UNIVERSITY OF CAPE COAST

EFFECT OF NON-FARM ENTERPRISE INCOME ON POVERTY IN GHANA

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BY

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DECLARATION

Candidates Declaration

I hereby declare that this thesis is the result of my original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature …… Date ……..……

Name: Emmanuel Adu-Darko

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature……. Date ……..……

Name: Dr. Isaac Dasmani

Co-Supervisor's Signature……. Date ……..

Name: Dr. Benedict Afful Jnr.

ABSTRACT

The purpose of this study is to determine the effect of non-farm income on household's poverty status in Ghana. This study was approached using a cross sectional study and employed a secondary data from the updated seventh round of the Ghana Statistical Service. The study focused on Two-Stage least square estimation model in analysing the findings of the study. The study found that non-farm income has a significant and reducing effect on the poverty status of household considering either the unidimensional (consumption poverty) and multidimensional poverty. However, the results showed that even though both measures are quite consistent in analysing the poverty status of households in Ghana, the multidimensional approach proves to be more robust as it considers several dimensional measures in its computation. The study therefore recommends that the government through the Ministry of Agriculture and relevant non-state actors create an enabling environment through the provision of credit, transportation infrastructure, and education and training on the relevant of non-farm activities for household since it plays an integral role in alleviating household poverty. Researchers should also incorporate the multidimensional approach in measuring household poverty since several dimensional measures are considered in its computation.

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DEDICATION

To my Parent Mr. and Mrs. Adu-Darko.

KEYWORDS

Ghana

Household

Multidimensional

Non-Farm Income

Poverty

Unidimensional

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ACRONYMS

GDP	Gross Domestic Product
IMF	International Monetary Fund
GSS	Ghana Statistical Service
MPI	Multi-Dimensional Poverty Index
HDRO	Human Development Report Office
HPI	Human poverty index
GLSS	Ghana Living Standard Survey
OPHI	Oxford Poverty and Human Development Index
INCNF	Income of non-farm
HHEXP	Household expenditure
WRRVM	Wholesale Retail and Repair of Vehicle and Motto
NFI	Non-farm income
TSLS	Two Stage Least Square

CHAPTER ONE

INTRODUCTION

This chapter provides a general introduction to the themes addressed in this thesis. This chapter begins with the background to the study, statement of problem, the purpose of the study, research questions and hypotheses. It also presents the significance of the study, delimitation, limitation as well as the organization of the various chapters.

Background to the Study

Many developing countries around the globe have begun to pay more attention to poverty alleviation in recent decades. As such, there has been significant growth in alleviating poverty over the past decades as demonstrated by the World Bank's Millennium Development Goals, which sought to reduce the world's poverty rate by half by the year 2000 (World Bank, 2018). Despite development made in reducing poverty, people living in poverty remains unacceptably high. It is in line with this that the program was replaced with the stainable development goals (SDG's) as the new international development goals. The SDGs are wider in scale than the MDG's. Stating in a more specific term the SDG 1 seeks to end poverty in all its forms everywhere by 2030. This however became important because of the world figures which indicated that, 10% of the global population continues to lives on less than $2 a day. Over seven (700) million people live on less than $1.90 a day, which is the World Bank's international line for extreme poverty (World Bank, 2018). This indicates that the progress to alleviate poverty incidence still exists, and there are still many issues regarding poverty to solve (Haq et al., 2015).

While, it can be acknowledged that the poverty issues in Ghana have been tackled with all the seriousness it deserved to see its current reduction. This current reduction is unevenly distributed in all the localities in the economy. According to the Ghana Statistical service 2016/2017 report, the Rural coastal, Rural Forest and Rural savannah localities over a decade recorded rather an increase in poverty incidence. Rural areas are mostly targeted by many emerging economies. This is because a significant proportion of their population resides in this area and they are characterized by high dependence on agricultural income. Poverty rates are high in areas where interventions targeted for the agricultural sector are difficult to reach directly. Since most rural areas lack adequate resources to "farm their way out of poverty," eradicating poverty would necessitate the development of remunerative jobs in sectors other than farming, such as industry, services and agribusiness. (Yumkella et al., 2011).

Non-farm economic activities are gaining worldwide attention in most developing countries, owing to the agricultural sector's inability to provide jobs and a decent living for rural households (Siti, 2013). Non-farm income is predicted to account for 40 to 45 percent of average rural household income in Latin America and Sub-Saharan Africa, and 30 to 40 percent in South Asia. according to various reports, with the bulk of this coming from rural sources rather than urban migration. (Reardon, Stamoulis, Lanjuow, & Balisacan, 2000; Barrett, Reardon & Webb, 2001). This shows that non-farm activities are a vital component in the livelihood of the rural poor. Non-farm work continues to be an important part of rural households' livelihood choices, owing to the

agriculture's limited capacity to provide income opportunities. (Iqbal et al., 2018).

In Ghana, agriculture has been the mainstay of Ghana's economy and thus employing the majority of people in the country. The non-farm sector also has played a vital part in providing decent jobs and even increasing the standard of living for the most of the people as well as sustaining economic growth, specifically the rural poor (GSS, 2015 Labour Force report). This however can be said to be motivated by the SDG 8 which seeks to promote and sustain economic growth full and productive employment for all. Also, the Ghana Living Standards Survey Round 6 reports (2014), that approximately 3.7 million households, or 44.3 per cent of all households in the country, run non-farm businesses, with over 36.8% of this population in the rural areas.

The GLSS 5 and 6 indicate that there is a sharp rise in the number of people engaged in non-farm business. The estimated number of persons engaged by all non-farm household sectors as reported in the GLSS 6 is 8,564,734 showing over 4 million increases from the previous 3,190,552 (GSS 2013&2015). However, it is expected that a rise in these non-farm employments should be associated with a consistent rise in income. Further, the incomes earned from these employments are also expected to subsequently aid the reduction of poverty incidence in the country.

On the contrary, the Ghana Statistical Service in 2017 reported that, in absolute terms, the number of people living in extreme poverty has increase and more Ghanaians are becoming extremely poor base on 2017 poverty indicators (GSS, 2017). It is however indicated in the same report that whiles half of the

ten regions (Eastern, Central, Western, Ashanti, and Greater Accra) had poverty rates that were smaller than the national average of 23.4 per cent. the remaining half (Volta, Northern, Brong Ahafo, upper east and upper west) had higher rates than the national average. This indicates a high-income inequality in the country, a problem the SDG 10 seeks to address. These differences in statistics on regional poverty estimates raise the concern on the impact of non-farm employment on poverty reduction. The question arises as to whether the income of off-farm enterprises has a poverty-reducing effect on the economy.

Statement of the Problem

Non-farm income serves as an imperative constituent of livelihood options for rural household (Iqbal, 2018; Egyei, Harrison, & Adzovor, 2013). Various empirical studies have shown that non-farm enterprise income would substantially add to the income of farming households and finally reduce rural poverty (Iqbal, 2018; Onya, Okezie & Ejiba, 2016; Mat & Abdul-Hakim, 2011). Even though Ghana has its fair share of the increase in rural non-farm activities from the subsequent report of the GLSS 5,6 &7 the anticipated fall in the poverty figures in these areas has been abysmal. Poverty remains paramount in these rural cohorts; a major part of the farming and rural population still experiences an extreme form of poverty.

Empirical studies in Ghana have assessed the effect of non-farm employment on poverty (Anang & Yeboah, 2019; Domfe, Osei & Ackah, 2013), others on the role of non-farm work on vulnerability to food poverty (Zereyesus et al. 2017; Anang, 2017; Lay et al. 2008). However, these studies

focused on the use of a uni-dimensional approach for measuring poverty which however has been massively criticized.

In Ghana, poverty has been examined through the context of the poor who lack control over basic consumption needs, such as food and non-food products, and this has been termed as a person being consumption poor. However, poverty is a multidimensional notion (Iqbal, 2018; Jatta, 2013). Alkire and Foster (2011) argued that using a single-dimensional resource variable, such as food or income to evaluate poverty fails to capture other crucial dimensions of poverty especially in developing countries such as Ghana. Ghana statistical Service (2020) declared that comparing the incidence of multi-dimensionally poor of 45.6% to the incidence of consumption and expenditure poverty of 23.4% revealed a difference of 22.2 percentage point. This indicates that finding the role of non-farm income on poverty using consumption approach-based measurement, may lead to misleading policy recommendation since it does not reflect the true poverty situation in the country. Therefore, there is the need for a more rigorous approach to the measurement of poverty which takes several dimensions and well-beings of the household into consideration to reveal how non-farm income enterprises can affect the actual poverty situation in Ghana.

It is against this background that this current study sought to demonstrate the need of using the multidimensional approach in analysing the effect of non-farm enterprises income on poverty in Ghana.

Purpose of the Study

The purpose of the study is to use the multidimensional approach to analyse the effect of non-farm enterprises income on poverty in Ghana.

The specific objectives of the study were to;

1. examine the effect of non-farm enterprises income on consumption poverty in Ghana.
2. determine the effect of non-farm enterprise income on multidimensional poverty in Ghana.

Hypotheses

1. H_0: Non-farm enterprise income has no significant effect on consumption poverty in Ghana.

H_1: Non-farm enterprise income has a significant effect on consumption poverty in Ghana.

2. H_0: Non-farm enterprise income has no significant effect on multidimensional poverty in Ghana.

H_1: Non-farm enterprise income has a significant effect on multidimensional poverty in Ghana.

Significance of the Study

As purported by Koomson, (2018), development practitioners and researchers are becoming increasingly convinced that the growth of non-farm enterprises is crucial in reducing the unemployment rate in the country as well as encouraging, improving job opportunities, income distribution, economic growth and reducing poverty. Hence, the findings from this study will help policymakers especially in the areas of poverty alleviation to understand the dynamics of poverty in Ghana and as such inform them in designing new approaches in addressing the county's poverty. Again, information from the findings will help investors and NGOs among other agencies to know which non-farm activity helps improve the living standards of households in Ghana.

Lastly, the study will add to existing literature on the effect non-farm enterprise income has on poverty and how the two major approaches view it.

Delimitation

This study is delimited in the following ways. Foremost, the study is restricted to Ghana. Further, the study uses the seventh round of the Ghana Living Standard Survey. The study focused on household-level analysis. Another delimitation imposed by this study is the consideration of only nonfarm households.

Limitation

Like any other study, this study is not without limitations. The following are the limitation of the study. First, the study focuses on household analysis rather than individual-level analysis. This limitation would have affected the results because it could be that other members of the household earns income which will not be captured in the data provided. However, this will be mitigated by the fact that these cases may be rear and will not affect the results. The study is based on cross-sectional data from Ghana Living Standard Survey, Ghana Statistical Service round seven. However, given these continuous changes in behavior over time, longitudinal data may provide significantly different results which cannot be done in this cross-sectional study. Despite the limitations stated, however, care was taken to ensure that the results presented were as accurate as possible.

Organization of the Study

This study is organized into five chapters. Chapter One introduces the subject of the study. It contains the introduction, background to the study, the

statement of the problem, the purpose of the study, research hypotheses, significance of the study, delimitation of the study, limitation of the study, and finally the organization of the study. Chapter Two captures the review of the relevant literature of the study (both theoretical and empirical literature). Further, Chapter Three highlights the methods which were employed for the study. This chapter gives a detailed description of the scope of the study, theories, variables used for the study, and the econometric model used for the estimation of the research objectives. The study present results and discussion in Chapter Four. Finally, Chapter Five focuses on the summary, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter discusses the overview of poverty and non-farm enterprise income, theoretical and empirical information from research works related to the research problem under study. The aim is to gain an understanding of the history, evolution and dynamics of non-farm enterprises and household poverty which will justify the knowledge gap for this study.

Overview of Poverty and Non-Farm Income Poverty

Poverty has been a major challenge for humanity in the twenty-first century. This can be echoed by the collective agreement to half poverty by 2015 (Laderchi et al., 2003) and the need to prioritize poverty reduction in the post2015 development agenda (Arauco etal., 2014; UNDP, 2014). One challenge that has been of great bother to humanity is poverty. Regardless of the several efforts to reduce world poverty, over 2.2 billion people still live in multidimensional poverty (UNDP 2014), with a billion others living in extreme poverty (Arauco etal., 2014; World Bank, 2015). Whilst so many concerns have been shown on the agenda "poverty reduction", the term 'poverty' is still not a universally agreed-upon concept concerning its meaning (Orliange, 2020). The social, political and economic circumstances often influence the meaning people give to the concept. Most times, poverty has been misunderstood as economic (income) deprivation only.

Not to dispute the fact that this is an essential dimension of the concept, other equally important dimensions relating to social, cultural and political circumstances do exist. Thus, poverty has been defined from a

multidimensional perspective, characterized by deprivation of basic goods and services, hardship, powerlessness, limited choices and capabilities, and lack of resources (Mokaka & Marcus, 2004). Poverty can also be defined in terms of absolute and relative terms. Whiles the former on one hand is associated with establishing poverty status in terms of a given threshold, usually based on required nutritional and other essential requirements. The latter is established through comparisons of the lowest and the upper income segments of the standard threshold. This is frequently measured in income quartiles or deciles.

Shepherd (2014) brings in new dimensions of poverty where he explains poverty not only in terms of absolute and relative terms but under three different categories. He believes that poverty may either be classified as extreme, severe or chronic. According to him, individuals living in extreme poverty consume less than the US $1.25 a day, while those living in severe poverty consume less than US$0.70 (based on the average consumption of the poor in Sub-Saharan Africa). However Chronic poverty exists when severe poverty persists over years, or even a lifetime and is often transmitted generationally (ibid). From the above discussions, it is prudent to be cautious in one's measurement of poverty. Thus, poverty measurement is a critical process in understanding and thus alleviating poverty.

The definition attributed to poverty is very crucial in determining how poverty is measured and consequently, the subsequent policy and program interventions to alleviate it (Mokaka & Marcus, 2005). Contrary to the fact that poverty when viewed as a unidimensional phenomenon leads to ill-policy formulation, many poverty analyses have usually focus on quantitative

approaches that make use of income or expenditure which is purely a unidimensional approach. This approach has been widely used not because of its efficiency but rather due to its ability to make data collection and quantification easy.

Rural Livelihoods

A livelihood, as defined by Warren (2002) is a means of living. Other expanded definitions equate livelihoods to the range of assets, capabilities (Resources, stores claims and access) and activities needed for a means of living (Sharma, 2020) to people, their capabilities and their means of living, including assets, food and income (Chambers, 1991). Rural inhabitants use various strategies in the pursuit of their livelihood's goals. A livelihood strategy, according to the Department for International Development, is "the variety and combination of activities and choices that people make to earn a living." (DFID, 2000).

These techniques illustrate how people combine their different sources of income, use their assets, choose the assets for investment, and manage their existing assets and income. Four main livelihood options have been identified: intensification, extensification, diversification and migration (Carswell, 2000; Warren, 2002). Agricultural intensification involves gaining a means of living from the practice of agriculture. Under this livelihood, farmers strive to achieve maximum yields per unit area through capital investment and increases in labour outputs. In extensification, households seek to increase productivity by bringing expansive land into cultivation. Diversification involves engaging in a range of farming activities or pursuing a series of nonfarm activities. Lastly, migration entails seeking a livelihood by moving away, temporarily or

otherwise (ibid). The current study will focus on the literature on livelihood diversification; specifically, in the non-farm sector.

Rural Non-Farm Enterprises

The rural non-farm sector plays a vital part in sustaining rural households' subsistence in Africa. Gaillard & Gaillard (2015) observes that the rural nonfarm sector is relatively small, often consisting of part-time subsistence-oriented activities in its early stages of development. This is consistent with, Naler & Naude's (2014) comparative study findings on the rural non-farm sector using data from some African countries which included Niger, Ethiopia, Malawi, Nigeria and Tanzania. Their findings confirm that, there exist a few differences across countries, the non-farm sector is predominantly small scale and informal. Most of the activities are seasonal and most often operated within the household dwelling or the immediate surrounding.

Similarly, Dary and Kuunibe (2012) found that 89 per cent of the non-farm activities carried out in Ghana were in the informal sector. Rural non-farm enterprises can be classified as human capitalbased operations, manual labour-based activities, and human and capital-intensive activities (Mahabub, 2004). Self-employment in cottage industries and wage employment in rural enterprises are examples of manual labour-based practices., households or farm, transport operations and construction labour. These enterprises have limited entry barriers and are less remunerative. Human capital-based operations include salaried services in the public and private sectors such as teaching, religious leadership, the medical profession as well as other types of personal services such as laundry and midwifery among others. Physical and human capital-intensive operations include such things as agro-processing medium and

large-scale trading as well as offering contractor services. Non-farm enterprises can be those ventures that cannot be classified as primary production activities.

Based on this understanding, Onwuemele (2011) classifies nonfarm enterprises into three categories Secondary activities, tertiary activities and small-scale distribution are all examples of secondary activities. Popular trades such as blacksmithing, carving, and woodworking are examples of secondary practices. Traditional crafts such as shoemaking, tailoring, watch repair, auto repair and welding bicycle repair among others are also included. The small-scale distribution activities include all trading activities whether in retailing or wholesale. Tertiary activities are comprised of enterprises such as transport operations, house ownership, and restaurants among others. Gordon and Craig (2001) as well as UNCTAD (2015) outline three major stages in the progression of rural non-farm enterprises.

During the first stage, most of the enterprises tend to be closely linked with agriculture and mainly encompassing manual labour operations, most especially in rural setups. In the second stage, rural-urban interlinks are noticeable, with some tendency towards commuting (away from the household dwelling), rapid growth towards agro-processing, and industrialization, albeit on small scales. In the third stage, there is a greater focus on rural-urban linkages, employment in non-agricultural sectors, and agro-industrialization. (ibid). According to this classification, non-farm activities in sub-Saharan Africa are in their early stages of development, partly explaining their insignificant contribution to employment (Nagler & Naude, 2014, UNCTAD, 2015).

The rationale for Non-Farm Activity engagement

Engaging in the non-farm sector has been considered the norm rather than the extraordinary in sub-Saharan Africa (Banchirigah & Hilson, 2010; Dary & Kuunibe, 2012; Madaki & Adefila, 2014). The literature on non-farm activities indicates that there are various motivations behind farmers' participation in these activities. Generally, rural households engage in non-farm livelihoods to achieve a set of goals, which, among others include: risk mitigation and management, coping and adaptation during times of shocks and stresses, satisfying household consumption needs, accumulation of household savings, and allocation of surplus labour (Watson & Van Binsbergen, 2008; Smith et al., 2001; Carswell, 2000).

Non-Farm Income as a Source of Livelihood Security

Since there are few records on non-farm in most developing countries' statistics, collecting data on income distribution from non-farm sources for these developing economies such as Ghana, Niger, Burkina Faso is difficult. Rural non-farm enterprises are being promoted as a way to absorb excess farm labour, improve rural productivity, and alleviate rural poverty. (Christensen & Lacroix, 1997). Limited off-farm earning opportunities, along with unequal access to complementary labour inputs, with low market access for domestic goods, shortage of rural credit and land consolidation barriers, are cited as some of the key reasons for stagnant rural incomes in most developing economies (Illien, Pérez Niño, & Bieri, 2022). According to Furey (2020) agriculture serves as a safety net against unemployment, and hidden unemployment is widespread and rising in most developing countries.

Greif (1997) pointed out that, there is a major gap between off-farm operations of private family and farms large-scale agricultural enterprises, according to Greif (1997). Employees who work for large-scale agricultural operations may often operate their own companies, which may or may not provide services to the large-scale farm. However, small-scale private farmers can provide services to large farms or non-farm businesses, as well as become directly involved in the production, marketing and food processing. Thousands of small-scale producers of non-agricultural origin participate in subsistence farming as part of this group. Only part-time farmers with extra income or rural households in developed countries that combine commercial and subsistence farming with non-farm work and relocation should equate themselves directly to the private family farm population. It is difficult to say whether demand-pull or distress-push factors are at work in the transition, from farm to non-farm sector in transition economies. Davis and Pearce (2000), for example, propose that entrepreneurs in these countries join the non-farm sector primarily for demand-pull reasons based on lessons learned from non-farm case studies in the Czech and Romania. On the other hand, Chirca and Tesliuc (1999) say that most rural households participate in non-farm jobs for their daily upkeep rather than been profit-oriented– thus distress-push reasons.

Theoretical Review

This section presents the theoretical literature review, which is an evaluation report of related theories that forms the basis of this study. Many theories in their attempt to explain what causes poverty have attributed the causes of poverty to a different phenomenon. Based on these different attributes

some of the few theories that have attempted to explain the poverty issue may include but not entirely limited to the Marxian theory of poverty, Structural theory of poverty, Neo-conservative theory of poverty and Cultural theory of poverty.

Marxian Theory of Poverty

The Marxian theory believes that poverty may stern from three broad categories. Firstly, when a differentiation in property and power allows from the emergence of class base exploitation and oppression. This hypothesis contends that poverty is exacerbated by the circumstances in which a deprived person finds himself or herself. As a result, the unfortunate individual is a victim of situations brought on by a variety of factors, one of which is the manufacturing process. According to Karl Marx (1986), the owners of means of production's (capitalists') entrepreneurial practice of shifting away from labor-intensive to capital-intensive means of production in order to maximize production and profits results in significant unemployment.

In addition, layoffs have resulted in significant unemployment. People who have been laid off may either move to urban areas to reengineer themselves or change careers. In this attempt the labor force may engage in non-farm activities which are usually predominant in the urban areas. Others who are not able to fit in these job areas may become poor out of being unemployed in the urban areas since these areas even have a higher cost of living. Continued austerity raises the number of unemployed people in the country, which, in the end, increases the poverty level. A series of institutional failures have increased the impoverished population. Hassan (2010) added to this hypothesis by arguing that major structural change leads to a rise in social and

economic marginalization of a whole community of people. Owing to a lack of access to opportunities, certain groups end up poorer. According to the Marxist theory, poverty alleviation can be achieved by improving production structures and providing more education and training to those who have been rendered obsolete by technological advancements, allowing them to adapt to changes in their environment and change their profession.

Neo-Conservative Theory of Poverty

Thomas Robert Malthus Malthusian model developed in (1766-1834) and expanded later upon by Robert Brenner in 1976, has had a significant influence on this theory (cited in Manjoro, 2017). According to these model economic factors such as subsistence and population pressures causes poverty. This model is based on two assumptions; which emphasize that poverty is due to a discrepancy between the output potential of the previous years and demographic patterns in what is known as demographic catastrophes. Unless regulated by positive checks, the difference continues generating a rise number of poor people. Famine, disease, misery and war are all constructive tests that hold over-production at bay. Poverty continues to grow as these positive checks become more uncommon.

Second, marginal production of labour, technology and land as well, as to how these factors influence food and other resource supply, helps to understand poverty over time. Prices have an effect on the supply of commodities within the population, resulting in factors such as retrenchments, which explain poverty (Manjoro, 2017). Although this principle extends to Ghana because of so-called positive checks, poverty continues, suggesting that positive checks alone are insufficient to eliminate poverty. To mitigate

suffering, the Neo-Conservative theory of poverty proposes that moral education be given to minimize overpopulation. Moral education leads to sexual restrictions, marriage postponement, and abstinence before marriage. Improved manufacturing technologies will also help to mitigate poverty by ensuring the demand for goods and services is met at fair prices. (Winch, 1987). It's also worth noting that this idea doesn't apply to Ghana because the country has plenty of land and resources, and there isn't much friction between population pressures and subsistence.

Structural Theory of Poverty

This is where poverty is blamed on conditions and institutions in the social or economic systems, such as sexism, racism, and segregation barriers, rather than on individual conduct (Gordon, Edwards & Reich, 1982). Poverty is therefore induced by a lack of appropriate training and work opportunities to sustain reasonable living conditions. (Cobb 1992; Duncan 1992 & Maril, 1988). Albrecht et al., (2001) contribute to these ideas by suggesting out that massive structural reform leads to increased economic and social marginalization of a whole community of people. The weak are blameless according to systemic theories. Poverty is blamed on systemic deficiencies such as racism sexism, and weak governance, as well as a dreadful state of infrastructure, ineffective growth policies, and job opportunities and even geographical placement. Therefore, is upon this argument that the study adopts this structural theory of poverty in analysing the outcomes from the objectives of the study.

Empirical Review

This section reviews empirical works in the context of their focus, methodology and, most importantly, their findings concerning this work. Many

developing countries around the world have begun to pay more attention to poverty alleviation in recent decades, and it remains a top priority for many developed and developing economies today (Haq et al., 2015). For many developing countries, the main issue is addressing rural poverty, because many of these countries depend mainly on farming, and the majority of their populations are in rural regions. Many developed countries' primary priority is to counter rural poverty, which is endemic in nature, and many of these countries depend mainly on agricultural operations, which are generally clustered in rural areas. Nonetheless, it has been shown that declining agricultural income cannot minimize rural poverty because the rural economy is not exclusively dependent on the agriculture sector (Csaki & Lerman, 2000). Since agriculture has minimal capacity to generate revenue, the majority of poor rural residents in many parts of the world depend on it for survival, Davis and Bazemer (2001), hence, non-farm practices have emerged as a critical component of rural households' livelihood choices.

Several works have been done in both developed and developing countries to examine the impact of rural non-farm income on the poverty status of rural farm households, and these studies have precipitated mixed findings in some instances. Tegegne (2000) study in Damot Gale Woredas and KachaBira of southern Ethiopia, investigated the effects of the non-farm operation on farmers' production decisions and identify the factors that influence non-farm activity. It was discovered that the farm sector in the study sites is characterised by a scarcity of land, low crop yields, a lack of grazing land and a scarcity of draught animal. The inference is that the farm sector is inadequate to accommodate the high population density in the study areas. As a result, farmers

in the study area have revealed greater participation in non-farm operations, and non-farm income plays a significant role in their livelihood. Trade was the most significant non-farm operations. Many people involved in non-farm operations are younger and more educated. Family size was not found to be a major factor, but villages near urban centers have a higher proportion of households receiving non-farm income and engaging in trading activities.

Senadza (2011) also found in his study in Cote d'Ivoire that, whiles the land-poor derived non-farm income was usually earned from unskilled off-farm activities (low skill non-agricultural wage and agricultural wage - and self-employment), the land-rich derived non-farm income primarily was earned from trades and professional employment. In a study by Escobal, (2001) on the determining of non-farm income diversification in rural Peru, it was discovered that employment for non-farm accounts for 51% of rural household income among individuals in Peru. The findings on the effect of non-farm income on rural income disparity indicate that the non-farm sector should be investigated in various countries (Canagarajah et al., 2001).

Barrett et al. (2001) describes these findings by pointing out that, while non-farm income is normal in rural households, wealthy (and landowning) households have better access to appealing and high-return non-farm practices. Poor households on their part, face major barriers to entry into these high-return operations, exacerbating income disparities in rural areas through the non-farm market. However, a study by Canagarajah et al. (2001) reasons that poor households are usually forced into non-farm activities, mainly if they lack land and are unable to engage in agriculture. As a result, non-farm income does not

necessarily have a favorable linear relationship with wealth status; instead, a U-shaped pattern in non-farm income distribution may arise, with the very poor (and landless) and the wealthy (land-rich) receiving proportionately more of their total income from non-farm sources.

According to Ashong and Smith (2001) rural households partake in nonfarm primarily to increase their food security and reduce poverty. Ashong and Smith (2001) use data from a peri-urban area in Kumasi to show how households can deplete their assets by selling cattle to buy food during weak seasonal rains. Poorer households, on the other hand, who cannot afford cattle, are forced to rely on income from non -farm activities. According to the writer's descriptions, running non-farm businesses is the last recourse for survival in poorest households.

Adams (2001), looked at the influence of multiple sources of income on poverty and inequality in rural Egypt and Jordan. He discovered that, while poverty reduced due to household engagement in non-farm activities, income distribution on the other hand also increased hence serving as an element in reducing poverty in Egypt. However, in Jordan, non –farm income is highly received by the rich, which intends to increase rural income inequality. Adams in his study associates the difference in his findings to ownership of land. On the other hand, the land of Egypt is highly productive, yet, the poor do not have enough access and are thus "pushed" into non-farm jobs. However, since land in Jordan is not very productive, the wealthy are “pulled” into the non-farm sector by more attractive rates of return. Meaza (2014) investigated the role of non-farm activities in maintaining respondents' livelihood in Enderta Woreda.

The study made use of standardized and unstructured questionnaires from 190 (hundred and ninety) randomly selected households as well as information from a focus group interviews. The study area's main challenges and opportunities, as well as the contribution of nonfarm activities, were identified and analysed. In general, a study by Meaza concluded that rural households in the study area have diversified incomes from a variety of sources, and participate in a variety of activities. This is because of non-farm livelihood is highly diversified. The study also indicated that households have inadequate access to sufficient fixed and working capital, which is a major challenge to obtain high-returns on non-farm activities.

Van de Walle and Craty (2004) examined whether the emergence of non-farm market economy has the ability to eradicates households from poverty in Vietnam. Although there were some common causative variables, such as education and residence area, the processes deciding poverty and inhibiting diversification are not the same, according to detailed national household surveys conducted between 1993 and 1999 it was indicated that not all Vietnam's poor household were involved in the developing of rural non-farm market economy. This presuppose that the rural non-farm economy was not a grantee to poverty reduction in Vietnam. According to a study conducted by de Janvry et al. (2005) in China's Hubei province, non-farm jobs accounts for 36 per cent of rural household income. The writers also discovered that households that worked in non-farm jobs had higher incomes than households that did not work in non-farm jobs. Furthermore, the authors discovered that non-farm employment decreases both income inequality and poverty. This assertion

aligns with Abdulai and Abdul-Rahman (2011), who believes that non-farm work is a valuable source of income that aids in income smoothing.

In the Northwest Mountains of Vietnam, Tran (2015) investigates the determinants of non-farm participation and the effects of nonfarm jobs on household income among ethnic minorities. The logistic regression analysis shows that education and the availability of local enterprises or trade villages, notably among other factors, have a significantly increasing impact on the likelihood of taking up wage employment, while the presence of paved roads provides households with a greater opportunity to engage themselves in nonfarm work. The study discovered that households with wage or nonfarm self-employment have higher per capita income than those without non-farm employment, using a propensity score matching research. The results suggest that for ethnic minorities, nonfarm work is a way out of poverty.

Mishra, Mottaleb, and Mohanty (2015) investigated the impact of off-farm income on rural Bangladeshi household food expenses. Their studies revealed the heterogeneous effects that exist through the distribution of overall food intake expenses and offered unbiased estimates of the unconditional impact of off-farm income on food expenditures. With the exception of the 25th quantile, the findings show that the consequences of off-farm income are largely favorable through the unconditional quantile regression and significantly raise food intake expenditures for all quantiles. Furthermore, they found that schooling, experience, and household position all lead to higher food prices in rural households.

In the southwest Nigerian states of Osun and Oyo, Adepoju and LapadeOgunwole (2015) investigated the effect of non-farm income on poverty levels among rural farmers. The study used a structured questionnaire to gather data from 240 respondents who were randomly selected from both states. According to their estimates, the average monthly non-farm income in Osun and Oyo states was N33,440 ($222) and N47,845 ($319), respectively. Furthermore, their tobit findings indicated that poverty in Osun and Oyo states increased with age but declined with farm and non-farm income.

In Vietnam and India, Imai, Gaiha, and Thapa (2015) investigated whether rural non-farm jobs reduce poverty and/or vulnerability. To account for sample selection bias, they used a treatment-effects model and discovered that log per capita intake or log mean per capita expenditure increased significantly in both Vietnam and India as a result of access to rural non-farm jobs – which is in line with its poverty-fighting position of promoting access to services – with Vietnam having a greater aggregate impact than India. When they break down non-farm sector jobs by form, they find that sales, practitioners, and clerks have far greater poverty and vulnerability-reducing effects in both countries than unskilled or manual labour.

Odoh and Nwibo (2016) examined the linkage impact of rural non-farm income diversification on poverty reduction among farm households in Southeast Nigeria. A combination of multistage and purposive sampling techniques was used to select 360 rural farm households for the analysis. The Foster Greer Thorbecke (FGT) poverty index, which allows for the quantitative estimation of poverty level, was used to achieve objective (i) while objectives

(ii) and (iii) were achieved by basic regression analysis. The findings discovered that 50.6 percent of rural farm households remained in poverty, with 33.4 percent dropping only below the poverty line. Again, 11.3 percent of poor farmers in the Southeast of Nigeria were living in poverty. As shown by the Herfindal Index, there has been a 66 percent increase in incomes of farm household in rural areas because of diversification. Also, non-farm income, which accounts for 62 percent of total household income in Southeast Nigeria, has a positive impact on farm household poverty reduction. Based on the results, the study proposed that rural farm households diversify their incomes fully in order to break the poverty cycle.

A study by Fox and Sohnesen (2016) claims that the non-farm businesses have been around for a long time and can even provide long-term solutions to the employment problem. This claim may be flawed in companies that have existed for a long period of time, yet still it will function at a subsistence level, using low-productivity technology and relying heavily on family labour. Senadza (2011) analysed the impact of non-farm income on income disparity in rural Ghana using nationally representative household survey data from 2006. The results of the Gini-decomposition technique show that aggregate non-farm income increased income inequality among Ghanaian rural households. Nonfarm self-employment income decreased income inequality, while non-farm wage income raised it. The single most important variable leading to the inequality-increasing existence of non-farm wages, according to a factor decomposition of inequality, is schooling. For non-farm wage income, the impact of education on inequality is more pronounced. The

policy implications are for a reduction in rural income inequality and poverty in Ghana by narrowing education inequalities among rural households and growing access to non-farm jobs.

Tsiboe, Zereyesus, and Osei (2016) studied the relationship between household food nutrient availability and various forms of nonfarm employment (own business, wage workers, and their combination) in northern Ghana. According to the findings of a linear regression of endogenous treatment effects model applied to a population of 3488 farming households and 5770 individuals, non-farm study has a favorable impact on food nutrient supply, and farming households with non-farm enterprises outperform in terms of nutrient availability and food stability. Besides that, households seeking supplemental income through the labor market do not have greater food coverage than those solely engaged in farming.

Finally, the research discovered that women who serve in non-farm occupations contribute the most to the supply of food nutrients in households. The study did, however, advocate the introduction of policies and the construction of infrastructure that promote the development of non-farm income generation opportunities in northern Ghana, as well as a system that allows women to take advantage of these opportunities. Adjognon, Liverpool-Tasie, de la Fuente, and Benfica (2017) examined non-farm workers and household health in Malawi's rural areas. The study looked at the connections between rural non-farm activities (salaries and self-employment) and rural Malawi household welfare using national panel data and a variety of econometric techniques. The study investigated the average treatment effects and

distributional effects on participants' health measures such as per capita spending expenditures. The paper then examines how non-farm activities affect the use of agricultural inputs, which is one direction in which non-farm workers might support rural households. According to the findings of the study, non-farm wage workers and non-farm self-employment increase welfare and reduce poverty. Households at the bottom of the income spectrum, on the other hand, gain far less from inclusion than the richest. While the results favor promoting the rural non-farm economy to reduce poverty, they also conclude that tailored interventions that improve poor households' access to high-return non-farm resources are more likely to result in greater rural poverty reduction.

Iqbal, Abbas, Ullah, Ahmed, Sher, and Akhtar (2018) looked into the role of non-farm income in farm poverty and income inequality. Their research was based on information gathered from 480 cotton farmers in six districts across Pakistan's Punjab province. The Gini coefficient and the Foster, Greer, and Thorbecke (FGT) poverty index were used to estimate non-farm wealth impacts on household poverty and income inequality. The findings suggest that non-farm incomes tend to reduce household poverty in the sample region. Nonetheless, an increase in non-farm income was found to have slightly increased income inequality among Punjab Province households.

The impact of non-farm income on farm household's poverty in Ogun state, Nigeria was assessed by Ibrahim, Akerele, Ojawole, Uthman and Aminu (2019). The study made use of primary data gathered from 120 households in a cross-sectional survey. In analysing the results, Heckman selection model, Descriptive statistics, Foster, Greer, and Thorbecke indices, and Logit regression were used. The findings revealed that 93.0 percent of survey

participants worked in non-farm jobs and earned an average of N33,208 per year, with trading and business being the most common activity. Moreover, 49.0% of the farm households were poor, with poverty gap index and poverty severity of 0.31 and 0.22, respectively. They also discovered that household size, schooling, and the availability of good roads all play a role in non-farm job participation, while non-farm income is positively influenced by schooling and becoming a woman. The findings of the logit regression indicate that non-farm income has a negative significant impact on prevalence of poverty, and as a result, there is empirical support for a move away from an exclusive emphasis on agricultural production as a route to rural development and toward an inclusive policy structure that supports non-farm jobs as an alternative path to improved rural welfare. They recommended that efforts to provide good roads and improve access to education should be made so as to open up alternative employment opportunities to rural farm households.

Abdullah, Amin, and Hossain (2019) analyzed the impact of non-farm income on asset ownership in rural Bangladeshi households using a two-stage econometric method based on a multilevel mixed-effects linear regression model and nationally representative Household Income Expenditure Survey (HIES) data from 2010. Non-farm income has a major positive impact on household wealth ownership, according to the results. The Horvitz-Thompson (HT) estimator of the Foster, Greer, and Thorbecke (FGT) indexes, as well as Gini, Theil's, and Atkinson income inequality indicators, were used to investigate the effect of nonfarm income on poverty and income distribution in rural Bangladesh at the division and national levels. Non-farm incomes, on the

other hand, have increased the divide between rural and urban households. Provided that Bangladesh's agriculture is largely subsistence and semi commercial, it is crucial to encourage non-farm income practices in order to boost the well-being of rural agricultural households.

In India, Rahman and Mishra (2020) used a national rural household survey panel, and night-time light intensity as an instrumental variable (IV) for non-farm income, and found that it has a positive impact on general food spend of non-agricultural livelihoods, especially non-cereal items, allowing for greater food diversity. They contend that their findings have significant policy consequences for India's nutrition transition, where agricultural incomes have been stagnant for the past decade.

Ba, Anwar, and Mughal (2021) analyse the effects of non-farm labour participation in rural Mauritania on poverty reduction. They looked at the relationship between poverty and non-farm labour activities in terms of prevalence, intensity, and magnitude of poverty. To assess the signs and impacts of participation on alleviating poverty, they used probit, propensity score matching, and inverse likelihood weighting techniques. Their results revealed that households with at least one member engaged in non-farm activities have a 5.9% lower risk of being poor than those whose only source of income is agriculture. Furthermore, involvement in non-farm activities is related to lower poverty incidence and severity (3.6 percent and 1.9 percent, respectively). They came to the conclusion that rising income by diversification into non-farm activities is an efficient way to minimize poverty in rural areas.

Danso-Abbeam, Dagunga, and Ehiakpor (2020) assessed the possible effect of rural non-farm income diversification on household welfare and adoption of Zai-technology (a proxy for agricultural technology adoption). To estimate welfare and Zai-technology impacts of non-farm income diversification, they used Propensity Score Matching (PSM) and Inverse Probability-weighted Regression Adjustment (IPWRA) techniques. The findings indicate that non-farm income diversification raises the likelihood of Zai-technology adoption and leads to considerable household welfare benefits after controlling for differences in covariates. They propose that the operations of agricultural extension services and farmer-based organizations (FBOs) are increased by facilitating the diversification of non-agricultural income, thereby increasing investments in productive technologies (ZAI) and household welfare.

Chapter Summary

This indicates that involvement in rural non-farm enterprises could be driven by an urgent need or a constructive, long-term strategy. The survivalist vs. strategic diversification dichotomy could be of limited use. When opposed to households that do not diversify their incomes, households that diversify their incomes have more stability and durability (Warren 2002). Diversification is more dynamic than static in most situations, requiring a constant reorganisation of livelihood portfolios in response to evolving constraints and opportunities (Bigsten & Kayizzi-Mugerwa 1995). What begins as a survivalist or coping strategy can turn into something strategic, and vice versa.

Overall, while livelihood diversification strategies such as the operation of non-farm enterprises may eventually lead to household emancipation, the

outcomes may not be unidirectional. Geographical locations and types of activities may have an impact on the outcomes and effects. In essence, diversification results are not standardised in terms of derived benefits for households. Because of the complexity and dynamism of non-farm activities, as well as between countries, in-depth, sector-specific, and country-specific studies based on panel data is needed before any definitive generalisations can be produced.

CHAPTER THREE

RESEARCH METHODS

Introduction

The study examined the effect of income from non-farm enterprise on poverty in Ghana. This chapter presents the methods used to test the variant hypotheses of the study. The chapter presents the research design, the data source, theoretical model specification, the empirical model specification used for testing the study hypotheses, description of the variables used for the study and finally how the post estimation tests of the study will be conducted.

Research Design

For the study to determine a valid conclusion based on the association between income from non-farm enterprise and poverty, the study employed the quantitative research design which made use of a survey conducted by the Ghana Statistical Service. The entire study followed the positivist philosophy. Validity, authenticity, objectivity, accuracy, and generalizability are used by positivists to determine the rigor of quantitative research. This means the results obtained from the study is not based on concepts but rather on a scientific method of enquiry. The survey design is employed for the study due to its appropriateness to measure the quantitative nature of the outcome variable.

Data Source and Description

The study used secondary data from the Ghana Statistical Service (GSS), specifically the Ghana Living Standard Survey round 7. The Ghana Living Standard Survey (GLSS) is a multi-purpose household survey that collects data on a wide range of living standards, including health, education, jobs, and household spending on food and non-food products. The research used

the 7th round of the Ghana Living Standard Survey. Sections used for the study included data on the income of non-farm businesses identified in the aggregates file, the poverty status of the household head in the poverty file, as well as some sections of the education file, the household file and the non-farm business file. Additional explanatory variable such as age, sex of the household head, household size, location, educational level, marital status, employment status, religion and region were used.

Econometric Specification and Estimation Techniques

Two-stage Least Square

This study employed the two-stage least square equation modelling to investigate the effect of non-farm enterprise income on poverty. This modeling was used because there was the presence of endogenous variables in the model which could affect the validity of the result when a linear regression system is used. To prove this, we test for endogeneity which sources was from bicausality between non-farm income and consumption poverty. The endogeneity test was carried out using the Wu–Hausman test with robust standard errors (Hausman, 1978; Wu, 1974) and Wooldridge's (1995) robust regression-based test (p-value=0.031) for models with robust standard errors, and both (at 5% alpha level) resulted in the rejection of the null hypothesis that non-farm income is exogenous. With this, we concluded that non-farm income is an endogenous variable. Hence two stage least square approach was used to manage the endogenous explanatory variables. This approach required two runs of Ordinary Least Square (OLS). In a two-stage least square (TSLS) the first stage is used to find the portions of the endogenous and exogenous variables that could be assigned to the instruments. During this point, each variable in the model is

subjected to an OLS regression on the collection of instruments. The second stage involved regressing the original equation with all variables replaced by the fitted values from the first-stage regressions. The TSLS estimates were used as the coefficients in this regression. In the second stage regression model, the expected values from these regressions replaced the endogenous variables' original values. In other words, if a household head earns (X) from the non-farm company, the structural equation can be written as:

$$Y_i = \beta_0 + \beta_1 X_i + u_i \qquad (4)$$

because the factors which affect non-farm enterprises income vary from the factors which affect household head poverty, the reduced form equation can be written as:

nbk $X_i = \pi_0 + \pi_1 z + v_i \qquad (5)$

Empirical Model Specification

To achieve the first objective which seeks to find the effect of non-farm enterprises income on consumption poverty in Ghana, the study begins the explicit estimable econometric model expressed as follows:

$$CP_i = \beta_0 + \beta_1 NFI_i + \beta_2 age_i + \beta_3 age\_square_i + \beta_4 sex_i + \beta_5 residence_i + \beta_6 size_i + \beta_7 underemployment_i + \beta_8 marital\ status_i + \beta_9 region_i + \varepsilon_i \qquad (6)$$

β represent parameters to be estimated, ε represent the Gaussian white noise. CP_i denote consumption expenditure poverty for the household. NFI denotes income from non-farm enterprises, age denotes the age of household head, age_square denotes age square of household head, sex denotes the sex of household head, $Residence$ denote residence of household head, $size$ denotes the household size, $underemployment$ denotes the number of hours they

spend at work, $marital\ status$ denotes the marital status of household head, $region$ denotes the regional location of the household head.

To analyse the effect of non-farm enterprises income on multidimensional poverty in Ghana. The econometric model expressed is as follows:

$$MPI_i=\beta_0+\beta_1 NFI_i+\beta_2 age_i+\beta_3 age\_square_i+\beta_4 sex_i+\beta_5 residence_i+\beta_6 size_i+\beta_7 underemployment_i+\beta_8 marital\ status_i+\beta_9 region_i+\varepsilon_i \quad (7)$$

β represent parameters to be estimated, ε represent the gaussian white noise. MPI_i denote multidimensional poverty index for household. NFI denotes income from non-farm enterprises, age denotes age of household head, age_square denotes age square of household head, sex denotes the sex of household head, $Residence$ denote residence of household head, $size$ denotes household size, $underemployment$ denotes if a household head spend less than 40 hours at work in a week or more, $marital\ status$ denotes the marital status of household head, $region$ denotes regional location of the household head.

Emanating from the fact that some of the factors which affect non-farm enterprise income could affect household head poverty status, the study treated income from non-farm and poverty as systems of equation and used two stage least square modelling to determine the nature of the relationship. The structural and the reduced form equation for each poverty dimension is thus specified as

Structural Equation

$$Y_i=\beta_0+\beta_1 income_i+\beta_2 age_i+\beta_3 age\_square_i+\beta_4 sex_i+\beta_5 residence_i+\beta_6 size_i+\beta_7 underemployment_i+\beta_8 m\_status_i+\beta_9 region_i+\varepsilon_i \quad (8)$$

Reduced form equation for both structural equations is:

$$Income_i = \beta_0+\beta_1 income_i+\beta_2 age_i+\beta_3 age\_square_i+\beta_4 sex_i + \beta_5 residence_i+ \beta_6 size_i + \beta_7 underemployment_i + \beta_8 marital\ status_i +\beta_9 region_i + \varepsilon_i \quad (9)$$

Where Y_i is the dependent variables (consumption expenditure poverty and multidimensional poverty), whereas independent variable is the same as equation (8).

Measurement of Dependent Variables

Poverty measurement in this study comes from two main sources; the unidimensional (consumption-base) and multidimensional approach. Whiles the unidimensional approach employs the consumption expenditure of the household head. the multidimensional approach comprises an index following Alkire-Foster (2010) multidimensional poverty methodology. Detail composition of each of the two poverty measures are as follows:

Consumption Poverty

The unidimensional approach in this study employs the consumption expenditure of household heads. Consumption spending refers to the amount of goods and services bought by individuals, obtained from home construction, or collected as gifts or payment in kind (GSS, 2014). The aspects of consumption spending that were used to generate this aggregate can be classified into two categories: There are two kinds of items: food and non-food. The following are the particular products in each group, as well as the method for aggregating the consumption components:

Food items comprise Food consumed within the household from a wide range of sources (food sales, self-produced food, food collected as gifts, remittances,

and payments in kind), as well as food consumed outside the household (restaurants etc.).

Non-food items include college expenses (such as textbooks, tuition costs, and so on), insurance expenditures (medical care and leisure expenses), and a variety of other non-food and other expenditures (such as domestic fuel and electricity, personal care, clothes and accessories, transportation, entertainment, tobacco products, and miscellaneous goods and services) (GSS, 2014). In estimating the absolute poverty line, i.e., who is poor and who is non-poor, the expenditure of a minimum consumption basket required by an individual to fulfil his or her basic food and non-food was calculated (GSS 2014).

Multidimensional Approach

The Oxford Poverty and Human Development Index (OPHI) proposed the Multidimensional Poverty Index (MPI). Among the problems discussed by the MPI was a lack of proper sanitation and clean water, inadequate health, nutrition, low schooling, social isolation, inadequate housing conditions, stigma, abuse, and disempowerment (Alkire & Foster, 2011 Santos, & Alkire, 2011). The MPI was principally introduced as an improvement upon the Human Development Index (HDI) with the strong need to move away from the unidimensional space to a multidimensional one (Alkire & Santos, 2010, 2010; Alkire, Foster & Santos, 2011; Neumayer, 2012).

The MPI is a poverty index that tracks extreme poverty (Alkire et al., 2015). Acute poverty is characterised by two characteristics. To begin with, it includes people who live in circumstances where they do not meet the minimum globally agreed-upon requirements for basic functional indicators such as being

well-nourished, educated, or drinking healthy water. Second, it applies to people who live in circumstances where they fall short of minimum requirements in many fields at the same time. In other words, the MPI assesses people who are suffering from various deprivations, such as being undernourished and lacking access to safe drinking water, proper sanitation, and clean fuel. The MPI is used once again to explain the interconnections between deprivations. This facilitates improved aid targeting to the most vulnerable, the detection of poverty traps, and, as a result, the impact of MDG-related initiatives (Alkire, & Santos, 2010; 2011; United Nations, 2010). The MPI is a quantitative indicator of poverty that can be compared across locations and overtime to assess which groups are the poorest and if poverty has decreased or increased.

In conclusion, the central innovation of MPI is that it distinguishes the heads of households who suffer from overlapping deprivations. The MPI contains a profile of multidimensional poverty for each household head, which can be broken down by indicator to display the composition of multidimensional poverty across various regions, ethnic groups, families, or any other population sub-group, with policy implications. (Alkire & Santos, 2010; 2011; United Nations, 2010). Multidimensional poverty comprises Education, Health and Living Standard.

Education: Within the education factor, the MPI uses two metrics that complement each other: the first looks at completed years of schooling for household heads and the second looks at completed years of schooling for household members. i.e., all individuals within a household. Besides, the other aspect considers children who are attending school at age of eight years and

above. Years of education often function as a proxy for household members' level of information and comprehension. The two metrics that are not considered is that, this measure does not account for the standard of education, the amount of knowledge gained, or the skills acquired. Both measures, however, are accurate and readily accessible, and they offer the best possible approximation to household members' educational levels. In terms of cut-offs for this dimension, the MPI requires that at least one member of the household have completed five years of education and that all children of school age are enrolled in school by the eighth grade.

Health*:* The first indicator looks at child survival. Most of the child mortality are preventable and result from infectious disease or diarrhoea. Malnutrition plays a part in the death of infants. Each household member is considered deprived in the MPI if at least one child death (of any age) has been recorded in the household. The second metric looks at the nutritional status of members of the household. Malnutrition may lead to other health issues in children; they are less able to learn and focus, and they may not do as well at work. The nutritional predictor for children is being underweight (also known as weight-for-age), which is used to monitor the Millennium Development Goals. If a child's weight is two or more standard deviations below the reference population's median, she is considered underweight. The BMI (Body Mass Index) is a health measure for adults (BMI). If an adult's BMI is less than 18.5, he or she is considered undernourished.

Living standards: The MPI considers the following indicators for standards of living. It includes access to the use of electricity, access to improved sanitation,

and clean drinking water, cooking fuel, flooring material and household member's asset ownership (Alkire, Foster & Santos, 2011). The final indicator covers the ownership of some consumer goods examples are: telephone, television, radio, bicycle, truck, motorbike and refrigerator. Each of the deprivation cut-offs of the dimensions is as follows:

***Water*:** If the water source is piped water, borehole, public tap or pump, protected well, rainwater or protected spring, whether it is within 30 minutes' walking distance, the person has access to safe drinking water (roundtrip). If it fails to fulfil these criteria, the household is deemed to be without water.

***Improved sanitation*:** If a person lives in a home with a latrine or flush toilet, composting toilet or a ventilated improved pit that is not shared, they are considered to have improved sanitation. If a household does not meet these requirements, it is considered sanitary deprived.

***Electricity**:* If an individual does not have access to electricity, they are called deprived here.

Flooring: Deprivation in flooring is characterized as flooring made of soil, sand dung, or 'other' (unspecified) materials.

Cooking fuel: If a household cooks with dung, charcoal, or wood, the individual is considered to be without cooking fuel.

Assets: Each member of a household is deemed deprived if the household does not have more than one radio, television, telephone, bicycle, motorcycle, or refrigerator, as well as no vehicle or tractor.

Definition of independent Variables

The description of the independent variables used for the analysis is discussed in the following section.

Type of business activity

This variable is categorical. It measures the type of business entity or a non-farm enterprise activity a household head does. This component is recoded into six categories: manufacturing, construction, wholesale and distribution, maintenance of motor vehicles and bicycles, transport and storage, lodging among food services, and others non-farm operations.

Years of operation

This variable measures the number of years of operation a household head has been in a non-farm enterprise. This variable is discrete and also serve as a proxy for years of experience in the non-farm enterprise.

Difficulty in operation

This variable measures the difficulty that a household encounters in nonfarm activities. This variable served as a covariate of income-earning from nonfarm activities. That is whether difficulty in operation affects the progress or otherwise of the non-farm enterprise. This variable has four categories which are no difficulty as the base category, difficulty in obtaining capital/credit, difficulty in getting technical assistance and difficulty in government regulations.

Sex

The variable measures the gender of the household head engaged in the non-farm enterprise. This variable is a dummy and seeks to ascertain the gender role in non-farm enterprises in Ghana.

Income

This variable is continuous. It measures the income generated from nonfarm enterprise or activities. This variable is used as a proxy to measure the growth of non-farm enterprise in this study.

Marital status

In this variable, the marital status of a household head is categorical. It measures the marital role in non-farm enterprises as well as in poverty discourse. This variable has five categories. The first category represents whether an individual is in a consensual union. The second category represents whether an individual is separated from marriage. The rest of the categories represents divorced, widowed, married, not married and single.

Age

The variable age is continuous. It measures the age of the household head as age is shown in literature to influence the poverty status of the household head.

Residence

The variable residence measures the locality of the household head. This variable is dummy with rural as the base or reference category.

Region

The variable region is categorical. It measures the regional location of the household head engaged in the non-farm enterprise. This variable has ten categorical with the Western region as the base category and represents the old regional demarcation of the nation, Ghana.

The summary of the definition and measurement of variables is presented in Table 1.

Table 1: Definition and Measurement of Variables

Variable	Type	Definition	Aprior sign
Consumption poverty	Continuous	the total amount of products and services purchased by individuals, consumed from home construction, or obtained as gifts or in kind	
Multidimensional household deprivations in education, Health and Living Standard	Poverty Index (MPI)	Index Measures experiencing	
Non-farm Income	Continuous	Measure the income from the non-farm-enterprise of the household head	
Underemployment	Dummy	Measured if household head spends less or more than 40hours at work in a week.	-/+
Sex	Dummy	Female=0, male=1	+
Age	Continuous	Age of the household head	+
Age squared	Continuous	Measure age squared of the household head	+
Marital status	Categorical	Not married =0, consensual union=1, separated =2, divorced=3, widowed=4, married=5	-/+
Household Size	Continuous	Measure the number of members in a household	+
Residence	Dummy	Rural=0, urban=1	-/+
Region	categorical	Western=0, central=1, Greater Accra=2, Volta=3, Eastern=4, Ashanti=5, BA=6, Northern=7, Upper	-/+

East=8, Upper West=9

Source: Author's Constructs (2020)

Post Estimation Test

To ensure the model's estimates are consistent, the study conducted Breusch-Pagan/ Cook-Weisberg test for heteroskasticity. The null hypothesis for the Breusch-Pagan test is that the model has constant variance (homoskasticity) against an alternative hypothesis of non-constant variance (heteroskastic). The study also conducted Cameron & Trivedi's decomposition of IM-test. The Ramsey RESET test using the powers of the fitted values was also conducted. The null hypothesis test for the presence of no omitted variables against the alternative hypothesis of model has omitted variables.

Chapter Summary

In conclusion, the study examined the effect of non-farm enterprise income on poverty in Ghana. This chapter presented the methods used to test the hypotheses of the study. The study employed a Two Stage Least Square equation modelling to investigate the effect non-farm enterprise income has on consumption/multidimensional poverty in Ghana. Again, it uses multivariate analysis to test the difference in variance among unidimensional and multidimensional poverty of non-farm enterprise. Finally, the study presented how the post estimation test were conducted in this study.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter of the study presents an analysis and discussion of the results. The results have been organised in the form of tables and figures for a better understanding of the values and direction of the relationship between variables. The chapter is organised into the following sections: Descriptive statistics of discrete and continuous variables. The chapter is then followed by the discussion of the results for effect of non-farm enterprise income on poverty (i.e., both consumption poverty and multidimensional poverty).

Summary Statistics

This section presents the summary statistics of the continuous variables. Table 2 show that multidimensional poverty (MPI) has an average value of 0.295, with a standard deviation of 0.118. The maximum value for MPI is 0.7 and the minimum reported value is 0.06. This indicates that each poor person is, on average, deprived in about 30 percent on the weighted indicators. That is multidimensional poor person is deprived in 3 out of the 12 weighted indicate on average. It has a mean value of GHC 57835.44 with a standard deviation of GHC 234661.3. The high standard deviation shows that there are significant variations in total yearly income among household heads in the country. This assertion is further affirmed when we examine the minimum reported value (GHC 25) and the maximum reported value of GHC 5836265.

Table 2: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Minimum	Maximum
(Multidimensional Poverty Index) MPI	3,953	0.295	0.1108	0.066667	0.7
Non-Farm income (INCNF)	3,953	57835.44	234661.3	25	5836265
Household expenditure (HHEXP)	3,953	15115.37	13115.71	165.5031	228002.2
Age	3,953	43	12	17	88
Years of operation	3,953	7.686	7.452	0	99
Household size	3,953	4.147	2.348	1	27

Note: Obs. represents observation and Std. Dev. represents Standard Deviation.

Source: Author's Constructs (2020)

HHEXP represents total household expenditure in a year. The average household expenditure is GHC 15115.37, with a standard deviation of 13115.71. Some households were found to spend as low as GHC 165.5 within a year and the maximum reported value for household expenditure is GHC 228002.2 The average age among household heads engaging in non-farm labour activities is 43 years. This depicts that's on average, households considered for this study are within their working age. The minimum recorded age was 17 years and the maximum age was 88 years. Also, the years of operation measures the number of years the firm has been in operating. In all, we find that the oldest enterprise in our sample was 99 years old. Household size represents the number

of members in the household. On average the member of household is 4 and ranges from 1 member to as high as 27 members.

Descriptive statistics of categorical variable

The Table 3 shows that Wholesale Retail and Repair of Vehicle and Motto industry forms the majority of the non-farm enterprises. This is followed by other enterprises, manufacturing, accommodation and food service, transport and storage, and construction. This is not entirely surprising as it is consistent with existing studies in countries that have similar characteristics with Ghana. For instance, a study by Binswanger-Mkhize (2016) in Kenya also revealed similar findings. The sector that reported the lowest participation was the transport and storage sector. Households were also asked to indicate the level of difficulty they face in establishing non-farm businesses. Out of the total sample used, 1560 household heads representing 39.46 percent indicated having no difficulty in establishing non-farm businesses. Notwithstanding, 2251 representing almost 57 percent of the sample mentioned credit constraint as the biggest obstacle to non-farm business establishment. This indicates that majority of non-farm business could not survive because of lack of credit constraints which could have their income and also their poverty level.

Table 3 shows that a higher proportion of persons who engage in nonfarm enterprises are males (64%) compared to females (36%). This finding is in line with international business establishment survey-iBES (2015) which indicated there are more male (60.3%) firm establishment than females (39.7%). With regional distribution for participation in non-farm businesses, the results indicate Greater Accra and the Ashanti regions to have the highest participation rate in non-farming business activities (963 and 865 respectively). This result is

similar to the international business establishment survey Phase II (2018), which indicated that Greater Accra and Ashanti region constitute a greater proportion of small-sized establishments. The results also indicate that majority (55%) of persons engaged in non-farm businesses are married. This followed by those in consensual unions (12.88), never been married (10.82) and those who are separated (5.9%).

Table 3: Descriptive statistics for distribution of non-farm participation

Variable	Frequency	Percent	Cum Freq
Type of enterprise			
Manufacturing	745	18.85	18.85
Construction	138	3.5	22.36
WRRVM	1,747	44.2	66.56
Trans & storage	121	3.06	69.61
Accommodation & food service	224	5.65	75.27
others	978	24.73	100
Difficulty Enterprise			
No difficulty	1,560	39.46	39.46
Capital/credit	2,251	56.94	96.4
technical	101.	2.56	98.96
Government regulation	41.	1.04	100
Sex			
Female	1,405	35.55	35.55
Male	2,548	64.45	100
Residence			

rural	1,335	33.77	33.77
urban	2,618	66.23	100
Underemployment			
less than 40 hours	1,530	38.69	38.69
40 hours or more	2,423	61.31	100
Region			
Western	355	8.98	8.98
Central	388	9.83	18.8
Greater Accra	963	24.36	43.16
Volta	374	9.46	52.63
Eastern	476	12.05	64.68
Ashanti	865	21.89	86.57
Brong Ahafo	312	7.89	94.46
Northern	113	2.85	97.31
Upper East	74	1.86	99.17
Upper West	33	0.83	100
Marital Status			
Never married	428	10.82	10.82
Consensual union	509	12.88	23.7
Separated	233	5.9	29.59
Divorced	283	7.17	36.77
Widowed	314	7.95	44.72
Married	2,185	55.28	100
Total	3,953		

Source: Author's Constructs (2020)

Effect of Non-Farm Income on consumption Poverty

The first objective seeks to determine the effect of non-farm income on consumption poverty. To solve this the study uses the two-stage least squares (2SLS). Table 4 presents the findings of the 2SLS econometric results. Looking at the coefficient for non-farm income (NFI) in Table 4.

The result shows that non-farm income of the households has a positive and significant effect on the poverty status of the household. The results indicate that with a cedi increase in the non-farm income of the household heads there exist 0.097 units increase in the consumption poverty status of the household holding all other factors constant. This result does not conform to the economic intuition and the a-priori sign expectations. Empirical studies have shown that income earned play an essential role in cushioning households against excesses of economic hardships. However, this result suggests that focusing on income from non-farm business on just consumption as a way of escaping poverty proves futile. The increase in income may not necessarily means an increase in consumption the income could have been used for savings among others hence will not reflect on the consumption of the household head. This provides basis that there could and still exist some other factors that need to be tackled by authorities and household heads in an attempt to alleviate poverty. This finding is in conformity with the study of Sylvester (2013) who indicated that poverty alleviation policies should concentrate both on improving household activities already available, most prominently farming and on expanding the range of

potential dimensions that are essential and affects the daily lives of family members.

Moreover, pertaining to household characteristics the results indicated that age of the household head has a positive and significant effect on the consumption poverty status of households. The results revealed that a year increase in the age of household head leads to a 0.23 rise in the household consumption poverty. This indicates that at early ages, the young headed household does not have enough resources to alleviate their household from poverty. However, the age squared of the household head has a significant negative effect indicating that, after attaining certain number of years, the household head turns to have the necessary resources such as land, produces and experience to reduce the poverty level of the household. This means that the household head's life cycle involves a quadratic relationship. This suggests that the older the household get the easier they are able to provide enough resource for the household to escape the poverty line. This result is consistent with the findings of Akaakohol and Goodness (2014), Gounder and Xing (2012) and Chang and Mishra (2008).

With the sex of the household head, the result revealed that there is positive and significant relationship with consumption poverty. The results show that male-headed household with a non-farm income has the potential of increasing consumption poverty by 0.060 compared to a female-headed household. This result is in line with Shakil, Tariq & Ijaz (2017), who say that a male-headed household has a slightly higher chance of falling into poverty than a female-headed household. But, however, contradict with the findings of

Imam et al. (2018), Mishra et al. (2015) and Gounder and Xing (2012). For example, according to Hossain et al. (2018), male-headed households have higher per capita consumption expenditure than female-headed households. This may be because males are more engaged in earning activities in rural Bangladesh. They came to the conclusion that female-headed households are worse than male headed households.

Table 4: Effect of non-farm income on consumption poverty

VARIABLES	
	2SLS
Non-farm Income	0.097***
	(0.021)
Age	0.023***
	(0.005)
Age square	-0.0002***
	(0.00003)
Sex (base= female)	
Male	0.060***
	(0.023)
Residence (base=rural)	
Urban	0.287***
	(0.021)
Household size	0.089***
	(0.004)
Underemployment (base= less	

than 40 hrs)	
40/more	0.012
	(0.019)
Marital status (not married)	
Consensual union	0.105***
	(0.038)
Separated	0.022
	(0.048)
Divorced	0.021
	(0.045)
Widowed	0.065
	(0.046)
Married	0.221***
	(0.034)
Region (base=Western)	
Central	0.116***
	(0.037)
Greater Accra	0.334***
	(0.038)
Volta	-0.204***
	(0.036)
Eastern	0.058
	(0.037)
Ashanti	0.085**

	(0.037)
Brong-Ahafo	-0.026
	(0.040)
Northern	-0.231***
	(0.048)
Upper East	-0.376***
	(0.044)
Upper West	-0.445***
	(0.053)
Constant	7.148***
	(0.173)
Observations	3,953
R-squared	0.413

Source: Author's Constructs (2020)

Furthermore, the coefficient of the residence of a household and consumption poverty has a positive and significant relationship. This indicates that residence in urban areas increase their consumption poverty of the household. The results show that if a household is situated in the urban center, then this increases the likelihood of household incidence level of consumption poverty by 0.287 compared to those living in rural areas. This finding contradicts the most finding in the literature (see, Shakil, Tariq & Ijaz, 2015). In addition, the positive and significant coefficient of household size indicates that large families have a tendency to increase the consumption poverty of the

household. This implies that a large household size is vulnerable to consumption poverty than those with fewer household members. This is consistent with the findings of Zereyesus et al. (2017), Shakil, Tariq and Ijaz (2015) and Lanjouw and Ravallion (1995). According to Lanjouw and Ravallion (1995), larger families are wealthier because they pay less per person per family.

Table 4 also show that being in a consensual union and being married increase the chances of being poor by 0.105 and 0.221 compared to being single respectively. The results further indicate that living in the Central, Greater Accra and Ashanti region increases the chances of being poor by, 0.116, 0.334, 0.085, compared to those living in the Western region. While those residing in the Volta region, Northern, Upper East and Upper West regions are 0.204, 0.231, 0.376 and 0.445 less likely to be poor based on the consumption poverty measure compare to living in the Western region. These results are significant at all levels.

Effect of Non-Farm Income on Multidimensional Poverty

Alkire and Santos (2010) created the Multidimensional Poverty Index (MPI) for the 2010 Human Development Report. It's a metric of extreme multidimensional poverty focused on Alkire and Foster's (2011) dual cut-off approach for assessing poverty. The MPI is a much more actionable and policy relevant measure for countries and agencies than the HDI since it is focused on household survey results (Human Development Index). For the sake of the problem of heteroscedasticity and multicollinearity which could not be addressed by the use of OLS estimation technique, this section of the study focuses on analyzing the effect of non-farm income on multidimensional

poverty using a Two Stage Least Square (2SLS) as it covers this problem with a minimum standard error and applies complete exogenous.

Table 5 present the results on the effect of Non-Farm Income on Multidimensional Poverty using the 2SLS. This result reveals that a cedi increase in non-farm income reduces poverty status by 0.009 unit and this is significant at 5% alpha level. It is also evident that the main reason behind engaging in non-farm activities is for survival rather than wealth accumulation.

This is supported by the fact that majority of the households spent their nonfarm income on basic commodities especially food and education rather than investment in businesses or other more remunerative ventures. Poverty is widespread, with 23.4% of the households studied living below the poverty line as 2017. The nature of non-farm activities undertaken is consistent with the low level of education and training, which consequently reinforces the poverty situation in the economy. In the absence of other interventions, this trend is not likely to relieve the poor rural households of their poverty situation. This finding is in line with the works of, Ashong and Smith (2001), Abdulai and AbdulRahman (2011), Senadza (2011), Assan (2014), and Amin and Hossain (2019).

Also, the results show that the age of Household heads has a positive but insignificant effect on Multidimensional poverty status of the household, however, results from age squared shows that as the age of household heads grow above their average age (43) an additional year reduces multidimensional poverty status of the household by a marginal (0.0001) unit which is significant at 5 percent. It can be well said that several studies conclude that households

headed by young people (especially below 40 years) are the most diversified (Ghimire et al., 2014; Nagler and Naude, 2014; Demissie and Legesse, 2013). The current study however finds that households heads who are mostly older than the average household age of 43 are more diversified as thus their activity help reduce the multidimensional poverty status of the entire household. This finding may be due to the unavailability and, or non-utilization of opportunities that favour the economic advancement of the youth related household enterprises. As such the youth or younger households may not have accumulated enough wealth to enable them participate in such activities as business enterprises that require large capital to start which can motivate a significant fall in their poverty status. This finding contradicts the works of Qureshi, Nazli, Haq and Arif (2000) but consistent with the findings of Djurfeldt (2012).

Table 5: Effect of Non-Farm Income on Multidimensional Poverty

	2SLS
Non-farm income	-0.009**
	(0.004)
Age	0.001
	(0.001)
Age square	-0.0001**
	(0.00004)
Sex (female)	
Male	0.054***
	(0.005)

Residence (base=rural)	
Urban	-0.053***
	(0.004)
Household Size	0.002**
	(0.001)
Underemployment (less than 40 hrs)	
40/more	0.003
	(0.004)
Marital status (not married)	
Consensual union	-0.006
	(0.008)
Separated	-0.000
	(0.010)
Divorced	0.011
	(0.009)
Widowed	0.010
	(0.009)
Married	-0.026***
	(0.007)
Region (base=Western)	
Central	0.007
	(0.008)
Greater Accra	0.018**
	(0.008)

Volta	0.010
	(0.007)
Eastern	0.004
	(0.007)
Ashanti	0.001
	(0.007)
Brong-Ahafo	0.010
	(0.008)
Northern	0.013
	(0.010)
Upper East	-0.006
	(0.009)
Upper West	-0.002
	(0.011)
Constant	0.368***
	(0.035)
Observations	3,953
R-squared	0.115

Source: Author's Constructs (2020)

Table 5 also shows that a large differential in poverty between male and female-headed households when decomposed by sex. It describes that having a male head of household raises the household's multidimensional poverty status by 0.054 units as compared to having a female head of household. This could

emanate from the fact that there are several dimensions for the poverty index considered that are mostly handled effectively by women. For instance, nutritional and health status of member of household are mostly directly catered for by the women. Therefore, incorporating all these factors means the effect of men in the household which is mostly realized by household income is not enough to alleviate the household from poverty.

Household size on the other hand has a significant relationship with the multidimensional poverty status of the household. There is an increasing effect of 0.002 unit on multidimensional poverty status of households assuming a unit increase in the size of the household. Wolde (2013) asserted that families with large sizes, greater than the average family size for the entire study, have substantially higher poverty indices as calculated by all poverty indices, and this result is consistent with his results.

Table 5 also reveal that at an alpha level of 5%, living in the urban areas reduces the multidimensional poverty status of house households by 0.053 units compare to households living in the rural areas. Again, being a married household heads also shows to have a reducing effect of 0.026 on multidimensional poverty status of the households compared to a household head who are not married. And lastly, this table shows that living in the Greater Accra region increases poverty status of households by 0.018 units compared to living in the Western region. This results in a way contradicts the report from living in the urban area, since most part of the Greater Accra region can be characterized as urban.

Chapter Summary

From the above estimations and analysis, the results identified that nonfarm income has a significant effect on household poverty status when using the multidimensional poverty index but tend to increase with the consumption poverty index. However other variable such as age square and region decreased the poverty status irrespective of the type of dimension used in measuring the poverty of household's heads in Ghana. Further the results indicated that with a significant difference in the mean values of both poverty measures, multidimensional poverty measure outweighs the consumptions poverty and thus endorses the assertion that the multidimensional poverty measure is a better approach in assessing the poverty status of households in the country. Moreover, with a post diagnostic test, the screen plot of eigenvalues after Manova (Appendix 1a and 1b) indicates that with a mean covariance of 1 all factors considered for the analysis are valid as they had their eigenvalues exceed one. As such any conclusions made pertaining to their effect on the poverty dimensions are credible. Again, the Linktest (Appendix 4) suggest that there exit no specification error and thus the variables used are correctly specified as the null hypothesis is rejected at all levels of significance. Moreover, results from the VIF (Variance Inflation Factor) indicates only Age and Age squared suffered from the problem of Multicollinearity with their VIF being greater than 10 (see Appendix 3).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter provides an overview of the entire study. It begins with a summary of the whole study, drawn conclusion, policy recommendations and some suggestions for further research that could be used to investigate the current problem.

Summary

This research investigated the effect of non-farm income on poverty status in Ghana. With several arguments raised on the deficiencies associated with the use of a unidimensional approach in measuring poverty. There is therefore the need for a more rigorous approach to the measurement of poverty, that is using the multidimensional approach which takes several dimensions of the household into consideration. These dimensions help reveal the actual effect of nonfarm income on multidimensional poverty in Ghana. The purpose of the study is to demonstrate the need of using the multidimensional approach in analysing the effect of non-farm enterprises income on poverty in Ghana. Specially, the study seeks to:

- examine the effect of non-farm enterprises income on consumption poverty in Ghana.
- determine the effect of non-farm enterprises income on multidimensional poverty in Ghana.
- assess the statistical difference between unidimensional poverty (consumption poverty) and multidimensional poverty in Ghana.

In the review of relevant literature and theories, the Marxian theory of poverty, Neo-conservative theory of poverty and Structural theory of poverty, as well as empirical works in the context of the study was focus, the methodology and findings on non-farm enterprises income and poverty in Ghana, were also studied. The study adopts the positivism philosophy. The research employed secondary data from the Ghana Statistical Service (GSS), namely the Ghana Living Standard Survey, which collects information on a number of aspects of living conditions such as schooling, health, jobs, and household spending on food and non-food products. The study employed the seventh round of Ghana Living Standard Survey. Based on this data the researcher examines the effect non-farm enterprise income on poverty (unidimensional and multidimensional poverty). To achieve these objectives, the study employed the two stage least square equation model.

Key Findings

The study found that non-farm income has a strong and meaningful impact on household status when looking at either unidimensional (consumption poverty) or multidimensional poverty. However, the results showed that even though both measures are quite consistent in analysing the poverty status of households in Ghana, the multidimensional approach proves to be more robust as it considers several dimensional in its computation.

Nevertheless, for a reliability and credibility of the results a post estimation analyses were conducted. Therefore, in checking the validity of each factor variable used in the estimations. A screen plot for eigenvalues after manova was plotted and the results showed that indeed all factors were found

to be at the higher boundary (thus with a mean covariance greater than one). As such their inclusion were credible and valid for any inferences.

Conclusion

The study concludes that households with income emanating from nonfarm activities has a higher capacity to alleviate them self from the claws of poverty considering the multidimensional poverty. This approach proves to be more robust as it considers several dimensional in its computation. Other factors include age, residence, household size, married household head, and others in the Upper West, Greater Accra, Northern, Volta, Upper East, Ashanti and Central regions.

Recommendations

Having considered the findings and conclusions of this study, the following recommendations are proffered:

- To enhance the benefits derived from non-farm activity engagement, the following should be given prime consideration: Reduction of entry barriers into the non-farm industry, especially offering training in various non-farm activities so as to improve on the earnings obtained from the non-farm sector.
- The financial institutions should provide financial credit to create an enabling environment for the growth of the non-farm sector, to enable them to increase income their non-farm activities so as to help reduce their poverty situation. This will go a long way in creating employment in the non-farm sector besides reinforcing farm and non-farm activity linkages.

- There should be a consideration in improving transport infrastructure, since this will go a long way to increase the non-farm activity engagement through improved access to non-farm ventures, especially those that can only be performed away from the house.
- And lastly, since training in non-farm activities requires some level of education, there is also the need to enhance the levels of general education. This could be done through offering financial and other forms of help to support education and training of children from poor backgrounds. It will also be beneficial to sensitize residents, especially the youth and women on the availability of government funds that can work to their advantage in the establishment of remunerative non-farm activities. This is an area that seems to be unexploited, especially with few respondents having used the same funds to start or enhance their non-farm activities.

Suggestion for further research

Future research on non-farm activities could investigate the levels of inequality brought about by non-farm activity engagement especially given the fact that different non-farm activities yield different levels of income. Further, there is need to establish the most appropriate adaptation mechanisms to aid rural households in coping with the effects of climate change.

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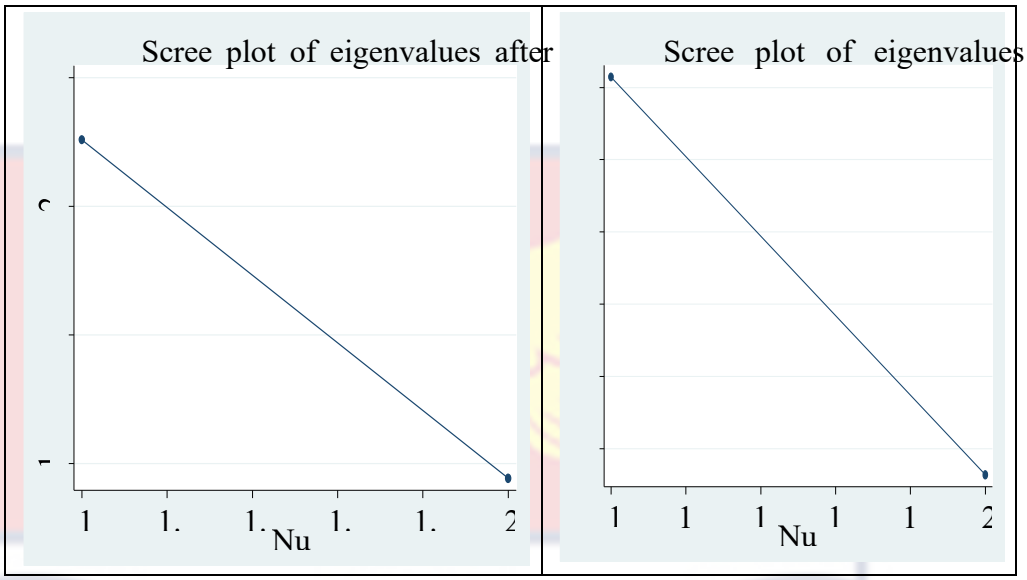
Appendix

Appendix 1a Manova- Multidimensional poverty and non-farm income
Appendix 1b Consumption poverty and non-farm income



Appendix 2a HETEROSKEDASTICITY TEST

Effect of Non-farm on demographic

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance 15.85

Variables: fitted values of NFI

Prob > chi2 0.0001

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	P-value

Heteroskedasticity	532.52	261	0.000
Skewness	182.89	25	0. 000
Kurtosis	100.91	1	0. 000
Total	816.31	287	0. 000
Ramsey RESET test using powers of the fitted values of NFI	F(3, 3924)	Prob > F	
Ho: model has no omitted variables	4.39	0.0043	

Appendix 2b: Effect of non-farm income on consumption poverty

VARIABLES	OLS First Stage
	NFI
NFI	-
	-
Age	0.056***
	(0.016)
Age square	-0.001***
	(0.000)
Sex (female)	
	0.047

(0.079)

Residence (base=rural)

0.436***

(0.063)

Size 0.061***

(0.013)

Underemployment (less than 40 hrs)

0.353***

(0.059)

Marital status (not married)

-0.399***

(0.127) -0.297* (0.162)

-0.088

(0.152)

-0.141

(0.154)

-0.053

(0.115)

Region (base=Western)

0.332***

(0.122)

0.590*** (0.122)

-0.192

(0.120)

	-0.004
	(0.123)
	0.310**
	(0.122)
	0.292**
	(0.134)
	-0.408**
	(0.160)
	-0.375**
	(0.147)
	-0.812***
	(0.170)
Type of enterprise (manufacturing)	
	-0.029
	(0.160)
	0.571***
	(0.076)
	0.810***
	(0.183)
	0.432***
	(0.135)
	-0.175**
	(0.085)
Years operation	0.037***

	(0.004)
Operational difficulty (difficulty)	
	0.184***
	(0.059)
	0.340*
	(0.194)
	0.270
	(0.299)
Constant	6.793***
	(0.352)
Observations	3,953
R-squared	0.143

Effect of non-farm income on multideminsional poverty

VARIABLES	OLS First Stage	Standard Error
NFI		
Age	0.056***	0.016
Age square	-0.001***	0.000
Sex (female)		
Male	0.056	0.079
Residence (base=rural)	-0.000	
Urban	0.439***	0.063

HSize	0.061***	0.013
Underemployment (less than 40 hrs)		
40/more	0.355***	0.059
Marital status (not married)		
Consensual union	-0.403***	0.127
Separated	-0.299*	0.162
Divorced	-0.090	0.152
Widowed	-0.142	0.154
Married	-0.056	0.115
Region (base=Western)		
Central	0.331***	0.122
Greater Accra	0.592***	0.122
Volta	-0.189	0.120
Eastern	-0.004	0.123
Ashanti	0.307**	0.122
Brong-Ahafo	0.291**	0.134
Northern	-0.408**	0.160
Upper East	-0.374**	
Upper West	-0.812***	0.170
Type of enterprise (manufacturing)		
Construction	-0.059	0.160
WRRVM	0.573***	0.076
Transport and Storage	0.757***	0.183

Accommodation and food services	0.471***	0.135
Others	-0.185**	0.085
Years operation	0.036***	0.004
Operational difficulty (difficulty)		
Capital/Credit	0.187***	0.059
Technical knowhow	0.323*	0.193
Government regulation	0.160	0.298
Constant	6.793***	0.352
Observations	3,953	
R-squared	0.143	

Heteroskedasticity test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity		Prob > chi2
Ho: Constant variance	chi2(1)	
Variables: fitted values of expend	13.07	0.0003

VIF (MULTICOLLINEARITY TEST)

Variable |	VIF	1/VIF
Non-farm income	1.11	0.901136
Age	46.04	0.021722
Age square|	44.13	0.022660

Male	1.66	0.604160
Urban	1.22	0.822557
Size	1.40	0.712906
1.under_emp |	1.07	0.937882
| Single		
Marital status	2.22	0.450316
Separate	1.62	0.616162
Divorced	1.86	0.538859
Widowed	2.17	0.461543
Married	4.09	0.244425
Region |		
Wwstern	2.07	0.482723
Central	2.38	0.420464
Greater Accra	2.17	0.461591
Volta	2.05	0.488344
Eastern	2.21	0.453391
Ashanti	1.77	0.565709
BroNG Ahafo	1.46	0.683639
Upper East	1.61	0.619995
Upper West	1.38	0.722396
Mean VIF |	5.98	

Appendix 4 **LINKTEST**

Source	SS	Df	MS	Number of obs	3,953
			F(2, 3950)		1412.23
Model	775.809575	2	387.904788	Prob > F	0.000
Residual	1084.97036	3,950	.27467604	R-squared	0.4169
			Adj R-squared	=	0.4166
Total	1860.77993	3,952	.470845125	Root MSE	0.5241
Expend	Coef.	Std. Err.	[95% Conf. Interval]		
_hat	2.145174	0.567564	1.032428		3.257921
_hatsq	-0.0615053	0.030466	-.1212362		-0.0017745
_cons	-5.318475	2.6403	-10.49495		-0.1419952