
	.....	7	
	.....	8	
(ii) If yes, where do you cook them?	a. At the site	1	
	b. Home	2	
	c. Other, specify...	3	
(iii) Who cooks the food?	a. Self	1	
	b. Spouse	2	
	c. Employee	3	
	d. Other, specify	4	
42. If you have leftovers of prepared food at the end of the day what do you do with it?	a. Throw it away	1	
	b. Take home to eat	2	
	c. Sell the next day	3	
	d. Sell at a lesser price	4	

43. What are your significant inputs in your business?			
Items	Cost/item	Quantity	
a.			
b.			
c.			
d.			
e.			
f.			
g.			

44. Who are your main suppliers					
Name of suppliers	Item supplied	At what price do you buy	Quantity (kg)	How is the input provided	How often
a.					
b.					
c.					
d.					
e.					
f.					
g.					
h.					
i.					
j.					

45. Are there problems in getting some significant inputs? Explain	a.
--	------------------

	b.			
46. Have you ever purchased inputs jointly with other vendors?	a.			
47. What is your total running cost?	R.....			
48. How much do you spend on the items listed below per month?	a. Electricity	R..... ...		
	b. Gas	R..... ...		
	c. Employee	R..... ...		
	d. Transport	R..... ...		
	e. Water	R..... ...		
	f. Cell phone	R..... ...		
	g. Bank charges	R..... ...		
49. How much do you sell your plate	Beef ful-R.... Beef hlf-R ...Chickn ful-R....Chickn-hlf-R			
50. Do you set the price of your plate? If NO, answer question 51. If yes answer question 52	a. Yes	b. No		
51. Who sets the price	..... .....			
52. What informs the decision of how much the plate should cost?	..... ..... ..... ..... .....			
53. Are you satisfied with the price of supplies of the food?		a. Yes	b. No	
54. Are you satisfied with the price of selling the food?		a. Yes	b. No	
55. What is the total profit of your business per month?		R.....		
56. What is your target market?	a.	Rural consumers	1	
	b.	School children	2	
	c.	Government employees	3	
	d.	Middleman	4	
	e.	Other (specify)	5	
57. How do you communicate with your customers when selling or marketing your food?				
58. Do you deliver food to your customers		a. Yes	b. No	
59. Do you have any of your foods going to waste?		1. Yes	2. No	
60. If Yes, how much food goes to waste (bucket/crates/boxes)?				

SECTION D REVERSE ANALYSIS OF THE STREET FOOD

61. item	a. How much do you buy (kg) (bag) e.g 10kg	b. What price (kg) (Raw) e.g R230	c. How frequent do you buy the bulk (50kg/day/wk.)? e.g Daily	d. How much is the plate/cup/spoon e.g R45	e. Who supplies (bakkie, own, farmer, spar, Shoprite) e.g Farmer	f. How many plates/day do you sell? (Total plates) e.g 100	g. How many dishes with this food item do you sell per day? e.g 30	h. How much do you serve (quantity in kg/g) per plate) e.g 1 serving sp	i. What price is the food item per serving (a spoon of cabbage) e.g R10
Vegetable									
Mutshaina									
Cabbage									
Tomato									
Carrots									
Potatoes									
Onion									
Arthaar									
Tomato/onion stew									
Pap/rice									
Meat									
Chicken (broiler)									
Chicken (mukokoroshi)									
Offal's (magulu)									
Dust chicken									
Goat									
beef									
Novel feeds									
Mopani worms									
Madzulu (termites)									
Nememe									
Mushidzi									
Murudi									
Thebe									
Delele (okra)									
Water									
Soft drink									
Juice (concentrate)									

62. Do you have a certificate of acceptability to sell street food from the DOH?	a. Yes	b. No	c. If no, please provide reason.....
63. If yes, when did you receive this	a. ....Year.....		Month...
64. Do you have a permit or concession letter or lease to sell street food?	a. Permit	1	
	b. Concession	2	
	c. Lease	3	
	d. Other	4	
65. If you could choose an area to trade in, which one would it be?	..... ..... .....		
66. How safe is the area where you trade?	a. Very safe	1	
	b. Safe most of the time	2	
	c. Dangerous	3	
	d. Often dangerous	4	
	e. Very dangerous	5	
67. What standards requirements do your business to conform to?	..... ..... ..... .....		
68. How helps to conform to these standards and requirements	..... .....		
69. Do you have any problem in this regards?	..... ..... .....		
70. Are there any government policies/regulations that benefit your business? If yes, please answer question 71 and 72	a. Yes	1	
	b. No	2	
What are the policies/regulations that benefit your business? Describe registration, inception, subsidies, incentives, etc.....			
71. What governmental policies/regulations are obstacles to growing your business?.....			

72. Does your on-site stall have access to	a. Water	1	2
	b. Electricity	1	2
	c. Gas	1	2
	d. Stove	1	2
	e. Refrigerator Fridge	1	2
	f. Freezer	1	2
Do you pay for water?		a. Yes	b. No.
73. What is the source of water for use in your business	a. Tap around the vicinity	1	
	b. Nearby shop	2	
	c. Borehole	3	
	d. Have water on-site	4	
	e. Water from the public toilet	5	
	f. Bring along from home	6	
	g. Other(specify)	7	
74. Distance to your water source?	..... .....		

75. Do you have facilities for hand washing on-site	a. Yes	b. No
76. If yes, indicate the facilities	a. basin with water	1
	b. Sink and tap	2
	c. Others specify	3
77. How far is the stall from the toilets?	Distance .....Km	
78. Do you have fire extinguisher on-site?	a. Yes	b. No
79. What is the essential infrastructural constraint affecting your business?	a. Transport	1
	b. Crime	2
	c. Storage facilities	3
	d. Finance	4
	e. Other (specify)	5
80. What is the organization doing about this?	..... ..... .....	
81. What is the environmental challenge significantly affecting your business operation?	a. Rainfall	1
	b. Temperature	2
	c. Lack of water	3
	d. Don't know	4
	e. Others (specify)	5

SECTION E: INFRASTRUCTURE IN YOUR BUSINESS/MAIN SOURCE OF WATER

Fixed Infrastructure usage

Available infrastructure

82. Do you have an asset register?	a. Yes	1
	b. No	2

83. May you please indicate the most critical infrastructures that you use for your street food vending business?

a). Type of infrastructure	b). Condition (e.g., poor, good, etc.)	c). Quantity	d). Age (yrs.)	e). Estimated value (R)

Technology usage

84. May you please indicate most essential technologies that you use for your business?

a. Type of technology	b. Estimated cost

INFRASTRUCTURE AT YOUR BUSINESS SITE/MAIN SOURCE OF WATER

What is the primary source of water? Do you use it in your business? Please, as applicable describe/show the key features of the infrastructure and its water source

85. WATER ACCESS TO BUSINESS: STORAGE, QUANTITY, AND QUALITY

(a)	Does your business use any means of transport for fetching the water? A. Yes, B. No <i>Please, circle the right answers, (if the respondent doesn't carry water somewhere else, skip to 85(b))</i>	A	B
(b)	If the answer above is Yes, please what you use to fetch water: A = Walk; B = Animal-drawn cart; C= Bicycle; D= Bus; E= Taxi; F= Hired car; G= Own car; H= Other (Specify)	A	B
		C	D

	 <i>If is no skip to 85(c)</i>	E	F
		G	H
(c)	Who is the primary person who usually goes to the source to fetch the water for the business? A. The owner, B. Laborer, C. Both, D. Other (Please specify).....		
		A	B
		C	D
(d)	Who is the next person who often goes to the source to fetch the water for the business? A. The owner, B. Laborer, C. Both, D. Other (Please specify).....		
		A	B
		C	D

86. - WATER STORAGE				
a)	Do you have water storage for water uses at your business or surface water? A. Yes, B. No <i>Please, circle the right answers,</i>		A	B
b)	What type of container do you use to store water for your business use?	Type of storage container	Number	Mark with X
		a. Small containers (20l)		
		b. Small container (25l)		
		c. Other (Specify volume.....)		
87. WATER QUANTITY				
a)	Would you be able to estimate the actual quantity of water consumed by each specific use in a day? A. Yes, B. No <i>Please, circle the right answers, if yes, complete 86(b)</i>		A	B
b)	Please estimate the actual quantity of water consumed by each specific use per day.	Specific water use	Estimate the quantity of water used (liters/ day)	
		a. Drinking by people		
		b. Cooking for business consumption		
		c. Hand washing		
		d. Washing utensils		
		e. Cooking food for sale		
		f. Brewing (making) drinks for sale		
		g. Other (Specify)		
88. - WATER QUALITY				
-a)	Is the water used for the business in good use for the company? A. Yes, B. No <i>Please, circle the right answers, If no skip to 88(c)</i>		A	B
-b)	If YES, which uses? <i>If no skip to 88 (h)</i>	..... .....		
-c)	If you do not use water for business uses, why?	..... .....		
-d)	Has your business ever had problems caused by the use of poor quality water? A. Yes, B. No <i>Please, circle the right answers, If is yes, skip to 88 (e) (water samples to be taken)</i>		A	B
-e)	If not good then what is wrong with it. Dirty, B. Carries diseases, C. Saline, D. Toxic, E. Others Specify..... <i>Please, circle the right answers, If is yes, skip to 88 (h)</i>			
			A	B
			C	D
			E	

-f)	If your answer is Yes, how many times was that experienced in the past twelve months?	Number of times water quality related problem has been experienced in the past twelve months	
-g)	Have you ever treated the water to make it safer for consumption as drinking water in your business? A. Yes, B. No <i>Please, circle the right answers,</i>	A	B
h)	If your answer is Yes, what did you do to make the water safer for consumption? A. Boiling the water, B. Add bleach/chlorine, C. Sieve it through clothes, D. Water filter (ceramic, sand, composite, etc., E. Let it stand and settle, F. Do not know, G, Other, specify..... <i>Please, circle the right answers, as many as possible. If is no stop here</i>	A	B
		C	D
		E	F
		G	
i)	When was the last time you treated the water using the method?	per.....(duration, e.g., month)	
-j)	How much does this water treating method costs?	Rand	
-k)	How would you rate the quality of your drinking water consumption from the primary source? On the scale from 1= good, 2= better, 3 = poor <i>Rate all according to the above rating.</i>	Rating	
		A. Clarity (no sediments in the water)	
		B. Colour	
		C. Smell	
		D. Taste	
		E. Healthiness	

SECTION F: MULTI-STAKEHOLDER INFORMATION

89. Are you a member of street vending business (s)/association(s)?		Yes	
		No	
90. If yes, name the associations or organizations you belong.....			
91. List all possible stakeholders you need in the street food vending business.		1.	
		2.	
		3.	
		4.	
		5.	
		6.	
		7.	
		8.	
92. Please identify significant stakeholders from the list above in the street food vending business, indicate their roles, prioritize their importance to you and provide several interactions.			
a. Name of stakeholder	b. Priority (number from 1 as most important)	c. Roles and objectives	d. How frequently do you see them in a month/year?

--	--	--	--

93. From the stakeholders identified above, list the contributions made

a. Stakeholder	b. Contributions

94. Which stakeholders do you regard as crucial stakeholders and why?

a. Stakeholders	b. Key stakeholders 1=Yes; 2=No	c. In what way

95. Who else can play an essential role in the street food vending business?

a. Stakeholder	b. Role

96. Who of the **major stakeholders** do you think are the leaders (movers) in street food vending business? In which area do they lead and to what level of influence is exerted by these movers

a. Movers stakeholders	b. Area of leadership	c. Level of influence (1=low; 2=intermediate; 3=high, 4=very high)

97. Do you have interactions with major stakeholders? Please indicate the type of interactions you have and the frequency of interaction

a. Stakeholder	b. Type of interaction (meeting, visit, training, email, phone,	c. Frequency of interactions 1: weekly; 2=bi-monthly; 3=monthly; 4=other (specify)

98. Do you experience problems with some of the above stakeholders? (1. Yes; 2. No).....

.....

.....

99. If you answered Yes above, list problems you experience when interacting with the stakeholders and order the importance of the issues

a. Name of stakeholder	b. Problems	c. Order of seriousness: 1=very serious problem; 2=serious problem; and 3=less serious problem

100. What are the possible causes of the **very serious** and **serious** problems mentioned above?

a. Problem	b. Causes

101. Who are the responsible stakeholders to solve each of the problems and how should the problem be solved?

a. Problem	b. Stakeholder responsible for solving the problem	c. A solution to the problem

102. What resources are involved in solving each of the problems and who is the provider of those resources?

a. Problem	b. Resources: 1=Human; 2=Finance; 3=Infrastructure; 4=Equipment; 5=inputs; 6=Other (specify)	c. Provider of resources

103. Do stakeholders ask for your feedback for the service they provided to you? (1. Yes; 2. No).....

104. If you answered No above and were allowed to provide feedback, what will you say?

a. Name of stakeholder	b. Feedback

105. What primary activities are carried out by vital individual stakeholders? (both knowledge related activities and other events)

a. Key stakeholders	b. Activities

106. What resources are controlled by each key stakeholder? This might include human resources, qualifications, market share, budget and capital

a. Key stakeholders	b. Resources controlled

107. What sources of information do you regularly use in the street food vending business?

.....

108. What type of information (e.g., strategic, operational, technical, policy, etc.) do you obtain from those sources, how often do you use each source

a. Source of information	b. Type of information obtained: 1=Strategic; 2=Operational; 3=Technical; 4=Policy; 5=Other	c. The frequency of use of resource: 1=Weekly; 2=Monthly; 3=Quarterly; 4=Annually

109. How do you use the information obtained from each of the sources?

a. Sources of information	b. Use made of the information

110. Please rate the different sources of information in their order of importance?

a. Source of information	b. Rating: 1=less important; 2=Important; 3=Very important

111. Is/are there any committee(s) that you know and belong in the street food vending business? (1. Yes;2. NO).

.....

112. If Yes give the name of the committees

.....

113. Which environmental factors have some influence on your business and how?

Environmental factor	Nature of influence on your business
a) Agro-ecological	
b) Socio-economic	
c) Political	
c) Others	

114. Section G: street vendor's perception of business potential

To what extent do you agree with the following comments on business potential? Please tick in the relevant box that best describes your view(s). (The table below will be used to score the average factor condition)

Views The following production factors are causing a decrease in business potential	Responses				
	1	2	3	4	5
	Strongly disagree	Disagree	Not Sure	Agree	Strongly Agree
Production conditions					
1. Cost of production					

• Labor cost					
• inputs cost					
2. Water					
• Insufficient source of water					
• cost of water					
3. Infrastructure					
• lack of quality					
• lack of availability					
• type					
• transportation					
• communication systems					
• electricity					
4. Capital/ Finance					
• costly					
• lack of availability					
5. Lack of knowledge of production					
6. Lack of technology					
7. Natural Factors					
• climatic conditions					
• disasters					
• diseases (specify)					
• pests (specify)					
Markets conditions					
8. Distance to the market					
9. Market information					
• Lack of quality					
• Lack of availability					
• Cost					
• market agents					
10. Quality of products					
11. Is there markets for your product					
Views The following production factors are causing a decrease in potential production	Responses				
	1	2	3	4	5
	Strongly disagree	Disagree	Not Sure	Agree	Strongly Agree
Related and supporting industries					
12. Financial institutions					
13. Research institutions					
14. Inputs suppliers					
15. Suppliers of packing materials					
16. Electricity suppliers					
Government support					
17. Poor interaction					
18. Poor support					
19. Indirect support					
20. Labor policy					
21. Transformation policy					
Firm strategy, structure, and rival					
22. Adaptability					
23. Culture					
24. Structure					
25. Flexibility					
26. Pricing strategy					
Chance					
27. Economic stability					
28. Oil and fuel					
29. Aids					
30. Political stability					
31. Price stability					
32. Crime					

SECTION H: INTERVIEW QUESTIONS LIST

This section will be focusing on the qualitative questions seeks to understand the possible challenges interaction with the municipality and available policies used to govern the operation of the business. The problems also try to ask vendors about the possible solutions that can help them out of the challenges highlighted.

1. If there was one thing you could change about your vending operation, what would it be?

.....
.....
.....
2. Do you have any challenges running your vending operation? If yes, please describe them.

.....
.....
.....
3. In your view what could be the possible solutions to the challenges?

.....
.....
.....
4. Do you think there is anything the municipality can do to help improve your business?

.....
.....
.....
5. What are the significant incentives you have for investing in/ promoting change in the value chain?

.....
.....
.....
6. What do you think are the strength of the vending industry locally or nationally?

.....
.....
.....
7. What do you think are the main weaknesses in the vending industry locally or nationally?

.....
.....
.....
8. What made you decide to get in the vending business?

Appendix 3: Research study information leaflet and consent form

TITLE OF THE RESEARCH PROJECT: Development of an informal agricultural food enterprise model in rural towns in Limpopo, South Africa

Development of an informal agricultural food enterprise model

PRINCIPLE INVESTIGATOR / RESEARCHER(S) NAME(S) AND CONTACT NUMBER(S):

Name of student/researcher	Student number	Contact number
Tjale cloupas Mahopo	2016443059	076 9448 868
Azihangwisi Edward Nesamvuni	NA	082 9249 898
Johan Van Niekirk	NA	083 2317 380
Noxolo Cebisa Nesamvuni	NA	082 9247 424

FACULTY AND DEPARTMENT:

Natural and agriculture science
Sustainable agriculture

STUDYLEADER(S) NAME AND CONTACT NUMBER:

Professor AE Nesamvuni
082 924 9898

WHAT IS THE AIM / PURPOSE OF THE STUDY?

The aim of the study is to develop an informal agricultural food enterprise model in rural towns in Limpopo Province. The following objectives will be determined to help achieve the study aim: (1)To characterise agricultural food enterprises in Limpopo (2) To investigate the potential model for multi stake-holder interaction for agricultural food enterprises (3)To Conduct vulnerability assessment of agricultural food enterprises to the impact of climatic change (4)To Investigate the potential commodity production by agricultural food enterprises (5)To investigate the value chain of agricultural food enterprises in the Limpopo province (6)To conduct policy analysis to inform the operation of agricultural food enterprises in the rural town of Limpopo province. In the Limpopo province there is no model that guides the informal food enterprises and the intersection between food chain and food security. Moreover, very little research has been conducted to understand the intersection of the South African economy and with food (in) security

WHO IS DOING THE RESEARCH?

I Mahopo Tjale Cloupas PhD candidate at the University of the Free State, in the center for sustainable agriculture. I am conducting this study under a supervision of research team: Professor AE Nesamvuni (Univen and UFS), Dr. Johan Van Niekirk (UFS) and Dr. CN Nesamvuni (Univen). I am a nutritionist working at the University of Venda as a lecturer and as a team we would like to conduct this research to have better insight of the value chain of foods from the plate sold by you as a street vendor to the farm gate. We would like to understand all sought of linkages that works with you. This will help us to determine the strength and weaknesses of the vending business.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received approval from the Research Ethics Committee of UFS. A copy of the approval letter can be obtained from the researcher.

Approval number: To be inserted after served in the ethics committee

WHY ARE YOU INVITED TO TAKE PART IN THIS RESEARCH PROJECT?

It has been established that most of the street food vendors selling food in the towns are from rural villages and most of them were women. Furthermore, street food vending is one large source of employment amongst all other informal businesses in the cities and towns of the developing countries and contribute to total household income. The study investigator will first make appointments with the relevant stakeholder in various districts and municipalities of the Limpopo province to request permission to conduct the study. After obtaining permission, the principal investigator with the field workers will therefore make arrangements with street vendors in various towns. Interviews will be conducted at the stalls where the street vendors will be selling their foods so that we do not disturb the operation of their businesses. Aim and objectives of the study will be explained to the street vendors before the commencement of the interviews to seek participation of the street vendors. Only street vendors who agreed to signed informed consent form will be interviewed for the purpose of this study. There will no treatment that will be given to the study participant, these study requires only interviews with the participants. Interviews with the street food vendors will be conducted once and follow up will only be done with the other stakeholder referred by the particular street food vendor. We estimate to have about 1000 participant with 200 from each town.

WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?

As a participant you are requested to provide information regarding your business operation and stakeholder you normally work with. We will have both open and closed ended questions using a questionnaire to interview you regarding your business. The expected time for this interview will not be more than one hour. The study does not foresee any risk we are working with you as an adult and we will only interview you without touching or doing any assessment of the human body.

CAN THE PARTICIPANT WITHDRAW FROM THE STUDY?

Participation in this study is voluntary and there is no penalty or loss of benefit for non-participation. Being in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

There are no direct incentives to be given to the study participants. Your participation will help us to have larger sample size needed to generalize the findings of the study. Your participation in the study will be kept confidential, but information about him/her will be given to the study sponsor.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

The study does not foresee any risk or discomfort for the participant. The operation of the business will continue as usual because fieldworker will interview street vendor while they are busy doing their business activities.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

The study will be performed in accordance with the principles of the Declaration of Helsinki (2008) and laws of South Africa. Code and number will be used in the study so that no one will be able to connect you to the answers you give. All answers will be given a fictitious code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. With regard to people who will have access to the data we assure you that only the fieldworker, principal investigator and study promoters will only have access to the data from this study. All people involved in the use of this data will be obliged to sign a confidentiality agreement to maintain confidentiality. Your answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external coder, and members of the Research Ethics Committee. Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records. This data may also be used for the purpose of research reports, journal articles and conference presentation. However, your names will not be used and no links will be done to any information provided to you by any person. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report. Please keep in mind that it is sometimes impossible to make an absolute guarantee of confidentiality/anonymity. Note that there will be in-depth interview to be conducted during the course of the data collections that will require more of your attention and expression. While every effort will be made by the researcher to ensure that you will not be connected to the information that you share during the. For this reason, I advise you not to disclose personally sensitive information in the during your in-depth interview with your fieldworker. Remember participation in this study is voluntary and you can withdraw at any time of the study.

HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?

Hard copies of your answers will be stored by the researcher for a period of five years in a locked cupboard/filing cabinet at the University of Venda for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. After five years, hard copies of the questionnaire will be shredded and burned. The study does not foresee any potential level of inconvenience and/or discomfort to the participant. You are assured that there will not be any person who can relate the information collected on the paper and you because we are using numbers/codes instead of names.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There is no payment expected from to be interviewed nor any payment to be given to you after the interview. There will be no monetary or any other types of remuneration. Moreover, there will be no cost that you are expected to cover toward this study.

HOW WILL THE PARTICIPANT BE INFORMED OF THE FINDINGS / RESULTS OF THE STUDY?

If you would like to be informed of the final research findings, please contact: Mahopo Tjale Cloupas on 076 9448 868 or tjale.mahopo@univen.ac.za. The findings are accessible for 5 years. Should you have concerns about the way in which the research has been conducted, you may contact Professor AE Nesamvuni @ 082 924 9898. However, we

would like to assure you that the study does not foresee any risk that may come from others identifying the person's participation in the research.

Thank you for taking time to read this information sheet and for participating in this study.

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the insert specific data collection method.

I have received a signed copy of the informed consent agreement.

Full Name of Participant: _____

Signature of Participant: _____ Date: _____

Full Name(s) of Researcher(s): _____ ---- _____

Signature of Researcher: _____ Date: _____

Appendix 4: Ethics Approval letter

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35,4%



GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

10-Apr-2019

Dear Mr Mahopo, Tjale TC

Application Approved

Research Project Title:

DEVELOPMENT OF AN AGRICULTURAL FOOD ENTERPRISE MODEL IN RURAL TOWNS IN LIMPOPO, SOUTH AFRICA

Ethical Clearance number:

UFS-HSD2019/0059

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

Dr. Petrus Nel

Chairperson: General/Human Research Ethics Committee

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