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The Impact of Heatwaves Condition on the Livelihood of Market Women in Ghana. A Case Study in the Kumasi-Kejetia Market.

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DECLARATION

I David Akyen, certify that, to the absolute best of my awareness, this dissertation is entirely original with no submissions for credit toward a degree from another university or other honours.

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DEDICATION

This degree is a testament not only to my effort but to the unwavering support and hard work of my family and my girlfriend. Their encouragement and sacrifice have been pivotal in helping me reach this milestone, and without them this achievement would not have been possible.

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List of Acronyms

GMA	Ghana Meteorological Agency
ILO	International Labor Organization
SDG	Sustainable Development Goal

Abstract

In recent years, heat waves have become more intense and prevalent due to the constant changing in the atmospheric conditions, posing critical health and economic challenges for outdoor workers globally. It is worth mentioning that market women, particularly in developing regions are vulnerable as their livelihood on prolonged exposure to open-air markets where resources to mitigate extreme heat are often lacking. This study investigates how heat waves affect market women's livelihood, focusing on how limited resources, constrained capabilities and affect functioning exacerbating their vulnerability.

Utilizing the Capability Approach as a theoretical framework, the research examines how essential resources such as shade, cooling equipment and healthcare access are crucial yet often inaccessible to market women in the Kejetia Market, restricting their ability to cope with extreme heat in supporting their livelihoods. Through the use of qualitative interviews, a sample size of 15 participant were adopted from the market through the purposive sampling technique. Market women selling various goods and services such as; Fishmonger, Fruit, Vegetable, Food vendors and Head porters were engaged in the study. The findings reveal that market women's capabilities such as knowledge, agency and social support are crucial for adapting work practices during heat waves. However, limited access to reliable institutional support networks constrains their freedoms to make informed decisions leading to a diminish in their resilience. Additionally, the study highlights the severe impact on functioning, demonstrating how heat waves compromise health, income stability, and work productivity, with many women facing reduced earnings and deteriorating wellbeing due to prolonged exposure. The research concludes with the need for targeted interventions to mitigate the adverse effect of heat waves, ensuring that market women can achieve valued outcomes despite these environmental stressors.

Relevance to Development Studies

This topic relevant to Development Studies insofar as it explores the intersection of environmental challenges, gender and informal economies, which are critical areas in the field. Examining the effect of heat weather on the livelihood of market women with the use of the capability approach as a focal lens, the research highlights how climate change exacerbates vulnerabilities for marginalized groups. Development studies aim to understand and address social and economic inequalities, especially those affecting low-income, informal workers who often lack institutional support and resources.

The study therefore, contributes to development studies by shedding light on the lived experience of market women, offering insights into how environmental stressors limits the capabilities of market women such as the freedom to work in safe conditions, maintain health, and achieve economic stability. This focus aligns with the discipline's goals of promoting inclusive, sustainable livelihoods and resilience against climate-induced adversities. Furthermore, by identifying the gaps institutional support and advocating for targeted interventions, the research provides actionable recommendations that could inform policy, infrastructure improvement and community programs, ultimately advancing equitable development. In doing so, the research connects the societal, economic and ecological aspect of development, emphasizing the importance of comprehensive, people-centred solutions in tackling climate impacts on vulnerable populations.

Keywords:

Market women, Heat waves, climate, Livelihood, Kejetia

Chapter 1 INTRODUCTION

This chapter introduces the scope and importance of the study, which examines heat waves on the livelihood of market women. It is worth mentioning that as climate change intensifies, extremes weather events like heat waves also becomes prevalent, posing serious threats to humanity. The chapter therefore, outline the background, motivation and objectives of the research.

1.0 Background of the Study

The growth of cities has emerged as a significant and pressing issue for many nations in recent times. It is noteworthy that many developing nations are experiencing an urban crisis, characterized by a greater influx of people towards their urban centres compared to the developed world (Li, Westlund and Liu, 2019, p.135). Worldwide change in the climate is estimated to have an impact on both living and working environments, and pose health risk to many lives globally (Ebi et al., 2021, p.293). The mean global temperature is rising and it is projected to increase by an additional 1.8-4.0 degree Celsius with a projected mean of 3.0 degrees Celsius by the year 2100. A trend known as “urban heat island effect” also causes an increase in the weather as a result of trapped heat by modern city development, including; cement buildings (Vujovic et al., 2021, p.469). The Kumasi Central Market (Kejetia- Market) has experience substantial growth since the construction of its initial covered building in 1924, which were designed to house approximately seven hundred (700) merchants (Arielle Badger Newman and Barney, 2023, p.9). Currently the market holds the distinction of being the most expansive marketplace in Ghana and also recognized as one of the biggest markets in the entire West Africa (Okoye, 2020, p.9). Therefore, to examine the impact of heat waves on the livelihood of market women in Ghana the issue of the re-construction of the Kumasi Kejetia Market becomes a great concern. The emergence of “modern marketplaces is an increasingly popular approach in local fiscal strategy aimed at improving key business centres in cities of the developing world”. Nevertheless, these advancements have substantial ramifications for venders on the street, who engage in economic endeavours in public area, such as trade roads, walkways and transportation stations, creating social reproduction of inequalities with the labour force while exposing many market women to excessive implication of heat waves in these current times (Okoye, 2020, p.2). Studies suggest that the Kumasi Metropolitan Assembly (KMA) in their effort towards the re-construction of the market

promises that, the redevelopment of the market will provide sufficient opportunities for street sellers to rent space. Nevertheless, the quantity of merchants originating from the Kejetia significantly surpasses the KMA's planned capacity of the new market. The KMA's decision to move the street vendors unsuitable and hard-to-reach site, without offering any assistance to sustain their livelihoods in the new market generate a geographical segregation that directly and negatively impacts the vendors capacity to earn income (Okoye, 2020, p.14).

1.1 Contextual History of the Kejetia Market

Kejetia Market also known as the Kumasi Central Market is located in the city of Kumasi, Ghana. The market being one of West Africa's biggest outdoor marketplaces, traces its history from the pre-colonial times where it's served as a vibrant centre for regional trade within the Ashante Kingdom. Evolutional developments depicting the economic, social and political changes which had occurred in Ghana over the centuries, reflects the shifts in urban development, commerce and social organization.

1.1.1 Important Historical Shifts and Continuities

Pre-colonial and Colonial era revealed the Kejetia Market as a hub for trade between the Asante people and other nearby ethnic groups in pre-colonial era. The market made trading in handicrafts like textiles and beads, as well as native commodities like yams, maize and kola nuts, easier. History depicts that during the era of the British colonial administration, the market's significance increased, serving as a hub for the gathering redistributing of products and growing to suit new trading networks founded by colonial interest.

Post-colonial Era; following Ghana's 1957 declaration of independence, the market remained a vital area of economy, with women predominating in trade and business. As a result of economic liberalization in the 1980s and 1990s, which increased imports and broadened the range of commodities offered for sale, facilitated it continue growth. Market women also became important players in Ghana's black market at this time, transacting in both domestic and foreign items (Amoako-Agyeman and Mintah, 2014).

Moreover, the market has experienced a recent development due the renovation into a contemporary market complex. The goal of the renovation project, which started in 2015,

was to enhance sanitation, upgrade the infrastructure and rearrange trading areas (Okoye, 2020). This has led to changes in how the market is organized and who has access to trading spaces, raising concerns about affordability and displacement of some traditional traders. Mensah et al. (2022), found that market women's income disparity grew as a result of traders being resettled throughout the shift in the Kejetia Market. The analysis demonstrate that the new market structure caused discrepancies particularly for those who were unable to gain good locations in the renovated market. Although this initiative is good for the infrastructure, it has changed the market's conventional spatial patterns and upset long-standing trade networks.

Notwithstanding, Amoako, Adjei-Poku and Dankyi (2022), asserted in their study that looked at the implementation of major infrastructures in Kumasi, and the study reveals that many traders were force to relocate and that some of them found it difficult to pay the high rent in the new complex due to their inability to compete with larger companies and highly resource traders who were able to get better stalls, many small-scale vendors lost revenue as a result of this displacement, and the variety of goods they sold decreased.

It is surprising to note that regardless of these changes, one of the fundamental key continuities has been the central role of women in the market. Women have historically been, and continue to be, the primary traders in Kejetia, with distinct network of trade and organization that have shaped the market's economic dynamics. Comparatively, Leshkovich (2014) illustrates similar themes in the Vietnamese context, where women in the market adapt to socioeconomic changes while sustaining roles as economic backbones, both Kejetia and the Vietnamese markets highlight women's crucial roles in maintaining family livelihoods and contributing to local economies despite modern pressures, thereby reflecting enduring patterns of resilience and adaptation among market women in varied cultural settings.

1.1.2 The political economy and the role of association in the Kejetia Market.

The political economy of the Kejetia Market is deeply intertwined with the organization and operation of market associations, the dynamics of trade and the economic practices of traders most of whom are women. It is noted that market associations perform crucial duty in the organization and governance within the market, and these associations, often divided along product lines, which also serve as a regulatory body that oversee the activities of their

members. They mediate disputes, allocate trading spaces and offer rules of conduct of business. Membership ideally is usually mandatory and it comes with both benefits and obligations, the benefits sometimes convince people to join however, the obligations attached refrain several others women not to be a part of these association.

Traders in the market also pay membership fees to join an association, and they contribute to the association's welfare fund as well. The funds raised are known to be used for various purposes such as providing financial support during difficult emergencies or for organizing social event. Membership also gives traders access to group bargaining power, security and support during conflict.

It is worth noting that the associations in the market have some influence on market governance. The Kejetia market associations are often involved in decision-making processes, especially in negotiations with municipal authorities on issues such as fees, space allocation and market regulations. In recent years, the influence of associations challenged by the market redevelopment project, where decisions are increasingly being made by external actors, sometimes leading to tensions between traders and authorities.

1.1.3 Trade Organization and Economic Practices

The organization of trade within the Kejetia market is complex and varies by product type. Traders can be broadly categorized into wholesale and retail traders, with many women operating as intermediaries between farmers or fishers and end consumers. The source of goods in the market varies. It is significantly asserted that for agricultural produce, some traders buy directly from farmers, while others purchase from bulk seller who transport goods from rural areas to city. For imported goods like textiles, traders often source from wholesale markets in Accra or directly from importers. Women selling cooked food often in stalls, while others move around the market, selling to other traders and customers. The preparation and selling of cooked food are also noted as a key economic activity for many women, providing a relatively stable income for their livelihood.

1.1.4 Financial Dynamics in the Market

The financial dynamics of market are characterized by a combination of credit agreements and cash transactions within the market (Malmendier, Pouzo and Vanasco, 2019). Credit arrangement is also prevalent, even though many transactions especially those involving perishable goods are settled immediately. After selling their goods, traders might repay producers or wholesalers on credit. It is therefore significant to acknowledge that while this postponed payment strategy helps traders manage their cash flow, it also raises their risk profile. The margins of profit vary greatly based on the kind of commodities offered, where the stall is located and how strong the trader is in negotiations. As a results to the significant danger of spoiling, sellers of perishable commodities for instance operate on lower margins than traders of non-perishable goods, such as textiles, who may enjoy better margins. On the other hand, excessive overhead expenses like transportation, association dues, and rental fees might lower overall profitability.

1.2 Problem Statement

The economy of Ghana as well as human growth is susceptible to the impact of warming temperature and climatic-related shocks. The nation Ghana between 1960 and 2000 experience a rise in average temperature of approximately 1°C (World Bank, 2022). It is worth mentioning that precipitation patterns have become increasingly unpredictable, consequently, there has been rise in occurrence and intensity of weather and extreme climate in the environment leading to more frequent storms, dryness and scorching temperatures. These events combined with greater vulnerability result in human casualties destruction of public and private property and interruption of economic activity (World Bank, 2022). In the absence of proactive measures taken at global and internal levels to address climate change, elevated temperatures and stress from heat will exert detrimental impact on productivity of crops and labour (World Bank, 2022). The manifestation of substantial harm to individual, physiological and environmental resource is presently occurring, the growing population of Ghana is associated with significant hazard such as extreme drought, heat stress, inadequate air quality and flood (World Bank, 2022). Consequently, prolong instances of heat waves have led to substantial agricultural damages in the last ten years, leading to the lack of food security or famines, as well as a decrease in productivity and livelihoods. In the future,

Ghana's economy will be further affected by rising temperature and recent unpredictable weather patterns which may involve both immediate consequences like destruction of properties from increasing heat waves and water scarcity which negatively affect the productivity of labour (World Bank, 2022).

According to, Roson and Sartori (2016) elevated temperatures will addition reduce labour efficacy due to heat strain, especially for individuals engage in outside physical work, such as agricultural related activities and construction labours. It is projected that heat stress and heat related diseases might lead to a decrease in agricultural labour efficiency of 8.5% by the year 2050 (Saeed et al. 2022, p.2). It is significantly noted that while several urban informal workers, such as construction workers or street vendors are exposed to extreme weather temperatures, the impact of these conditions vary significantly depending on the type of work and the social context. The case study of this study focuses on market women, a group whose work is not only defined by their socio-economic status but also by their gender. Market trading in Ghana, particularly in open-air markets like Kejetia, is predominantly performed by women, who often have to balance this labour with household responsibilities. This dual role makes market women uniquely susceptible to heat stress because they have fewer opportunities for rest and recovery compared to their male counterparts.

Research have proven that females are often physiologically afflicted by the heat due to differences in body composition and hormonal regulations, which can exacerbate the health impacts of prolong heat weather exposure (Borg et al., 2021). In addition to, due to the prevailing gender conventions, women are less inclined in many countries to speak up about their health issues or demand improved working conditions (International Labor Organization, 2024). This gender vulnerability makes the case study outstanding from the generalized informal workers since it centres on only the experience of market women.

Furthermore, engaging in market trading requires exposure to outdoor conditions for extended periods. Unlike construction workers, who may have designated break periods and often work in groups, market women often work independently, which limits their ability to take breaks without losing customers. The nature of trading activities also reflects that they constantly handling perishable goods, making it difficult to leave their stalls for cooling breaks. The layout of markets like Kejetia, characterized by crowded stalls, limited ventilation, and exposure to direct sunlight, creates a microclimate that can exacerbate heat stress. The layout therefore reflects the claim according to Liu et al. (2021) which explains the fact that, urban heat island effect causes market regions to have greater temperatures than nearby

urban districts, exposing how markets women experiences are unique since heat stress in the markets is frequently more severe than those in other unofficial employment settings.

1.3 Justification of the Study.

The issue of heatwaves is gradually becoming a global issue of concern, due to climate change-related occurrences (Li, Westlund and Liu, 2019, p.135). The research aims to investigate the impact of heatwaves on market women, who plays major role in local economic operations but are often vulnerable to environmental shocks. It is important to note that, understanding how heat waves affect market women is critical for developing targeted interventions to improve their resilience and success. This study is specifically significant to the SDG 3 (Good health and wellbeing) and SDG 8 (Decent work and Economic Growth). Studies asserts that market women endure extended periods of time outside and are significantly vulnerable to the expose elevated temperatures which has resulted in health-related ailment. The study aims to evaluate the health consequences of heat waves on these women and propose measures to alleviate these risks such as providing access to cooling centres, hydration stations and health education thereby enhancing the health and well-being of female vendors which is directly in-line with the SDG 3, which aims to guarantee healthier lives and foster well-being across all age groups. In broader sphere the study contributes larger comprehension of climate resilience among susceptible people. The research bridges the gap in the already existing studies by examining the connection within gender, informal work in conjunction with climate change specifically among market women. The result can be utilized to support the promotion of climate policies that are sensitive to gender issues and inclusive economic planning. This will ensure that the specific requirements and susceptibility of market women are acknowledge and dealt with in strategies for adapting to climate change.

1.4 Research Positionality

As a male researcher studying impact of heatwaves in relation to the livelihoods on female market vendors, inherent gender dynamics in this research. Market trading, especially in the specific situation being studied, is primarily a profession dominated by women. The gender gap might possibly impact the interaction between myself and the respondents, perhaps influencing the extent to which they are open and provided in-depth replies. Women may be reluctant to reveal specific experience or alter their replies based on perceived gender norms. In order to address these possible problems, the gender-sensitive approaches was used, to achieve that, female research assistant was recruited and trained online on the ethical issues and how to properly conduct the interviews from the field in Kumasi, Ghana to create a respectful and safe atmosphere that encourages open and sincere discussion.

The existence of social and economic inequality within this group might lead to inequality that might lead to unequal distribution of power, perhaps leading respondents to feel intimidated or obligated to provide responses that they see as being socially acceptable. In order to tackle this issue, a participative strategy was adopted to actively involve the community via first casual visits, building a strong relationship, and displaying sincere curiosity and admiration for their experiences. In addition, research assistants were trained to use easily understandable language to provide clear communication about the study objectives and methods.

The possibility of socially acceptable reactions poses a serious problem for this study, particularly when it comes to the subject of heat waves. People may grumble about the heat in a coordinate manner, believing that this is the expected or intended reaction. The results may be distorted by this bias, giving the impression that all negative effects are present without taking into account the varied experiences of market women. The study uses qualitative data gathering techniques, to combat this. The study also adopts approaches like triangulation, addition to interviews and observational methods to validate replies in order to provide a more thorough and accurate picture of how heat wave affect their way of life.

1.5 Research Objectives

Studies have steadily shown that hot weather temperatures have a profound impact on the livelihood, particularly in the vulnerable province. Hot weather conditions can lead to reduced agricultural productivity due to heat stress on crops and livestock, which in turn affects food security and income for farmers and market women (Saeed et al. 2022, p.2). In addition to, extreme heat can exacerbate health issues increasing the incidence of heat-related illnesses and reducing overall labour productivity as workers struggle to perform in oppressive conditions. The elevated temperatures strain water resources, leading to shortages that affect both daily life and agricultural activities. In view of the above assertions this essay seeks to examine effect of heat spell on markets women's health, earning and cost incurred. The research aims to explore on the how different high temperatures affect market women both normal periods and excessive heat periods.

The hot weather can have significant adverse effects on health, particularly among people working outside. Studies indicate that long hour's exposure to high temperatures can lead to hot changes such as heat exhaustion and inadequate hydration (Kenny et al., 2018 p.506). Moreover, extreme heat can affect cognitive function and productivity, posing further risks to those working in such conditions. The study with regards to the above assertion seeks to find out the strategies implored by market women in controlling excessive food loss during high temperature and mitigating strategies to protect their health.

Again, it is worth mentioning that these challenges posed by the climate change can result the health risk, the informal workers in as much as they contribute to the economy, they are in mostly disregarded however, these individuals in the informal economy have a demand from the government that could help them reduce the challenges posed by the climate change in order to unravel these, the study exposes the needs of female vendors in the market from the government to promote their wellbeing.

1.6 Research Question

- 1.6.1 What is the effect of heat waves on market women's health, earning and cost incurred?
- 1.6.2 What are strategies implored by market women in controlling food spoilage during high temperature and mitigation strategies to protect their health?
- 1.6.3 What are the needs of market women from the government in promoting their well-being?

Chapter 2 LITERATURE REVIEW

2.1 Introduction

This section analyses the various concepts used in the study, as well as the theory adopted to critically analyse the phenomenon and finally assess the previous empirical studies exploring more key literatures on climate change, informal work and gender vulnerability in development context.

2.2 Conceptual Review

2.2.1 Definition of Heat waves

Heat waves are weather phenomena that are naturally erratic, of short duration, and cause discomfort. Heat wave has also been defined as the severe weather phenomenon that is linked to climate change (IPCC, 2012). It is worth noticing that heat waves lack an entirely accepted unique meaning, yet widely recognized as a sustained period of extremely high temperatures. This phenomenon is typically linked to heat stress caused by atmospheric conditions. Defining heat waves is set to be also determined by the geographical location, since it involves determining the appropriate intensity and time frame for an event and connecting it to the climate conditions of the specific place being studied (Marx, Haunschild and Bornmann, 2021, p.782). The Ghana Metrological Service also define “heat waves as a period of excessively hot weather, which may be accompanied by high humidity, especially in tropical context”. Typically, such situations must persist for at least three consecutive days with the weather condition significantly higher than the usual maximum temperature for the region during that time of the year (Ghana Meteorological Agency, n.d.).

2.2.2 Livelihood of market women

Livelihood refers to the sufficient availability of food and economic resources to fulfil essential demands. Security encompasses the protection and control of resources and income-generating activities, such as reserves and assets, to mitigate risks, manage unexpected events and address unforeseen circumstances (Natarajan et al., 2022, p.105898). Livelihood in its most basic definition refers to a method or source of obtaining a means of sustenance (Chaya and Gheewala, 2022, p.248). Livelihood has also been defined as the skills, resources

as well as deeds relevant for the maintenance of one's manner of life. A stable livelihood is one that is able to resist and recover from challenges and disruptions, while also improving its resources and opportunities for future generations (Paehlke, 2020, p.130). The term livelihood has been created to encompass both research and development strategy. It's a framework of analysis has two primary aims; the first one connects the diverse methods by which rural individuals sustain their lives within their respective environments. Secondly, it focuses on the mechanisms that influence these endeavours, as well as the actions of organization and individuals who are not part of the communities being studied yet have a role in how people strive to earn a living (Tao and Wall, 2009, p. 139).

2.3 Empirical Review

Heat sickness is the term used to describe minor diseases such heat cramps and heat rash as well as severe signs directly linked to an increased in body temperature including heat stroke. The recent heat sickness has caused considerable morbidity and mortality results that would burden at risk population greatly in relation to health care. Heat related sickness mostly rise seasonally and this in recent times has increased rapidly due to the harsh climate affecting both the western world and the southern world (Gu et al., 2018). Again, a longitudinal study data point to women being more likely to get heat illness (Notley et al., 2017). Systematic body of research also indicates that both outside and inside temperature have negative health impact among exposed workers (Lee et al., 2021; Ebi et al., 2021). Heat stress is noted to have caused intellectual and physical performance for workers on their job, and in most recent worldwide evaluation of the impact of weather condition on humanity, there has been an increase prominence on people wellbeing due to heat exposure. It is also worth mentioning that elevated temperatures have indirectly heighten the susceptibility to contagious illnesses. High temperatures in tropical regions provide a significant obstacle to using mosquito nets at night, making them being vulnerably exposed to illness like malaria all as a result of heat stress (Pulford et al., 2011). The leading cause of death during high temperatures is noted to be cardiovascular disease (Semenza et al., 1996), followed by the respiratory disease (Bunker et al., 2016); also, the increase in hydration among outdoor workers especially market women who work in the sun and sometimes in concrete buildings face chronic kidney diseases which is also noted to be a prospective cause of death (Bunker et al., 2016).

Heat waves in several studies has reveal productivity loss, (Dehaghi et al., 2022; Marinaccio, Bonafede and Morabito, 2022). Farmers reported degrees of stress from heat and the frequency related diseases or symptoms greatly influence labour productivity loss (Budhathoki and Zander, 2019), and the assumption from this study reveals that this productivity loss stands the chance of affecting the pricing of commodity due to the scarcity in food product, making live more difficult for market women since they would have to incurred much money purchasing these limited food items.

Moreover, having mention this, it is also asserted that heat stress can potentially cause a change in efficiency of labour or cost of providing labour in situation when individuals are exposed to heat. Therefore, in situations when there is unbearable heat temperature, it is anticipated that workers would alter their choice on relaxing or work and this is mostly evidential in the activities of those working in the agricultural sector (Graff Zivin and Neidell, 2010). Research in the field of ergonomics has also confirmed a significant correlation between increased temperature and decreased productivity (Lan, Lian and Pan, 2010).

2.4 Theoretical Review

2.4.1 The Human Capital Approach

The human capital theory refers to an economic principle used in explaining the importance of investing in individual's education and abilities to enhance their productive efficiency to expand their earning potential. The theory was first introduced by Gary Becker and Schultz who classified expenditures on human development as investments rather than consumption. It asserts that just as physical capital such as (computers, buildings, etc.) can improve productivity, so as human knowledge, skills and abilities could also enhance productivity. Human capital theory also posits that there is a direct correlation between education/skills and economic benefits, which reflects that individuals with more education or higher skills are likely to earn than those with lower educational attainment (Galiakberova, 2019, p.410). In the context of this study, this approach interprets heatwaves mainly in terms of how they affect women's ability to work and their economic productivity. However, the framework is limited because it frames people as economic agents whose value is tied to their ability to generate income (Marginson, 2019, p.289). It does not fully capture the broader impacts of heatwaves on the entirety of women's wellbeing and their capacity to achieve a variety of life goals. The theory treats individuals as labour input in an economic system,

rather than as people with multiple needs and aspirations (Marginson, 2019, p.289). The theory is limited since it does not account for how extreme heat affect women's non-economic aspect of life, such as their ability to care for their families, maintaining their sense of personal dignity and agency. These limitations make it less suitable for addressing the full scope of the study, where understanding how heat waves disrupt the overall quality of life for market women that goes beyond their income. To avoid these lapses the capability approach reveals the best theoretical framework in reviewing the research questions of the study.

2.3.2 The Capability Approach

The Amartya Sen's Capability Approach emerged from the late 20th century (Garces, 2022) offers a nuanced framework for understanding how heat spells affect market women and their livelihoods by emphasizing the significance of capabilities, these refers to as the actual opportunities individual gets to direct the lives the cherish, which encapsulate what individuals are to become and to operate (Nussbaum, 2011, p.146). The theory was propounded by an economist philosopher Amartya Sen, this theory was a response to traditional welfare economics, which Sen noted inadequate in addressing human wellbeing comprehensively, this theory shifted focus from the economic wealth and resource distribution to what individuals can actually do and be given their personal and environmental circumstances (Nussbaum and Sen, 2010). Capabilities encompass the range of potentialities that an individual possesses or can achieve, whereas functioning represent the actualized conditions or actions that an individual experiences or engages in (Nussbaum, 2011, p.146). The approach prioritizes the significance of enhancing individual's capabilities that live the type of lives they deem valuable. Assessing functioning in this particular phenomenon reveals that market women working in high heat face significant risks to their health, such as dehydration, heat-stroke, chronic health problems. The extreme heat can impair their ability to function effectively both in their work and personal live, with respect to market women economic stability, it is evidently clear that market women rely on market sales for their livelihood.

Furthermore, the inability to work effectively due to heat can result in reduction of income, affecting their capacity to support their families and reinvest in their businesses. Market as the work environment also exposes market women to extreme heat that undermines the capacity to perform job duties in a healthy and secure setting and this limits market women capacity to attain economic stability and good health. The context within which the Amartai Sen Capability approach is used reveals that market women access to resources such

as availability to shade, hydration, healthcare and cooling measures such as the use of fans and air conditions are noted to be crucial in building their capacity to work safely and effectively. One of the fundamental issues that is important for the research is analysing whether market women have access to the above-mentioned resources and examines how the lack of these resources has cost them in the recent heat resulting from climate issues.

According to Nussbaum and Sen (2010), capability approach also explains the views that transcends beyond providing resources to enabling real opportunities for wellbeing and resilience, highlighting the importance of addressing both immediate needs and long-term capabilities, this provides a framework that could be used to draft policies that does not only alleviate the immediate impact of heat spell but also build the capacity of market women to thrive in diverse and challenging circumstances. Simpson (2018, p.366) argues that the term capability refers to the qualities or abilities that individuals have a strong justification to appreciate such as the capacity to reside in hygienic and good surroundings and these qualities form the basis for the various options that an individual has in choosing a specific lifestyle. The approach demonstrated the interconnections between capacities, wellbeing and the sustainable livelihoods strategy in modern work (Lienert and Burger, 2015).

To promote the wellbeing of market women in this crisis climatic conditions it is very important to also access how collective agency of market women can enhance their collective capabilities. The concept of collective agency is frequently associated with collective action for social change, which involves the modification of institutions through the act of rallies (Van Staveren, 2024, p.224).

Again, as asserted by Van Staveren, (2024, p.224), collective agency ought to be functional, and that suggest that there should be a universality for each member of the group, and this stand to reveal that if market leaders are taking the needs of all members into consideration it will help enhance the wellbeing of market women which will in turn promote their capability. Collective capabilities are often defined as the combine abilities of individual with a group, considering the impact of their interactions, such as social capital. The influence of interaction on the development of combined skill occurs at the meso-level (Von Jacobi, 2017, p.856).

2.3.2 Theoretical Frame Work

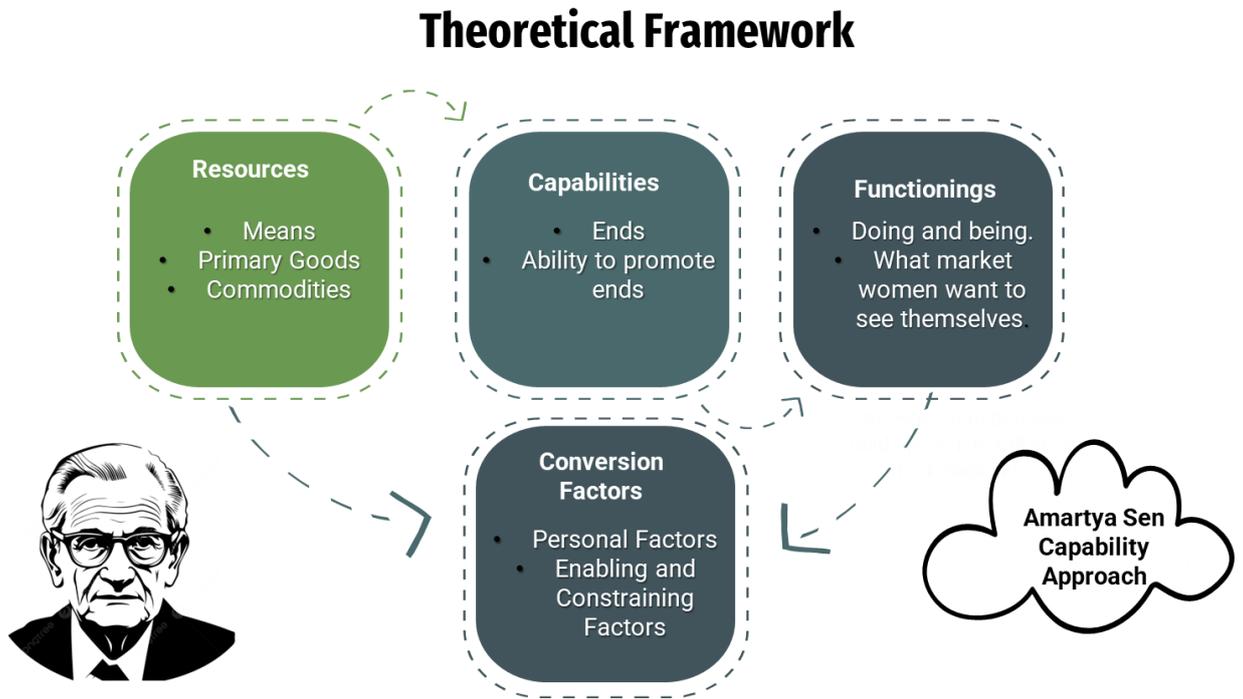


Figure 1.1 The Capability Approach Theory Structure

The capabilities approach is a theoretical structure that suggests how capacities serve as substitutes for freedom. The framework is suitable for evaluating wellness and social fairness. When evaluating wellbeing, the usual emphasis is laid on wealth (actual profits, assets, as well as material possession) and viability (pleasure or the fulfilment of desires). The theory challenges the concept used in welfare economics and the underlying philosophy of utilitarianism which has traditionally formed the basis of housing policy studies (Kimhur, 2020, p.260).

The capability approach suggests that instead of focusing on resources and usefulness, we should evaluate and compare advantages and deprivations of individuals based on the space within which they operate. In relating this framework to the study of heat waves impact on the livelihood of market women, the study seeks to analyse how some market women benefit or lose with regards to those that have access to trade resources. The resources in this context are referred to as the tangible and intangible assets that individuals have access to which includes means, primary goods and commodities. Income levels as part of the means resources highlights how high-income level may enable market women to better mitigate the effect of heat waves by affording cooling devices such as fans, air conditioners) and getting superior healthcare. In addition to the resources market women who have access to savings and loans can manage the immediate financial consequences of decreased production

or heightened healthcare during heat waves at the expense of the other market women who do not have such access.

Primary goods also focusing on the basic needs and public services reveals how the capability of market women can be either improved or diminished. Water supply as part of the basic needs depict that ensuring dependable access to uncontaminated and enough water is essential for female vendors at the market, particularly during the periods of extreme heat, in order to avoid dehydration and heat related ailments. During heat waves it is crucial to have sufficient shelter that offers protection from excessive heat and access to appropriate sanitary facilities to promote good health and wellbeing.

Lastly, under the resource is commodities and this highlights market goods and Infrastructure that also have the chance to promote or hinders market women capabilities. Market Infrastructure that is well-designed, with shaded places, ventilation, and water stations, can help reduce the negative repercussion of heat on health and productivity of women working at the market. In the case of the Kejetia market it is observed that some market women are privilege to sell in the concrete Kejetia market while others also sell at the peripherals, accessing these phenomena reveals how market women from this different perspective may suffer from the impact of the heat waves. The reasoning of the idea is intimately linked to its other important characteristics, including the notion of factors deemed as conversional, recognition of individuals variation, and agent-oriented perspective (Kimhur, 2020, p.260.).

According to the paradigm of the capability Approach, capabilities are the liberties or chances that people have to enjoy the lives they cherish. Therefore, market women facing heat waves, these capabilities especially their ends and their ability to promote these ends, significantly impact their livelihoods. It is important to know that market women who aim to maintain good health to their livelihood activities are being threaten by illness as a result of heat waves. Social and community network also help in this regard and in the analysis of this phenomena, it is also interesting to investigate into how market women also in their attempt of surviving this heat waves are being supported by their families, friends and community organizations like labour unions.

The conversion variables in the framework also highlights the reality that individual having varying capacities for examples in the case of the market women at Kejetia being able transform means resources (Concrete Market Building with Shade) into valued opportunities (the ability to sell comfortably) or results (Functioning). The theory of capability also explains the role of personal factors that could also affect individual market women livelihoods in this recent crisis of heat waves. The personal factors that promote or hinders market

women's livelihood may differ, some could be age, wage, body shape whether being fat or slim and their resistance capacity to sweat, nursing mothers, rich and the poor market women and several other biological factors. The study investigates to understand whether market women have a community economy that support their collect capacity, and lastly literature probe to find out if there exist any functional buffer that help market women to get some income to stay home when there are hot weather condition. More importantly, under the conversion variable enabling and constraining factors are also considered and organizations such as Trade Union are accesses from market women whether their activities are helping and promoting their well-being or it is rather constraining them.

In terms of how the capability approach is relevant for analysing the challenges faced by the informal women workers, which involves the market women, it focuses on their freedoms and opportunities to achieve well-being within often restrictive environment (Alexandre Apsan Frediani, Clark and Biggeri, 2019, p.8). The is informal work setting is popularly known as lacking essential resources, leaving women workers vulnerable to environmental shocks. The capability approach emphasizes not just the readiness of the resources but also the ability for people to utilise them to pursue valued outcomes, such as maintaining health, achieving financial security and sustaining family life. (Bartolomei, Genowefa Blundo-Canto and Pasquale De Muro, 2024, p.369).

Chapter 3 RESEARCH METHODOLOGY

3.1 Introduction

The section outlines the methods explored on how heat waves affect the livelihood of the market women. It describes the study's qualitative approach, including participant selection and data collection through semi-structured interviews, designed to gather detailed insights into their experiences and challenges. The chapter also covers the ethical considerations and study limitations ensuring transparent and reliable research process.

3.2 Design of the Research

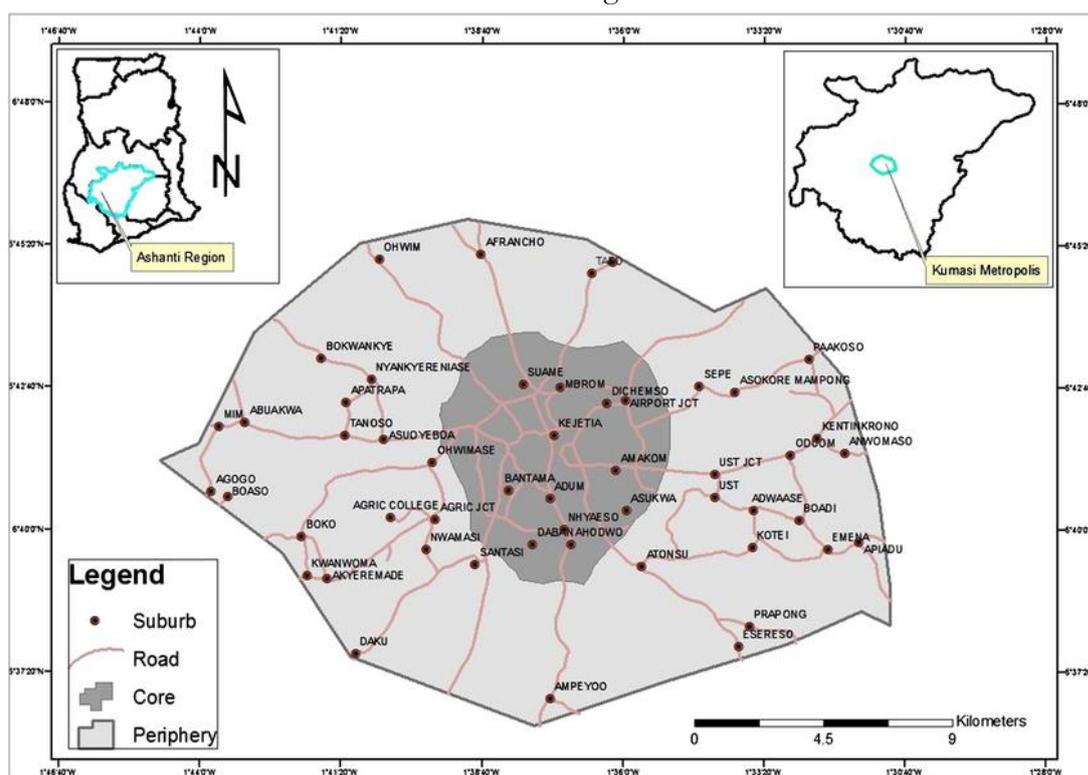
3.2.1 The Study area and Population

The research selects Kumasi Kejetia as its study area. This area is grounded in several compelling reasons, encompassing climate conditions, socio-economic factors and urban characteristics. Kumasi Kejetia is a home of West Africa's huge market (Okoye, 2020, p.2). According to Ghana Statistical Service (2021), the total population of Kumasi Metropolis is approximately, 443,981 of which 213,662 are males and 230,319 are females. This statistic reveals the urbanized nature of the area of study. The socio-economic situation of the area of study also reveals that in Kumasi 80% of the workforce is engaged in the unregulated economy (Ghana Statistical Service, 2012). A higher quantum of unauthorized labourers is involved in sectors such as trade, production, building and transporting business. However, it is significant to note that, these fields exhibit gender disparities. Ghana Statistical Service (2014) asserted that a larger proportion of women about 80.9% are employed in the informal economy rather than men 52.5%. The majority of females engaged in unauthorized employment in the cities of Ghana are found in trade about 46% as at 2014 and current Ghana Statistical Service survey in 2021 revealing a consistently higher number of females in the Kumasi Metropolis makes this study area interested for the research topic. The city of Kumasi consistently experiences high temperature across the year which is a tropical figure. The average daily temperature in Kumasi varies between 26-28°C, with afternoon temperature between 30-33°C (Essel, 2017, p.6). Kumasi has a weather condition with a daily mean lowest and highest temperature of "21.5°C and 30.7°C" accordingly (Koranteng, Simons and

Nyame-Tawiah, 2019, p.755). According to Frimpong, Koranteng and Molkenthin (2022, p.7), asserted that the annual heat indices showed upward pattern at both Accra and Kumasi, the heat indices reveal a value of 0.08 and 0.06 for Kumasi and Accra respectively during chilly days. Mensah et al. (2018, p.20) also posit that Kumasi for decades climate records spanning 55 years from 1960 through to 2015 has marginally altered, with mean surface temperature increasing by 1.2°C over fifty-five (55) year and this is resulting from high level of land use leading to the cause of low evaporative urban surfaces. Therefore, the hot temperature intercepting with the urbanized nature of the study area with women mostly engaged in informal work makes the study of heat waves very interesting to explore it impact on market women livelihood.

Map 3.1
Map of Kumasi, Ashanti Region, Ghana.

source researchgate.net



Monthly Climatology of Average Minimum Surface Air Temperature, Average Mean Surface Air Temperature, Average Maximum Surface Air Temperature & Precipitation 1991-2020; Ashanti, Ghana

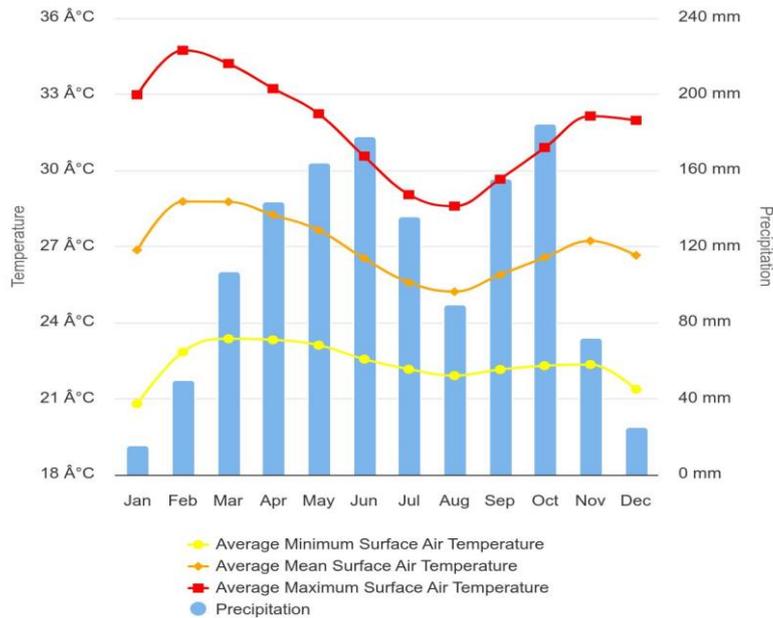


Figure 2.1: climateknowledgeportal.worldbank.org, 2021)

Kumasi, located in the Ashanti region, Ghana and it is noted for tropical climate that comes with high temperatures throughout the year, making it a compelling site for studying the impact of heat on livelihoods. The region typically experiences average annual temperatures of 27°C which can rise even higher during the dry season, influenced by the arid harmattan winds. The rationale behind what makes Kumasi particularly interesting for such a study is its proximity to both forest and Savanna zones, making it more exposed to fluctuations in weather patterns like heat waves compared to the coastal or the northern regions. This variability in climate combine with the dense population and large informal markets has the tendency exacerbate the effects of extremes heat on market women, who often operate in open and unshaded areas.

3.2.2 Sampling Technique/Size

The study employs the qualitative interviewing method, the use of this method aims at obtaining a comprehensive understanding of their individual encounters, difficulties and methods of managing the situation. This technique enables a thorough comprehension of

the subtle impacts of heat waves on individuals' everyday lives, wellbeing and economic endeavours, which quantitative approach may not completely encompass. Through the use of interviews, the purpose of the research seeks to gather comprehensive with intricate narratives that accurately depict the many viewpoints and resilience of market women. The study also employs the purposive sampling technique in the analysis of the data and this particular technique enables the researcher to choose individuals who possess the specific characteristics and are most impacted by the issue being studied (Obilor, 2023, p.5). Through the utilization of the purposive sampling the study concentrates on market women who have firsthand experience of the impact of heat waves, guaranteeing that the data gathered is pertinent and illuminating. The purposive sampling is adopted due to its ability to ensure detection of subtle effects and adaptive measures that may not be as apparent when using a random sampling technique (Obilor, 2023, p.4). The stratified purposive sampling technique is used in the to ensure the inclusion of wide range of market women, taking into account criteria such as age, kind of goods sold, and the location of the market whether in the constructed building or in the outdoor (peripheral) which are essential for comprehensive understanding of varies ways in which heat waves influence their livelihoods. This sampling technique not only improves the credibility of the results but also guarantees that the research outcomes are directly relevant to the individuals who are most impacted by heat waves in Kumasi-Kejetia Market. The research utilizes a total of 15 research participant for the investigation. The justification for this sample size is based on the research targeted and exploratory nature, utilizing a smaller and a well selected sample enables a thorough examination of the precise effects of heatwaves on market vendors. Participants were selected using stratified random sampling. The sample was divided into product categories, and from each category, three women were randomly selected. To achieve this, the study approach individuals sequentially and randomly until two participants from each category agreed to participate. This approach ensured representation across all product categories, giving a thorough understanding of the phenomenon.

The study encompasses market women from the five selected category with 3 participants from each sector, that is; vendors of vegetables, fruit vendors, head potters, fishmongers and the prepared food vendors making a total of 15 research participant by selecting from among these diverse groups the study guarantee a comprehensive perspective on the effects of heat waves on several areas of the market.

3.2.3 Sources of Data

The qualitative data were obtained directly from the market women themselves serve as the primary source of information for this research, which investigate the influence that heat waves have on the livelihood of the market women in Kumasi (Taherdoost, 2021, p.11). The purpose of these interviews is to provide in-depth insights into the human experience, challenges and coping techniques of the market women during heat waves also collecting observational data was useful for the purpose of the study and the outcome was contextualized with the interviews gathered from the field to capture the environment and operational settings under which market women in the study area work and lastly the use of secondary data also suggest to be relevant for the study and that information were gathered from market records, local health reports, and pertinent climate data from meteorological organizations, were utilized to supplement data in order to provide a thorough knowledge of the broader context (Taherdoost, 2021, p.13).

3.3 Data Collection tools

Gathering data on the impact of heat weather on livelihood of market women, a qualitative research approach was used, with the using of semi-structured interview guide. The field work provides involve-in-depth, face to face interview with the Kejetia local market (Taherdoost, 2021, p.18). The semi-structured question guide contains open-ended questions designed to explore the personal experience, challenges and coping strategies of market the women during heat weathers. The interview questions cover area such as health effect, economic impact, changes in work patterns perception on environmental conditions. Interviews were also conducted at times convenient for the participant to ensure that participant are willing and comfortable to share their story. The interview with inform content, every interview was recorded and later transcribe. Research participant was interviewed at their work place and were given a token of Gh¢ 20.00 which and snacks to compensate for their time and effort to support the study.

Furthermore, to guarantee the successful implementation of data collection for the study, a research assistant who has the requisite abilities and expertise to efficiently accomplish the research goal was hired. The research assistant worked as a research assistant at the Kwame Nkrumah University of Science and Technology, Ghana and was taking through an

online training for 2 hours within three days and Gh¢200.00 was paid per an hour for the training with sum total of Gh¢1,200.00 paid for the training on the research goals, methodology and the particular area of emphasis for the thesis to ensure genuine and dependable data and Gh¢2,400 paid for the actual data collection from the field.

3.4 Data Analysis

The research examines the effects of heat waves on the economic activities of female vendors in Kumasi, was conducted using a systematic method. The process commences with the transcription of interviews, which is then followed by data familiarization achieved by the repeated reading of transcripts to find first trends. Following that the process of initial coding was identified and emphasized repeating themes and important phrases (Li and Zhang, 2022). The codes were categorized into bigger themes through the process of the thematic analysis. The themes undergo scrutiny for precision during the reviewing theme phase and were explicitly delineated and labelled in the defining and naming themes stage. Data analysis establish connections between these topics and the wider body of literature, resulting in the formation of significant conclusion (Li and Zhang, 2022). Ultimately, the results were showcase in a well-organized report during the presentation stage, providing a comprehensive analysis of the themes and their consequences.

3.5 Ethical Consideration

Ethical consideration plays a vital role in social science research. The term explains the set of principles that differentiate between acceptable and inappropriate behaviour (Creswell, 2021). Ward (2020, p.68) emphasize the need of clearly articulating the study's objective and obtaining consent from participant. The participants were provided with clear information on the research's aims and processes and their obligations to refrain from the research at any point without any negative consequences. Informed consent forms written in straightforward language were given out to participants, and interpreted to assist non-native speaker in fully understanding the study's objectives and their participation.

Moreover, to ensure anonymity, information concerning participants were anonymized and with regards to that, no identifiable data were included in the final report. The study also employed the use of Pseudonyms during data transcript in order to protect client safety, delicatied themes like financial difficulties and heat-related health concerns were also discussed without causing emotional or mental distress.

Lastly, data security and management measures, was strictly enforced. All electronic data was stored on encrypted devices and backed up in a secure, password-protected system accessible only to the researcher. Addressing these ethical concerns with such specificity, the study aims to uphold the highest ethical guidelines approved by the ethics board at International Institute of Social Studies of Erasmus University Rotterdam.

Chapter 4 PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.0 Introduction

The analysis section of the research, the data collected on field from market vendors in the Kumasi Kejetia Market on the specified objectives were presented. The identities of the respondents are withheld from the analysis along with their opinions in order to maintain anonymity and confidentiality. The chapter captures a summary data presented and analysed on the demographic background of the market women; the impact of heat waves on market women's health earning and cost incurred also the strategies implored by market women in controlling food spoilage during high temperature and mitigation strategies to protect their health and finally the needs of market women from the government in promoting their well-being.

4.1 Socio-demographic Characteristics of Participants

Table 1.1 Socio-demographic Characteristics of Participants

Participant Reference/ Unique Identifier	Gender	Age	Religion	Work Experience	Type of commodity sell in the market	Place of selling in the market	Part of an Association
FVC01	Female	36	Christian	2 years	Fruits	Concrete building	N/A
FVP 02	Female	44	Christian	10 years	Fruits	Peripheral	No
FVC 03	Female	30	Muslim	24 years	Fruits	Concrete building	N/A
FDVP 04	Female	30	Christian	2 years	Food	Peripheral	No
FDVC 05	Female	24	Muslim	2 years	Food	Concrete building	N/A
FMVP 06	Female	41	Muslim	2 years	Fish Monger	Peripheral	N/A
FMVC 07	Female	45	Christian	30 years	Fish Monger	Concrete building	Yes

FMVC 08	Female	51	Christian	4 years	Fish Monger	Concrete building	No
VVP 09	Female	48	Christian	15 years	Vegetables	Peripheral	Yes
VVP 10	Female	25	Muslim	15 years	Vegetables	Peripheral	No
FDVC 11	Female	36	Christian	7 years	Food	Concrete building	N/A
VVC 12	Female	37	Christian	8 years	Vegetables	Concrete building	N/A
HPP 13	Female	43	Christian	3 years	Head Porter	Peripheral	N/A
HPP 14	Female	44	Muslim	11 years	Head Porter	Peripheral	N/A
HPP 15	Female	42	Christian	1 year	Head Porter	Peripheral	N/A

Source; Fieldwork data, 2024.

Since the study targeted respondents was on women, all the 15-participant involved in the study were females, with 10 of them being Christian and 5 being Muslim. Participant religious background was captured since their beliefs might have influence on their experience with heat waves on their livelihoods. The table also depict the maximum work experience of participants recruited in the study at Kejetia market to be 30 years and with a minimum work experience of 2 years. 7 market vendors from the concrete Kejetia Market building also known as “Dubai” while 8 of the market peripherals were involved in the study. The experience of these varied market women shared deeper insight on how heat waves affect their lives and well-being.

Surprisingly, 9 out of the 15 respondents did not want to share their status on whether they are with any association or not, 4 of them asserted that they are not in any association and only 2 affirming membership to an association. It could assess that, the unwillingness of the majority to disclose their status suggest that discussing might be sensitive or potentially controversial within the market environment, since market association play a dual role, such as promoting advocacy and also being perceived as political or bureaucratic entities that impose rules, fees and obligations. The participant silence could resonate as being judged from other market women for being part of a particular group. The 4 participant who openly stated their status that they are not into any association could also depict that, their decision might be rooted in personal mistrust of organized groups, or the belief that these associations do not provide any significant value. Conversely, the 2 participants in the market who admitted to being member of a market association are likely to see tangible benefit in belonging to such groups, as collective bargaining power and access to resources.

4.2. How does heat waves in the experience of market women entails?

Generally, the fundamental idea behind selling at the Kejetia Market is that vendors could advertise their commodity well in the market and sell successfully to earn a living for themselves and their families as well. However, based on the findings of the interviews conducted from the field, market vendors shared their experience by specifically drawing on their own narratives as market women who have been selling in a couple of years. The responses on their experience on heat waves in the market has can be classified into three main themes. i. Heat waves and the Health of Market Women, ii. Economic Consequences of Heat Waves, and iii. Heat waves and Market Dynamics.

4.2.1 Heat Waves and the Health of Market Women

All participant interviewed asserted that heat waves has affected their health both those in the concrete building and the peripheral, depicting how heat waves exert inevitable health consequences to individual irrespective of the place of selling. A vendor in the peripheral market assertion below better depicts this theme;

“Eiiii... excessive heat issue is what you want to talk about, I even became very sick and was admitted to the hospital, a lot of my family member also got sick during the heat waves, in my family, I can't even count one who wasn't affected by the impact of the recent heat waves, anw so with illness we have really suffered, the heat waves this time has really affected greatly” (Food vendor selling at the peripheral market participant 04).

The assertion made by the participant concerning that fact that she cannot even count one of the family members that was not affected by heat related illness reveals how heat waves affect the health of many individuals.

Another participant in the concrete market building asserted that;

“The heat waves cause me to get acne and this is cause as a result of the severe sweat” (Fruit Vendor selling at the concrete building participant 01)

The above quote suggests how severe sweat associated to heat waves stands the chance of resulting several market women in uncontrollable skin disease which affect them greatly in her ability to work effectively in the market.

Additionally, probing further to investigate the specific health problems associated with heat waves, one vegetable vendor asserted that;

“...the high heat can also cause you to have malaria, it can also let you get typhoid so what we mostly do is that when the heat becomes very severe, we turn to drink more of chilled water, and drinking of this chilled water can prevent you from getting produces excessive heat ...” Vegetable vendor selling at the Peripheral participant 09.

Participant having said this, affirms Koenker et al. (2013) study that argued that the primary deterrent to using a nocturnal mosquito net in several tropical nations is high temperatures, hence, heat stress execute huge role in exacerbating risk of illness like malaria and dengue fever.

Interestingly, one of the participants associated the heat waves and bad sales could result in weakness and fatigue.

“Ann... the heat waves can cause you to be very weak especially when sales are bad but when the sales are booming you don't feel the weakness caused by the heat waves” (Vegetable vendor selling at the Peripheral market participant 10)

This statement depicts a complex interplay between physical and psychological factors, highlighting how emotional and mental states can influence the perception of physical discomfort. Critical observation of this assertion reveals that the impact of hot weather is felt intensely when sales are poor, implying a psychological component to physical discomfort. Conversely, when sales are booming, the participant does not feel the fatigue, suggest that positive emotions or a heightened state of motivation can mitigate the perception of physical strain.

Critically assessing the trends and patterns of the demographic characteristics of these varied market vendors in relation to the effect of heat stress on their health.

In relation to age factors, it was observed that younger market women between the ages of 20-35 years tend to have physical resilient to the impact of the excessive heat than those above the ages of 36 years, allowing them to withstand longer hours in the high temperature without immediate health consequences. Nonetheless, a continues exposure to the extreme

heat have led to skin problems such as pimples. The younger market women in the case of the female head porters are able to carry heavier loads of commodities and engage in more highly demanding physical tasks, which could also heighten their risk of getting ill in presence of the heat waves as compared to the adult market head porter vendors.

Considering the place of selling in the market and how heat waves affect them, the dynamics reveals that vendors in the open-air market face higher health risk as a result of their exposure to the direct heat, while those in the concrete structure experience less immediate exposure but still encounters challenges due to poor ventilation and heat entrapment.

4.2.2. Economic Consequences of Heat Waves

Exploring this theme of economic consequences that heat waves impose on the livelihood of market women reveals how extreme temperatures disrupts daily income generation, alter sales patterns and challenge the overall financial stability of these women, who often operate within the Kejetia market and its environs.

4.2.2.1 Income loss

It emerged from the findings that, the heat waves rapidly cause food spoilage creating greater economic loss to market women and affecting their livelihoods.

One of the research participants in the peripheral of the market asserted that;

“The heat has affected our business, these commodities here, if I am unable to sell all, I will cover them and keep it for the next day and you will realize that it stinks, but I used money in buying them so I can’t just throw them away... and if a customer buys it and send it home, they choose not to come to us again and it’s really a problem for us. (Food Vendor participant 04)

The above statement from the research participant highlights the lack of real economic freedom. The situation illustrates a central tenet in Sen’s Capability approach which could be observed that market women although have freedom to engage in trade yet their choices are severely constrained by the economic and environmental conditions they face. The need to sell spoiled goods due to the financial pressure of recovering costs indicates that these market women do not have the genuine capability to make choices that would ensure both their

economic well-being and their customers satisfaction. The impact of heat waves becomes a crucial concern since it exacerbates these constraints, forcing market women into cycles where they must choose between financial loss and selling substandard goods, neither of which are desirable or aligned with a flourishing life.

Furthermore, the participant highlights that selling spoiled goods results in loss of customers, which further erodes their business reputation, Sen Capability approach suggest that this is not just an economic problem but also a matter of human dignity. The inability to maintain quality standards due to external factors like heat waves undermines women's capability to sustain their businesses with dignity and to maintain the trust and respect for their customers. The participant evidently declares that by engaging in that act causes customers to ignore buying from them again also reveals how loss of customer trust directly affects their ability to maintain or expand their customer base, thereby reducing their capability to achieve economic stability and growth.

Lastly, the participant experience points to the broader systemic inequality that limit the capabilities of market women. It becomes very evident that their vulnerability to heat waves and subsequent economic consequences are exacerbated by the lack of adequate infrastructure such as refrigerator which would otherwise preserve the quality of their goods and this aligns with Sen's argument that enhancing capabilities requires addressing the systemic factors that inhibit real freedom, such as availability of infrastructure, resources and assistance that could mitigate the impact of adverse conditions like heat waves.

To affirm the assertion made by Sen's above another research participant also in the peripheral asserted that;

"...so this is really a problem to our activities of selling in the market, especially in relation to our fish as you can observe for us in the peripheral we don't have a place to keep our refrigerator in the market to keep our fish, so after we have gone for the fish from the retailers to sell, if some are left, when the sun keep scorching we see that all the ice starts melting from the fish and it becomes very soft it creates problem for us a little"(Fish Monger Selling at the Peripheral participant 06)



Figure 3.1: A picture depicting a fish that has gone bad in the market being exposed to flies.

Source: Author's Fieldwork Data, 2024

4.2.2.2 Increased Expenditure

According to vendors, the need to replace spoiled goods at no cost to customers directly increase their expenditure reducing their overall income. This practice is known to diminish their financial resources, which could have been reinvested in their business or used to improve their personal or family's well-being.

A participant from the Kejetia Concrete Market infrastructure asserted that;

“The cost of this fish keeps on increasing as the day goes by. The issue is due to the heat, the fish are expose to food spoilage in a shorter duration so when customers buy and send them home, they always come another time to complain that the fish had already gone bad, so you always have to give them for free to replace the spoil ones and we do that not to lose our customers and doing all these are part of the cost incurred and this is not only one customer who complain but many of them, some says that after buying the fish they realized that it was smelling bad and all these are cost incurred”. (Fish monger vendor selling at the concrete market building participant 08)

In Sen's framework, this financial loss represents a reduction in market women economic capabilities, because with fewer resources such as access to electricity and preservation equipment such as refrigerators which is a critical component of the capability approach at their disposal, their ability to sustain their business and meet personal needs is compromised, reducing their economic resilience and capacity to thrive.

It is worth noting that the practice also affects market women sense of agency and empowerment. Constantly compensating for spoiled goods can lead to feelings of disempowerment as they are forced to absorb the financial losses due to factors beyond their control. The inability to break free from this cycle indicates narrowing their business-related capabilities being trapped in a reactive mode, constantly mitigating losses rather than proactively growing their business. This affects their capability to maintain a stable and profitable livelihood, hindering their freedom to pursue other valuable life goals.

It is therefore not surprising that during the interviews one other participant also argues that;

“I would say that in these recent times money has been very difficult to come by, there is no money in the country, if everyone is to tell the truth, they will assert that money has been very difficult to come by. For instant your startup capital can be gh¢1000 you observe that it keeps reducing and you also having children to care for its really difficult, bmm many of the other market women can also tell, everyone’s startup capital keeps depreciating and also those who took loans from other financial institutions are also finding it difficult to pay” (Food vendor selling at the peripheral market participant 04).

4.2.2.3 Sales Reduction

Many market women, income from their daily sales is crucial not only for their own survival but also for supporting their families. Sales reduction during heat waves not only threatens their immediate financial stability but also undermines their long-term ability to sustain their livelihoods and support their families, making them increasingly vulnerable. Below is an assertion made by a vegetable vendor concerning sales.

“During the normal weather people used to buy from us in the market, but when there is heat waves, people don’t normally come out to the market to buy. You will see them coming out when the heat waves begin to go down during the day around 13:00 to 14:00, so people don’t really like to walk through this heat waves most people are concern about their skin complexation too” (Vegetable vendor selling at the Peripheral participant 10)

4.2.3 Heat waves and Market Dynamics

The Market dynamics subject delves into the several elements that drive consumer behaviour, sales trends and general economic activity in the marketplace. It specifically examines how heat waves affect market women's means of subsistence. In the attempts of investigating into ways in which environmental shifts such as high temperatures interact with structural, social and economic components of the market-to-market women's everyday realities and obstacles. One of the market women asserted that;

“Oh, it doesn't really matter where you are when it comes to sales; those in the concrete building do business here and those of us in the periphery do business here as well. I don't measure myself against the others in the building when I sit here sometimes people in the concrete building will say “Sales aren't coming in, but we'll be having more” and vice versa. Although neither they nor I visit there much we used to have more sales back then than we do now. Those who work at the Kejetia concrete Building can also speak to this fact that their sales were higher before moving to the concrete building.” (Vegetable vendor selling at the Peripheral participant 10)

The claim made by the respondent demonstrates an intricate understanding of the market dynamics influenced by the shifting sales trends brought on by heat waves. The assertion surprisingly depicts that even though they work from different locations, whether operating from the concrete building or the periphery, market women acknowledge the external factors such as the presence of heat waves, uniformly affect sales across different market spaces.

Critically analysing the trends and dynamics of how heat waves has extensively affected the economic livelihood of market women with differences largely driven by the type of commodity they sell and the nature of their work. Fishmongers with a critical observation from the field experience the greatest economic losses due to the rapid spoilage of highly perishable goods, which sometimes place vendors to a situation of not being able to sell their products leading to a greater economic strain. Similarly, fruit and vegetable sellers also suffer from spoilage, though their goods do not deteriorate as quickly as fish. Vendors from this category also experience some substantial losses as produce such as tomatoes, pepper, bananas rot in the heat. Food vendors also selling cooked meals in the Kejetia market are similarly

affected, as prepared food spoils quickly in high temperatures, forcing them to discard unsold cooked meals, which cuts into their profits.

In contrast, head porters (kayayei), while not directly engaged in the selling of goods, are economically impacted by the hot temperature due to fatigue, that limit their capacity to carry enough loads for efficient income. Therefore, unlike the other vendors who sell perishable goods, the head porter's losses are tied to reduce labour output rather than unsellable goods. Finally, sellers of non-perishable goods were another category of vendors found on the field who sells goods like; rice, flour, sugar are the least affected, as their product do not spoil quickly, and this gives them the advantage and the flexibility in managing sales irrespective of the present condition of heat waves. In general, while all market vendors are economically affected by the heat waves, those dealing with perishable goods, like fish, fruits, vegetables and food bear the most immediate financial burden, whereas head porters and non-perishable goods sellers encounters more indirect effects.

4.3 Mitigating strategies implored by market women in controlling food spoilage during high temperature and mitigation strategies to protect their health.

This section also investigated into the methods market women use to prevent food from spoiling during hot weather and how they safeguard their health when it is extremely hot outside. The investigation also reveals health-conscious tactics that help market women withstand the physical demands of their jobs in an increasingly hostile environment, in addition to the pragmatic methods utilized to reduce financial losses. In the course of the interviews several strategies were highlighted which market women claims that it has indeed helped them survive the difficulties pose by the heat waves others also suggested means which they can protect their commodities yet some they encounter several challenges in applying those strategies due to inequalities infrastructures and equipment.

A participant asserted that;

“There are some people when this heat waves becomes so intense they experience skin diseases, and that is why people will prefer to come and sell in the mornings to avoid the heat stress, so by the time the sun set in they will not be around” (Vegetable vendor selling at the Peripheral Participant 09)

The participant's adaptive labour adjustment technique, which involves arriving at the market early in the morning to avoid the peak heat, is intended to resolve the negative effects of heat on their livelihoods as female vendors. A critical analysis of this strategy reveals that by adjusting their work hours, market women aim to maintain their economic activity while minimizing the risks of heat exposure. However, this strategy may limit their potential for sales, as they shorten their working hours, possibly missing out on customers who shop later in the day. This trade-off highlights a constrained economic capability, where their freedom to maximize income is limited by the need to protect their health. The capability approach theory suggest that real freedom encompasses not only the ability to make decisions but also the effective execution of those decisions. The requirement to modify work schedules in order to avoid heat suggests that market women are forced to make choices from a limited range of options as a result of economic and environmental constraints. Heat waves as an external circumstance therefore makes it difficult for market women to achieve both economic security and well-being which forces them to operate in a reactive rather than proactive manner.

In addition to the mitigating technique previously discussed, the market women both in the concrete market building and the peripheral market identified several other strategies that could have aided them in managing the heat waves conditions. However, they were unable to implement or utilize these strategies due to unforeseen circumstances.

Using air cooling devices, like fans or air conditioners, to lessen the effects of the intense heat was one of the noteworthy measures brought up by the participants. However, the lack of electricity made these gadgets useless, making it difficult for them to put their plan into practice. The absence of reliable power supply not only limited their options for cooling but also exacerbate the challenges they faced in managing the hot weather conditions. This scenario emphasizes the vulnerabilities that might developed when such supplies are absent as well the vital role that infrastructure, like power, plays in enabling effective responses to environmental stressors.

One of the market vendors in the concrete market building reacted to this situation by arguing that;

"I believe that when you are room the temperature is hot you turn on the fan, so if the electricity should be efficient in supply we would have turned on our fans and that will have brought us a relief, but due to the heat when we come to work we don't get to spend much time in the market, we close within a short time, so

customers also when they observe that the concrete market building has been trapped with heat it deters them from entering the market to come and buy from us, the person prefers to buy from those selling outside and go his/her way. So honestly our work is not really booming as it used to” (Fish Monger Vendor selling at the Concrete building participant 07).

Again, in addition to the issue of air-cooling strategies one of the claims of the market vendors posit a serious problem with the underuse of infrastructure, particularly the market installed air conditioning equipment.

“... but one of the issues is that when the whites were building this concrete market place, they installed air conditioning in it, but the sad issue is that the leaders never turn it on for us. Yes, this is where it is....so because they don’t turn it on sometimes, we really feel hot but if they were to turn it on here would have been better than the peripheral and this place would have resemble abroad.... but they don’t turn it on” (Food vendor selling at the Peripheral participant 04).

The lack of the use of the air conditioning equipment raises the possibility of a discrepancy between the infrastructure made available and the market authorities’ operational procedures. It can be a sign of insufficient technical expertise, insufficient maintenance capabilities or insufficient funding to run the system efficiently. On the other hand, bureaucratic inefficiencies, a lack of accountability, or other administrative difficulties may be the reason why the authorities are ignoring the system. This underutilization raises more general concerns about waste and sustainability. It is obvious that enormous financial and environmental investment is made when air conditioning is installed and addition to wasting this investment, not using it denies vendors and customers at the market a more comfortable setting that might enhance business operations and market activity in general.

Furthermore, the state of affairs indicates a squandered chance to improve the market’s attractiveness and competitiveness, especially in an area where severe weather may discourage consumer traffic. If the air conditioning were fully operational, it could have potentially attracted more customers, increased revenue and enhance the livelihood of the vendors. Instead, the authorities’ inaction perpetuates discomfort and dissatisfaction among market users.

In order to find out if market women receive any financial support for staying at home during exceptionally hot weather, a question about the perception of rest as a mitigating strategy was posed. The majority of the participant stated in their assertion that while getting enough sleep and rest is important for maintaining good health and their livelihood however, they are unable to stay at home because no one provides them with a financial backup.

“There is no financial arrangement for anyone who chooses to stay home due to heat waves, sometimes people may choose to go home when there is heat waves to do house chores like cleaning, washing and all that” (Vegetable vendor selling at the peripheral market participant 09)

“Oh.... No, no I don't get any compensation for staying home ...” (Vegetable vendor selling at the peripheral market participant 10)

The suggestion that market women should stay home and rest as a measure to mitigate the challenges posed by heat waves was met with resistance largely due to the lack of financial buffer to support them during such periods. This answer draws attention to the vulnerable financial circumstances in which these women live, where a daily income is essential to their existence. A thorough examination of this problem demonstrate how economic vulnerability and health are intertwined as well as the wider effects on their livelihoods.

“Yes, sometimes I really do prefer to stay home when there is excess heat but the question, I ask myself is if I stay home what will I eat and this compiles me always to come to the market and sell. “Fish Monger Vendor in the Concrete Market participant 08)

The assertion of these market women reveals that, the ability to cover basic needs like food, housing, and healthcare is significantly at danger when they stay at home, even for a short while due to the lack of financial safety net. Many people rely on their daily sales for their income, thus any disruption in work results in lost income. These women work in the informal economy are noted to be people with little to no financial security unlike the salaried workers who may be able to access paid time leave or savings. Therefore, regardless of the severe weather that could endanger their health, many find it extremely difficult to take time off due to a lack of funds or other sources of income.

Moreover, their livelihoods are affected in ways that go beyond simple money matters. It worth noticing that a prolonged exposure high temperature without sufficient rest or cooling techniques can cause long-term health problems such as heat exhaustion, dehydration, and cardiovascular disorders. Over time these health issues may make it harder for them to work, which would jeopardize their capacity make a steady income and exacerbate their

financial instability. More importantly, the necessity of working in dangerous situations can also result in a decline in general wellbeing, which impacts not only the women but also their families who rely on their income.

The use of umbrella is also one of the major means through which market women protect themselves and their commodities in the market. The use of umbrella gives the vendors the opportunity to reduce their direct exposure to the sun, which helps lower the risk of heat exhaustion, dehydration and heatstroke.

“...during sunny times we are always under umbrella and that is what protect us from the direct sunlight” (Vegetable vendor selling at the peripheral market participant 10).

The participant having said this reveals that the umbrella is functional in their activities as it offers basic shade, lowering the body’s absorption of heat and mitigating the negative health impact of high temperatures. Not only does the use of umbrella protect the market women’s health, it also protects their commodities from getting perished at a faster rate.

“Yes, it is very true the sun has been very scorchy these recent times and has resulted in heat temperature and this most causes my salad, spring onions to get spoil at faster rate, so when the heat waves become so severe the best thing, I can do is to remove it from the open display or to cover it with an umbrella to serve as shade. The eggs for instance the heat waves mostly cause it to become rigid so when you crush it you see equally mixed of the yoke in the egg making the eggs appear as losing it value, the carrot, spring onion and the salad also becomes very soft and start showing sign of spoilage” (Vegetable vendor selling at the peripheral market participant 09)

It is surprising to discover that umbrella is not only used for rain however, it also has the potency of helping keep commodities colder and preventing their decay. This is critical for maintain the quality and freshness of the products, which boosts sales and lowers economic losses due to spoilage. Keeping goods out of direct sunlight as asserted by the participant above is also a renowned mitigating strategy as it aids commodities visual appeal. A critical observation of this strategy reveals that fresh food that has not been exposed to intense sunlight is less likely to wilt, discolour, or lose texture, making it more appealing to buyers, as customers are more likely to purchase products that appear fresh and well-preserved.

The usage of an umbrella is therefore regarded as a low-cost and easily accessible adaptation method that addresses both market vendors health and product quality. However, while profitable, it also emphasizes the larger issue of poor infrastructure and support for small vendor, who must rely on basic procedures to deal with environmental pressures. The reliance on umbrellas indicates an inadequate level of more solid options, such as covered market places or cooling systems, which may provide more thorough coverage.



Figure 4.1: A picture demonstrating how the umbrella is used in the market as a mitigation strategy measure in the periphery of the market.

Source: Author's Fieldwork Data, 2024.

In the attempt of investigating how any personal/biological factors serve as enabling or constraining factor towards mitigating heat stress on market women's livelihood, a female head potter (kayayo) asserted that

"In this heat waves by considering myself as a female head potter I tried my best not to engage myself in carry heavy loads because some weights are specifically for men, especially goods like cassava can be very heavy

when loaded in a sack, ohh ... I can't carry that, part apart from these heavy load's stuffs like rice, flour, oil and sugar I can carry" (Head Porter in the peripheral market Participant 13)

The participants decision to avoid carrying heavy loads such as cassava in sacks reveal the role that physical strength plays in her daily work. It could be observed that while head porters are accustomed to transporting goods, extreme amplifies the physical stress involved in their activity making it dangerous and challenging for women, who may not have the same muscular capacity as men to handle such burden. A critical analysis of this actions by the participant demonstrates that her decision serves as a protective strategy, allowing her to mitigate the effect of heat waves by avoiding overexertion, which could have led to heat illness even though may reduce her potential income.

In the broader vulnerability context, it is revealed that this market women experience exemplifies indefensible situation for female workers in informal economies, where physical labour is a significant aspect of their livelihood. The gender-based limitation associated with heat waves, further limit their opportunities and expose them to risk that disproportionately affect their health and economic stability.

4.4 What are the needs of market women from the government in promoting their well-being?

This section also examines the governments primary demands that market women describe in order to support their livelihoods and advance their wellbeing, particularly in light of issues like heat waves. Market women confront several challenges as frontline workers in informal economies, which includes limited access to adequate infrastructures and healthcare as well as little financial support. It was therefore imperative to comprehend their distinct requirements and preferences in order to formulate efficacious policies and initiatives. Through a thorough examination of their viewpoints, this analysis seeks to draw attention to the deficiencies in the existing state of governmental assistance and offer practical solutions that can improve market women's general health, economic resilience and well-being.

Investigating into whether the government has been able to promote any means to support the livelihood at the market, about 90% percent of the market women at the peripheral asserted that they have not received any help from the government regarding heat waves

“I have not seen neither have I heard of any help from the government saying that the government is coming to help us in this phenomenon, no I have not seen anything like that.... no...no...no...for us we are here 24/7 so if something any help have come, I would have shared that... (Food Vendor at the peripheral participant 04)”

Surprisingly, not only those in the periphery asserted that they have not yet received any help from the government regarding heat waves, market women in the concrete building also shared same sentiment, one of the vendors argued also that.

“We have not received any help from the government in this heat waves challenge”. FMVC participant 08

The absence of government assistance reveals an inadequacy of institutional mechanisms designed to protect and support market women, that are adversely affected by heat waves. The lack of support from the government intensifies their exposure to heat stressors that further threatening their livelihoods and well-being. It is also clearly observed that this oversight responsibility reflects a wider systemic neglect of informal workers, whose contribution the economy is often underestimated in policy planning and resource allocation.

The assertions made by the vendors at the Kejetia Market also revealed the perception that the government has failed to provide any assistance which has led to a significant erosion of trust in public institutions. It was observed and critically analysed that, this has reinforced a sense of neglect and marginalization, further alienating them from government initiatives that could otherwise support their well-being and this was evidential in an assertion made by one of the participants below;

“ oh I don't need any support from the government, because even if the government support us he will take interest as well, this work I am doing, I don't get even Gb₵ 50.00 for savings all I get is sometimes Gb₵ 10.00 or Gb₵ 5.00 and that is what I save for a day, the government will never offer support for free, every support that comes from the government is associated with interest, because the money he is giving to you he doesn't own it, so he give it out so we can use it for work and get profit and pay back with interest rate attached (Vegetable vendor at the peripheral market participant 10)”

Amidst all these claims, some vendors also suggested things they look forward from the government that could help promote their livelihood.

“... so, Government promoting that initiative by providing a lot of canopies at various joints could help the wellbeing of we market women and the customers as well in both raining and sunny seasons. The transport officers have gotten passengers seats under comfortable shades to rest so we suggest to the government that getting us shades like that could really help. (Vegetable vendor at the peripheral market participant 09)”

This assertion also revealed that for the government to avoid missing opportunities for resilience building, assisting them with more infrastructure such as providing shaded areas, cooling centres, or access to refrigeration can enhance the resilience of market women against heat waves.

The Unseen Politics shaping Livelihoods in Kejetia Market

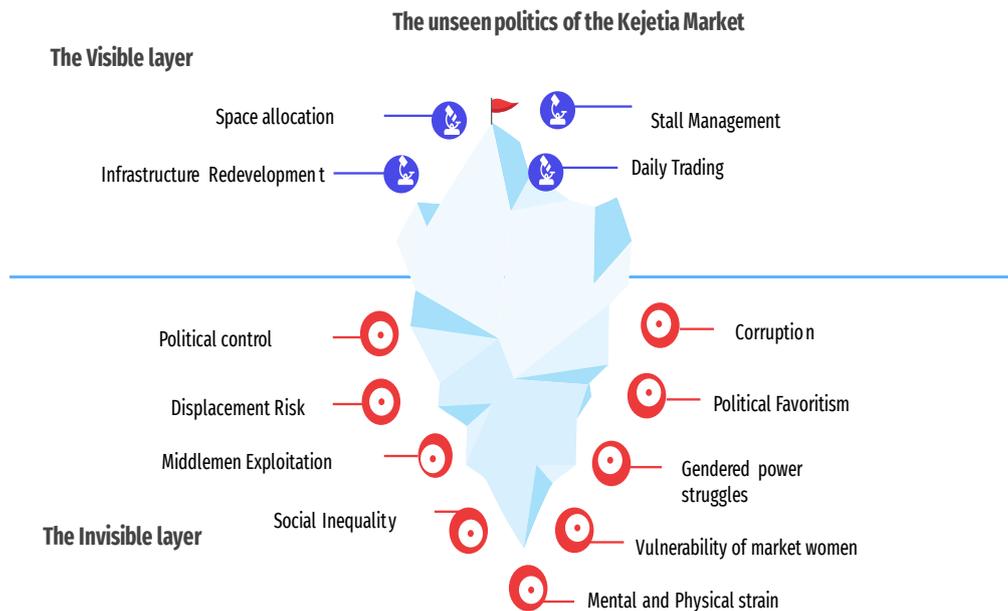


Figure 5.1: The Unseen Politics shaping Livelihoods in the Kejetia Market. Adopted from (Salleh et al., 2015, p.334)

The Kumasi Kejetia market is a complex hub for economic activity, but beneath its bustling surface lies inter-connected political, economic and social dynamics which affect livelihoods of the market women, using the iceberg approach the study distinguishes between visible, surface-level issues from deeper, underlying factors the study unpacks these

dynamics. On the surface, the market appears as a vibrant centre of trade, where market women engage in selling various goods, from foodstuffs to textiles. These women are visibly hard workers, managing stalls, negotiating prices, and interacting with customers. The recent redevelopment of the market, with new modern infrastructure, showcases efforts to improve business conditions, also the market seems to offer opportunities for economic empowerment as these women, often sole breadwinner, sustain their families through daily trading.

The political impact that exists in the market is another obvious factor when it comes to market-related difficulties. It is crucial to note that the queen mothers in the market have an existing hierarchical structure and they also exercise control over other vendors. The queens take charges of particular areas in the market, they also exhibit a form of local government by exercising power, and these power dynamics sometimes creates tension and struggle between market women and the queen mothers of the market over issues like prices, rules, and market area distributions.

It is surprising to note that, market women's livelihood is shaped by more complex and intricate political and social dynamics that lie beyond the obvious layer of the iceberg model. It is important to note that local governments and political parties have substantial market power, and with regards to that, in most cases leads to political favouritism in order to gain access to market stalls or desirable location in the market. The fascinating problem is that, although some women gain form some of these connections, several others most especially those without political connections encounter the challenge of discrimination in the form of being passed over for important positions. The reality is that, these political interference results in unequal market possibilities and put some market women in a vulnerable position.

In addition to, a critical market observation at the Kejetia market, makes it evident that there is a problem with economic pressure and exploitation. These unseen economic pressures include hidden costs associated with renting stalls, or maintaining a presence in the market. These fees are often inflated by corruption, as middlemen and authorities demand bribes or impose unofficial taxes on the women and as these activities continue, causes market women who operate on slim profit margins to pass this cost onto their goods, making it harder to remain competitive. The reality is that, this economic exploitation is rarely talked about openly but significantly erodes the women's ability to thrive. Market women therefore face significant mental and physical burdens as they navigate through these power dynamics, since they do not only have to manage their businesses but also deal with political pressures, corruption and market uncertainties.

4.5 Discussion of Result.

4.5.1 Resources

The result indicates that limited access to vital resources such as shaded workspaces, cooling, electricity hampers market women's ability to manage the adverse effects of heat waves. The study reveals the importance of the use of umbrella as a resource in prevention of spoilage. It was evident that for vendors selling at the peripheral of the market, who sells perishable goods such as fruits, vegetables, or fish, direct exposure to sunlight accelerated spoilage and that by providing shade the umbrella helps in maintaining a cooler environment for these goods, slowing the rate of deterioration thereby maintain the visual appeal of the commodities to attract customers.

Again, the study reveals that inadequate access to water increases the risk of dehydration and heat-induced illness, which without reliable healthcare, can lead to compounding health issues. These limitations in resources not only affect market women's health but also restrict their economic resilience, as reduced productivity during heat waves directly translate to income loss. More importantly the study reveals how institutional policies and support structures can directly impact market women's resilience and demonstrate that without institutional intervention market women remain constrained in their ability to access and control essential resources at their disposal, limiting their capability to sustain livelihoods in the face of extreme heat.

4.5.2 Capabilities

This refers to the freedoms market women have to make choices and take actions that align with their well-being that are essential for coping effectively with heat waves. The findings reveal that market women with better access to information and support systems are better able to exercise their agency, modifying their work practices or accessing resources that enhance their resilience. The findings of the study demonstrated that market women who were aware of ways to adjust their schedules to avoid peak temperatures were able to protect themselves from worst impacts of the direct sunshine. The institutions also execute a critical duty by expanding or distorting these capabilities of the market women. Again, the

assertion made by some market women that they do not need any assistance from the government can be critically examined through several lenses, revealing underlying factors such as distrust in governmental institutions, a feeling of self-reliance, and the historical antecedent of ineffectiveness of governmental interventions. This perspective can be linked to previous literature on informal economies. It is worth noticing that market women's reluctance to seek government help in most cases stems from a previous ineffective or adequate support. Foregoing literature argues that in several developing context, informal workers, including market women, have subsequently encountered government programs that fail to address their specific needs or are marred by corruption and mismanagement. For example (Pan and Chen 2018, pp.602-620). This experience leads to deep-seated mistrust, leading vendors to tag government interventions as either irrelevant or unhelpful.

Furthermore, there is also a belief that there are more bureaucratic roadblocks than advantages to receiving any kind of governmental support. Literature on governance informal economies, such as (Ware, 2017, pp.499-519) highlights how red tape and corruption reproduce inefficiencies that discourage informal workers from engaging with governmental programs. This leads to a desire for market women to stay away from the government entirely, as they think that navigating these procedures would be time-consuming and result insignificant effects.

4.5.3 Functioning

This dimension of the capability approach reveals the actual outcomes that market women achieve in terms of health, income stability and productivity are severely impacted by the limitations in resources and capabilities. The findings highlight that heat waves lead to significant health challenges, including dehydration and heat exhaustion, which directly affect market women's ability to maintain consistent attendance and productivity. Consequently, as their hours of working decreases, so does their income, creating feedback of loop where health issues exacerbate financial instability. Additionally, heat waves compromise the quality of perishable goods, leading to further income loss as customers hesitate to purchase products that have been visibly affected by the heat. The findings revealing how heat waves have significantly decrease customer turnout, resulting in lower sales for market women confirms the study that was conducted by (Dehaghi et al., 2022; Marinaccio, Bonafede and

Morabito, 2022) that indicated how recent climatic conditions has led to lower productivity. Moreover, the extreme temperatures accelerate the spoilage of perishable goods, causing additional financial losses. These combined factors create an economic strain that threatens the sustainability of their businesses, limiting their ability to generate consistent income. In addition to, market women also face increased expenses as they try to replace spoiled goods or offer compensations to maintain customer relationships is also revealed as a situation where financial burden is added to female vendors in the directives of reduced revenue leaving them with fewer resources and this affirms the study by (Budhathoki and Zander, 2019). These compounded impacts on health and income highlight a critical functioning gap, where market women are unable to achieve basic livelihood goals due to environmental stressors.

Chapter 5 SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.0 Introduction

The final section of the study offers an overview of the study's main conclusions and outcomes. The primary conclusions are designed to address the issue in order to meet the study's goals. In light of the current concerns around climate change, the research also offers a conclusion based on the data and suggests suggestions pertinent to scholars, practitioners and other associated informal economy activities.

5.1 Results Summary

This portion of the study answers the primary research question and summarizes the major findings and conclusions pertinent to a thorough comprehension of the phenomena. The study focused heat waves and its impact on the health and financial income of market women, the coping mechanism used in preventing food spoilage and protecting of their health and finally the needs of market women from the government. The study focused on 15 market vendors from the Kejetia market of which the vendors included, Fishmongers, food, vegetable, Fruit and Head porters to gather different perspectives of heatwaves from these various vendor groups.

5.1.1 The effect of heat waves on market women's health, earning and cost incurred.

- Market women are at higher exposure to illness resulting from heat such as dehydration as well as heat exhaustion due to higher exposure to hot temperatures.
- Market women work efficiency capability is diminished due to fatigue and discomfort caused by heat waves in recent times.

- Extreme heat deters customers from visiting the Kejetia market which leads to a highly significant reduction in daily sales.
- Poor product quality due to heat-related spoilage drives away customers, leading to a long-term decline in earnings.
- Increased expenditure on replacement of spoiled commodities causes market women to incur additional cost adding financial strain.

5.1.2 The strategies implored by market women in controlling food spoilage during high temperature and mitigation strategies to protect their health.

- In controlling food spoilage during high temperature, market women strategically start selling their commodities early in the morning to reduce the exposure of perishable goods to high temperatures, aiming to sell before the heat peaks.
- The use of umbrella as a vital instrument to provide shade for both vendors and their commodities, which helps to keep their product cooler and reduce spoilage.
- Market women apply storage techniques like improvised cooling methods, for instance keeping goods in shaded or cooler spots within the market area.
- Market vendor in order to protect their health sometimes decide to work in the chilly period of the day by selling in the early mornings to minimize their exposure to intense heat.
- Market vendors in the Kejetia market increase their water intake to stay hydrated and prevent heat exhaustion.

5.1.3 The needs of market women from the government in promoting their wellbeing.

- Market women in Kejetia expresses their experience on having skepticism towards government assistance, often referring to past experience of ineffective or inadequate support.

- Vendors from the Kejetia market prefer to depend on their own strategies and community support networks rather than seeking government assistance. It is therefore observed that this preference stems from a sense of independence and a belief that they can better manage their challenges without external interference.
- Market women especially those in the peripheral market needs canopies, tents and restrooms to be built by the government to serve as shade to promote their wellbeing.
- Electricity shortage was also a challenge for many vendors in the concrete building and therefore they call on the urgent need of the government to promote constant supply of electricity.
- Underutilized cooling equipment like the already installed air conditions and fans in the concrete market should be effective to promote hydration and avoid heat strokes and subsequence illness.

5.2 Recommendation of the Study

The study's conclusion has led to the following suggestions.

- Collaborative initiative for heat-resistant in the market can be implemented by the local governments, market labor unions and market associations in the Kejetia market, through the use of ventilated roofing and solar-powered fans. The labor union also playing an advocacy role for market women's health and safety by negotiating for this better working conditions will ensure that the needs of workers are met to achieve the SDG 3 Good Health and Well-being.
- Market association can contribute and collaborate with the Ghana's ministry of water and sanitation resources to ensure accessible water point at vantage points in the market where market women can refill their bottles and stay hydrated during the extreme heat. This initiative will create safe and sustainable working condition for market women, thereby meeting the SDG 8 (Decent work and Economic Growth).
- Economic resilience program through market union microcredit scheme. Implementation of microcredit program specifically designs for market women in the market organized and managed by market labor unions in collaboration with local financial institutions would provide small interest to market women to help them protect their goods from getting spoil to maintain productivity. Through this policy Labor unions

can manage the distribution and ensure transparency, while also advocating for fair loans terms.

- Future researchers can examine a broader range of market vendors such as wholesalers and street hawkers to comprehend more on how heat waves affect varied types of market participant base on their business scale.
- Since many vendors were hesitant or unwilling to discuss their involvement with market associations, future researchers should examine the role of these associations in greater depth in such climatic crisis.

5.3 Conclusion

The study reveals the profound and multifaceted impact of heat waves on the livelihood of market women. These women, who essential in the informal economy, deals with a numerous difficulty such as unstable economies, health hazards and little government assistance. The study sheds light on the complex ways that excessive heat exacerbates vulnerabilities, endangering their overall well-being and economic sustainability through decreased sales, greater food spoiling, and elevated health concerns. Market women have shown incredible resiliency in the face of these difficulties by utilizing a variety of coping mechanisms, including modifying their work schedules and leaning on support from their communities.

However, the negative effect of the heat waves cannot be mitigated by these measures alone, due to the fact that market women since the past, have gain some mistrust in governmental initiatives causing a widespread scepticism when it comes to government programs. In reaction to these reservations, many market women now choose to be self-sufficient rather than seeking assistance from other avenues, which leaves them to be even more vulnerable. The study's findings therefore highlight the necessity for a holistic strategy that can help market women deal with the challenges posed by the climate. These strategies must involve resources that are tailored to individual needs such as access to good and healthcare, as well as targeted infrastructure improvement. In order to win back the confidence of the vendors, the government must also involve these group in the formulation of public policy and fulfil its obligations in an open and effective manner. The survival of market women ultimately depends on their well-being, which also is essential to the areas they serve's broader in the social and economic structure. It is critical to address their demands and difficulties in light

of the growing dangers associated with climate change in order to promote reliance and guarantee the survival of these essential contributors to the informal sector.

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Appendices

Interview Guide Question Final

Final Draft for Semi-Structured Interviews; The impact of heat weather condition on the livelihood of Market women in Ghana. A case study in the Kumasi-Kejetia Market.

b. Name of town/community:

c. GIS coordinates: ALTITUDE-----LATITUDE-----
LONGITUDE-----

d. Demographical Data of Participant.

1.1 Unique Identifier/Reference	1.2 Signed Consent form (Y/N)	1.3 Age (yrs.)	1.4 Ethnicity/Religion if Not too Sensitive	1.5 Work experience year	1.6 Type of Commodity sell in the Market	1.7 Role/ Position held in the market	1.8 Phone number	Place of Selling in the market Concrete/ Peripheral

Background Information of Participant

e. Can you tell me a bit about yourself and your work here at the market; Probe; *Types of goods sold, has she change the kind of good she used to sell, if yes why?*

Effect of Heat waves on Health

f. How often do you experience heat waves in this area of the market and how does heat waves affect your daily activities in the market?

g. Can you give me examples of health problems you or other market women have faced during heat waves?

h. In this situation of heat waves what **public good** do you have access to that protect your health? Probe; *Water facility, Toilet facility (Washroom), shade equipment, rest room.*

Effect of Heat waves on Earnings and Cost Incurred?

i. How do heat waves affect your sales compared to normal weather, and in what ways does the change in customer purchasing behavior during heat waves affect your livelihood?

j. What additional cost do you incur because of heat waves? Probe; (Cost related to health, cost related to preventing food spoilage; other cost).

k. How does you selling at the Concrete Market Building with Shade/ Peripheral helps promote or hinder your livelihood.

Mitigation strategies

l. What strategies do you currently used to prevent food spoilage and your health during heat waves? Probe; How are these strategies effective.

m. How does any personal/biological (such as gender, *age, complexion, weight, nursing mother*, factors serve as enabling or constraining factor towards mitigating the impact of heat waves on your livelihood.

n. Do you prefer to stay home during heat waves, Probe: ***Is there any financial buffer to compensate you while you stay home due to the heat?***

Needs from the Government

o. What support do you need from the government to help cope with the effect of heat waves? health, financial, Infrastructural support.

p. Are there support you received seen as enabling or its constraining can you explain how?

q. Have you or your market group reached out to government officials or agencies for support? If yes, what was the response? if no, what are the barriers to doing so?

General Feedback and Recommendation

r. Is there anything else you would like to share about your experience or suggestions on how to better manage the impact of heat waves?