

**STREET FOOD VENDORS AND FOOD ACCESS: A COMPARATIVE STUDY
OF VIWANDANI AND BURU-BURU RESIDENTIAL AREAS IN NAIROBI,
KENYA.**

BY

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DECLARATION

This is my original work and has never been presented for the award of a degree in any other university.



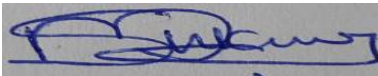
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DEDICATION

To my parents, genuine friends and all street food vendors who participated in Viwandani and BuruBuru.

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ABSTRACT

This was a comparative study between Viwandani and Buruburu residential areas, where demographic, and socioeconomic characteristics were used to assess the contribution of street food vendors to urban food access. The objectives of the study were to; a) compare the demographic and socio-economic characteristics (education, income, gender, age, marital status and experience) of the street food vendors, b) Map and characterize the street food types sold in Viwandani and Buruburu, c) Assess the contribution of street foods to urban food access, d) Analyze the sources of food sold in the study area. Primary data were obtained from a census survey administered to one hundred and four street food vendors in the study region. Geographic Information Systems were used to examine the mapping data, while descriptive statistics were utilized to evaluate the socioeconomic data. The results showed that vendors were concentrated along the main roads, railway line and footpaths forming a linear pattern. Women comprised majority (73%) of food vendors in Viwandani, and 68% in Buru Buru. The majority of the food vendors in Buru Buru were more educated than their counterparts in Viwandani. In addition, 55% of the food vendors in Buru Buru have worked in the street food business for 2 to 5 years while those in Viwandani were the most experienced having worked for over 10 years. An observation was made that the food sellers failed clean fresh food appropriately. Food vendors interviewed prepared their foods in unhygienic environmental conditions near dusty roads. They sourced their food from formal markets, informal markets, shops, farms, and wholes. The government is recommended to invest in the street foods as it generates jobs and provides inexpensive food to urban dwellers.

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ABBREVIATIONS AND ACRONYMS

FAO	Food and Agriculture Organization
LFS	Local Food System
SF	Street Food
SFV	Street Food vendors
NCDs	Non-Communicable
COVID 19	Coronavirus disease
2019 WBG	World Bank Group
WB	World Bank
NASVI	National Association of Street Vendors of India
SSA	Sub-Saharan Africa
KFC	Kentucky Fried Chicken
MUFPP	Milan Food Policy Pact
PNT	Positioning, Navigation, and Timing
GPS	Global Positioning Systems
GNSS	Global Navigation Satellite System
GIS	Geographical Information System
XY	Latitude Longitude
QGIS	Quantum Geographical Information System
KDE	Kernel Density Estimation
GK	Government of Kenya
NCC	Nairobi C i t y County
NCIDP	Nairobi County Integrated Development Plan
CBT	Consumer Behavior Theory
MH	Ministry of Health
MHFA	Ministry of Health Food

Act CRS Coordinate Reference
System

UTM Universal Traverse
Mercator

WGS 1984 World Geodetic
System

CSV Comma Separated Values

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The Food and Agriculture Organization (FAO) defined street foods as “ready-to-eat foods and beverages prepared and/or sold by vendors and hawkers especially in streets and other similar public places” (Peter et al., 2002). Street foods are a constituent of the local food system. Street foods in urban areas help to enhance food security through increasing food availability for the urban dwellers (Peter et al., 2002). Local food systems (LFS), are developing field of study in the realm of food geography (Gatrell et al., 2011). These food systems have adequate development potential for changing the whole food system framework (Gatrell et al., 2011).

The focal point of this study is the street food vendors. In the recent years, street food selling has become a remarkable global development. According to Sambo (2014) in a study in Lusaka Central Business District, food street vending is caused by;

...“deterioration of rural living conditions, migration to the cities, and accelerated urbanization leading to enormous urban congestion, long commuting distances between the workplace and home, and a shortage or absence of establishments that serve reasonably priced food close to the workplace”.

Rena and Ahirrao (2016), the enterprise of street food selling belongs to the unrecognized sector. Although street meals provide a diverse range of economically priced and conveniently accessible foods to a considerable number of individuals each day, it is unrecognized by government policy (Muinde and Kuria, 2005). A study carried out by National Street food Vendors of India (NASVI) in (2018), stipulated that in many

industrializing countries, street food trade is a growing sector as a way to give ease nourishment to a developing urban population of jobless individuals and low-wage laborers. Further contends that selling of street foods is a household-based practice that has turned out to be a chance to produce income for some urban dwellers.

Alimi (2016), emphasized the importance of street food due to their moderate pricing and hence affordability for urban low and middle-income earners. NASVI, (2018) in their study in India observed that street food vendors are indicative of life in many towns in Indian. The activity of street food sale contributes to livelihood through income generation for some individuals who don't fit into the formal sector. Street food vending not just fill in as a substantial income hot spot for some individuals in the business. However, it additionally adds to the food security of urban dwellers (FAO 1995).

Street meals are perceived to be the most economical and convenient option for low-income people to get a readily prepared meal outside the household (Privitera and Nesci, 2015). Street food vending is viewed as enveloping a broad scope of fully prepared-to-eat food and drinks available, prepared and sold along streets and overall public spaces like transport stations, parks, schools, building destinations and whatever other areas where the number of possible clients is high (Sambo, 2014). Street foods are normally traded from kiosks, pushcart, and impermanent stalls and costing less amount than a restaurant. Street food enterprises' are commonly little in size, and generally requires a little amount of money to start (Oluwoyo and Enemali, 2016).

Sverdlik et al., (2016), street food selling in African unplanned urban areas play an essential function, but unmarked roles in relieving food insecurity. A large number of vendors are women trading low-cost food to their chap residents.

1.2 Problem statement.

This study is a comparative analysis of Viwandani (low-income area) and Buru-Buru (middle-income area) street food vendors to demonstrate their roles in providing food access to urban dwellers through a comparative analysis. Food vendors in urban low and middle-income residential areas plays a key role in guaranteeing urban dwellers have access to food (Battersby and Marshak 2016).

This study was carried out in Viwandani (low-income area) and Buru-Buru (middle-income area) residential areas in Nairobi. It sought to compare street food vendors in low and middle income in an urban area. The comparison was important in understanding how the low and middle income earners are feeding themselves in an urban area.

Several existing studies such as Muinde and Kuria (2005) which focused on hygienic and sanitary practices of street food vendors in Nairobi showed that, researchers are still giving a lot of focus on the street foods in the street of Nairobi, dangers of street foods, and did not compare street food vendors in low income and middle income areas, and their importance in making food available to urban dwellers, and creating employment. The aim of this study is to compare street food vendors in low income and middle income areas. Comparing is unique and important in this study as it help us form a baseline for street food vendors as far as the food they provide, their demographic and socio-economic characteristics, and the environment where they operate is concern. By providing empirical data, future studies will know if street food vending is making any progress.

1.3 Research questions

- i. How do the demographic and socio-economic attributes of street food vendors of Viwandani compare with those of Buru-Buru?
- ii. What foods are sold in Viwandani and Buruburu, and how are they spatially distributed?
- iii. How does street food vendors contribute to urban food access?
- iv. What are the sources of food sold in the study area?

1.4 Objectives of the study

1.5 General Objective.

The general objective of this study is to compare the street food vendors of Viwandani and Buruburu residential areas in relation to demographic and socio-economic factors, personal hygiene, environmental conditions they operate in, sources of food sold, and contribution to food access.

1.5.1 Specific Objectives.

- i. To compare demographic, and socioeconomic characteristics of the street food vendors in Viwandani and Buru-Buru.
- ii. To map and characterize the street food types sold in Viwandani and Buruburu.
- iii. To assess the contribution of street foods to urban food access.
- iv. To analyze the sources of food sold in the two study areas.

1.6 Justification of the Study.

The aim of this study is to compare street food vendors in low income and middle income residential areas through a GIS approach. This study is in line with SDG number two; zero hunger and one of the Big Four agenda of the Government of Kenya on the food security. The government of Kenya has assigned a priority to food security and promised to guarantee that by 2030, all Kenyans will be food-secure by enhancing food production, supply, and decreasing food prices to guarantee affordability, and by promoting added value in the food pricing value chain (Sverdlik et al., 2016).

The right to food is a fundamental human right within the Kenyan constitution. Article 43 of the constitution builds up Kenya's entitlement to be liberated from hunger and have sufficient food of satisfactory standards. Section 21 states that measures must be taken by the state to accomplish the dynamic acknowledgment of rights ensured by article 43. National food policy (sessional paper No. 4 of 1981) was Kenyan's first food policy and intended to maintain self-sufficiency and to guarantee fair dissemination of nourishment of dietary benefit to all citizens (Lee-Smith and Lamba, 2016).

Available data on the urban street food policies is very scanty in Kenya, yet this is the most common type of food in urban low and middle-income areas. Lack of specific policies and regulations to govern street food sector provide room for poor standards. As the country moves towards the realization of Vision 2030, there is a need for empirical data that highlights the functions of street food vendors in providing food to urban dwellers. World Bank (2017), states that more than half of the Nairobi population lives in low and middle-income areas. It is, therefore, vital to ascertain how the low and middle-income urban dwellers are feeding themselves by data, which will help understand street food vending in an urban areas.

This study on the street food vendors in Viwandani and Buru Buru will be significant for the following ways;

It will provide a strong stimulus for the improvement of street food vendors policy by providing a comparative of low income and middle income residential areas empirical data on the significance of street food vending as a contributor to urban food access. It will contribute to the comprehension of the street food vending.

1.7 Scope of the study.

This study was carried out in the low and middle-income areas, which are Viwandani and Buru Buru, respectively, in Nairobi city county. This study endeavored to spatially analyze and map the streetfood vendors of Viwandani and Buru-Buru concerning the spatial distribution of food vendors, types of foods they sell, socioeconomic characteristics, food sources, urban food access and proximity to strategic locations that customers can access them at ease. The study was limited to the food vendors, particularly street foods vendors that serve the urban poor through informal street foods and little cafés not commonly registered businesses. It mapped and characterized the food sold in the local food network of Viwandani and Buruburu, analyze and compare the socioeconomic essence of the street food suppliers, evaluating the contribution of the street foods to urban food access and analyzed the food sources of Viwandani and Buruburu.

1.8 Operational definitions.

Local Food Systems: Local food systems and local foods are frequently founded on a geographical definition identified as separating food providers and customers (Martinez et al., 2010). As per Peters et al., (2008), the terms are frequently used

reciprocally to refer to food retailed in proximity to its place of production and consumption. In this study, local food system is used to refer to food that is procured by consumers who live in the neighborhoods of where the food is sold.

Food System: the inter-connected network of stakeholders in a geographical area that takes an interest legitimately or by implication in the formation of goods/services geared towards gratifying nourishment needs of one or group of customers in the equivalent geographical region or somewhere else (Rastoin & Ghersi 2010).

Informal food system: refers to the food supply chain that transcendently appeals to the working urban poor by unregulated street food vendors, and small restaurants not commonly listed as businesses. (World Bank Group, 2017).

Food security: Defined as “when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (world food summit, 1996).”

Street food: refers to ready and prepared-to-eat food or beverages offered by food vendors on the street or other public places (Simopoulos & Bhat, 2000).

Street food vendor: widely referred to as an individual who offers affordable cooked or uncooked food and beverages drinks available to be purchased to the general population having no fully built infrastructure to sell from. They might be stationary as they settled in spaces on the pavements. (Sharit, 2005).

A consumer: "an individual who purchases, can and afford to purchase, goods and services offered for sale by marketing institutions to satisfy household desires, wants, or needs" (Walters, 1974).

Consumer behavior: “the process through which people determine whether, what, when, where, how, and from whom to purchase goods and services (Walters, 1974).

Geographical Information System (GIS): Dueker (1979), defined GIS 'a computer system for acquiring, storing, verifying, and displaying data relating to location on earth's surface'.

Global Positioning System (GPS): is a network of satellites and receiving devices used to determine the location of an object on Earth. It is a U.S. operating system offering Positioning, Navigation, and Timing (PNT) facilities to users. There are three segments in this system: the space segment, the user segment, and the control segment. The United State Air Force designing, managing, and running the space and control modules. GPS is an effective radio-navigation system globally that comprises of a collection of spacecrafts and their ground stations.

CHAPTER TWO: LITERATURE REVIEW, THEORETICAL AND CONCEPTUAL FRAMEWORKS.

2.1 Introduction.

The primary goal of this chapter is to present an effective assessment of the various studies related to the subject. The literature review concentrated on street food vendors by clearly introducing informal street food vending. The chapter also provides the theoretical underpinnings of the study and conceptual framework.

2.1.1 Socio-economic and demographic characteristics of street food vendors.

Chen, (2001) in his study analyzed the features of street food sellers and observed that socio-economic characteristics of street food vendors vary. He performed a global survey on the informal food industry and found that street food sellers in most countries ranged from 25- 60 years of age, with a plurality in the age category 30-40 years. Beneria and Maria (2006) research on labor market information, gender and social protection found that street food vendors' revenue relies on the foods they offer and ranges from item to item, from place to location, as well as amount and terms of exchange. Krishna (2011) estimated street food vendors' monthly income at 3000-3500 takas (3871-4516 Kenyan shillings). Adewale et al. (2022) in their study in Nigeria discovered that the average monthly income of street food vendors was N28, 023.35 (Ksh.7843.26).

In a study by Codija (2002) conducted a study on street food vending in Pretoria, it was observed that women are the major players in the street food vending business. While Depeolus et al. (2007) found that there were only women in the street food business of major towns of Ogun in South West of Nigeria. Furthermore Mwangi (2002) in another study in central Kenya observed that women in Kenya were found to participate in street food selling because it is an extension of their cultural roles.

Additionally, the low capital required to engage in street food sale makes it an easy business that offers many women a quick entry.

Depeolus et al. (2007) in their study found that 96.7% of the street food vendors were married compared to 3.3% who were single. They further found that those in the age category 41-50 (36.7%) were more compared to those in age category 61-70 (3.3%), with 28.6% having no formal education. Muinde and Kuria (2005) observed that more than half of the food vendors 57.5% were married, and Sixty-two percent of the vendors they surveyed had primary education of which more were women. According to their study (Muinde and Kuria, 2005) no street food vendors had been trained on food preparation skills but rather majority 61% acquired knowledge on food preparation through observation.

Street foods provide reasonable nutrients to majority of the individuals operating in low and middle-income areas in the developing countries (Gawande et al., 2013). This study used the following socioeconomic attributes to analyze every food vendor. They include; (i) age, (ii) gender, level of education, (iii) income (iv) experience in food vending, (vi) washing practices, serving practices, (vii) waste disposal, (viii) personal hygiene, environmental condition; (ix) working hours. There is an expanding body of acknowledge that shows street food sales play a significant socioeconomic function such as employment opportunities, giving exceptional income especially for women, and supplying meals at reasonable costs, mainly to low and medium income people in the cities (Chukuezi, 2010).

2.1.2 Characterizing and mapping the street food sold by street food vendors.

Foods found on the streets are diverse, they are either cooked or uncooked, processed and unprocessed foods. For instance, in Delhi in India NASVI (2018) found that major food stuffs sold were chana-bhatura, rice, vegetables, roasted peanuts, mutton, chapati,

fruit chaat, samosa, popcorn, and bread pakora. Kinabo et al., (2006) in the street of Dar-salaam in Tanzania observed that street food vended include, ugali, rice, beans, chicken, fish, meat, chapatti, doughnuts, and black tea, vegetables, egg chops, boiled eggs, grilled maize combs, Beef (soup / stew), Cassava (boiled). In another study Muinde and Kuria (2005) found that vegetables, fruits, beans, green grams, fish, chicken, roasted maize, chapati, mandazi and beef are the type of foods vended in Nairobi.

GIS provides the opportunity to spatially display "measures of proximity, connectivity, and density" with characteristics of food vendors. Abu (2012) in his study in Illinois used GIS methodology to map street foods and found that they are not evenly distributed but rather scattered. In his study, Abu (2012) identified stationary food vendors using aerial photographs. Battersby et., (2016) on the other hand carried out a study in Cape Town where local food was mapped. A GPS receiver was used to record the coordinates of each food vendor and the data was downloaded to a laptop, and ArcGIS was used after which it was displayed on a map. They found that the distribution of food vendors was scattered.

Githiri et al., (2015) in her study in Nairobi's informal settlements used participatory GIS and community-led mapping and aerial images from balloon mapping to map street food sellers. They study analyzed data using QGIS and from their findings, they observed that the distribution of street food vendors was linear. They observed street food vendors tend to align themselves along footpaths and main roads.

2.2.3 The role of the informal food economy in addressing urban food access and job creation.

Street food provides sustenance and nutrition for the urban population thus supporting food security stable. Since street food vendors have small operations, they occupy free space without renting, maintenance costs are low, and are perceived to be cheap hence

easy to start a food vending enterprise. People with very small incomes afford street foods every day to support themselves and their families.

Street foods often provide nutritional support for low-income urban community and livelihoods in many developing countries for a significant portion of the population. Food is usually accessible through trade in the area, and street food sales (FAO,1990).

Street food provide direct employment to vendors as well as indirect employment to many urban people who would otherwise be unemployed (Jayasuriya, 1994). Agriculture is also promoted because many products for street foods are purchased locally (Cohen and Garrett, 2010).

The food system has a strong opportunity for jobs creation in low-and middle-income urban areas, considering the primacy of food in family spending for all of the population. Street food vending offers jobs to food sellers and their workers. The informal food infrastructure not only increases physical access to food, but also provides prospects for income production, which is key in a city where access to food relies on cash income (Maxwell 1999). The significance of street meals also involves increased food access around the city. Street foods feeds and nourishes a large number of the population and contributes to the stability of food security. Fraser et al., (2014), observed that (65%) of street food vendors in Canada indicated that they offered food on credit to urban dwellers. This is another aspect of food access that enables urban dwellers to obtain food regardless of their income.

Food in cities depends primarily on the ability of individuals or households to purchasing food, which is dependant on family earnings, food prices and the location of food outlets. Githiri et al. (2015) study indicates that since street foods is moderately priced (75%) of the residents of informal settlements in Nairobi get street food at least five days a week. Street meals, as per Githiri et al., (2015), are constantly accessible on the street to meet the need of this expanding number of urban people since they provide quick, economical,

satisfying, familiar, and excellent cuisine within a short walk.

2.2.4 Local food sources.

The street foods sold in the streets of Mumbai in India are procured from farmers market, groceries, wholesale and supermarkets. These foods include; vegetables, wheat flour, dominos and pizza, donuts while meat was bought from meat retailers. The animal products included, buffalo meat, mutton, chicken, turkey meat, goat meat and seafood (NASVI, 2018).

Street foods vended in the streets of Dar-salaam in Tanzania are available from a variety of sources. Street foods are sourced from traditional markets, wholesale markets, retail shops and supermarkets, as well as from local farmers (Kinabo et al., 2006). Food sold is mostly ugali, rice, beans, chicken, fish, meat, chapatti, doughnuts, and black tea, vegetables, egg chops, boiled eggs, grilled maize combs, Beef (soup / stew), Cassava (boiled).

The street food vendors of Nairobi are getting their stock from a range of sources. Wholesalers are a big source of dry cereals, ovens, and cooking oil. Small shops and retailers are a common source of cooked eggs, drinks and supplies. For fresh fruits, fresh vegetables, and other fresh items, roots and tubers, dry cereal, fish, meat, chips, bhajia and cooking ingredients are preferably sourced from city's formal markets. Farms were the source of the freshest produce. But chicken, fresh fish, fresh corn and fresh milk were the primarily sourced from rural farms. While few vendors indicated that their inventory was taken from other manufacturers and retailers, chicken and fish were sourced between 15% and 20% from farms (Owuor, 2020).

In conclusion, Nairobi's informal food sellers were more likely to get the majority of the food they sold from other shops in town rather than directly from manufacturing companies, notably wholesalers and official marketplaces. Furthermore, while informal

food providers are linked to numerous formal suppliers, this does not encompass supermarkets, which play a minimal part in these suppliers' buying strategy (Sverdlik et al., 2016).

2.3 Research Gap

The greatest challenge that is facing global cities right now is how to provide food to the rapidly growing population. Over the past decades, food insecurity has come out as the main challenge in cities and as a pivotal issue for urban planners (Fattibene et al., 2019). There is a historical scarcity of enough data on the comparison of street food sellers in the low income and middle income residential areas. Street food selling in Kenya is the most common activity of ensuring food is accessible and available in the low and middle-income areas in urban (World Food Summit, 1996).

This study was on street food vendors in an urban centre. Several studies that have been undertaken on street food sellers focus on food vendors in the streets of Nairobi centre, dangers of street foods, and informal settlements but did not compare street food vending in low income and middle income residential areas.

This study filled the gap by providing data through a comparative study between low and middle-income residential areas on food vending to the scanty information on street food selling in low and middle-income areas as well as contributing to the body of knowledge on street food vending in Nairobi through a methodology GIS tool.

2.4 Theoretical Framework

2.4.1 Consumer behavior theory.

It is generally the study of individuals, or organizations and the procedures they use to explore, choose, utilize and to satisfy necessities (Richarme, 2007). It implies the subjective mental exercises that consumers or food vendors experience, in acknowledging needs, determining approaches to settle their demands, and devising purchase decisions. It endeavors to recognize and comprehend the decision-making procedures of buyers, both in groups and individuals. It likewise attempts to measure effects on the consumer, and food vendors at large (Richarme, 2007).

Global diets are continuously switching towards more traditional and greater-quality, nutritionally-dense commodities such as dairy products, oils, meat, and vegetables especially traditional vegetables such as *Terere* (Amaranthus), *Managu* (Black Nightshades), *Kunde* (cowpea leaves), *Nderema* (Bacella Alba) which are currently assumed to be more nutritious and vitamin-dense than conventional vegetables such as kale (Denning and Fanzo, 2018).

In recent years, there has been a shift in food taste among urban people towards street food consumption due to hard economic times (Branca et al., 2019). This has also changed the way street food is prepared and stocked. This is because street food vendors work so hard to meet the demands and preferences of consumers of their foods. This study observed a high number of street food consumers of both cooked and uncooked street foods (Atinkutt et al., 2018).

Street food vendors of Viwandani and Buru-Buru stocked in large numbers meat from *kuku kienyeji* (free range chickens) beef and goat meat. They also stocked traditional vegetables such as *Terere* (Amaranthus), *Managu* (Black Nightshades), *Kunde* (cowpea leaves), *Nderema* (Bacella Alba), *Mrenda* (Jute), *Mitoo* (Crotalaria) and *Saga* (spider

plant).

Stocking these food items in large quantities was a response by street food vendors to the high demand and preference of consumers. Due to the current trend of many consumers to avoid the consumption of fat-dense foods which may lead to obesity and other non-communicable diseases such as cancer, heart disease, and diabetes, they highly demand traditional vegetables.

Consumer behaviour demanding these products has also affected food vendors' stocking behaviour as vendors were seen stocking these products in large quantities. Some food vendors were observed to have started specializing in stocking traditional vegetables only.

According to this observation if this demand for these particular products (meat from free-range animals and traditional vegetables) continues for a long time uninterrupted it is then predictable that it may also affect product orientation at the farm level (Denning and Fanzo, 2018).

The theory of consumer behaviour presumes that consumers/suppliers are rational and efficient in decision-making (Atinkut et al., 2018). Consumer preferences influence their buying decisions, and this decision leads food vendors to stock large quantities of those products that are popular on the market (Nowicki and Sikora, 2012). Studies reported that people's behaviour toward foods has shifted towards street foods and has become a preference of many due to the perception that street foods are healthier.

2.5 Conceptual Framework

The conceptual framework (Figure 2.1) illustrates a proposed causal linkage among a set of concepts believed to be related to street foods, and how food supplied by retailers and street food vendors helps to nourish urban dwellers and provide urban food security. In the boxes are the concepts, while arrows, in this case, illustrate complex connections and impacts but not immediate causality. This conceptual model is the researcher's view and oversimplification of a complex reality in the world of street foods according to this study.

Humans must eat to survive, and the types of food they consume determine their health. A change in the feeding pattern of a consumer, for example, changing diet from the consumption of fat-dense foods such as chips that may lead to NCDs, will affect what the food vendor stocks (Klimis-Zacas et al., 2001).

For a street food vendor, education level, age, gender, and experience are essential socioeconomic and demographic factors. The level of education or skills in food handling is very crucial. A well-skilled street food vendor prepares clean food, which is a food with the right proportions of food additives such as cooking oil, salt, and other flavors, but unskilled food vendor who cooked food with too much fat and spices, for example, may expose the consumers to NCDs (Branca et al., 2019). A street food vendor with training in food preparation and handling and observe hygiene levels are likely to prepare and handle food in practical ways to avoid contamination and hence attract many consumers. Young street vendors are expected to trade with fast foods that are easy to prepare. Experienced street food suppliers are likely to have acquired the skills of culinary prowess hence make and handle food in the appropriate ways. Almost all of the qualified street food suppliers specialize in what their customers demand; for example, if most of his/her customers require is a local vegetable, they may choose only to sell these

vegetables.

Mapping is the activity of creating graphic representations of a piece of the Earth's surface. Maps of the study areas were created as well as maps of food vendors. This study mapped and visualized relationships between street food vendors and other features such as water points and public toilets.

What urban dwellers consume depends on what is available, accessible, and affordable and being offered by street food vendors at their proximity. This means changing what is sold by street food vendors will affect the whole process. People residing in low and middle-income areas may not have many options left to them from which to choose but to obtain their foods from the closest street food suppliers.

Urban food access is the primary dependent variable in the diagram bellow. A slight reduction in the food offered by street food suppliers to low and middle-income earners, through denying of license for them to operate, will threaten food access in low and middle-income urban areas. It is then necessary for all policymakers to deliver policies that will legalize the operations of street food vendors in these urban areas.

Consumer Behavior is the main decision-making factor for what food an individual consumes on a daily basis/ what food is stocked by the street food vendor. The choice of food is also determined by preference. People mostly consume what they prefer to be healthy for them and it is what is stocked in the market in large quantities due to demand. It is through these preferences that are driven by consumer behaviour that an individual chooses where and what food to procure, prepare and eat.

The outcomes consumer behavior is a diet that people choose that is diverse, and safe. The current shift to street foods demands that it ought to be a sustainable diet. When all factors in play, i.e., policymakers, government, and urban planners legitimizing street food vending, will result in a sustainable local food system. The FAO (2010) defined

sustainable eating or diets as those with a low ecological impact. Added value to food and nutrition, as well as healthy living for present and future generations.

The level of education for a consumer is very critical for choosing the most nutritious foods hence avoiding the consumption of junk foods that are predetermined to be the cause of NCDs. The income of a consumer correlates with the food they will afford, for instance, some local vegetables such as *Terere* (Amaranthus), *Managu* (Black Nightshades), *Kunde* (cowpea leaves), *Nderema* (Bacella Alba), *Mrenda* (Jute), *Mitoo* (Crotalaria) and *Saga* (spider plant) in Kenya are sold at higher prices than other vegetables simply because they are perceived to be more nutritious than the other conventional vegetables such as kale, cabbage and spinach. Young people are likely to consume fast foods because they may not be very keen or well educated on the effects of fast junky foods on their health. Most of them also may not like to cook for themselves hence end up depending entirely on the street provided meals. At the same time, older people are keen to choose the most perceived nutritious food as a way to avoid being overweight and live free from NCDs such as diabetes and high blood pressure, which are related to food consumed and the age of an individual.

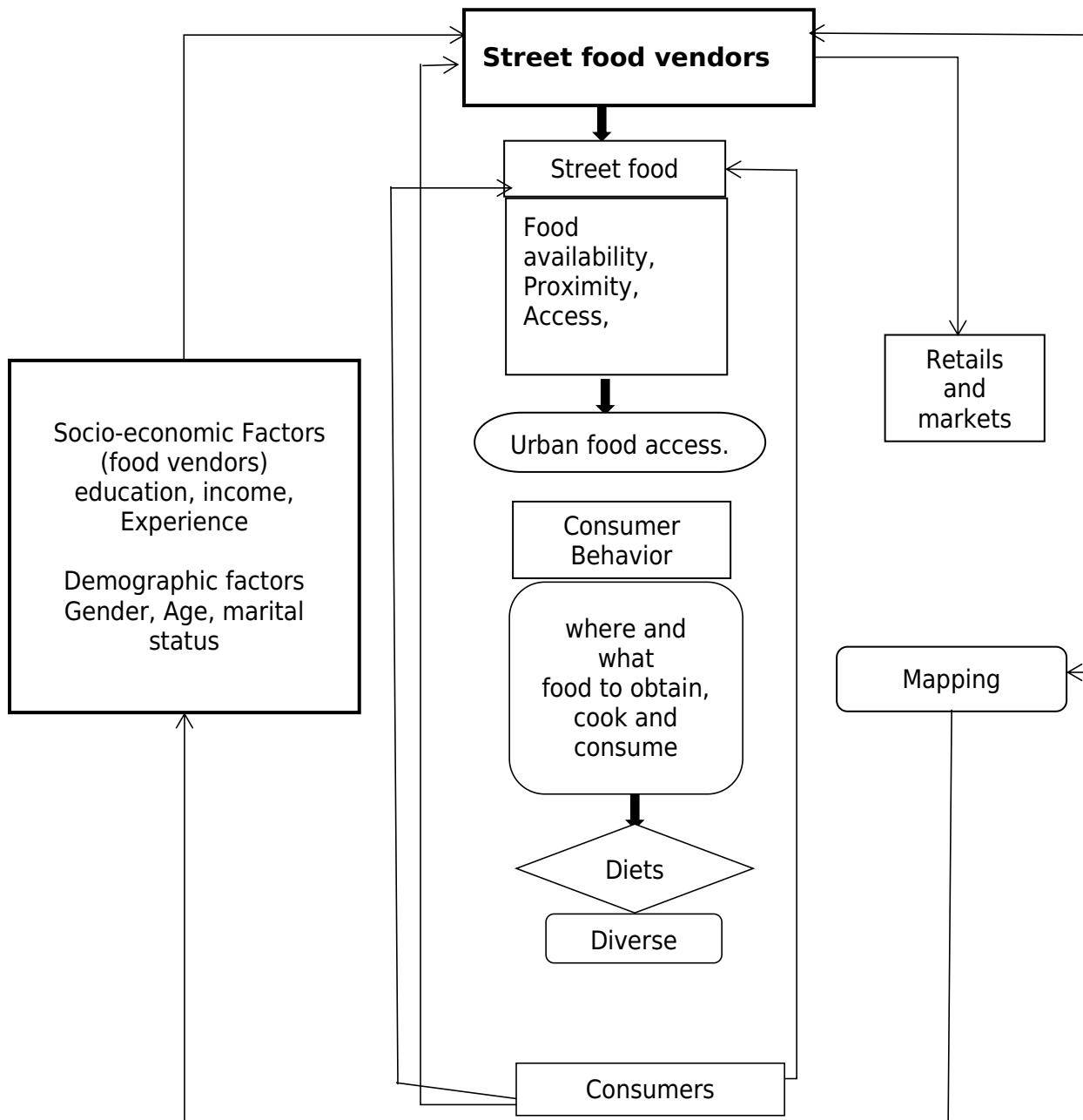


Figure 2.1: Conceptual Framework

Source: modified from Branca et al., 2019.

CHAPTER THREE: RESEARCH METHODOLOGY.

3.1 Introduction

This chapter provides a full overview of the study area as well as the methods that were utilized to collect and present data.

3.2 Study area

3.2.1 Location

The study was done in Nairobi City County, Kenya. This is one of the Republic of Kenya's 47 counties. Machakos County Borders Eastward, Kiambu Northward and Westward, and Kajiado Southward. This spans 696.1 square kilometers and extends from 36 ° 45 ' East to 1 ° 18 ' South. It is located at an altitude of 1,798 meters (Nairobi County Integrated Development Plan, 2014).



Figure 2: Location of Nairobi County in Kenya map boundary.

Source: Nairobi County Integrated Development Plan, 2014.

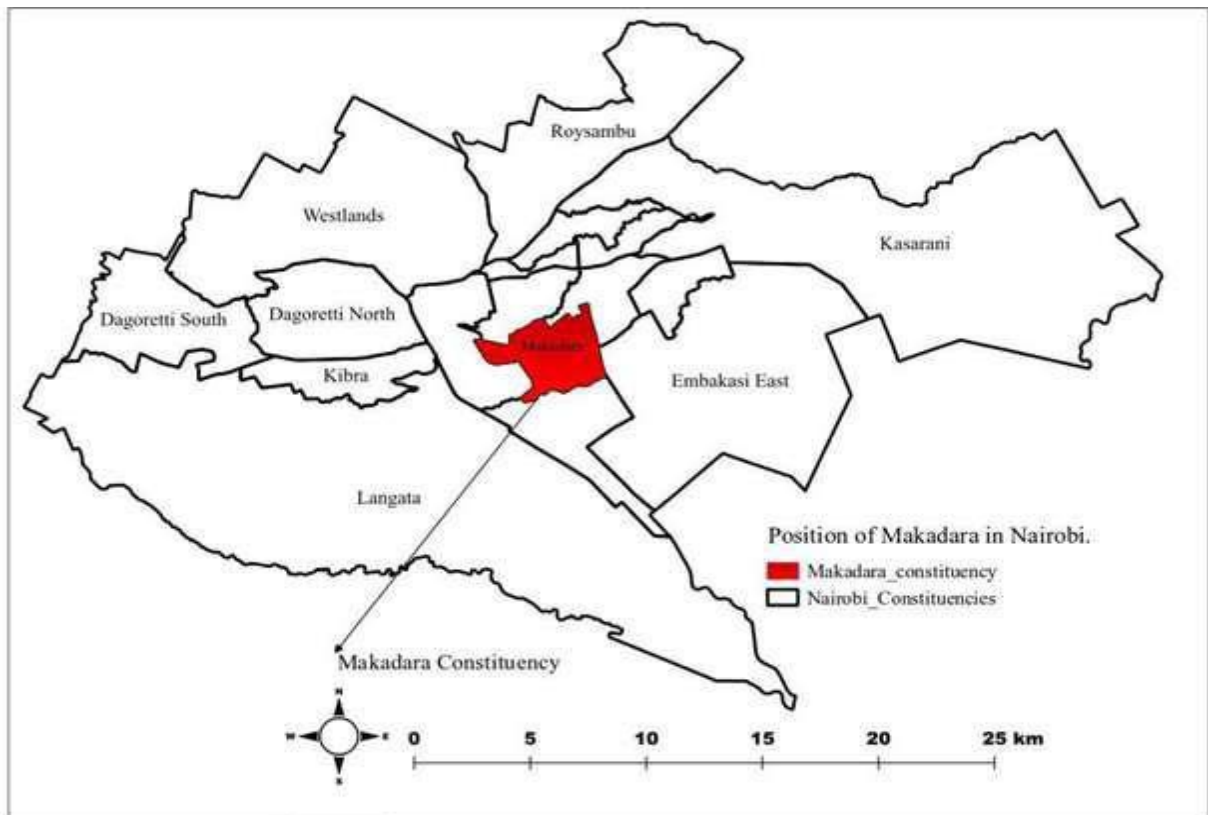


Figure 3: Position of Makadara in Nairobi boundary.
 Source: IEBC Data 2017 (Cartographer: Researcher).

3.2.1 Viwandani Ward.

Viwandani is a low-income area. It is situated 7 km South-East of the center of Nairobi in Makadara constituency and has 13 villages (Lunga Lunga Center, Milimani, Paradise A, B, and C, Kingston, Lunga Lunga Donholm, Sinai, Tetrapak, Jamaica, Riverside, and Sinali Reli). In Swahili, 'Viwandani' signifies 'at the industrial zones,' and the settlement provides accommodation to individuals operating in the neighboring industries. It started back in the 1960s when Lunga Lunga Centre was set up as a waste disposal site. The Ngong River, vigorously and heavily contaminated by industrial effluent, is situated to the south of Viwandani, while the industries are arranged towards the north of the settlement (Githiri et al., 2015).

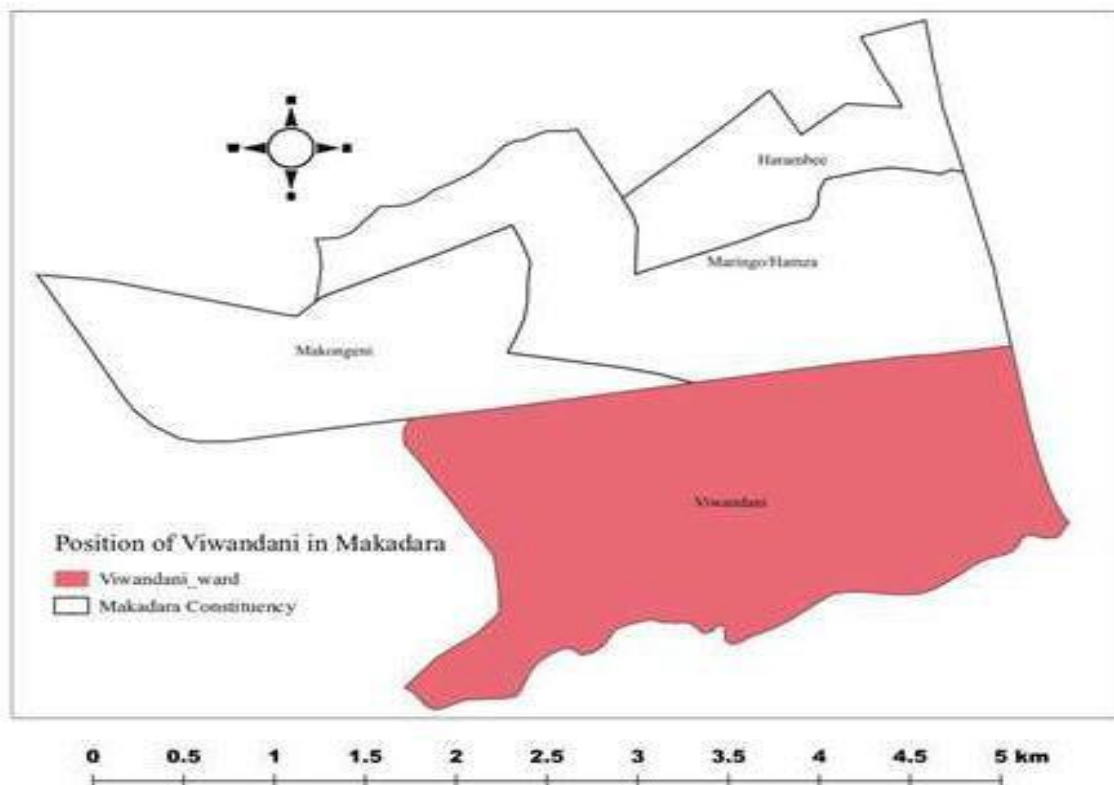


Figure 4: Location of Viwandani in makadara sub-county.

Source: IEBC Data 2017 (cartographer: Researcher).

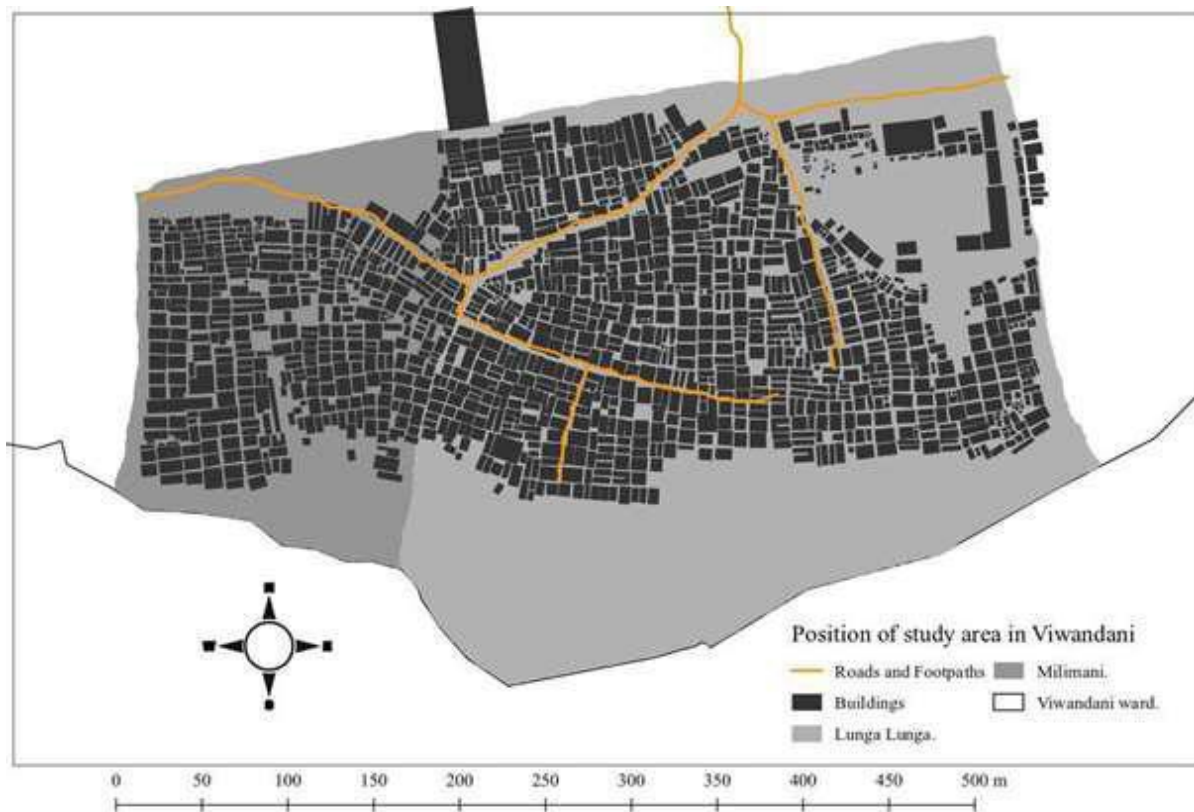


Figure 5: Location of the study area in Viwandani ward
 Source: IEBC Data 2017 (Cartographer:Researcher).

3.2.2 Buru-Buru.

According to Atakachia (2010), he traces the beginning of Buru-Buru to the 1962 Regional Boundaries Commission that supported the eastward extension of Nairobi for building project development, the activity that joined the former Denholm Sisal Farm into the city as a residential zone. Buru-Buru is located in the East-lands part of Nairobi city, about 12km. It is situated in Makadara sub-county in the Maringo-Hamza ward. It is a large middle-income residential area which consists of five phases of 1000 units each, with the fifth phase completed in the year 1982. The houses of Buru-Buru bear a likeness to the modern architecture of white buildings. They have a sensational, thrilling appearance of orange tiled rooftops built in a two-house alignment. The estate was build in the 1970s and 1980s and by then was mostly inhabited by Kenyan business people, professionals, and government officials.

Buruburu has very famous open-air markets such as Mutindwa. The significant dissemination ways that characterize the edges and detach it from neighboring areas comprise: (The Railroad line toward the South and Eastern course and Jogoo road toward the West. These two characterized the vast spans of free space toward the south that faces the industrial area. Rabai Street frames a circle on the Easterly and Northerly sides (Atakachia, 2010).

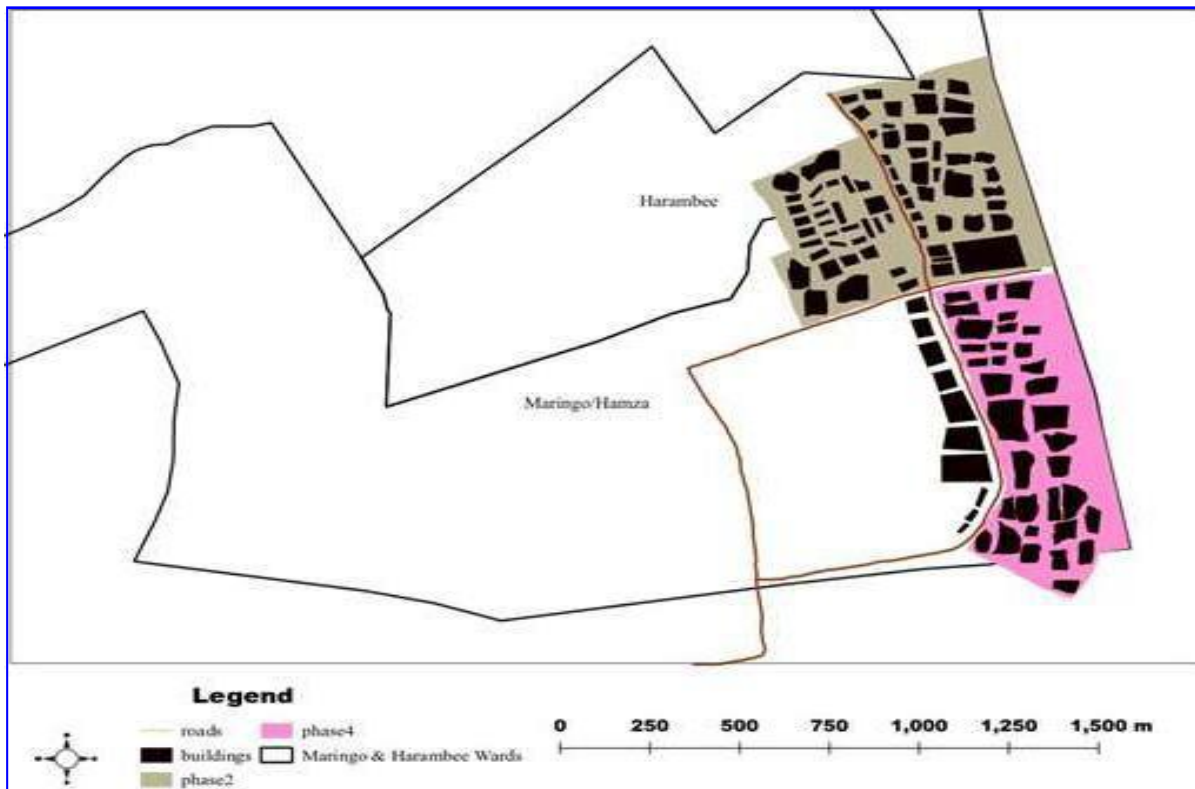


Figure 6: Location of Buru-Buru (phase ii & vi) in Maringo-Hamza & Harambee ward.

Source: IEBC 2017 data (cartographer: Researcher).

3.3 Research Methods

3.3.1 Research Design

This research used exploratory research design with qualitative data collection methods and analysis, to determine the socioeconomic characteristics of Viwandani and Buru Buru Street food vendors. The study, therefore, used qualitative to investigate the spatial distribution of street food providers in Viwandani's and Buru-Buru low- and middle-income areas in Nairobi.

3.3.2 Sources of data.

3.3.3. Secondary data

Data for this work had been obtained essentially from a desk revision of the full scope of literature on the street food vendors. Numerous research literature were consulted, reviewed, verified, and adopted from different sources including journal articles, theses, published reports, working papers, and statistical abstracts. The data was derived from various sources including national and university libraries.

3.3.4 Primary data.

Semi-structured interviews were utilized to gather the essential primary data for this study. This helped to elicit responses on socioeconomic characteristics of food vendors, gender, age, education level, income per month, personal hygiene of the vendor, experience, sources of food, nature of vending space, location of the vending area, time of operation, typology of food sold, the know-how of food preparation, space of food preparation, environmental conditions of vending space, vendors relationships with customers and structural drivers of business practices. Primary data was obtained from the field using interview guides and general observations. The interview guides were used to collect both qualitative data.

3.3.5 Target population

The researcher's target group included all street food vendors aged 18 years and above in Viwandani and Buru-Buru during the time of the investigation. But the accessible group was only street food vendors in the village of Lunga Lunga and Milimani in Viwandani which were low-income areas with an estimated population of 54 street food vendors and phase 2 and 4 in Buru Buru which was a middle-income area with an estimated population of 50 street food vendors. The population of this study encompasses all subjects (street food vendors) having the features of the inquiry (the sale of process, cooked or uncooked food) living within Lunga Lunga and Milimani, and Buru Buru phases 2 & 4). This research's target group included all street food sellers aged 18 and above in Viwandani and Buru-Buru during the time of the investigation.

3.3.6 Unit of Analysis

Acheampong (2016) referred to units of analysis as the observational units, objects and events to be studied or measured in order to study real phenomena. Street food vendors from the specific areas (Viwandani villagers and two Buru Buru phases) were the units of analysis used for this study and were 18 years or more at the time this study was conducted.

3.3.7 Sampling Technique

In this study, census sampling was utilized to choose all street meal vendors in Viwaandani village of Lunga Lunga and Milimani, as well as phase 2 and 4 in Buru-Buru, who served cooked, uncooked, processes and unprocessed foods in the study area.

3.3.8 Sample size

A sample size of 104 street food vendors was selected from a population of 104 from both areas for the study. However, response rate was lower given the period of COVID-19 when the data of this study was collected. The study was carried on in the specified study areas during the afternoon and evening when the vendors have comparatively opened their businesses. Only 92 respondents out of 104 accepted to be interviewed which is a response rate of 88%.

Table 3.1: population and sample

Location of the study	Estimated street food vendors population	Sample interviewed
Viwandai		
Lunga Lunga	30	24
Milimani	24	24
Buru Buru		
Phase 2	27	22
Phase 4	23	22
Total	104	92

Source: street food vendors survey 2020

3.4 Data Collection Methods.

3.4.1 Global Positioning System (GPS)

It is a U.S. proprietor service that gives users Positioning, Navigation, and Timing (PNT) services. GPS Garmin eTrex 30 was used in this study to capture coordinates of every individual structure from which a food vendor operates. The GPS setting was set to the satellite system GPS+GLONASS, degrees decimals, UTM position formats, and WGS84 datum. The location latitude longitude (XY) of each street food vendor, public toilets, and water points were captured, stored and saved as way points in the Garmin eTrex 30 GPS, and as well recorded in the questionnaire.

3.4.2 Interviews

Interviews are especially helpful for learning the backstory of a participant's encounter (McNamara, 1999). Semi-structured interviews were used in this study to get information on the demographic and socioeconomic characteristics of food vendors, types of the food sold, sources of the food sold, pricing of the meal, as well as the impacts of food vendors on food access. Qualitative data from interviews was grouped in themes and analyzed using content analysis.

3.4.3 Observation.

Apart from semi-structured interviews, observation was also used to look at what exactly people do. It was essential to gather observational information (in addition to structured interviews) since what individuals say is not generally what they do. This observation was executed in real-world settings to record all activities of the food vendors, types of food they sell, interaction with customers, how they handle foods both cooked and raw. The observation was also exploratory, and the researcher took extensive field notes as well as taking photographs for the vendors' sites, their surroundings, and the foods they sell.

3.5 Data Analysis

3.5.1 Descriptive statistics.

The data for the study was largely qualitative and some of it based on vendors perceptions about their contribution on food access. The data was summarized into sub-themes and analyzed using content analysis. Descriptive statistics were used in summarizing the data in form of percentages and Frequency distribution tables and piecharts. A frequency table indicated how many times each response occurred (Mugenda and Mugenda, 2003). Graphs, charts and verbatim text were used to display the data. Spatial data was analysed using GIS and displayed on maps.

3.5.2 Geographical Information System (GIS).

This study used Geographical Information System (GIS). Street food vendors, water points and public toilets whose location latitude longitude (XY) were recorded in the questionnaire together with other attributes of street food vendors such as socioeconomic features, types of food the sell, and sources of food were entered into an excel sheet. Later converted into comma separated values (CSV) and opened using free opensource software quantum geographical information system (QGIS) 3.16.0 Hannover. The data in CSV format was opened in QGIS then converted into GIS Esri shapefile (shp) data for the format in which GIS manipulations such as symbology and labels were possible. This data was projected to coordinate reference system (CRS) WGS84/Pseudo-Mercator EPSG: 6871 which is in metre in order to allow the manipulations of spatial analysis techniques such as buffering, spatial selection by location, and hot spot analysis which can only be performed using CRS that uses metre and not degree decimals.

3.5.3 Buffering.

Buffering is a spatial analysis procedure by which zones of the determined radius (buffer distance) or width are characterized around chosen vector features or raster grid cells. Buffering includes estimating distance outward in directions from an object. It should be possible on every one of these three types of vector information: point, region, line. The subsequent buffer is a polygon file. Point buffering in this study was utilized to measure proximity to food vendors by giving a reasonable buffer distance (e.g., 30m) that a customer has to cover to arrive at a food point.

3.5.4 Spatial Selection.

Another valuable technique is spatial selection by location. These spatial queries technique enabled the study to pick out aspects in one layer by their spatial connections (contain, intersect or touch) features in another layer. This functionality in GIS can be accessed through the Select by Location and Extract by Location Processing tools in QGIS. Spatial selection by location in this study was used to find out the number of meal sellers close to the water source and public toilet for hygiene purposes. Spatial selection by location in this context is the selection of features in one layer in this case food vendor's layer that intersect or touches features in another layer i.e water point and public toilet layer.

3.5.5 Hot spots analysis.

Hotspots analysis is a GIS spatial examination and mapping strategy interested in the recognition of the clustering of spatial phenomena. These spatial phenomena are delineated as points in a map and allude to locations of objects or events. This technique in this study was used to measure the density or to analyse the locations in the study area where food vendors are highly concentrated and possible factors that can be attributed to the hot spots.

3.5.6 Baseline mapping.

This entailed mapping the settlements to delineate the boundaries of the study areas, individual street food vendors, drainage, kiosks, solid waste disposal points, and transport-routes.

3.5.7 Field Problems and Limitations of the Study

During the data collection phase, a substantial number of respondents requested a token (money) in order to participate in this study. However, the difficulty was addressed by communicating the purpose of the research to specific respondents prior to participating. Participants were informed that the research was for academic purposes only and was not a financed activity. In addition, participants were told about the researcher's occupation as a student.

3.6 Ethical considerations.

Various ethical principles underpinning these was observed. This includes official approval from the authorities concerned, informed consent of participants and information confidentiality.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

The study's findings are presented in this chapter. The findings are examined and described in sections based on the study's objectives.

4.2 Demographic attributes of the food vendors

4.2.1 Gender of street food vendors

Out of 92 street food vendors interviewed in Lunga Lunga and Milimani villages of Viwandani, and Buru Buru phase 2 and 4, it was recorded that (73%) were females, and (27%) were males in Viwandani compared to (68%) females, and (32%) males street food vendors in Buru Buru (Figure 4.7). Twenty seven percent in Viwandani and (32%) in Buru Buru males participation in street food business as observed in this study, contravene the perception among many Kenyans that street food vending is only a women enterprise.

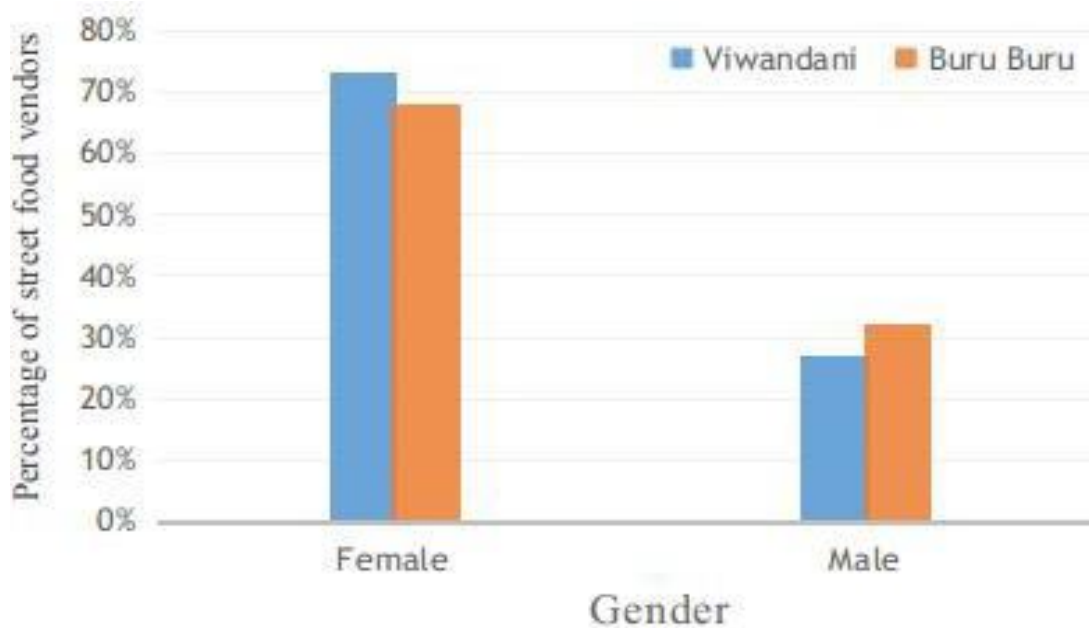


Figure 4.7: Gender of street food vendors

Source: Street food vendors survey 2020

4.2.2 Age categories of food vendors

With regard to age categories, the highest number of food vendors were found to be in the age category 40-49 comprising (40%) in Viwandani while in Buru Buru was found to be in 30-39 age category accounting for 50%. Viwandani had the eldest street food vendors in the age categories 50-59 (4%) compared to Buru Buru that had no elderly food vendors but had (26%) in the age category 20-29 (Figure 4.8). The synonymous age category of 40-49 comprising (40%) in Viwandani and 30-39 age category accounting for 50% in Buru-Buru is an indication of high rate of rural urban migration.

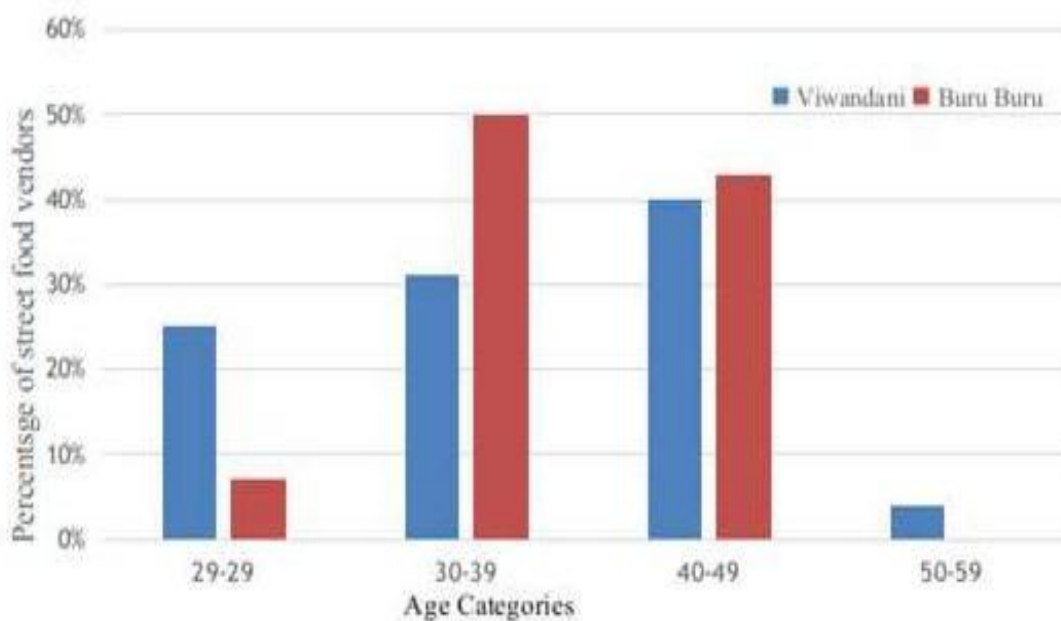


Figure 4.8: Age of food vendors

Source: Street food vendors survey 2020

4.2.3 Marital status of food vendors

In Viwandani, 56% of the street food sellers interviewed were married, while 10% were single, 6% divorced, 16% separated, 8% widowed, and 4% widower, compared to 59% single, 23% married, 11% separated, and 7% divorced in Buru Buru. Buru-Buru, unlike Viwandani, had neither a widow nor a widower (Figure 4.9).

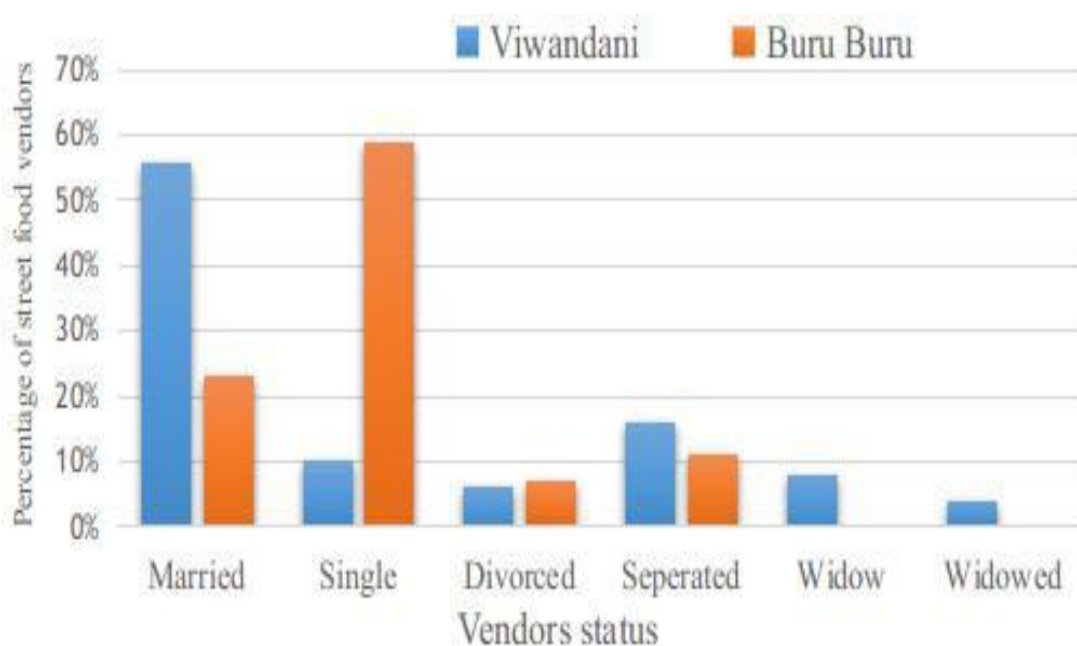


Figure 4.9: Marital status

Source: Street food vendors survey 2020

4.2. 4 Results of demographic attributes of the food vendors

According to Figure 4.7 of street food vendors interviewed in Lunga Lunga and Milimani villages in Viwandani, and Buru Buru phases 2 and 4, (73%) were females, compared to (68%) females, and (32%) male street food vendors in Buru Buru. As observed in this study, twenty-seven percent of Viwandani men and 32 percent of Buru Buru men participate in street food businesses, contrary to the perception among many Kenyans

that street food vending is exclusively women's business. This study found that there were more women in street food business (73%) in Viwandani, and (68%) in Buru-Buru than men.

This study's findings are similar to those of NASVI (2018), which found that 68% of Delhi's street food business was run by women. It is also similar to the Njaya (2014) who found that there were more women (82%) than men vending street foods in the streets of Harare. It confirmed Sverdlik et al., (2016) finding that there were more women (63%) selling street food in Nairobi informal settlements than men. However, females dominate mainly because they bear the responsibilities of taking care of their families, they view it as a quick way of making money, and it is easier to enter this type of business because less capital is required to start. Currently men are progressively involved in it, and from which this study found out a significant presence of about 27%, and 32% of men in the activity from Viwandani, and Buru Buru respectively.

Among the food vendors in Viwandani, the majority (40%) are in the age group 40-49, whereas in Buru Buru, 50% of the vendors are in the age group 30-39. As a comparison, Viwandani had the eldest street food vendors aged 50-59 (4%) while Buru Buru had (26%) in the age category 20-29. This shows that people of Viwandani and Buru Buru are engaging in the street food business at their productive ages. This distribution is very normal, given that it takes some effort to prepare and serve food, and particularly to transport food by mobile food vendors who have to walk around to look for customers. Using the Kenyan concept of youth as under 35 (Constitution of Kenya 2010), this indicates that the street food sector in Buru Buru was controlled by young people. The age structure signifies that the street food vendors are young people who have started street food vending in the productive age of their life. This finding is consistent with Njaya (2014) finding who found that there was a 46.7 percent of an economically active youths, and their engagement in the street food business mirrors Zimbabwe's high rate

of joblessness. They were asked about their previous source of employment, and it was found that most of them opted street food vending as their source of income without trying any other option. This implies that the people engaged in street food vending find it a prospective field and feel that it suits them best. The mean age of street food vendors of Viwandani and Buru Buru was 36.78, median of 35, and the mode was 38. This finding is similar to what Sverdlik et al., (2016) found that street food business in Nairobi informal settlements was a participatory of all ages.

Food vendors interviewed in Viwandani consisted of 56% married while 10% were single, 6% divorced, 16% separated, 8% widowed, and 4% widowers. This is compared to 59% single, 23% married, 11% separated, and 7% divorced in Buru Buru. Unlike Viwandani, Buru-Buru had no widow nor widower (Figure 4.9). This finding confirmed those of Ekanem, (1998) who found that the majority of people involved in the street food sector in Africa are married. The high percentage of separation in Viwandani and Buru Buru could be attributed to financial problems as it was clear when prompted of the reasons for separations and divorce. The highest number (56%) and 23% of married people who were mostly women in the street food vending in Viwandani and Buru Buru indicated that this was the only business they were engaging in and they mentioned that they were particularly participating in this business as a way of surviving in the city as there were no other jobs available to them at the moment.

4.2.5 Socio-economic attributes of the food vendors

4.2.6 Education levels of food vendors

In Viwandani, the majority (56%) of street food sellers had elementary education, 25% had secondary education, 10% had no education, and only 9% had college education, compared to 64% who had secondary education and 32% who had college education in Buru-Buru (Figure 4.10). Perception of many people is that street food vending is a business of people with low education level. However, this study found out that there

was 9%, and 36% of college graduates in the street of Viwandani, and Buru Buru respectively selling processed, cooked and uncooked food. Accordingly, the 9% and 36% college graduates in the street of Viwandani and Buru Buru implies that street food enterprise is not a preserve for a certain class of people in the society. On the contrary, this can be interpreted that the college graduate in street food business shows that there was lack of formal employment from the government and hence graduates resulted to the informal street food business in order to cater for their needs. This study found similar findings as those of Owuor (2020) where he found out that there are only very few street food vendors with no formal education in the informal street food sector in Nairobi and there were relatively well-educated street food vendors and that the informal food business is a key source of income for educated but jobless youth.

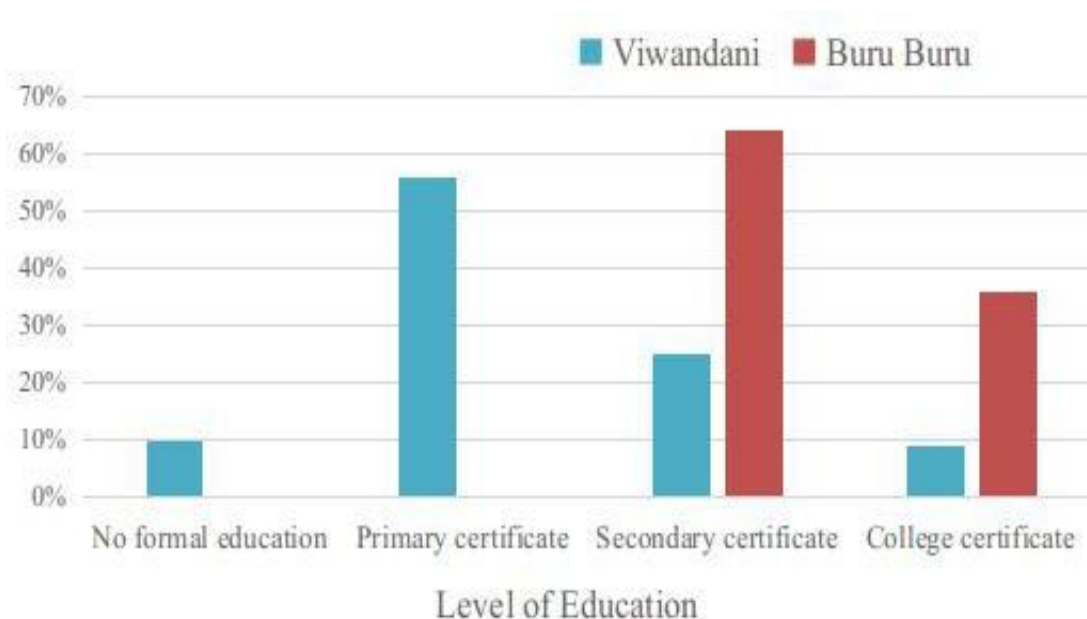


Figure 4.10: food vendors education

Source: Street food vendors survey 2020.

4.2.7 Vendors income per month

For the informal food providers, their income was estimated every month. The total income per month earned by women was Ksh.34,450 (59%) while the total earned by men was ksh.23,900 (41%) per month in Viwandani in comparison to Ksh. 27,600 representing 34% earned by males and a total amount of Ksh. 53,100 representing 66% earned by women in Buru Buru (Table 4.3). It was also crucial to note that the monies earned by food vendors of Viwandani and Buru Buru will be used to cater for all other household basic needs and therefore by the end of the month it's only their records indicate that some earned a given total amount of money but it's absent in cash because they would have used for basic needs. Therefore, women in Viwandani (Ksh.34,450) and Buru-Buru (Ksh.53,100) food enterprise earned more than men.

Table 4.3: vendors income per month

Viwandani			BuruBuru		
Gender	Income per Month (Ksh)	Percentage	Gender	Income per month	Percentage
Male	23,900	41%	Male	27,600	34%
Female	34,450	59%	Female	53,100	66%
Total	58,350	100	Total	80,700	100

Source: Street food vendors survey 2020.

4.2.8 Food vendors experience

More than half (58%) of food vendors in Viwandani worked in the Street food business for up to five years. This finding was similar to Sverdlik et al., (2016) who found that food vendors who worked for 2-5years in Nairobi informal settlements are the most experienced. Twenty seven percent have worked for up to 6-10 years and 15% have an experience of above 10 years. In contrast, in Buru Buru 55% of the food providers worked in the street food business for 2 to 5 years, 30% have worked for over six years and only 16% of them are new in this business as they have worked for only one month to one year (Figure 4.12). The 16% of new people who have ventured into this business was due to the hardship that was brought about by COVID-19 pandemic. This study was completed in the middle of the COVID-19 crisis, and a lot of difficulty among food vendors was witnessed. The results show that 30% of street food vendors in Buru Buru, who have worked for over six years were the most experienced, while in Viwandani, those who worked for 6-10 years were 27%.

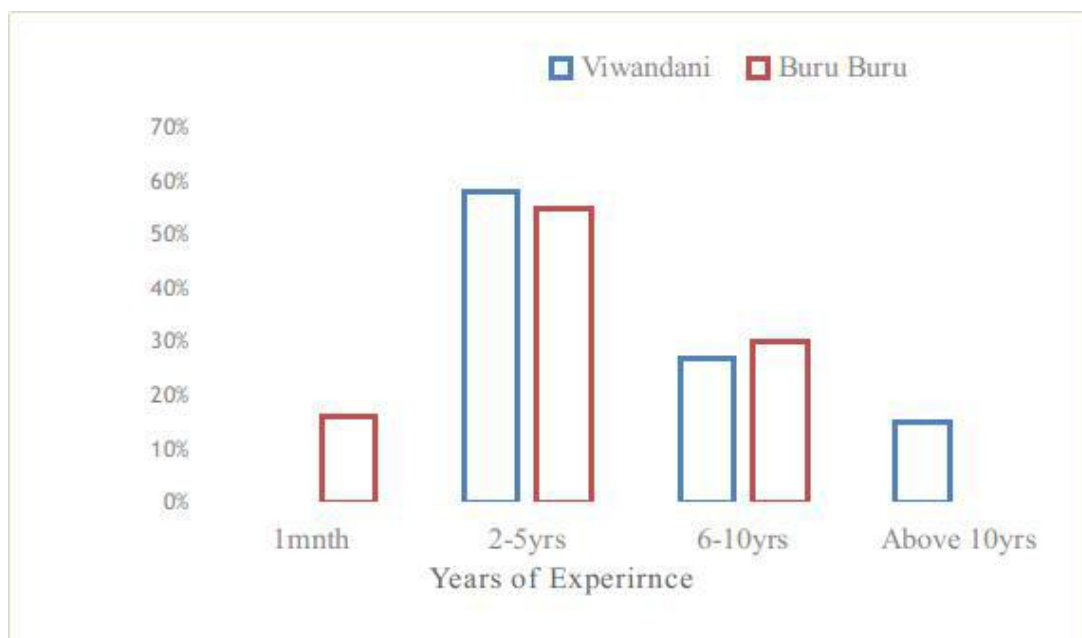


Figure 4.12: Experience of food vendors

Source: Street food vendors survey 2020

4.2.9 Vendors personal hygiene and food handling

At least 81% of the food vendors in Viwandani do not have an apron and cap when preparing food, while only 19% of the vendors had aprons and caps. Indeed, Meadow, (2009) indicated that a good personal hygiene can significantly make a reduction in the level of microbiological contamination of street foods. In this respect, the survey revealed that, in Buru Buru, 68% of street meal providers had aprons and chef caps during food preparation and handling, while at the same time, 32% did not have aprons nor chef caps at the food preparation sites (Figure 4.13). The observation was also made in the field during data collection, and it was observed that some food vendors had long colored fingernails, was only common to ladies, and hand-wrist bangles. It was also observed that uncooked food vendors selling vegetables such as spinach and fruits did not wash fresh food properly. They recycled the water for cleaning these products to the extent that the water turned to a brownish thick. Preparation surfaces were not cleaned, and the vendors could just reuse these surfaces without cleaning to remove the remaining of the food prepared the previous day. This promoted the spread out of house flies, which were observed throughout the vendors' food preparation sites. It was also discovered that all meal sellers received money while serving food.

Food vendors also packed takeaway foods, especially the uncooked food, in polythene bags, and when packing foods for their customers, they were observed blowing in air from their mouths to open the bags so that they could pack in food for customers. An observation was made that vendors' cooking oil to cook chips is reused to cook mandazi and fry other foods. The data collected indicated that those with aprons and chef caps were those with secondary education and college education. Their vending sites were also observed to be clean and were not handling food with their bare hands but uses polythene bags. It was observed that education has a positive impact on food vendors handling skills.

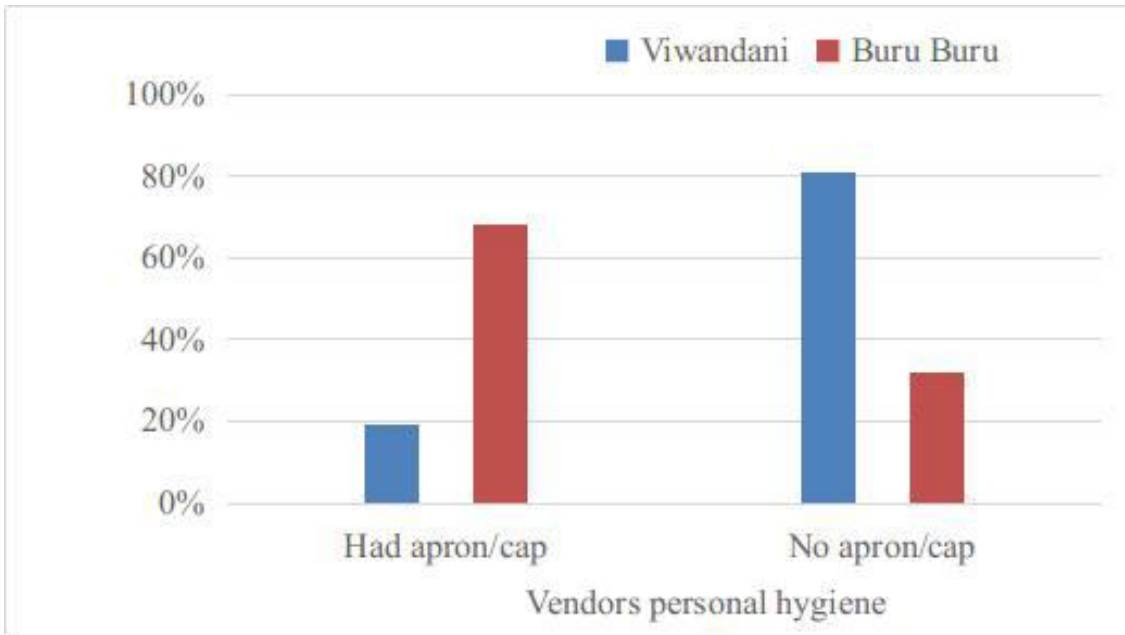


Figure 4.13: vendors personal hygiene

Street food vendors survey 2020

4.3 Mapping and characterizing street foods of Viwandani and Buru Buru.

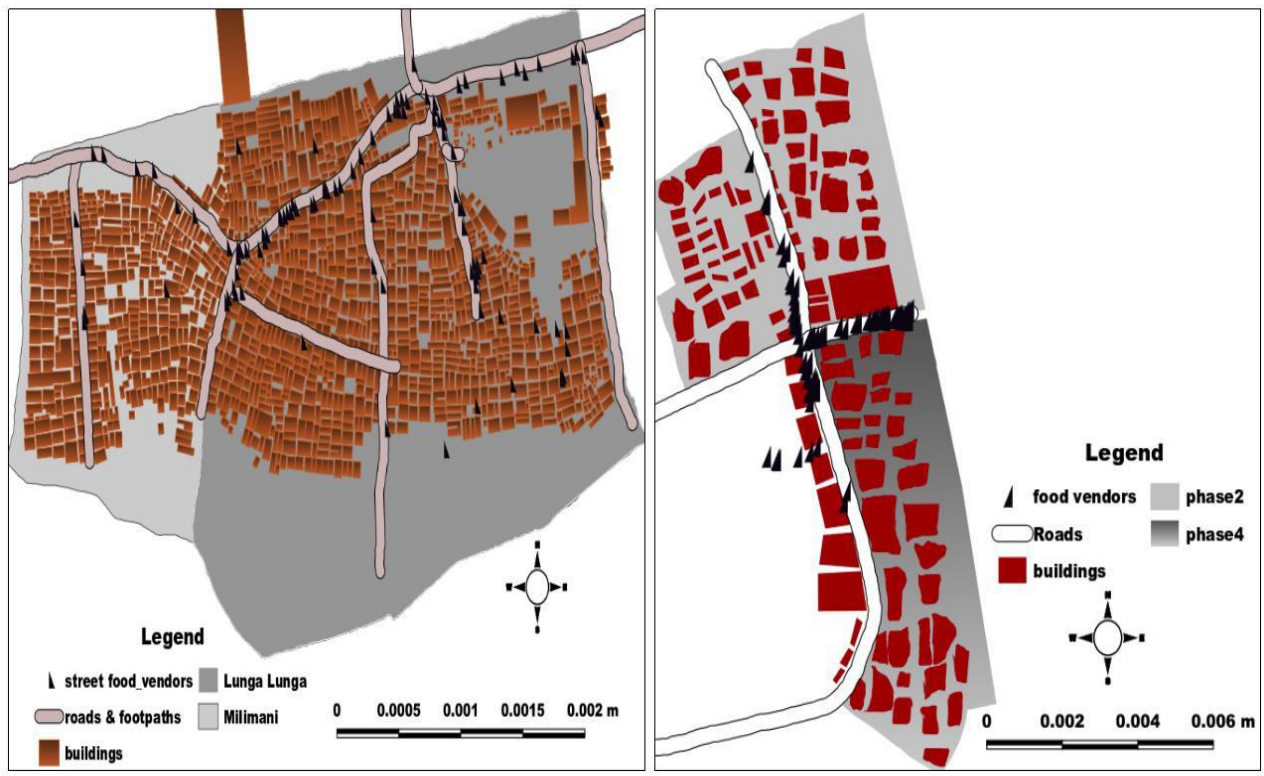
The main theme of this study was to characterize and place food on a map through a spatial analysis.

4.3.1 Spatial distribution of food vendors

Geographical information system (GIS) was used in this study to analyse and present the spatial distribution of street food vendors in Viwandani and Buru Buru. Approximately 92 meal sellers were interviewed, and they work at various hours and places around the villages of Lunga lunga centre and Milimani, and Buru Buru phase 2 and 4. Most vendors were located at the boundaries of lunga lunga and milimani, with fewer towards the centre of the villages while in Buru Buru operating their businesses along the main roads.

Sellers' locations were mostly linear, along major roads/footpaths, and they sold in the villages between 5 a.m. and 11 p.m. in the villages of Viwandani whose buildings are entirely build of iron sheets. The activity of vendors was seen to decrease progressively

as security and lighting of a village deteriorated, leading to the early closure of some food suppliers. In Buru Buru they operate between 6am and 9pm.



a) Viwandani

b) Buru Buru

Figure 4.14: Spatial distribution of street food vendors in Viwandani and Buru Buru

Source: Street food vendors survey 2020.

4.3.2 Food vendors on a 30 metre buffer

Buffering spatial analysis technique was used in this study to measure proximity. Point buffering in this study was utilized to measure proximity to food vendors by giving a reasonable buffer distance (30m) that a customer has to cover to arrive at a food point. A 30M buffer was generated. This shows that anyone who lived within 30m close to the food vendor will have ease access to food. The buffer zones are plenty food zones whose distance to a food point by a customer is 30 metres or less. Anyone who lives within the 30m buffer has food access. Those areas outside the buffer are food scarce and the distance to a food point is greater than 30m.

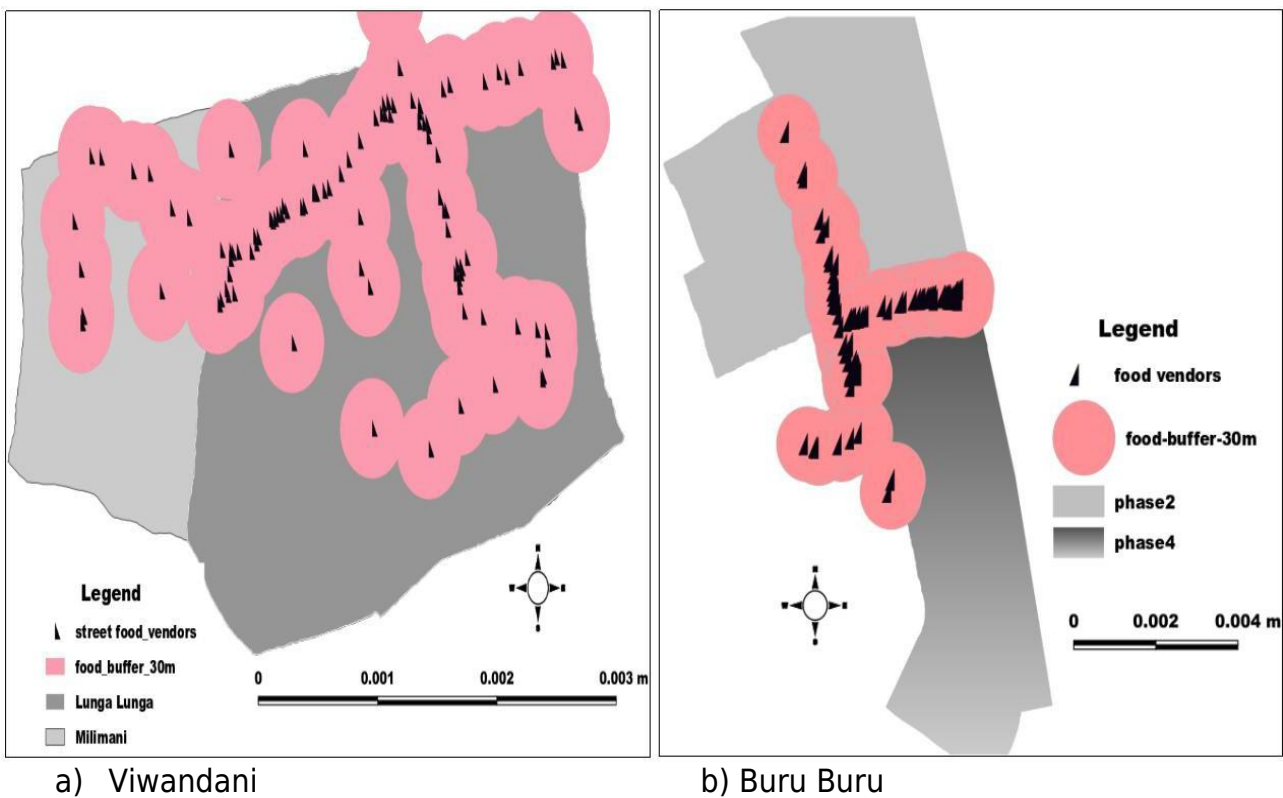
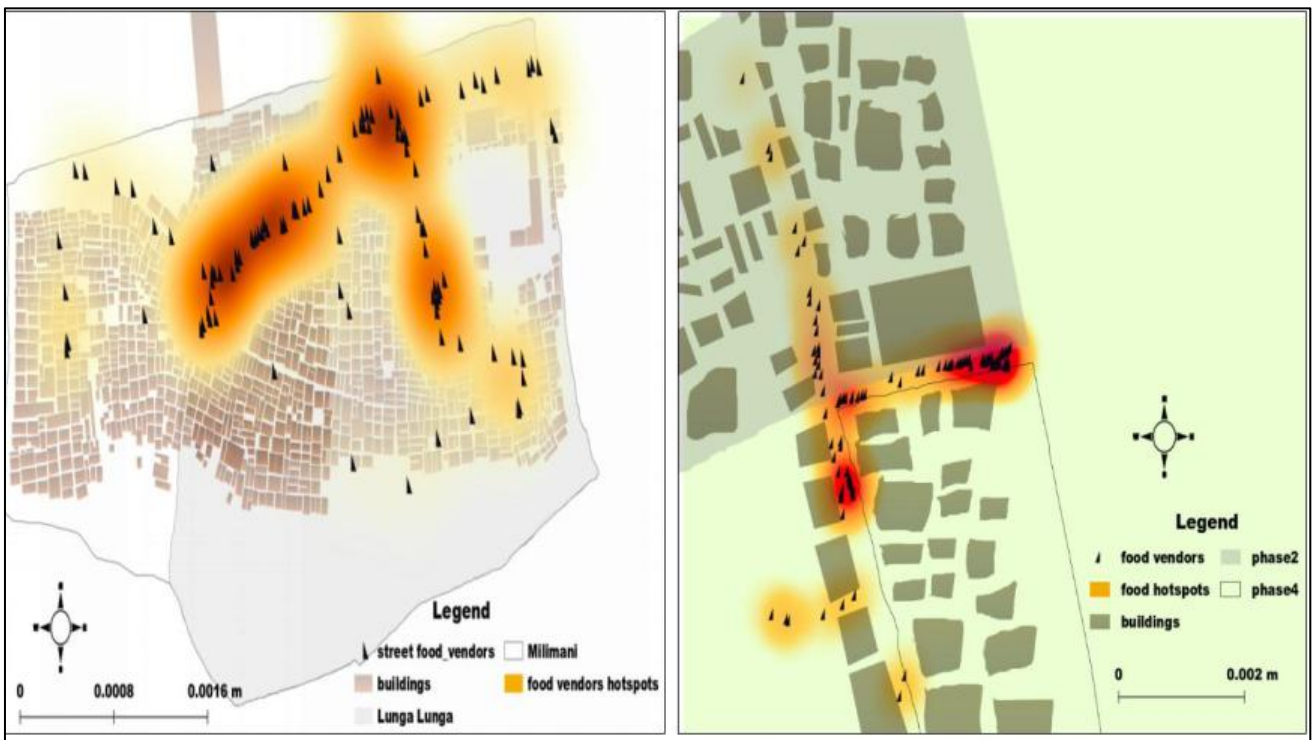


Figure 4.15: Food vendors of Viwandani and Buru Buru on a 30m buffer

Source: Street food vendors survey 2020

4.3.3 Hot spots analysis

This technique in this study was used to analyse the locations in the study area where food vendors are highly concentrated through the method of Kernel Density Estimation, and accounts for the possible factors that can be attributed to the pattern. The bright orange color in the figure below shows areas on the map which had high concentration of food vendors. Food vendors are concentrated along roads and junctions of roads and footpaths but are sparsely populated along footpaths in Viwandani and highly concentrated in Buru Buru phase 2 and 4 at the junction of Sonko road and at Mutindwa market. They are attracted along main roads because many people use the main roads from one village to the other hence get more customers, they are also attracted by street lights that makes along main roads safer hence are able to sell their foods up to late in thenight.



a) Viwandani

b) Buru Buru

Figure 4.16: Hot spots analysis of Viwandani and Buru Buru

Source: Street food vendors survey 2020

4.3.4 Characterizing Food types sold by food vendors in Viwandani and Buru-Buru.

The field data captured several food types sold by various food vendors of Viwandani and Buru Buru which ranges from cooked food (*githeri, chapati, mandazi, rice, matumbo, ugali, vegetables, beans, green peas, mutura, soup, chicken parts, mukimo, meat(fried, roasted, boiled), fish(fried, boiled, roasted), boil and fry eggs*, vegetables which included traditional vegetables such as *Terere* (Amaranthus), *Managu* (Black Nightshades), *Kunde* (cowpea leaves), *Nderema* (Bacella Alba), *Mrenda* (Jute), *Mitoo* (Crotalaria) and *Saga* (spider plant), kales, cabbages, spinach, tubers(potatoes, cassava) which was the most available at 64%.

Uncooked food which include fruits (melon, mangoes, oranges, tomatoes and uncooked vegetables) 36% are the most accessible food items in Viwandani throughout the day, however, some food items such as *mutura, soup, and mahindi choma* (roasted maize) were observed to be expected in the evening whereas in Buru Buru cooked food which was 27% for example vegetables, ugali, chapati, *githeri, mukimo, tea, mandazi, beans, beef, fish, and eggs*, and uncooked food 73%, for instance traditional vegetables, and others such as kales, spinach and cabbages, animals products such as eggs, meat, cereals such maize, rice, green peas.

The foods sold by the street food sellers assessed in Viwandani and Buru Buru were diverse. They include fruits and vegetables, grains, roots and tubers, meat, fish, chicken, eggs, and processed meals like sausages and popcorn. These classifications are not reciprocally exclusive nor all inclusive. Table 4.7 lists the different types of food available in Viwandani and Buru Buru.

According to the findings, the majority of the surveyed food vendors in Buru Buru offered vegetables and fruits (uncooked food 73%). Fresh fruits, leafy greens, and other

fresh vegetables were sold by somewhat more than half of the food sellers. These were the most popular foods, purchased by the majority of families on a regular basis (Owuor 2020). Fried and boiled eggs, cooked snacks, cooked meals, and processed foods were among the items sold by 64% of vendors in Viwandani. In Nairobi, ready-to-eat prepared snacks and dinners in the streets are emerging as a viable alternative to home cooking. Workers also purchase these dishes as low-cost lunches. Vendors also offered roots and tubers, fresh milk, bread, boiled and roasted corn, tea, and porridge. Plate 4.1 to 4.1.3. display the various types of foods offered in the study area.

Table 4.7: Types of foodstuffs sold

Viwandani			
Food category	Types of foods	frequency	%
Cooked meal	Vegetables (traditional eg <i>Terere</i> (Amaranthus), <i>Managu</i> (Black Nightshades), <i>Kunde</i> (cowpea leaves), kales, cabbages, spinach, Roots & tubers, meat(fried boiled & roasted), boiled eggs, fried eggs, beans, green grams, roasted maize, Chicken, Chips or bhajia, smokies, popcorn s, bread, ugali, tea, porridge, chapati, mandazi, milk, githeri, mukimo, mutura, njahi (dolichos), rice, fried fish etc	28	64
Uncooked meal	Fresh vegetables, tomatoes, fruits, tubers & roots, cereals such as maize, legumes such as beans, fresh meat, wheat & maize flour, fresh fish, chicken etc	16	36
Buru Buru			
Cooked meal	Ugali, chapati, vegetables, tea, beans, meat, rice, njaha, minji, githeri, mukimo, plantains porridge, roasted maize, fried meat, boiled meat, roasted meat, eggs (fried and boiled), fish, chicken	12	27
Uncooked meal	Fruits eg melons, oranges, bananas, pineapples, vegetables (traditional eg <i>Nderema</i> (Bacella Alba), <i>Mrenda</i> (Jute), <i>Mitoo</i> (Crotalaria) and <i>Saga</i> (spider plant), others eg kales, cabbages, spinach, eggs, fresh meat, chicken etc	32	73

Source: Street food vendors survey 2020

The plates below shows some of the foodstuffs mapped in Viwandani and Buru Buru.

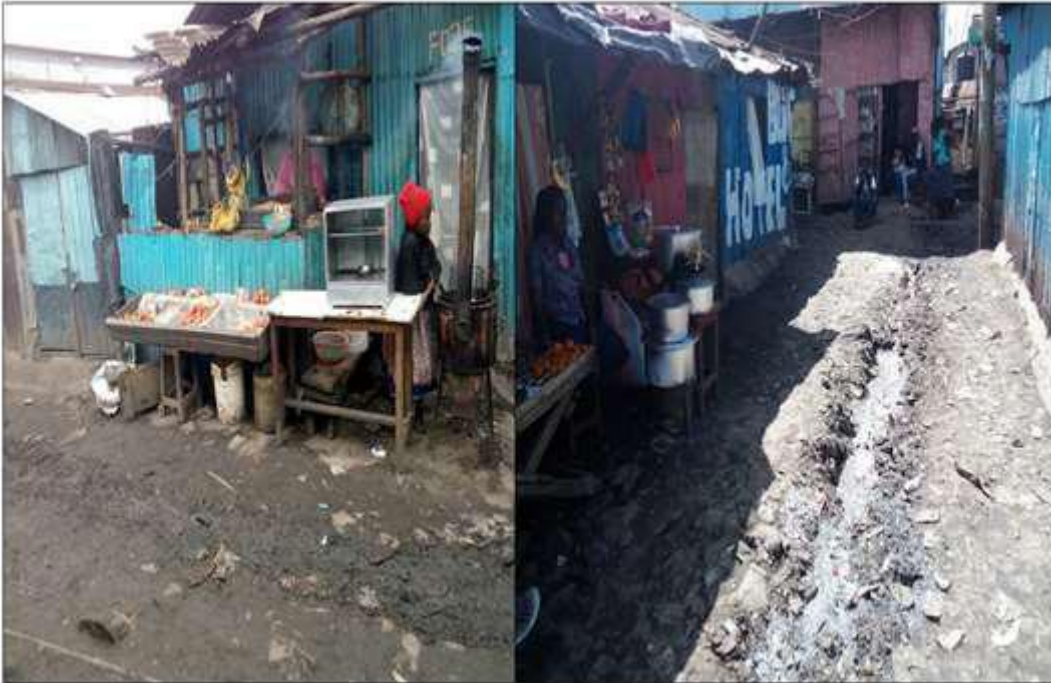


Plate 4.1: Food vendors selling cooked food (Viwandani)

Source: Street food vendors survey 2020



Plate 4.1.1: Uncooked food vended in Viwandani

Source: Street food vendors survey 2020



Plate 4.1.2: Cooked food vended in Viwandani

Source: Street food vendors survey 2020



Plate 4.1.3: types of food vended in Buru Buru

Source: Street food vendors survey 2020

4.4 Street food vendors contribution to urban food accessibility

Viwandani is a low-income urban area, and Buru Buru is a middle-income area. The data collected in both areas indicated that street food vending was the primary income source for street food vendors. Unlike Buru Buru, there were no supermarkets in Viwandani. Therefore the only source of food was street foods. It was evident in both areas that street food creates self-employment and employment to those who are employed by street food vendors on a part-time and full-time basis. It helps to provide moderately priced food to the urban dwellers. Most street food vendors in both Viwandani and Buru Buru do not engage in any other income-generating activity apart from the street food business. From the field data collected, food vendors indicated that this activity pays all their other bills, including medical, and school fees.

Street food contribute to urban food access by making moderately priced food available to urban dwellers, creation of employment, income generation and owning of assets by those who sell street foods. Mobile street food vendors breaks the geographic barrier of food access in cities by bringing food to where the consumer is.

Street foods further contribute to urban food access as food vendors in Viwandani and Buru-Buru prepared and sold culturally relevant foods such as traditional vegetables eg *Terere* (Amaranthus). This is an effective way to preserve food traditions and can also have significant health benefits. Globally, traditional diets tend to be very healthy.

Street foods is readily available to urban dwellers especially those who live in Viwandani and Buru-Buru as it was observed in this study that there were different types of foods sold in plenty which ranges from cooked (64%), uncooked (36%) in Viwandani whereas cooked (27%) and uncooked (73%) foods in Buru-Buru.

Food which was offered by street food vendors was prepared by well experienced food vendors. These food was prepared by food vendors who worked for decades as it was

observed that (27%) of food vendors worked in the street food business for up to 6-10 years in Viwandani. The data collected showed that street food vendors as households obtain ninety five percent of the food they consumed from the street food they sold.

4.4.1 Benefits of street foods

One vegetable vendor in Buru Buru said, *"The foods we sell are nutritious, yes we always work hard to make sure that the food we provide is a balance diet with all the required nutrients such as protein, carbohydrates and vitamins"*. It is also noted that, food vendors especially those selling cooked foods employ other people to help them in that when one is cooking food another one serves customers. Another vendor said, *"Even us food vendors invest, we take our money to the bank, for example because i have an Equity bank account, I take my money to the bank so that i can qualify to be given a loan, so because there are no banks here, I take to the Equity Agents here in the settlement, those who have banks agents and banks in general benefits from us too."* Another vendor noted that *" we solve people needs, for example I always open my business very early in the morning so that i provide hot mandazi to school going children and again the food we sell makes work easier and save the energy of our customers when they come home in the evening when they are tired from their working places by providing them with ready food."*

Street food vendors cited out that the foods they sell are relatively cheap and affordable to the urban consumers. Because street food is relatively cheap, customers can try much food in one location hence getting a balanced diet. Food vendors indicated that the food they often sell was of good quality. It was observed that more likely that the food stall owner did cooking and serving street food.

Food vendors explained that street food is fast food, and in that, it was intended to be swiftly served for you to grab and go. Consumers were able to grab the food, eat quickly where they stand, or go to the workplace or home. The introduction of new foodstuffs comes with the apparent ease of creating a road food business. You may have never heard of food, innovative food merges, or revamped classics designed for the customers. The menus may be more easily changed and updated to create new offers, such as the plantain porridge in the Buru Buru street foods menu.

The benefits of street foods to vendors include low start-up costs, versatile time lines, and quick investment returns. Simultaneously, customer advantages are affordability, availability, fast service, and ease of accessibility, as demonstrated by their symbiotic association. Street foods serve an essential socioeconomic commitment to serve urban consumers' food and nutritional needs at sustainable costs for the lower and middle-income classes.

4.5 Sources of food sold

Street food vendors of Viwandani sourced their food from formal markets (58%) (designated markets-those markets which were designed by Nairobi City Planners) such Muthurwa, Gikomba, Kyamaiko, Bama and Marikiti, nearby shops (13%), wholesales (21%), rural farms (6%) where they get products such as milk and informal markets 2% (not designated) such as nyamakima whereas in Buru Buru they sourced their food from formal markets (70%) such Muthurwa, Gikomba, Kyamaiko, Bama and Marikiti, nearby supermarkets (14%), rural farms (11%), and informal markets 5% such as outer ring road market, and nyamakima (Figure 4.17). Supermarkets were not a major source of food sold by street food vendors, although a few from Buru Buru sourced items such as milk, wheat flour, bread, beverages, sugar and other processed foods such as

sausage this way. Those who obtained meat organs from factories do so from slaughterhouse such as Dogoretti slaughterhouse. Formal markets were significant for obtaining fresh fruits, leafy vegetables, other fresh vegetables, roots and tubers, dry cereals, fish, meat, and ingredients for cooked meals such as onions, ginger, and tomatoes.

Wholesalers are the primary source of most food products including flour, bread, and milk sold in Viwandani while small shops and retailers are a popular source for eggs, beverages, and ingredients for cooked snacks and meals. Informal markets were significant sources of dry cereals, and fresh fruits. Supermarkets were not a popular source of food sold by the surveyed vendors in Viwandani, but in Buru Buru they sourced products such as bread, wheat flour, sausages, sugar, milk, beverages, and ingredients for cooked snacks from supermarkets.

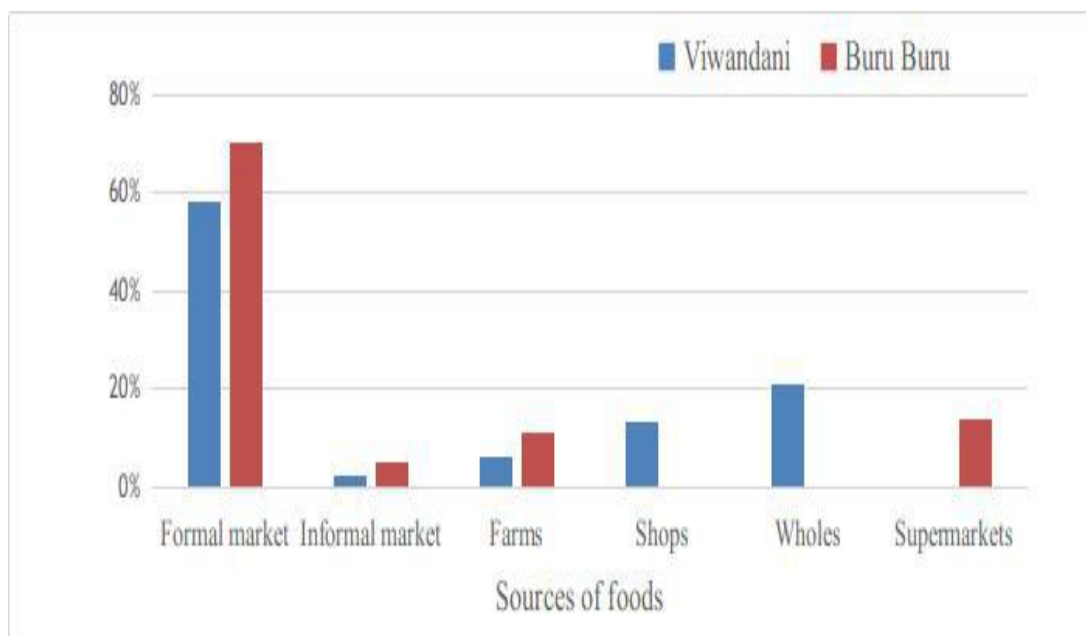


Figure 4.17: Food sources

Source: Street food vendors survey 2020

4.6 Aspects of the Space occupied by a food vendor.

4.6.1 Environmental conditions of vending space

Based on an observation, about 55% of the vendors interviewed prepared their foods in unhygienic environmental conditions near dusty and muddy road, 21% near dusty and open drainage, 19% close to dust and muddy footpath, and 5% near open drainage in Viwandani while in Buru Buru 82% of the vendors interviewed prepared and sell their foods near a tarmac road, and 18% near dusty railway line (Figure 4.18). Proximity to dusty roads and open drainage by food vendors becomes a food constraint and hazard. It was also observed that, most food vendors did not have garbage bins hence litter around their food stalls which attracts swarms of flies. In an event of rain floods due to poor drainage compel food vendors to halt from selling, open drainage is often choke off by trash and can disclose the food to flies or other insects that may again cause contamination.

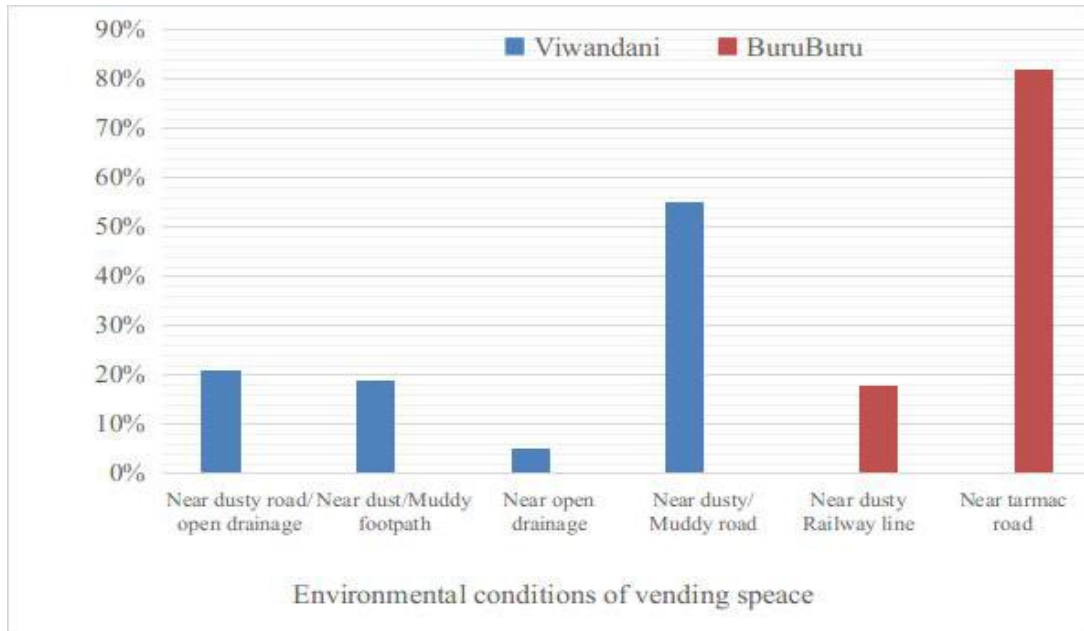


Figure 4.18: Environmental conditions of vending space

Source: Street food vendors survey 2020



Plate 4.2: Shaded structures selling uncooked food (Viwandani)

Source: Street food vendors survey 2020



Plate 4.2.1: Unshaded structures selling cooked food along muddy roads (Viwandani)

Source: Street food vendors survey 2020



Plate 4.2.3: Shaded structures in the open air market selling uncooked food (Buru Buru)

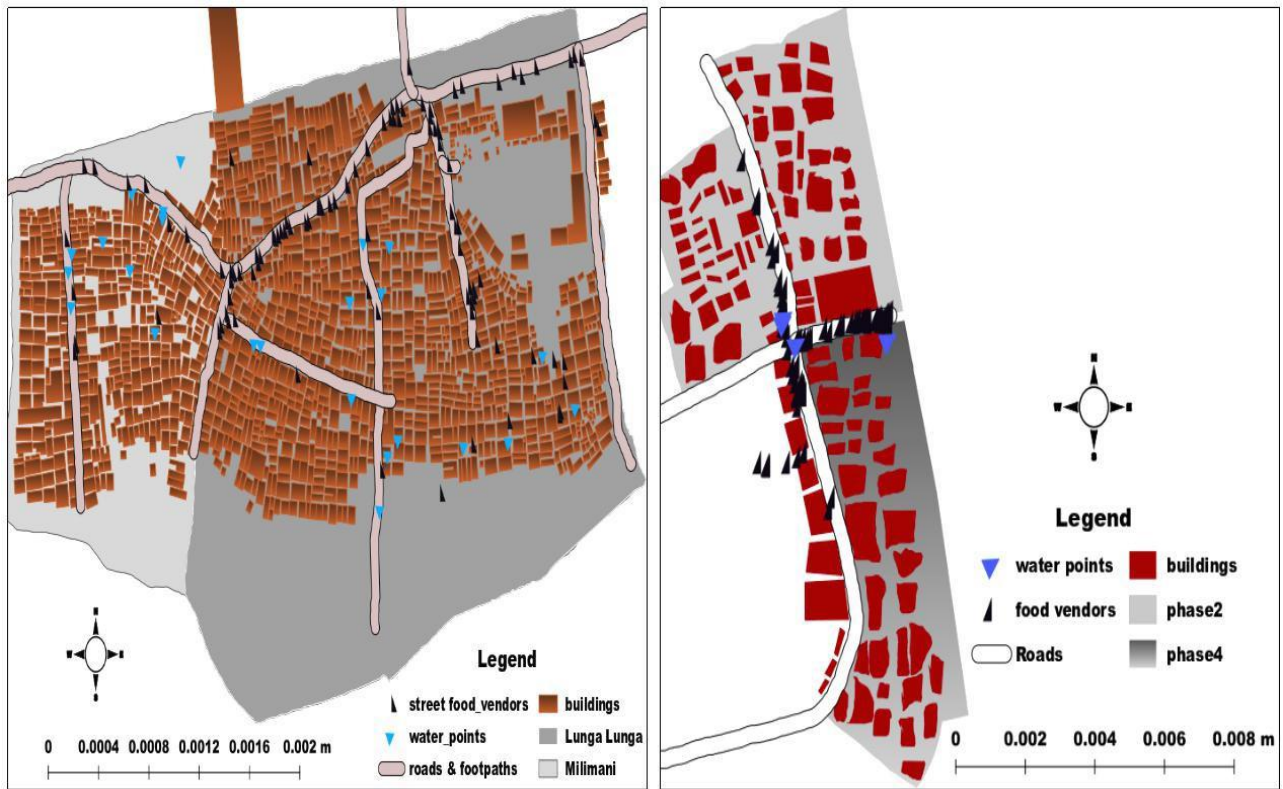
Source: Street food vendors survey 2020

4.7 Food vendors with access to infrastructures in Viwandani and Buru Buru.

4.7.1 Distribution of street food vendors and Water points in Viwandani and Buru Buru

The study area of Viwandani had 24 water points observed distributed across the village of lunga lunga and milimani while Buru Buru study area was distributed by only 4 water points (Figure 4.19). Water is of great significance for vendors when washing their commodities as well as utensils. Unfortunately not all food vendors were in a position to access this water. This is mainly because this water points were not evenly distributed across the study areas. Inadequate access to water can pose a major threat to food safety. It was then observed that some food vendors ferry water from their homes to their vending sites. They carried water to their business premises in containers of 20 litre

capacities and those who didn't carry and are not close to a water point, they buy this precious commodity from water vendors. To whatever degree that water was carried it was not enough for dish washing and food preparation.



a) Viwandani

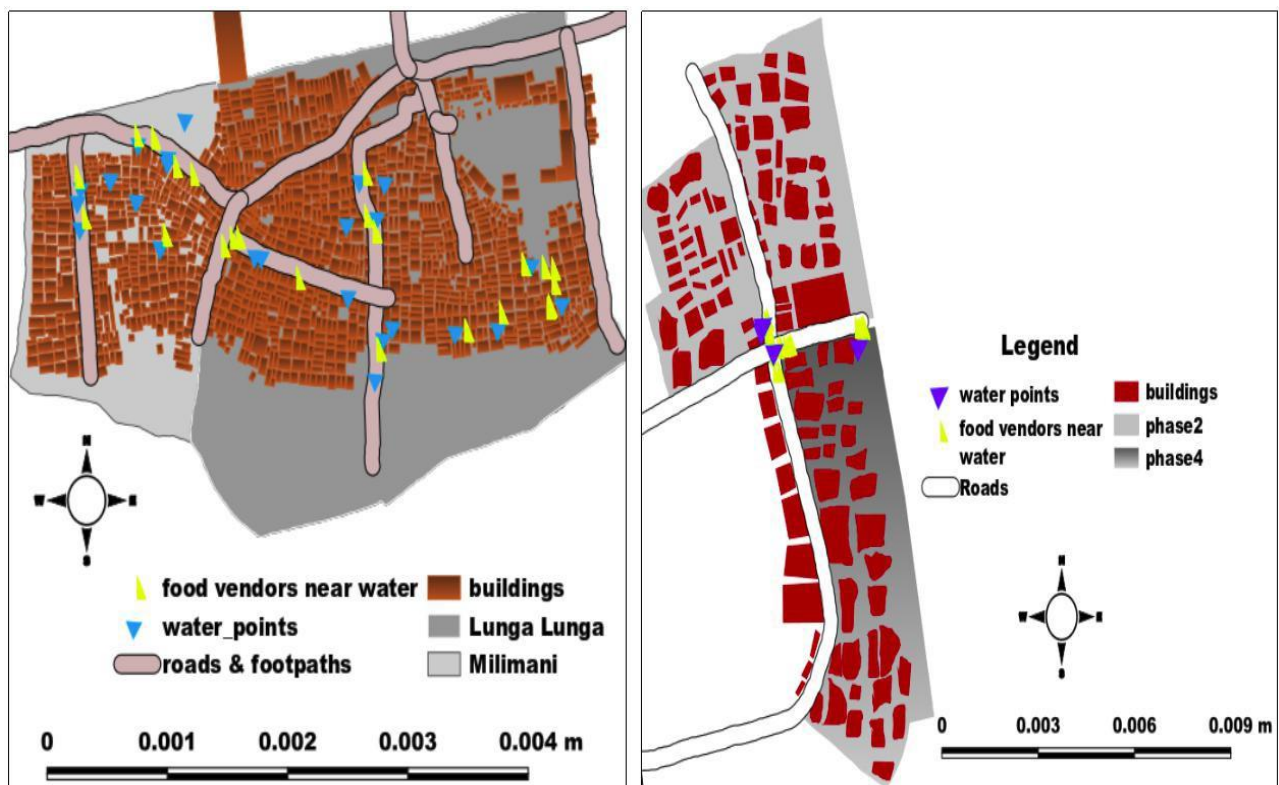
b) Buru Buru

Figure 4.19: map of Viwandani and Buru Buru food vendors and water points

Source: Street food vendors survey 2020

4.7.2 Food vendors with access to water in Viwandani and Buru Buru.

To know how many food vendors have access to water, a GIS spatial analysis technique was used. Spatial selection by location was used to generate the number of food vendors close to water points. Spatial selection by location generated only 23 food vendors close to water points. Spatial selection by location generated only 23 food vendors out of 48 having access to water in Viwandani while Only 26 food vendors out of 44 food vendors surveyed had access to water in Buru Buru (Figure 4.20). Spatial selection by location is basically selection of features in one layer that intersects or touches features in another layer. Those who did not have access to water were observed carrying water from their homes in 10 and 20 litres containers to their vending places. This finding was similar to Githiri et al., (2015) who have that food vendors having no access to water ferried the precious commodity from the their homes.



a) Viwandani

b) Buru buru

Figure 4.20: Food vendors with access to water in Viwandani and Buru Buru

Source: Street food vendors survey 2020

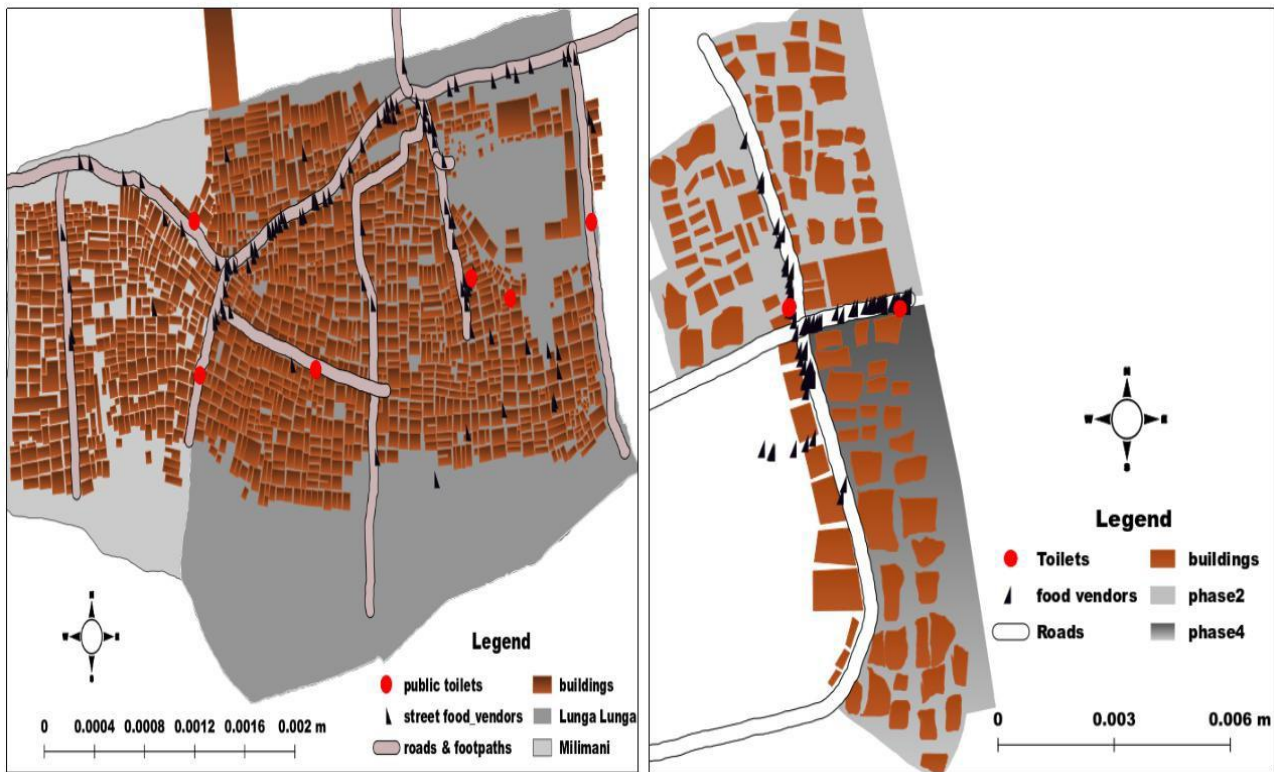


Plate 4.3: Water vendor kiosk

Source: Street food vendors survey 2020

4.7.3 Distribution of food vendors and public toilets in Viwandani and Buru buru

Toilets are equally as important to food vendors as water is. To maintain food hygiene toilets are significant. Inadequate access to toilets and food vendors' poor hygiene practices may create acute public health risks in informal urban food systems. A total of 6 public toilets were surveyed and mapped across the two villages of Viwandani while a total of 4 public toilets in phase 2 and 4 in Buru Buru were surveyed and mapped.. Public toilets were observed to be sparse. Figure 4.21 below shows the distribution of food vendors in Viwandani and Buru Buru, and public toilets.



a) Viwandani

b) Buru Buru

Figure 4.21: Distribution of food vendors and public toilets in Viwandani and Buru Buru

Source: Street food vendors survey 2020

4.7.4 Distribution of food vendors who are close to public toilets.

Spatial selection by location was performed on public toilets and food vendors to find out the number of food vendors who are close to public toilets. Spatial selection generated 17 food vendors out of the 48 food vendors surveyed and mapped in Viwandani who are close to public toilets whereas 19 out of the 44 food suppliers surveyed in the Buru Buru area, were the only with access to toilets (Figure 4.22). Those who have no access to toilet were seen using toilets in bars, supermarkets, petrol stations, and households next to them.



a) Viwandani

b) Buru Buru

Figure 4.22: Distribution of food vendors who are close to public toilets in Viwandani and Buru Buru

Source: Street food vendors survey 2020

CHAPTER FIVE: SUMMARY OF KEY FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter consists of three parts. The first section outlines the main outcomes of the data analysis in relation to the study objectives. The overview is presented as the objectives in introduction chapter. The next section deals with the study conclusion and the final section makes recommendations based on research results.

5.1 Summary of Key Findings

This study set out to analyze street food vendors contribution to urban food access. This research was a comparative study of low and middle-income areas in an urban centre. It was a GIS approach. Demographic and Socioeconomic characteristics of street food vendors were also analyzed.

With respect to the socio-demographic features of the residents analyzed for the study, it was observed that there were more females than males. Also noticed that majority of food vendors in Viwandani (low-income area) and Buru Buru (meddle-income area) were primarily youthful in nature and thus constituted the active workforce of the study area with ages ranging from 20-35. Furthermore, as the analysis showed, most of the participants were holders of primary education in Viwandani and secondary education in Buru Buru. This study discovered that Many street food vendors did not undergo any sort of food preparation training, nor did they attempt to seek it. FAO (1997) food vendors should possess the expertise and skills required, to allow them to deal with food hygiene standards. FAO (1999) advises that each food vendor /assistant must receive essential food safety training prior to licensing. In Viwandani, a very significant number of respondents were married while single in Buru Buru.

The study found that in terms of economic status, the majority were respondents receiving between ksh.2500-5000 in Viwandani while in Buru Buru the majority were receiving between Ksh. 10000-12000. The highest number of respondents in Viwandani were selling cooked food while the highest vending with uncooked food in Buru Buru. The results of the data collected further shows that the majority of the respondents in the both areas have an experience of 5 years and above.

Street foods being available and accessible make work easier for most consumers as indicated by most street food vendors that, street food is a fast food, and in that it was intended to be swiftly served for consumers. Street food offers part-time and full-time self-employment. It allows the urban poor to feed cheaply. Apart from creating jobs to food vendors, it also offers employment to other people.

Cleanliness practices during the handling and preparation of street food were discerned. It was noticed that the vendors did not clean fresh food appropriately. Vendors who offered fish and chips cleaned their raw food just once because they didn't have adequate water. Vendors who served fruit and vegetables were serving without cleaning them; they had no adequate water to clean them. This lead-food vendors to use small amounts of water to wash utensils and cleaning their commodities therefore impaired hygiene. Muinde and Kuria (2005) stress that only if sufficient water is available can personal hygiene be accomplished. Vendors should have ample drinking water, and enough running water for all cleaning purposes.

Structures used by food vendors were poorly designed and maintained. They could not adequately protect street food from dust and smoke from automobiles. The material used for building the stands did not safeguard the food from smoke and dust particles. The stands have been constructed along the roads and footpaths that are dusty, muddy, and smoke-prone. Muinde and Kuria (2005) stated that food ought to be prepared in a

place that is reserved specifically for this reason, furthermore the place of food preparation ought to be maintained and kept safe and cleaned at every moment. Food stalls should be designed and installed in a manner that allows easy ways of cleaning and management of the food stalls.

Food vendors observed limited hygiene for themselves. Many vendors didn't wear chef aprons or head caps and managed food with bare hands, and handled money at the same time. Bare handed handling of food can contribute to food contamination and therefore to the introduction of disease- causing bacterium. No food should be managed by someone who handled money. This is because money is contaminated and can pollute healthy food.

Most vendors were located at the boundaries of lunga lunga and milimani, with fewer towards the centre of the villages while in Buru Buru operating their businesses along the main roads. Vendors' location was mainly linear, following the main roads/footpaths. Spatial analysis technique buffering was used to create a 30M which showed that anyone who lived within 30m close to the food vendor will have ease access to food. Another technique, hot spots analysis was used and showed that food vendors are concentrated along roads and junctions of roads and footpaths but are sparsely populated along footpaths in Viwandani and highly concentrated in Buru Buru phase 2 and 4 at the junction of Sonko road and at Mutindwa market. Spatial selection by location indicated that only 23 food vendors out of 48 had access to water in Viwandani while Only 26 food vendors out of 44 food vendors surveyed in Buru Buru had access to water.

Street food vendors of Viwandani and Buru Buru sourced their food from formal markets, informal markets, shops, farms, and wholes. Wholesalers were the primary source of all processed food products including condiments, flour, bread, and milk sold in Viwandani

while small shops and retailers are a popular source for eggs, beverages, and ingredients for cooked snacks and meals. Informal markets were significant sources of dry cereals, and fresh fruits. Supermarkets were not a popular source of food sold by the surveyed vendors in Viwandani, but in Buru Buru they sourced products such as bread, wheat flour, sausages, sugar, milk, beverages, and ingredients for cooked snacks from supermarkets.

5.2 Conclusions

The study findings from Viwandani and, Buru Buru indicated that food vendors contribute to urban food access. Even though they contribute to urban food access, Viwandani's food vendors battle with multiple environmental hazards. This study showed that women control the street food industry as illustrated by 73 per cent of women in Viwandani and 68 per cent in Buru Buru. From this study (40-49), and (30-39) food vendors dominate the road food industry in Viwandani, and Buru Buru respectively.

The implication of people of both genders, all ages, and all levels of education being involved in street food business, shows that there is a potential for street food vending enterprise to contribute to employment opportunities for the youth and women if it is properly regulated. Apart from creating jobs for food vendors, it also provides employment for other people, as it has been noted that most food vendors have hired someone to help them. Females were more experienced than males from both Viwandani and Buru Buru. Street food vendors learned food preparation and protection from their parents. It was clear that food vendors have no food training skills. Several types of food were offered by different food vendors in Viwandani and Buru Buru, namely cooked and uncooked food, processed and unprocessed. The kind of food sold depends on which type of food yields the highest profits. Cooked food and

uncooked food on sale were primarily from energy-dense ingredients rich in carbohydrates (e.g. grains, tubers), proteins (e.g. meat, fish, eggs), and fat (e.g. deep-fried food). Micro nutrient-rich foods (e.g. vegetables and fruits) are rarely sold. Main reasons include consumer preferences, type of food yielding the highest profit, and lack of nutritional and food preparation knowledge.

It is apparent from this study that food contamination in Nairobi City is mainly due to poor water quality, shortage and unhygienic during food preparation, washing of utensils, poor personal hygiene, and crowded and dusty vending location as in the case of Viwandani. Vending sites located along busy roads with heavy vehicular traffic, increase air borne particles beside waste disposal sites adds to the contamination. These findings demonstrate that the food vended in Viwandani and Buru Buru constitute potential hazard to human health. Provision of education to the vendors and implementation of appropriate hygiene practices would improve food quality, and lessen food potential hazards.

Informal food suppliers from Nairobi sourced their products from a variety of formal and informal outlets. Street food vendors in Viwandani and Buru Buru sourced their food from formal markets such as Muthurwa, Gikomba, Kyamaiko, Bama, and Marikiti, nearby shops, wholesalers, and rural farms.

5.3 Recommendations

Based on the results and the discussions in this study the following recommendations are being suggested.

5.4 Recommendation to the policy makers

Sellers of street foods are recommended to observe hygiene practices. The hygiene procedures concerned included preparing the meals, cleaning the kitchen equipment, serving food, maintaining grooming habits, and preserving cooked food.

This study recommends that the government needs to invest in the street food as it generates jobs, provides inexpensive food, and a broad variety of delicacies for urban residents. By establishing standards of conduct for street-meal industry, regulations can be implemented through the Ministry of Health and Local Government departments to recognize the street food sector.

Nairobi city county should propose setting up street-food institution centers with appropriate equipment and services. These centers are to be used for training of street food vendors on how to handle, and prepare foods as well as to stock, cook, and distribute nutritious food. They should provide the requisite facilities such as treated tap flowing water, sufficient light, drainage, and solid-waste disposal, build an atmosphere conducive to the user being supplied with nutritious food, and maintain a safe condition for the information, training, and education services for vendors and customers as carried out by authorized agencies.

Policy mechanisms and regulations disregard casual food supply retail and, as an outcome, are poorly recognized. Majority of street food vendors work with no permits, generally due to how restrictive the costs of having one are. The government needs to put up policies that protect street food vendors from county officials who time to time vandalize the businesses of street food vendors, and issue them with the necessary

certification for them to operate lawfully. Kenya Gazette Supplement No.73 (Senate Bills No.10) on The Street Vendors (Protection of Livelihood) Bill, 2019 put street food vendors on notice to be registered and licensed. Part v—rights and obligations of street vendors, of the same Bill 2019 illustrated to us that street food vendors have a right to carry on business of street vending, right to adequate facilities, protection from harassment, and access to public utilities. Nevertheless, this law appears to have not been implemented. Therefore, recommend that it should be implemented and adhered to.

5.5 Recommendation to Institutions

Organizations such as Muungano Wa Wana Kijiji which was found to be well functioning in low- income areas should spread its wings to all food vendors in Nairobi and provide training to food vendors on handling and knowledge of food preparation.

5.6 Recommendation for Further Research

In the course of this study, a number of interesting aspects of street-food vending were identified. In future research, this might be covered. These include;

- i. The nature and economic value of street food trade in an urban area. There is need to thoroughly investigate the economic value of street food trade in urban areas and to include research on street food trade policies in order to provide an empirical data that will be helpful to policy makers on street food space allocation.
- ii. Contribution of street food to the nutritional consumption of average urban consumers. Street food is found to be a significant food source in urban settings in developing countries and is promising to be a critical urban dietary source. However, its nutritional significance in urban communities has not yet been entirely known. This therefore calls for in depth studies to help in understanding of dietary contribution of street food and hence further help in convincing urban planners,

health official and local government to treat street food business like other businesses in the city.

- iii. Mapping the Spatial, physical Constraints on street Food Safety in Urban Informal Settlements, a GIS approach. Street foods obstructions should be identified through research and hence assist those involves to be aware of the constraints. Environmental, infrastructural, space constraints for example need to be well articulated in order to help the policy makers on how to improve food safety situation in Informal Settlements.

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GLOSSARY

- 1) Githeri: Meal made of boiled and fried mixed maize and beans.
- 2) Mahindi choma: Roasted maize.
- 3) Chips: French fries.
- 4) Mandazi: A deep-fried leavened wheat bread. The distinguishing feature of mandazi is regarded more of a snack than a primary dish, an undeniable aroma which can be smelled within a distance. Made from a breaded deep fried lumps of dough.
- 5) Mutura: Large cow intestines filled with small bits of meat, such as liver, kidneys, spleen usually referred to as African sausage.
- 6) Ugali: cornmeal mush- Made of maize flour, applied to boiling water, and heated to a compact block of cornmeal paste, it is without a doubt the Kenya's staple.
- 7) Chapati: Crafted of a wheat flour wound into a ball, before rolling it into a smooth flat circle. It traces its origin from the act upon of Indian people.
- 8) Mukimu: made from boiled and mashed green peas and potatoes, before adding whole kernels of maize (corn) to give more starch and texture to the mash.

APPENDICES

Appendix1: Interview guide for street food vendors

SPATIAL ANALYSIS AND MAPPING OF STREET FOOD VENDORS: A COMPARATIVE STUDY OF VIWANDANI AND BURU-BURU RESIDENTIAL AREAS IN NAIROBI, KENYA.

Introduction

Hello,

My name is Lemomo Charles a student from the Department of Geography, Population and Environmental Studies, the University of Nairobi. I am conducting a research for a Master of Arts degree in Agricultural Geography. This research is being carried out in Lunga Lunga and Milimani villages of Viwandani and Buruburu phase 2 and 4, Makadara sub-county, Nairobi County to spatially analyze and map street food. You are respectfully asked to take part in this important exercise by giving answers to the below questions relating to the subject matter. Your information will be used for academic reasons only and will be treated strictly confidential.

{Please tick where appropriate}

Preliminaries

Date of visit.....

Name of respondent.....

Name of place.....

Village.....

Coordinates.....

PART 1: Demographic characteristics of the vendor

- 1. Gender: Male Female
- 2. Age Category: 20-29yrs 30-39yrs 40-49yrs 50-59yrs 60-69yrs Above 70yrs
- 3. Marital status :
Single Married Separateddivorced Widow Widower
- 4. Highest education attainment:
 No formal education Primary certificate Secondary certificate College certificate College Diploma College/University 1st Degree Master’s Degree Doctorate Degree
- 5. Total number of people in your household including you____

PART 2: TYPES OF FOODS SOLD IN VIWANDANI AND BURUBURU

- a) cooked food
- b) Uncooked food
- c) processed foods.....

PART 3: CONTRIBUTION OF STREET FOODS TO URBAN FOOD ACCESS

- a) How does street foods improve livelihoods.....
- b) What are the benefits of street foods.....

PART 4: THE SOURCES OF FOOD SOLD IN VIWANDANI AND BURU-BURU

- a) designated markets
- b) wholesales
- c) local shops
- d) mini-supermarkets
- e) Informal markets

PART 5: THE SOCIO-ECONOMIC ATTRIBUTES OF VENDORS IN VIWANDANI, AND BURU-BURU?

- a) Income per month _____
- b) Vendor's experience _____
- c) Knowledge on food preparation _____
- d) Time of operation _____
- e) Serving practices _____

(Part 3)

1. What inspired you to work in street food?

I desired to work for myself

It has a higher profits margin

The minimal startup expenses proved appealing

Provides the most job prospects for jobless people

2. What kinds of meals and beverages do you store?

3. What kind of a structure do you sell from?

wooden stall

Umbrella

Cart

car

Kiosk

Open space

4. How then do you advertise your enterprise?

I don't intend to advertise

leaflets

Facebook

Other (please specify)

5. What business strategy do you believe is most effective your enterprise?

leaflets

Facebook

I don't intend to market it

6. Which are the most pressing issues confronting street food sector right now?

Inconsistencies among city councils

Failure to acquire street trading permit

Regulations for street trade are very rigid

Compliance with legal requirements is too costly

very competitive

Appendix 2: An observation checklist

An observation checklist.

Keenly observe the location of the interview and its surroundings, and describe the following environmental aspects.

1. Location of vending space.

- a) along a tarmac road
- b) along a dusty/muddy road
- c) along a dusty/muddy footpath

2. Environmental conditions of vending space

- a) near dusty/muddy road
- b) near dusty/muddy footpath
- c) near an open/blocked drainage/leaking sewer
- d) near a dumping site

3. Nature of vending space

- a) permanent structure
- b) temporary structure
- c) semi-permanent structure

4. Vendor's hygiene

- a) no chef's apron/cap
- b) has chef's apron/cap
- c) washes utensils with soap water

- d) washes utensils with no-soap water
- e) recycle water for washing utensils/vegetable/fruits
- f) doesn't recycle water for washing utensils/vegetable/fruits
- g) had colored nails/wrist bands
- h) no colored nails/wrist bands

5. Location of food preparation

- a) vending site
- b) at home

6. Other sanitation facilities

- a) has tap water/tank
- b) near public toilet
- c) rubbish bin for waste disposal

Appendix3: Field photos





Uncooked food photos



Mobile food vendors with uncooked food



Typical of street foods when served

Appendix 4: Turnitin Report

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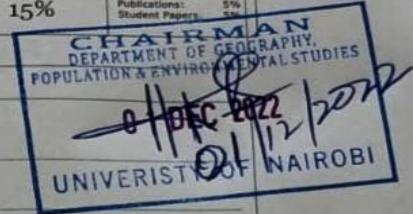
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Appendix 5: Declaration of Originality form

UNIVERSITY OF NAIROBI

Declaration of Originality Form

This form must be completed and signed for all works submitted to the University for Examination.

Name of student: Lemomo Charles Parorit

Registration Number: c50/12708/2018

College: CHSS

Faculty/School/Institute: ARTS

Department: Geography, Population and Environmental Studies


Course Name: Agricultural Geography

Title of the work: STREET FOOD VENDORS AND FOOD ACCESS: A COMPARATIVE STUDY
--

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