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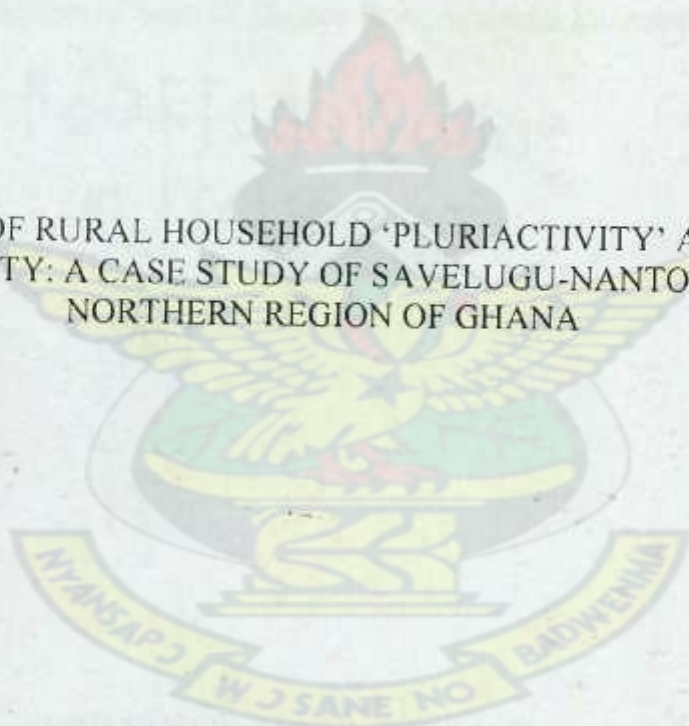
**COLLEGE OF AGRICULTURE AND NATURAL RESOURCES**

**FACULTY OF AGRICULTURE**

**DEPARTMENT OF AGRICULTURAL ECONOMICS, AGRIBUSINESS AND  
EXTENSION**

**KNUST**

**DETERMINANTS OF RURAL HOUSEHOLD 'PLURIACTIVITY' AND ITS EFFECT  
ON FOOD SECURITY: A CASE STUDY OF SVELUGU-NANTON DISTRICT OF  
NORTHERN REGION OF GHANA**



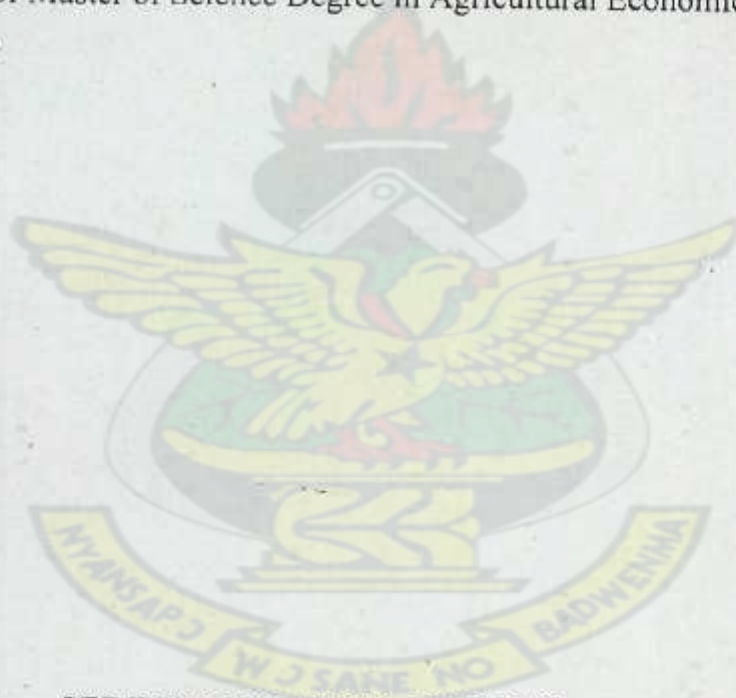
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**JUNE 2008**

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DETERMINANTS OF RURAL HOUSEHOLD 'PLURIACTIVITY' AND ITS EFFECT  
ON FOOD SECURITY: A CASE STUDY OF SVELUGU-NANTON DISTRICT OF  
NORTHERN REGION OF GHANA

A Thesis Submitted to the Board of Postgraduate Studies, Kwame Nkrumah University  
of Science and Technology, Kumasi, in Partial Fulfilment of the Requirements for the  
Award of Master of Science Degree in Agricultural Economics



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JUNE 2008

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## DEDICATION

This work is wholeheartedly dedicated to SEINI Family of Jisonaayilli, Tamale, Ghana.

# KNUST





## DECLARATION

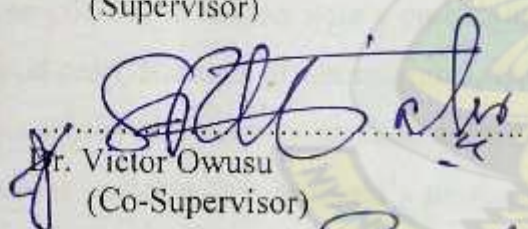
I do declare that, except references made to other people's work which have been duly cited, this work submitted as a thesis to the Department of Agricultural Economics, Agribusiness and Extension, College of Agriculture and Natural Resources, Kwame Nkrumah University of Science and Technology, Kumasi, for the degree of Master of Science in Agricultural Economics is the results of my own investigation.



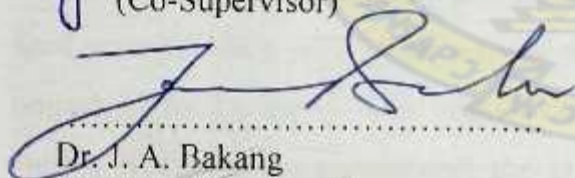
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## ABSTRACT

Over the years, emphasis has been placed on agriculture through the development and diffusion of appropriate technologies. However, general increase in national food production does not necessarily ensure household and individual food security. In the economics literature, participation in pluriactivity has been found to improve household welfare. Participation in non-agricultural activities allows farmers living near subsistence levels to acquire cash to meet their basic needs in addition to that supplied by own production. In most rural Ghana particularly in the Northern Regions, food insecurity and poverty is high. The study examines factors that influence household members' participation in pluriactivity as well as the effect of pluriactivity on household food security. The household is food secured if it can satisfy its food needs without mortgaging standing field crops for current consumption. This study employs a cross-sectional data collected from a sample of 150 households from ten villages in Savelugu-Nanton district of Northern Region of Ghana. About 91 percent of the sampled households participated in pluriactivity which contributed on the average, 60 percent of the total household income. The empirical analysis revealed that educational level, age, dependency ratio, animal wealth significantly had positive effect on the probability of husbands participation in pluriactivity. Access to micro credit package, level of education, age, and household size had positive effect on wife's probability of being pluriactive while duration of harvested food crop, Number of out migrants, Dependency ratio had negative effect. The impact of household pluriactivity on food security was analyzed by employing probit analysis. The results indicate that husband's pluriactivity had significant positive effect on household food security while wife's pluriactivity showed an insignificant negative relationship with household food security. This implies that income from pluriactivity of some wives is not sufficient enough to supplement the husband's income in solving their food security problem hence they had to mortgage their standing field crop for current consumption needs. Duration of harvested food crop and animal wealth included in food security had significant positive effect on the household food security. It is therefore recommended that in as much as efforts are made in promoting alternative income sources, attention must be given to improve their primary activity being agriculture (both crop and animal production).



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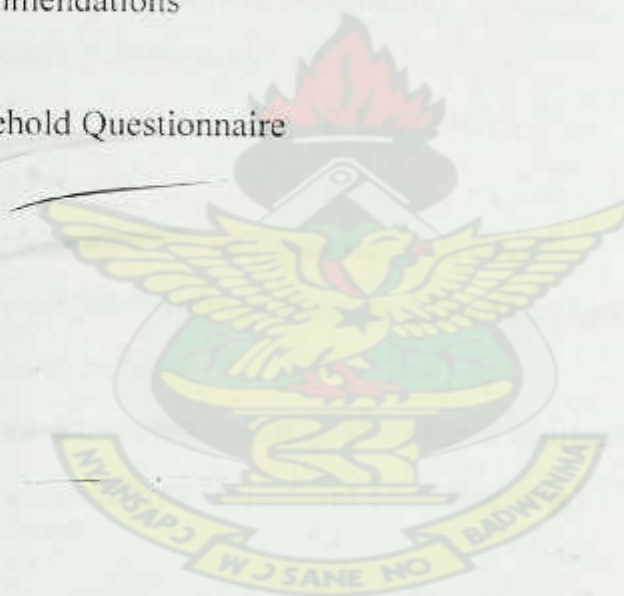
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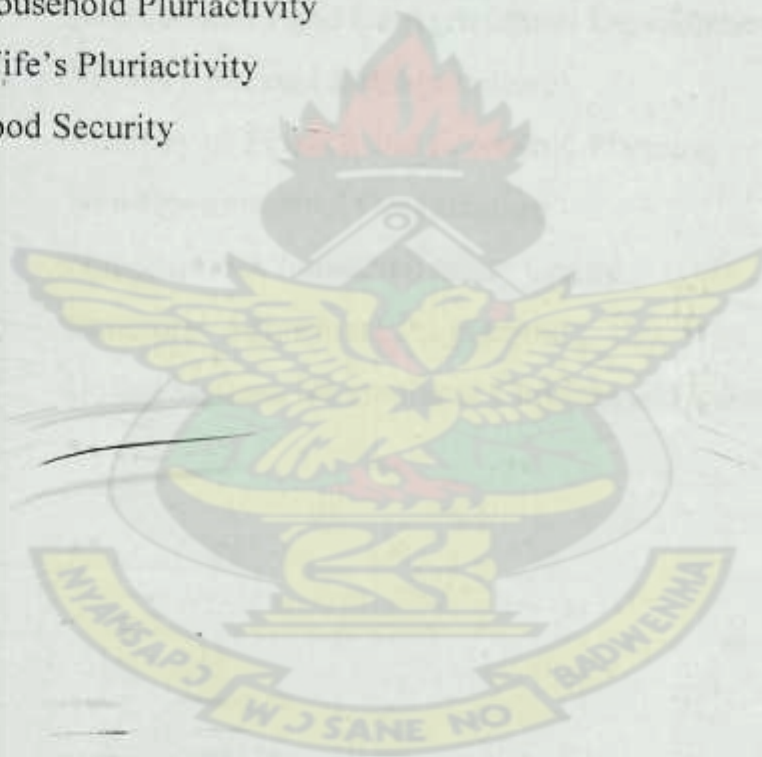
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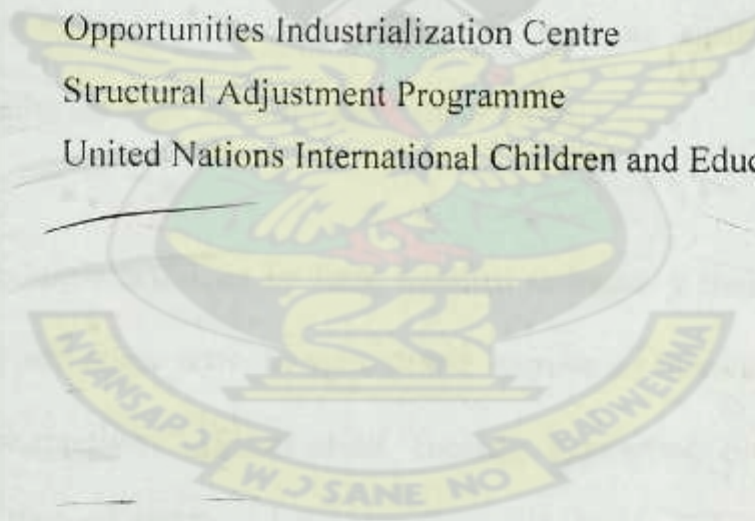
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## LIST OF ACRONYMS

GPRSP II	Growth and Poverty Reduction Strategy Paper II
GSA	Ghana Social Assessment
GSS	Ghana Statistical Service
IFAD	International Fund for Agricultural Development
MoFA	Ministry of Food and Agriculture
MFEP	Ministry of Finance and Economic Planning
NGO	Non Governmental Organization
O.I.C	Opportunities Industrialization Centre
SAP	Structural Adjustment Programme
UNICEF	United Nations International Children and Education Fund





# CHAPTER ONE

## INTRODUCTION

### 1.1 BACKGROUND

Rural households in developing countries have traditionally been viewed as though they were exclusively engaged in agriculture. Therefore, the common view of the rural sector among policymakers has been that of a sector driven almost entirely by agriculture. Rural income is equated with farm income. Thus, policymakers perceive policies to combat rural poverty and food insecurity solely as policies to enhance farm productivity through farm support services such as agricultural extension services and breeding for high yielding varieties of crops.

Participation in multiple activities by farm families to improve their livelihoods has been observed for sometime now. In agricultural economics literature, this has been referred to as "pluriactivity" (Shucksmith, Bryden, Rosenthal, Short and Winter, 1989; Evans and Ilberry, 1993) and there is the recognition of the likelihood of its increasing prevalence as agricultural income supports are gradually removed (Benjamin, 1994; Hearn, McNamara and Gunter, 1996). Pluriactivity also characterises the livelihoods of the urban poor as much as the rural poor in developing countries (Moser, 1998).

Agricultural producers are normally exposed to the risk of harvest failure. Weather related uncertainties (mainly rainfall), plant diseases and pests create harvest risk for all farmers. Fluctuations in food prices are also associated risks. Liberalisation of

markets often boosts prices of staples – a benefit to small farmers who are net sellers of food but a hurt to farmers who engage in seasonal switching, selling food immediately after harvest when food is plentiful and cheap and buying it when it is scarce and expensive (World Bank, 2000).

For the rural poor, diversification into non-farm activities holds the greatest promise for reducing food price and harvest risks (World Bank, 2000). Diversification of income sources, particularly if it includes activities that are not agricultural, can serve as alternative source of income for the rural household with which they can cushion the effect of food crop harvest failures. Income from pluriactivity can facilitate households' participation in the food market in order to smooth their consumption when self produced food crops fail to suffice for the whole year and hence ensure their food security.

When diversification is discussed in the rural development context, it is usually posed in terms of either the need for on-farm changes in the mix of agricultural activities or of the desirability of developing rural-based non-farm industries. While the former tries to correct the danger of relying on single crop, the latter seeks to create an alternative full-time employment for rural dwellers in locations other than urban areas. However, it is the maintenance and continuous adaptation of a highly diverse portfolio of activities in order to secure survival that is a distinguishing feature of rural livelihood strategies in contemporary poor countries (Ellis, 1998a).



Pluriactivity is noted to be widespread in developing countries. In sub-Saharan Africa, non-farm income constitutes a substantial portion of rural household incomes. Non-farm sources may already account for as much as 40-45% of average household income and seem to be growing in importance (Bryceson and Jamal, 1997; Reardon, 1997).

In the rural areas of Ghana, about 32.7 percent of females and 17.8 percent of males are employed in the non-agricultural sector (Ghana Statistical Service-GSS 2000). More women than men are engaged in pluriactivity (Abdulai and Delgado, 1999). Poverty among females can be reduced by reorganizing and creating opportunities for participation in pluriactivity. Considering only the savannah ecological zone of Ghana, 31.6 percent of the rural households operate non-farm businesses in addition to farming activities (Ghana Statistics Service 2000).

The realization of the significance of household pluriactivity in the rural sector is evidenced by the government's initiative in the promotion of agro-processing micro enterprises at the rural areas of the country (i.e. the rural microenterprises project) (MFEP, 2003). However, the success of any rural enterprise promotion programme depends significantly on the ability of the rural household members to participate in such activities. Hence, identification of the factors that enhance/limit the participation of household members in pluriactivity is crucial for ensuring maximum benefit from such local government initiatives.



## 1.2 PROBLEM STATEMENT

The main economic activity in Savelugu-Nanton district is agriculture as a reflection of the national situation with more than 60% of its population employed in the agricultural sector (MoFA, 2001). However, in recent times there is an emergence of non-farm and non-agricultural income generating activities such as agro-processing, trade, wage employment and service delivery, in response to economic and ecological changes. Households in the district make their economic decisions in an environment characterised by high levels of uncertainty and risk. Low average income levels, recurrent droughts and price variability create the need for effective risk management strategies as a means of protecting the welfare of household members. These have driven households in the district into pluriactivity (i.e. participating in multiple income generating activities and not purely agricultural as often perceived).

According to Ellis (1999) in sub-Saharan Africa reliance on agriculture tends to diminish continuously as income level rises. Studies in Europe have shown that households that adopt pluriactivity are more stable and secured in terms of income than those that are not pluriactive (Fuller, 1990). Also, studies conducted in Asia (Islam 1986; Oshima 1986; Shand 1986) have shown that when households are pluriactive, they are generally able to enhance their well-being. Reardon *et al* (1992) provide evidence that in West Africa, income diversification is associated with higher and stable incomes and food consumption over the whole year. Thus, pluriactivity has three main effects; improved income, a stable/smoothened income which leads to smoothened consumption.



The Research questions addressed in the study are what is the typology and dimensions of pluriactivity in the area? What is the contribution of the major activities to total household income? Which factors influence household members' participation in pluriactivity? Does pluriactivity enhance households' food security in the study area? These are the questions the study seeks to address.

### 1.3 OBJECTIVES OF THE STUDY

The main objective of the study is to examine the determinants of rural household pluriactivity and its effect on food security in Savelugu-Nanton District. The specific objectives are as follows:

- To outline the typology of rural households pluriactivity in the study area
- To identify the factors which influence household members' participation in pluriactivity.
- To estimate the relative contribution of farm and non-farm income to total household income.
- To determine the effect of pluriactivity on household food security.

### 1.4 JUSTIFICATION OF THE STUDY

There is a growing realization that promotion of farm activities alone cannot be relied upon to employ the rapidly growing rural population. There is thus a growing interest in the design and implementation of policies to promote the rural non-farm sector especially where it is found to contribute directly to rural food security and hence poverty reduction. In Ghana, most studies done in this direction have been baseline



surveys (Ghana Statistical Service 2000) illustrating the prevalence of pluriactivity in rural households. There has been very little research into the factors that influence the phenomenon and the context under which pluriactivity take place. This study fills the gap that exists in this respect. It will throw light on the factors that militate against or enhance the potential of households to participate in pluriactivity. Rural non-farm enterprises promotion is one of the Government's poverty reduction strategies set out in the Ghana Poverty Reduction Strategy paper II (MFEP, 2003). Also based on the perceived positive impact of pluriactivity on the lives of households in terms of food security, Non-Governmental Organisations such as the Catholic Relief Services, Opportunities Industrialization Centre (O.I.C), ACTION Aid-Ghana, Danish International Development Agency, Ghana Danish Community Project, TECHNOserve and NEWENERGY have rural non-farm enterprise promotion as part of their strategies for enhancing livelihood security in the rural areas of Ghana mostly in northern Ghana. Such efforts are aimed at encouraging and promoting pluriactivity, particularly diversification into non-farm income generating activities at the rural household level. However, due to lack of knowledge on the contributions of the various activities to household income, most of the NGOs set up enterprises based on ill-informed or uninformed guesses. A study of this nature will serve as a useful guide to the NGOs in choosing enterprises that would benefit rural households most..

There is limited knowledge about the dimension of rural pluriactivity in the study area. Even though it is generally acknowledged that pluriactivity has a positive impact on the livelihoods of rural households, policy makers lack knowledge about



the actual contribution of pluriactivity to households' food security, and factors influencing household members' participation in pluriactivity.

The findings from this research shall be of great value to the Central Government, the District Assembly and NGOs who are concerned with the promotion of rural enterprise development in a bid to enhance household livelihoods. Establishing the significance and direction of the effect of various factors on pluriactivity shall facilitate the drawing up of effective rural enterprise promotion programmes through the enhancement of the positive factors and elimination or reduction of constraining ones.

### **1.5 ORGANIZATION OF THE STUDY**

The study has been organized into five chapters. The first chapter sets out the introduction of the study. It outlines the problem statement, objectives, and justification of the study. The second chapter reviews the literature relevant to the study. The third chapter outlines the methodology employed to generate the data for the study. The fifth chapter presents the findings, recommendations and suggestions for future research.

## CHAPTER TWO

### LITERATURE REVIEW

To understand the relationship between pluriactivity and household food security requires knowledge in the behaviour of households. Hence, this chapter reviews literature on rural households' livelihood strategies, motivations for pluriactivity, types of pluriactivity, factors that influence their participation in pluriactivity. It also reviews the relationship between pluriactivity and food security as well as the definitions of the concepts in the study.

#### 2.1 DEFINITIONS AND CONCEPTS

This section explains the various concepts used in the study. The concepts include household, food security, pluriactivity, farm income and nonfarm income.

##### 2.1.1 Household

The household is the unit of analysis. It is defined as a self-sustaining unit, consisting of two or more persons that are usually related by kinship or marriage (UNICEF, 1999). The members of the household contribute to its subsistence and maintenance and share in the food that is produced on a household basis. It is a socially recognised unit headed by one person, either a man or a woman, who represents the household in the village or community and who controls its economic and social management (UNICEF, 1999).

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### 2.1.2 Food Security

It is defined generally as the ability of countries, regions, or households to meet their food requirements at all times (Siamwalla and Valdes, 1984). The International Fund for Agricultural Development defines household food security as "the capacity of a household to procure a stable and sustainable basket of adequate food" (IFAD, 1992). However, some of the terminologies used are difficult to operationalize. Adequacy may be defined in terms of quality and quantity of food, which contribute to a diet that meets the nutritional needs of all household members. Stability refers to the household's ability to procure food across seasons and transitory shortages, the more traditional definition of food security. Sustainability is the most complex of the terms, encompassing issues of resource use and management, human dignity, and self-reliance, among others (IFAD, 1992). Due to the operationalization difficulty, various researchers have evolved varied definitions in order to capture food security dimensions pertinent to their studies. Shama (1992) defined household food security as a situation in which a household has both physical and economic access to adequate food for all its members and the household is not at undue risk of losing such access. Household food security status is based on the households' ability to produce enough grain and ability to procure in case of shortage (Muyanga, 2004).

A drop in crop production and grain stocks are likely to subject a poor household to severe stress because of strong production-income-consumption links (Muyanga, 2004). A production shortfall can lead to a reduced food intake especially if compensatory income adjustments fail to take place. Physical access to food is



obtained through self-production. The households that are not able to produce sufficient food by themselves due to their specialization in other occupations or cash crop production obtain economic access to food through the participation in market using the proceeds from these other activities. In a bid for households to obtain access to sufficient food for today, sacrifices should not be made with regards to their investment for future consumption and livelihood security. Any household that sacrifices future investment for current consumption can be described as food insecure.

In the study, households that mortgage their food crops on the field are considered to be food insecure. In the study area, most of the households are peasant and near subsistence farmers whose main objective is to produce sufficient food for household consumption. Hence mortgaging food crops on the field for current consumption is a situation that jeopardises their future food situation.

### 2.1.3 Pluriactivity

Pluriactivity as defined in chapter one is the participation in multiple activities. Therefore it can be used synonymously with diversification of income activities. In this regard pluriactivity can be defined as the degree of diversification of an individual or household's income generating activities. The Inverse Simpson Index of diversity as used by Hill (1973) can be used to capture diversity (pluriactivity). The variation of activities engaged in by the households in the study area is very small as revealed by the PRA studies carried out prior to the main survey. Hence, this measure



of pluriactivity is not appropriate. The definition of pluriactivity by Bateman and Ray (1994) is adopted for the study. They defined pluriactivity as participation in income-earning activities by any member of the farm household in addition to the main farm activities.

Fuller (1990) in his review of literature explained pluriactivity as part-time farming by reference only to the working time of farm operator, with no account taken of the level of other resources allocated to the farm, including labour of farm household members other than of farm operator and the size and nature of the farm business. It implied that part-time farmers were small-scale and produced relatively little for the market.

Between 1984 and 1985, researchers working for the Arkleton Trust introduced the term "multiple job holding" (Fuller, 1990). It related specifically to activities that were remunerated, which Gasson (1986) described as "gainful employment". Since the early 1990s, the term "pluriactivity" has been adopted widely (ibid). It describes a wider range of activities than that explained by the term "multiple job holding", including activities for which payments are made in kind and mutual labour arrangement (Fuller, 1990). Studies conducted in Canada (Olfert, 1993; Weersink, 1992), North America (Huffman, 1980) and in the Asia (Department of Agriculture, Sri Lanka 1994; Shand, 1986), considered pluriactivity as off-farm employment consisting of different combinations of activities.

Transfer payments received by households such as food stamps and pensions are not considered as a pluriactive income, but may be nonetheless important contributors to farm household well-being (Fuller, 1990). From the above definitions of pluriactivity, it is clear that pluriactivity entails the diversification of the households' income generating activities. Hence rural and farm households which carry out other income generating activity in addition to farming are considered to be pluriactive.

#### **2.1.4 Farm income and Nonfarm income**

Farm income refers to income from crop production, animal rearing and fishing (Lanjouw *et al.* 2001). In this research nonfarm income refers to income from sources other than crop production, animal rearing and fishing. These non-farm activities include agro-processing, commerce, transport services, charcoal production, firewood gathering, artisan, and wage work, among others.

#### **2.2 Rural Households' Livelihood Strategies**

According to Ellis (2000, p.10), 'a livelihood comprises of the assets (natural, physical, human, financial and social capital), the activities, and the access gained to these that together determine the living gained by the household'.

According to E, assets form the households' endowment of resources with which they ~~gain~~ a living. In this definition the conventional meaning of assets is expanded to include, besides material and financial resources, household members' skills and experience (human capital) and their relations within wider communities (social



capital). They require investment, in terms of time or money to be obtained or formed. They can be used in an economically productive way.

Activities in the livelihood definition comprise all the ways in which household members utilize their non-leisure time to support their livelihoods. This broad definition includes work and care, employment and entrepreneurship, agricultural production and trade. Engagement in activities requires assets for a start and may also ultimately result in increase in household stock of assets or otherwise if the activities undertaken bring in losses to reduce the stock of assets.

Households' endowment of assets and involvement in activities jointly support their level of well being as illustrated by Ellis (2000) in a livelihood framework presented in Figure 2.1. Households with differing varieties and densities of networks can build relations in and outside of agriculture. Depending on the event and the wealth in tangible (physical) and intangible (social networks) capital assets, the family may be able to build only an agricultural portfolio or a combined one (rural/urban and agricultural), during times of stress or shock. Stress is understood as an event that imposes difficulties on the livelihood strategies such as a drought, while a shock is a more difficult event, such as death in the family.

—Households with portfolios of economic activities that are diversified and less covariant will be better able to cope with climatic risk (Dunn *et al*, 1996). As income grows, and families move away from food insecurity, it is expected that households

will specialize and use insurance markets if these markets exist and are accessible, instead of diversification, so as to negotiate risk. Others argue that diversification will grow as a strategy to maximize use of resources and therefore may exist with greater levels of commercialisation and wealth (Kusterer, 1989; Ellis, 1998b).

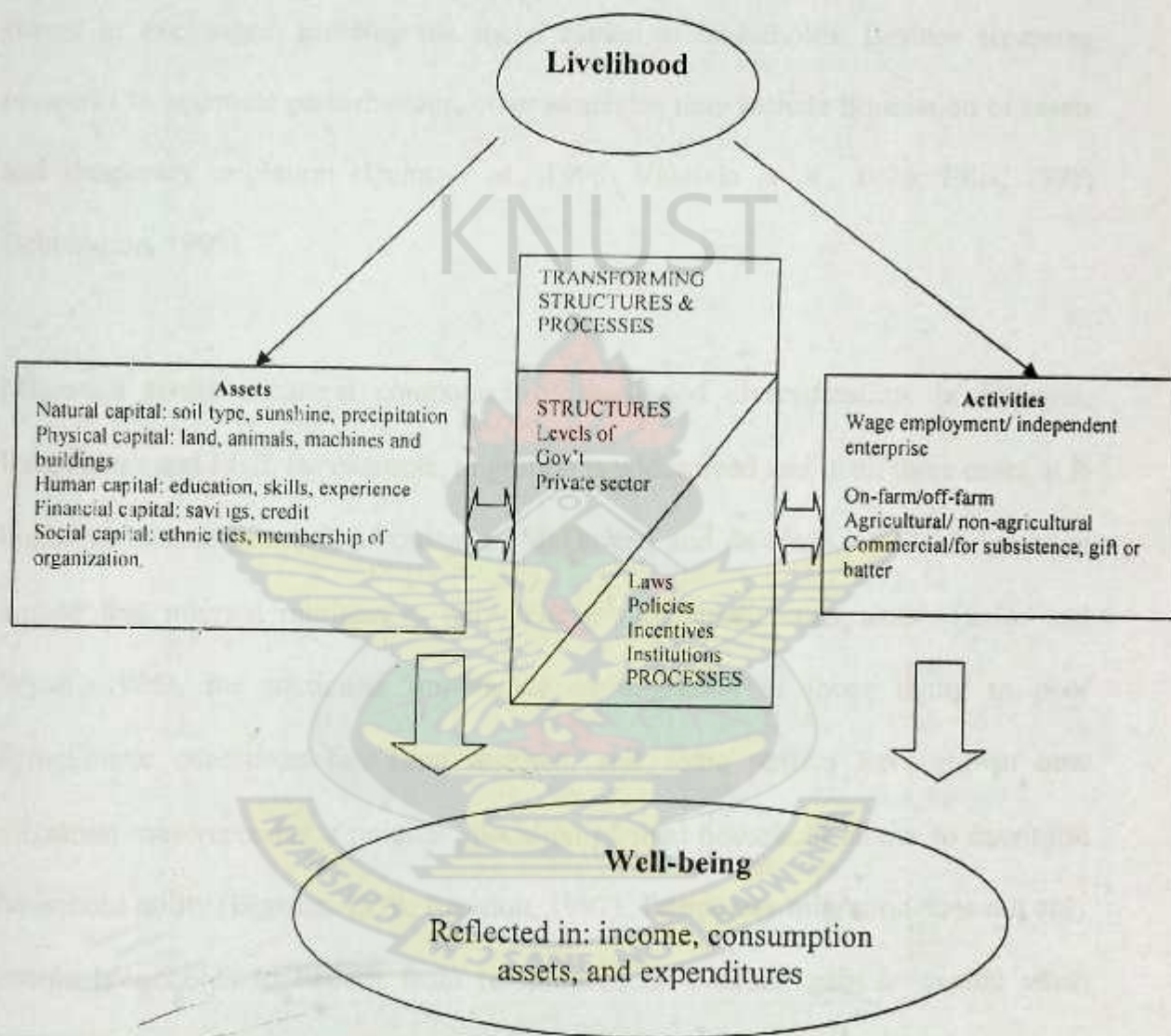


Figure 2.1: A framework for livelihoods analysis

Source: Ellis (2000: p.30)



When any idiosyncratic or individual risk occurs, non-market relations may be a key to coping. Households may access resources through networks of families and friends or social groups. This is an ex-post consumption-smoothing management strategy (Morduch, 1995; Dunn *et al.*, 1996). Conversely, in years of surplus this may be shared or exchanged, building the social capital of households. Besides accessing networks to negotiate perturbations, other strategies may include liquidation of assets and temporary migration (Dunn *et al.*, 1996; Valdivia *et al.*, 1996; Ellis, 1998; Bebbington, 1999).

Migration forms a central component of livelihood diversification. In Ethiopia, Bangladesh and Mali, for example, migration is widespread and in all three cases, it is linked to income generation strategies (McDowell and de Haan, 1997). It has been argued that migrant remittances may relieve rural credit constraints (Taylor and Wyatt, 1996), the particular importance of migration to those living in poor agroclimatic conditions has been asserted, and some writers have shown how migration may represent a rational allocation of total household labour to maximise household utility (Bigsten, 1996; Reardon, 1997). Temporary migration does not only enable households to benefit from remittances or eventual gain in capital when migrants return home with improved skills but also a means by which households reduce the number of mouths to be fed (Bigsten, 1996).

Rural households' livelihood strategy involves the decisions of households to undertake particular activity or a combination of activities given the amount of assets

and institutions as well as infrastructure at its disposal. Households could adopt purely agricultural strategy or a combination of agricultural and other income generating activities (pluriactivity) in order to secure survival in a risky environment or take advantage of the comparative advantage of individual household members' skills and expertise. Pluriactivity is acknowledged by Ellis (1998b) to be the normal livelihood strategy for rural households instead of the exception. Even though households adopt direct income generating activities to construct their livelihoods, other strategies do not directly reflect in income generation but crucial for survival. These include harvest sharing, providing labour on relative's farm, leasing out land to a neighbour in order to receive a share of the crop, and sending out a child to temporarily stay with a relative.

## **2.3 MOTIVATION FOR HOUSEHOLD PLURIACTIVITY**

Household pluriactivity entails the participation of household in multiple activities as a livelihood strategy. The pluriactivity therefore reflects household's income portfolio diversification. This section discusses economic factors, risk and seasonality as motivation for rural households' participation in pluriactivity.

### **2.3.1 Economic**

One possible starting point for examining livelihood diversification is a farm household model. Low (1986) presents a household economic model that predicts diversification as a function of on-farm returns to labour time compared to off-farm income earning opportunities. According to Low (1986), with a given asset base (i.e.



land plus farm infrastructure and equipment), and a given total amount of labour time, the household makes comparison between the return to using more of their time on the farm or deploying it in non-farm wage or other income-generating activities. Factors that increase the return to time spent on farm activities would tend to reduce the motivation to diversify. Two such important factors are an increase in the prices of farm outputs or a rise in farm productivity obtained, for example, by cultivating a higher yielding crop variety. Conversely, a rise in off-farm or non-farm wage rates, or greater opportunities to undertake more remunerative non-farm self-employment would increase the motive to diversify. However, there are other factors in addition to the economic motives, which govern household's participation in pluriactivity.

### 2.3.2 Risk

Risk, defined as the chance of loss or the loss itself, may induce people to become pluriactive (Valdivia *et al.*, 1996). The risk inherent in agricultural production may cause single source income to fluctuate, which can be mitigated by diversifying the portfolio of activities (Reardon *et al.*, 1998). According to Chambers (1992), rural people seek to counter the vulnerability arising from high levels of risk and uncertainty through deploying tangible and intangible assets. Their objectives may include ensuring the long-term capacity to survive or maintain well being, as well as protecting immediate levels of well-being. Making a living is done through a portfolio of activities so that households or individuals are flexible and can adapt to a wide range of misfortune and external shocks including macroeconomic shocks. Ellis (1998b) observed that the maintenance and continuous adaptation of a highly diverse



portfolio of activities in order to secure survival is the distinguishing feature of rural livelihood strategies in contemporary poor countries. Ellis (2001) indicates that households in Sub-Saharan Africa diversify their livelihoods when natural resource-based livelihoods are no longer able to provide a secure long-term livelihood on their own for a variety of reasons. Some of these are

- i Land sub-division at inheritance causing plots to become less viable for family food security.
- ii Adverse environmental change or cyclical trends that increase the risks associated with natural resource-based livelihood activities.
- iii Declines in agricultural markets relative to non-farm wage levels, making agriculture less viable as a source of livelihood.
- iv Rises in input costs due to the removal of subsidies under adjustment programmes, and
- v Deterioration in access to rural public services such as health or education due to poor economic performance, civil war, or cost-recovery policies under Structural Adjustment Programmes (SAPs).

These reasons are in addition to what Ellis (2000) described as the 'classic' or generic reasons for diversification namely, mitigating seasonality and spreading risks in order to reduce individual and family vulnerability to adverse events and trends. Pluriactivity may smoothen the flow of income to the household by reducing both predictable and unpredictable fluctuations in income. According to Valdivia *et al.* (1996), for predictable fluctuations, combining enterprises and activities that generate returns during different times of the year can smooth seasonal fluctuations in income,



while a diversified portfolio of economic activities with variances that are not perfectly correlated can reduce unpredictable fluctuations, such as those that create an unexpected loss in income.

Economic theory indicates that risk-neutral farmers will divide their labour supply between on-farm and non-farm employment opportunities such that the expected marginal returns to an extra hour of effort/work are equal (Mishra and Goodwin, 1997). If farmers are risk averse, less time will be allocated to the more risky jobs if the expected returns to each sector are the same, or alternatively, the farmer will be willing to accept lower wages in the less-risky environment (Mishra and Goodwin, 1997).

### **2.3.3 Seasonality**

Seasonal labour and asset employment of agricultural production may be another reason for the growth of pluriactivity (Davis and Bezemer, 2004). The long dry season is always associated with idle labour. During this period some members of the households migrate or engage in alternative ventures that generate income. This is to smooth income temporally.

## **2.4 TYPOLOGIES OF PLURIACTIVITY**

This section reviews the typology of pluriactivity. Pluriactivity is suggested to be distress-push and demand pull or income-driven and activity-driven. Davis and

Bezemer (2004) also distinguish diversification typologies as 'distress-push diversification' and 'demand-pull diversification'.

Distress-push diversification typically occurs in an environment of risk, market imperfections, and hidden agricultural unemployment and is typically as a result of economic adversity, which sets the household on a downward life trajectory. It implies engaging in economic activities that are less productive than agricultural production. It could be on a full employment basis and is motivated by the need to avoid further income decreases. Demand-pull diversification on the other hand occurs as a response to evolving market or technological opportunities, which offer the potential for increasing labour productivity and household incomes (Bezemer, 2004).

Regionally, distress-push diversification will dominate in rural areas which have one or more of the following characteristics: geographical isolation, low quality physical infrastructure, low human capital, underdeveloped markets, and scarcity of resources or recent shocks to the natural environment, economic systems or agricultural sector. Demand-pull diversification is possible in the presence of expanding technological innovations (whether within or outside agriculture), market development or intensifying links with markets outside the local economy (Davis and Pearce, 2001).

Within any rural area, distress-push diversification attracts households in a rural population, which are either less well-endowed or have lower incomes (Davis and Bezemer, 2004). These households will undertake non-agricultural activities that are



on average less rewarding (e.g. in terms of labour productivity) than demand-pull diversification activities, since the higher-return activities typically require higher investment that only the richer households can afford.

Apart from the distress-push and demand-pull distinction of diversification outlined above, another categorization is highlighted. Based on the literature about peasant economics two principal components in theory could be identified when analysing the process of diversification. They include **income** and **activity driven** diversification. The **income-driven** diversification hypothesis assumes diversifiers are profit maximizers, while the **activity-driven** diversification points to the different comparative advantage of household members on the wage market as underlying incentives for diversification (Ellis, 1993).

**Income-driven** diversification coincides with a period of capital accumulation (including financial and social capital, and information), while **activity-driven** diversification often occurs later when capital accumulation has already taken place. Income diversification does not necessarily exclude activity diversification. It is a mixed and dynamic process with income and activity diversification (depending on the household) often overlapping or occurring concurrently. Thus, for many rural poor households, capital accumulation is the consequence and not the aim of income diversification (Ellis, 1993).

Therefore, it is argued that diversification process involves two stages that are not necessarily sequential, but cyclical. First, the income-dominant phase is more linked to the aim of covering household's basic needs. This phase will be dominant so long as meeting basic needs is the household's main priority as reflected in low levels of income. When incomes are securely above a particular threshold, a certain amount of capital (whether financial, education, physical, or land) may be accumulated (Ellis, 1993). This is a consequence of the income diversification stage. This enables the activity diversification motive to become more important, allowing household members to pursue their comparative advantages in selecting particular activities freed from the necessity of catering for basic needs by whatever means available to them. Income-driven diversification places emphasis on obtaining the necessary income to cover basic needs while activity-driven diversification makes use of surplus resources once the main income source is assured and thus encourages a more active entrepreneurial behaviour, which is demand-pull diversification.

From the foregoing discussions, it can be argued that pluriactivity or diversification of households' livelihood is a process driven by a variety of circumstances. Depending on the motive or circumstance that drives the process, it can generally be classified into: distress-push or income-driven pluriactivity and demand-pull or activity-driven pluriactivity. Distress-push or income-driven pluriactivity may result in asset accumulation leading to demand-pull or activity-driven pluriactivity putting the household onto an upward trajectory of welfare and food security since demand-



pull pluriactivity occurs only after the basic household needs have been met (Davis and Bezemer, 2004).

## 2.5 FACTORS INFLUENCING RURAL HOUSEHOLDS' PLURIACTIVITY

Factors influencing rural household pluriactivity are discussed in this section which includes household and group level factors. Rural livelihood strategies are shaped by several factors. Rural household decisions to adopt any strategy are dependent on access and control of human, natural, productive, cultural and social capital (Bebbington, 1999; Valdivia, 2001), markets, institutions, and the political environment (Ellis, 1993; Ferguson, 1992).

Rural household pluriactivity, particularly in sub-saharan Africa, is observed to be the norm rather than the exception. Households engage in diverse strategies to construct their livelihoods. The decision of household members to participate in pluriactivity may be influenced by household level factors and group level or community level factors. These factors together influence the decision of households to participate in pluriactivity directly or indirectly.

The household factors according to Davis and Bezemer (2004) include asset endowments, access to markets, human capital attributes, and social capital while the group level factors include local physical infrastructure, proximity to towns and linkages with urban areas.

### 2.5.1 Asset Endowments

Asset endowments such as land, livestock, real estate and savings i.e. wealth as well as income levels tend to increase the opportunity to invest in education, contacts or productive assets that generate income either through entrepreneurship or wage labour (Moser, 1998). Asset endowment is more important because in many developing countries, markets, particularly credit markets, either function poorly or are non-existent (Davis and Bezemer, 2004). Wealth in virtually any capital such as land, cattle, or education confers a greater ability to diversify because this overcomes barriers to access faced by the asset poor (Ellis, 2001). Setting up of nonfarm income generating activity in addition to the main agricultural activities may entail high investment capital, which is always difficult for the poor to obtain. The wealthy in the community are able to raise such required capital for the establishment of alternative income generating activities in addition to their farm operations.

Risk, may threaten the economic security of low-income households (Valdivia *et al.*, 1996). These households, who are vulnerable to the negative consequences of a loss, employ two types of risk management strategies. The first type is the risk-reducing strategies, which are designed to smoothen income by reducing *ex ante* the possibility of loss. Diversification of income sources is an important example of a risk-reducing strategy. The second type is the loss management strategies, which are designed to mitigate *ex post* the consequences of a loss by smoothing consumption in the event of an income shock.



According to Moser (1998), asset management include labour, with multiple earners with high income levels as the best strategy; human capital, with better educated household heads faring well; productive assets, such as land and housing, with homeowners (for urban dwellers) having considerable advantages; household relations, where stable, nuclear or small, extended households with low levels of intrahousehold conflict do best; and finally, social capital, with active reciprocal support networks within communities, particularly between women, and participation in community activities facilitating trust and collaboration. Households with the advantage of the types of assets outlined above are better able to manage the *ex post* consequences of risk or income shock.

### **2.5.2 Access to Markets**

Markets may be generally absent or malfunctioning in a region or they may be inaccessible for people with low social, financial or human capital. Market access is also determined by factors such as distance to markets, access to transport, infrastructure and telecommunication, access to market information, the quality of goods and services produced (Bezemer, 2004).

### **2.5.3 Human Capital**

Human capital attributes such as age, skills, and education broadens the set of ~~employment~~ and entrepreneurial options for individuals (Dercon and Krishnan, 1996). Household age composition, usually assessed in the form of dependency ratio, and educational levels are often-cited measure of human capital used empirically to

explain the degree of participation in pluriactivity (Abdulai and Delgado, 1999). Educational level is a critical determinant of the type of labour markets in which diversification takes place. Those with more education can gain jobs in skilled and salaried labour markets. On the other hand, those with less education must often settle with casual, unskilled and part-time work in low wage labour markets.

#### **2.5.4 Social Capital**

Household's ability to form social network influences their decision to undertake pluriactivity (Moser, 1998). They are able to negotiate loss through the network with other members of the society due to their investment in such networks when times were good. Such opportunity is referred to as social capital. The socio-cultural setting of a community dictates the access pattern of resources. Existing gender biases may skew productive resources towards particular groups of the society rendering a particular group less productive and incapable of undertaking certain activities as compared to the other groups

### **2.6 PLURIACTIVITY AND FOOD SECURITY**

Economic literature suggests a relationship between pluriactivity and food security. Household pluriactivity may be crucial as a livelihood strategy for rural households in sub-Saharan Africa due to the circumstances under which they carry out their agricultural activities. Livelihood diversification may be undertaken to support the improvement of standard of living, allowing surpluses to be generated that can then be invested in a variety of other activities. Hirway (1994) shows this for both India



and Indonesia in Asia while Reardon *et al* (1992) provide evidence that in West Africa, income diversification is associated with higher incomes and food consumption, and more stable incomes and consumption over the whole year (Bernstein *et al* 1992). Stark and Lucas (1988), and Connell *et al* (1975), supported the claims that remittances from migrants were key elements in boosting agricultural productivity in Africa and Asia respectively. Evans and Ngau (1991) suggest that non-farm income provided risk insurance that enabled farmers to adopt new production methods and thereby raise output. Taylor and Wyatt (1996) point out that pluriactive income is useful in helping farmers overcome both risk and credit market constraints. Therefore, pluriactivity may lead to increased investment in local production of food crops to alleviate long term food insecurity.

In the short term to medium term, pluriactivity might be very important in ensuring household food access and food security. A given household copes with a drought or other cause of harvest shortfall by working off-farm and raising the needed cash to fill the food deficit. According to Delgado (1989), cultivators in Burkina Faso normally obtain 25-50 percent of their income from non-agricultural activities. The significance of this income was demonstrated in a study of the Department of Zabre, an area in South-Eastern Burkina Faso. Here, participation in non-agricultural activities allowed farmers living near to subsistence levels to acquire cash to supply ~~their~~ basic needs in addition to those supplied by own production. Households with a greater income diversification were able to buy food and reduce the effects of drought

and also tended to have higher overall incomes than those that were not able to supplement their farm incomes with other sources of income.

## **2.7 HOUSEHOLD PLURIACTIVITY AND FOOD SECURITY IN GHANA**

Pluriactivity describes the participation of farm households in other income generating activities in addition to farm work. IFAD (1992) defines food security as the physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life today without sacrificing investments in livelihood security tomorrow. Nonfarm employment guarantees additional income and can be used to satisfy consumption requirements when farm production is not sufficient to safeguard food security.

Although emphasis has been placed on agriculture over the years through diffusion of innovations, food insecurity and poverty appear to be prevalent in the Northern parts of Ghana particularly the Upper East, Upper West and the Northern regions. Most rural households in these regions adopt various livelihood strategies in order to survive the food poverty but Ashong and Smith (2001) argues that the regions are still experiencing food poverty. Korboe (1998) notes that rural households suffer seasonal strains in well-being and such seasonal pressures were found to be worst in the northern savannah region where agricultural households face declining food stocks and a lack of financial capital between February and July.



Farm households improve upon their income by participating in pluriactivity. Participation in pluriactivity may bring the extra income needed to purchase foodstuffs as well as reduce the risk of losing source of livelihood if a single source collapses. Trends in rural livelihood activities in Ghana over the period 1988-92 show evidence of pluriactivity. Whilst 30% of women in 1992 engaged in a second livelihood activity, compared to 53% for men, the nature of women's non-farm employment revolve around the wholesale/ retail trade and manufacturing, whilst men's secondary activities included trade, public administration, construction/ transport and so on. The traditional role of women as market traders in Ghana was evident from the statistics, with 9% of women reporting it as their main source of livelihood, and 34% as a secondary activity rising to 12% and 41% respectively in 1996 (Newman and Canagarajah, 1999). Korboe (1998) in his review of the Ghana Social Assessment (GSA) also highlighted the main livelihood activities practiced by rural households as petty trading (women and youth), production of cooked food (women), self-employed artisans (men), blue-collar work and small-scale agriculture for dwellers of the larger urban centers. The rural and provincial urban households were engaged in arable farming (men, women, and youth), small-scale processing of agriculture produce, petty commerce (women) and livestock rearing.

## CHAPTER THREE

### RESEARCH METHODOLOGY

This section presents a discussion on the theoretical framework, statement of empirical model, hypotheses, study area, and data collection related to this study.

#### 3.1 THEORETICAL FRAMEWORK

Pluriactivity entails participation in other income generating activities in addition to farming. The model of off-farm work participation developed by Huffman and Lange (1989) and applied by Tockle and Huffman (1991), and Benjamin and Gayomard (1994) is employed in this study. In this framework, the rural farm household is assumed to maximise utility subject to a budget and individual time constraints. The solution to this problem determines the conditions under which the farm operator (husband) and/or his wife will work off-farm. The farm household's utility ( $U$ ) is assumed to be a function of total household consumption  $C$  and leisure of the husband ( $L^H$ ) and wife ( $L^W$ ) for a given household characteristics ( $\Theta$ ). This is expressed as

$$U = U(C, L^H, L^W, \Theta) \quad (1)$$

Each spouse has a stock of time ( $T$ ) that is allocated to either on-farm ( $F^i$ ) off-farm activities ( $OF^i$ ) or leisure ( $L^i$ ):

$$T^i = F^i + OF^i + L^i; \quad i = H, W \quad (2)$$



The household consumption of goods ( $C$ ) is limited by the budget constraint (after normalising all prices and incomes by the price of consumption goods):

$$C = (P_o Q - P_x X) + W^H \cdot OF^H + W^W \cdot OF^W + V \quad (3)$$

where

$V$  is other exogenous household incomes,  $P_o$  is the price of quantity of output  $Q$ , and  $P_x$  is the input price vector of input quantity vector  $X$ ;  $W^i$  is off-farm wage rate and  $OF^i$  is the hours of work off-farm.

If the husband's labour ( $F^H$ ) and his wife's labour ( $F^W$ ) are not perfectly substitutable then the farm production is expressed as

$$Q = f(F^H, F^W, X; \Theta_2) \quad (4)$$

where  $\Theta_2$  denotes farm characteristics.

The wage-offer equations ( $W^i$ ) for the farm operator and his wife are assumed to be dependent on education ( $E^i$ ) which is an individual characteristics and local labour market conditions ( $K$ ) i.e.

$$W^i = W^i(E^i, K) \quad (5)$$

The household maximises (1) subject to the constraints (2)-(5) plus the non-negativity constraints:

$$F^i \geq 0, OF^i \geq 0, L \geq 0, \quad i = H, W \quad (6)$$

Huffman and Lange (1989) notes that if both farm operator and wife are working off-farm, the general form of these functions can be expressed as:

$$OF^i = OF^i(W^H, W^W, P_a, P_s, V, E^H, E^W, K, \Theta_1, \Theta_2), \quad i = H, W \quad (7)$$

Also the household head (husband) or wife will only work off-farm if their reservation wage is less than the market wage from off-farm work (Huffman and Lange, 1989; Benjamin and Guyomard, 1994).

$$\left. \begin{array}{l} OF^i > 0 \quad \text{if } W^i > W^{iR} \\ OF^i = 0 \quad \text{otherwise} \end{array} \right\} \quad i = H, W \quad (8)$$

The empirical reservation and nonfarm or pluriactive wage equations as noted by Abdulai and Delgado (1999) are:

$$W^H = \lambda_1 J_{H1} + u_{H1} \quad i = H, W \quad \text{and} \quad (9)$$

$$W^W = \lambda_2 J_{W2} + u_{W2} \quad i = H, W \quad (10)$$

where  $J_k$  are exogenous explanatory variables such as personal, household and sublocational characteristics of household heads and wives that influence their reservation and pluriactive wages; and  $u_{H1}$  and  $u_{W2}$  are random disturbance terms for the population of all household heads and wives.

An indicator variable of pluriactivity participation ( $Z_i^*$ ) of an individual  $i$  can then be defined as

$$Z_i^* = 1 \quad \text{if } W^i > W^{iR} \quad \text{and} \quad (11)$$

$$Z_i^* = 0 \quad \text{if } W^i \leq W^{iR} \quad (12)$$



Since  $u_{ri}$  and  $u_i$  are random variables, the probability of participation in pluriactivity given as

$$\begin{aligned} pr(Z_i^* = 1) &= pr(W^i > W^m) \\ &= pr(u_{ri} - u_i < \lambda_2 J_{i2} - \lambda_1 J_{i1}) \\ &= F_v(\lambda J_i) \end{aligned} \quad (13)$$

where  $v_i = u_{ri} - u_i$ ,  $\lambda J_i = \lambda_2 J_{i2} - \lambda_1 J_{i1}$ , and  $F(\cdot)$  is a cumulative distribution function for the random variable  $v$ .

## 3.2 EMPIRICAL MODEL

### 3.2.1 PLURIACTIVITY

The husband's or wife's pluriactivity  $Z_i^*$  is related to a vector of household, individual and location characteristics  $M$  which affects participation in pluriactivity as:

$$Z_i^* = \delta' M_i + u_i; \quad i = H, W \quad (14)$$

Since  $Z_i^*$  is unobservable, we observe a dummy variable  $Z$  defined by

$$Z = \begin{cases} 1 & \text{if } Z_i^* > 0 \\ 0 & \text{if } Z_i^* < 0 \end{cases} \quad i = H, W \text{ and } N(0,1) \quad (15)$$

The relationship in equation (14) can be estimated using a bivariate probit model.

Table 3.1 outlines the variables in the model and their expected direction of influence on probability of participation.

The dependent variables are HHPLURI, husband's participation in pluriactivity, HWPLURI, wife's participation in pluriactivity. Pluriactivity is a concept of household members diversifying their sources of income. Therefore it is captured as a dummy variable taking a value of 1 if an individual undertakes other activities in addition to farming.

Table 3.1. Description of Variables Used in Empirical Model

Variable	Variable Description	Expected sign	
		husband	Wife
DEPRATIO	Household Dependency Ratio	+	+
HHSIZE	Total number of individuals in the household	+	+
AGEHHD	Age of Household Head	+	+
AGEWIFE	Age of Household Head's Wife	+	+
HHYREDUC	Number of years of schooling for Household head	+	+
HHWYREDU	Number of years of schooling for Household Head's wife	+	+
CRDACCES	1 If household has access to credit	+	+
DISTNBTN	Distance to the nearest village market	-	-
GRPMEMSH	1 if household members belong to associations	+	+
MMIGRATN	Number of household members out migrated	-	-
IFCATTLE	1 if household possess cattle	+	+
DRNFDCRP	Duration of harvested food crops in months	-	-



DEPRATIO = Dependency ratio of the household is computed as the number of working household members divided by non working members. It captures the age composition of the household and also measures the human capital of the household. Households with higher proportion of grown up members are expected to have high probability to participate in pluriactivity.

HHSIZE = Total number of individuals in the household. The larger the size of the household the higher participation in pluriactivity.

AGEHH = Age of husband. Age is used as a proxy for experience and expected to have a positive influence on participation in pluriactivity.

AGEWIFE = Age of wife of household head. As already noted, we expect a positive relationship between the wife's age and participation in pluriactivity.

HHYREDUC = Number of years of schooling of husband. Education increases the individual's human capital and hence increases the probability to participate in pluriactivity. As the number of years of schooling increases, the probability to participate in pluriactivity increases.

HHWYREDU = Number of years of schooling of wife. Education improves the employment opportunity of an individual. Other things being equal, the probability for the wife to participate in pluriactivity increases as her years of schooling increases.

CRDACCES = Household members' access to credit. It is a dummy variable which takes a value of 1 if household members have access to credit. It is expected to have a positive relationship with pluriactivity.

DISTNBTN = Distance from home to market. This variable is a proxy for

household's access to market. Products and services from pluriactivity would be encouraged if households have access to markets. The longer the distance from home to the markets the lower probability to participate in household pluriactivity.

GRPMEM = It is a dummy variable representing group membership. Household members who belong to an association or organized group has greater access to pluriactivity.

MMIGRATN = The number of out migrants from the household is used to proxy for the social network of members outside the place of residence. If household have enough networks through which members can benefit from remittances there is a less likelihood that members would participate in pluriactivity.

CATTLE = Animal wealth status of the household. It is a dummy which takes a value of 1 if household possesses cattle. If pluriactivity is based on the economic motive, access to animal wealth will facilitate household pluriactivity. This is because wealthy households can diversify into nonfarm private enterprises which require high initial investment cost.

DURCRP = Duration of harvested food crops in months. If the motive of pluriactivity is to obtain extra income for household food needs, then the longer the household's harvested food crop, the lesser its probability to participate in pluriactivity.



### 3.2.2 FOOD SECURITY

To analyze the relationship between food security and pluriactivity, a probit analysis was carried out. In the study, households which mortgaged their standing field crops for current consumption were considered to be food insecure hence food security was captured as a dummy assuming a value of 1 if households did not mortgage their field crops and 0 if they did mortgage their field crops.

The households' decision to mortgage or otherwise of their field crops is influenced by its sense of food security  $Fs^*$  which is not directly observable, when  $Fs^*$  gets to a certain threshold  $F^*$  the household do not mortgage their field crops but otherwise they mortgage.

The household food security  $Fs^*$  is related to a vector of household characteristics  $M$  which affect the decision to mortgage field crops as:

$$Fs^* = \lambda M + \mu \quad (1)$$

Since  $Fs^*$  is unobservable, we observe a dummy variable  $Fs$  defined by

$$Fs = \begin{cases} 1 & \text{if } Fs^* > F^* \\ 0 & \text{if } Fs^* < F^* \end{cases} \quad N(0,1) \quad (2)$$

The relationship in equation (2) can be estimated using a probit model.

Table 3.2 outlines the variables included in the model and their expected direction of influence on probability of household food security.

The dependent variable  $Fs$ , is household food security. Household is considered as food secured if it does not mortgage its standing field crops for current consumption.  $Fs$  takes a value of 1 if household is food secured and 0 if otherwise.

The independent variables include:

HHPLURI, household head's participation in pluriactivity, is expected to have a positive effect on the probability of household to be food secured since extra income earned from these activities could be used to purchased food for consumption and prevent the household from mortgaging their stand field crops (Bernstein *et al*, 1992).

HWPLURI, Spouse of household head's participation in pluriactivity, is expected to have a positive effect on the probability of the household being food secure since proceeds from the spouse's activities could be used to supplement the household consumption (Delgado, 1989).

ANMLWTH, animal wealth, is expected to have positive effect on the probability of household being food secure, since proceeds from the sale of farm animals could avert the mortgaging of household field crops for current consumption (Valdivia *et al* 1996).

DRNEDCRP, duration of harvested food crops, is expected to have positive effect on the food security status of the household since foodstuff availability averts mortgaging of standing field crops (Muyanga, 2004).



Table 3.2. Description of Variables Used in Empirical Model

Variable	Variable Description	Expected sign
HHPLURI	Household head's pluriactivity	+
HWPLURI	Spouse of household head's pluriactivity	+
ANMLWTH	Animal Wealth	+
DRNFDCRP	Duration of harvested food crops in months	+

### 3.3 STATEMENT OF HYPOTHESES

The following hypotheses were tested:

1. Market access enhances the probability of household participation in pluriactivity.
2. Household animal wealth level increases the probability of its members' participation in pluriactivity.
3. Households' access to institutional credit enhances their probability of participating in pluriactivity.
4. Educational level enhances pluriactivity.
5. Household members' pluriactivity has positive effect on food security.

### 3.4 SOURCES OF DATA

This section discusses the study area, and explains how the data employed in the study was collected.

#### 3.4.1 The Study Area

Under this section, the location and size, climate, vegetation and soils, and socio-economic characteristics of the study area are discussed.

#### **3.4.1.1 Location and Size**

Savelugu/Nanton District is one of the eighteen administrative districts of the Northern Region. The District is located in the Northern Region of Ghana. It shares boundaries with West Mamprusi in the North, Karaga to the East, Tolon/Kumbungu in the West and Tamale Metropolitan Assembly to the South. The District's total land area is 1790.70 sq. Km.

#### **3.4.1.2 Climate**

The area receives annual rainfall averaging 600mm, considered enough for a single farming season. The annual rainfall pattern is erratic at the beginning of the raining season, starting in April, intensifying as the season advances raising the average from 600mm to 1000mm. This influences the timing of planting of crops and hence their yield. Temperatures are usually high, averaging 34°C. The maximum temperature could rise as high as 42°C and the minimum as low as 16°C. The low temperatures are experienced from December to late February, during which the North-East Trade winds (harmattan) greatly influence the District. The generally high temperatures as well as the low humidity brought about by the dry harmattan winds favour high rates of evaporation and transpiration, leading to water deficiency (Savelugu-Nanton District Profile, 2006).

#### **3.4.1.3 Vegetation and Soils**

The district finds itself in the interior (Guinea) Savanna woodland which could sustain large scale livestock farming, as well as the cultivation of staples like rice,



groundnuts, yams, cassava, maize, cowpea and sorghum. The trees found in the area are drought resistant and hardly shed their leaves completely during the long dry season. Most of these are of economic value and serve as important means of livelihood especially for women. Notable among these are shea trees, (the nuts which are used for making sheabutter) and dawadawa that provides seeds used for condimental purpose. The sparsely populated north has denser vegetation mostly with secondary forest. The populous south on the other hand, is depleted by human activities such as farming, bush burning and tree felling among others.

The middle and upper voltaian sedimentary formation characterise the geology of the District. The middle Voltaian covers the northern part of the District and comprises of sandstone, shale and siltstone. The Upper Voltaian covers the southern part of the District and consists of shale and mudstone. Underground water potential is generally determined by this underlying rock formation, which has varying water potential for underground water compared to the upper Voltaian formation. Consequently, borehole drilling is expected to have a higher success rate in the northern rather than the southern section (District Profile, 2006).

#### **3.4.1.4 Socio-Economic Characteristics**

The population of the district was 91,415 (Population and Housing Census, 2000). With a growth rate of 3%, the projected population as at March 2007 is about 109,442. This is broken down into 49% male and 51% female. With a land area of



1790.7 sq. km., the population density averages about 61 persons per sq. Km. which is high in the south and reduces towards the north.

The District remains an agriculture-based economy. The sector engages about 97 percent of the labour force, majority of who produce staple crops on subsistence level. Cash crop production is very minimal and includes sheanut, Soya beans, cotton and cashew. Agro-processing is generally done by traditional methods and on very small-scale bases. The activities generally include the processing of sheanut, groundnuts, rice, cotton ginnery, and soap manufacturing. Other activities include Trading in foodstuff such as maize, beans, rice and other grains, Sand winning, the bulk of which is used for construction work in Tamale Metropolis and Fishing along the Black Volta (Savelugu-Nanton District Profile, 2006).

There are four market facilities (markets) in the district. These are located at Savelugu, the district capital, Nanton, Diare and Tampion. The market days for these markets occur every six days. These days take turns to ensure maximum participation in each particular market.

The district has about 74 km of primary road, which forms part of the trans-national road network that stretches from Accra, the nation's capital on the Atlantic to Paga in the northern most boundaries. The part that stretches within the district begins at Dukoo (the southern most village) and ends at Kukuobilla (the northern most village) of the district. There are also 270 km of secondary roads (feeder roads) which link



major towns and villages with the district capital (Savelugu) and the regional capital (Tamale). The road network in the district is generally adequate for movement of goods and services. However, few of these feeder roads become difficult to use during the rainy season.

### 3.4.2 DATA COLLECTION

As already indicated the cross sectional data employed in the study was collected in the Savelugu/Nanton District of the Northern Region of Ghana from May to June in 2007 among 150 farm households.

Savelugu/Nanton District was chosen for the study because of its location and characteristics. The District is predominantly agrarian and about 97% of the economically active population engage in food crop production at subsistence level. However, the erratic rainfall pattern and long dry season sometimes results in production shortfalls. This situation pushes the people to search for additional sources of income to supplement their own produced crops.

The study area is made up of 143 communities but only 10 of them were randomly selected due to budgetary and time constraints. A two-stage random sampling technique was used to obtain a sample of 150 households from the district's population of 8,250 households using 90 percent confidence level.

From (Saunders *et. al.* 1997), the sample size was determined as,  $n = \frac{N}{1 + N(1 - C)^2}$

where,  $n$  = sample size,  $N$  = population, and  $C$  = confidence level

Table 3.3 shows the distribution of selected communities in the district and the number of sampled households. The 10 communities randomly selected from the list of the communities were obtained from the District Assembly using random numbers. Within each community, fifteen households were randomly selected by walking through the community.

Table 3.3 Distribution of Sampled Households

Community	Number of Households	Sample size
Bunglung	53	15
Challam	26	15
Kpendua	22	15
Fazihini	24	15
Kadia	70	15
Kanshegu	55	15
Laligu	36	15
Tarikpaa	96	15
Tibale	68	15
Zion	72	15
Total	522	150

Source: Survey Data, 2007

A focus group discussion was undertaken to identify the livelihood strategies of the selected communities. Community leaders such as chiefs, unit committee chairperson



or assemblyman and other members of the community participated in the focus group discussions.

The focus group discussions provided background information on household occupation, education, income, gender, age and farm characteristics of the households which assisted in the design of the questionnaire.

The questionnaire was pre-tested twice in each of the sampled community after which it was modified to achieve the study objectives. Some of the information captured in the questionnaire include personal data of respondents, farm characteristics, wealth status of household, income generating activities, duration of harvested food crop, household food security status and group membership (see appendix for detailed questionnaire).

The focus group discussions and the questionnaire administration were conducted in the local language, Dagbani, to facilitate easy communication and understanding of the research issues. The author and both assistants are very proficient in Dagbani so there was no communication barrier during the field survey.

## CHAPTER FOUR

### DISCUSSION OF RESULTS

This chapter consists of two main sections. Section one presents the descriptive analysis from the survey data. In section two, the empirical results on factors influencing household members participation in pluriactivity and the effects of pluriactivity on household food security are discussed.

#### 4.1 DESCRIPTIVE ANALYSIS

The survey data is employed in analysing the household's characteristics, duration of harvested food crops, participation in pluriactivity, access to institutional credit, group membership, household food security, relative contribution of farm and nonfarm income to total household income and household livelihood strategies.

##### 4.1.1 Household Characteristics

The household characteristics discussed under this section include age and level of education of household heads.

##### *Age of household heads*

Age of household head is important in determining life cycle state of the household and hence the decision making processes in the household (Valdivia *et al.*, 1996). The age distribution of the sampled household heads is shown in figure 4.1. About 78 percent of the household heads interviewed were above 40 years. Twenty-eight (28



percent) ranged between 41-50 years, 21.3 percent between 51-60 years and 28.7 percent were above 60 years. The majority of the household heads were above 60 years. This can be explained by the extended family system where compound house can contain several generations including grandparents. The oldest man in the house according to tradition is the household head in terms of social representation in the community or village. It is therefore not surprising to have such a distribution of household heads ages.

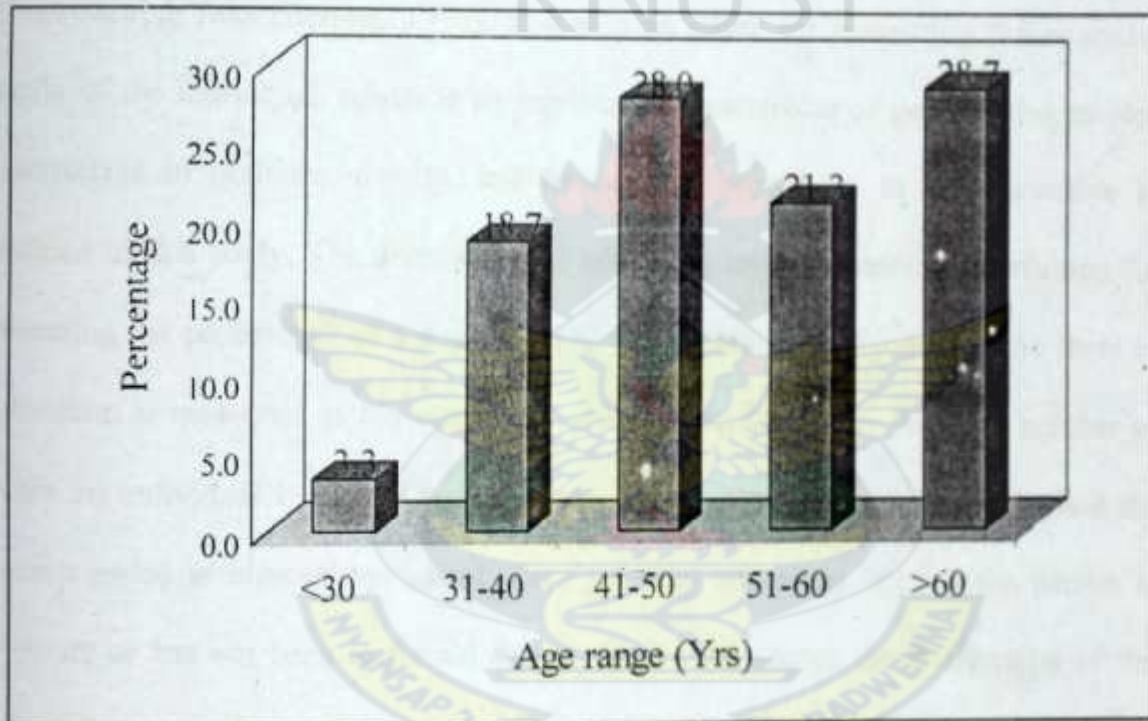


Figure 4.1 Distributions of Household Heads by Age  
Source: Survey Data, 2007.

Very few of the young are household heads since most of them are still in their fathers' compound houses where all resources are pooled together for common production and consumption. From the focus group discussion, it was gathered that the young becomes a household head only when their father dies and he has to

separate from the compound house to build his own house in which he takes care of his widowed mother. Even though the mother might be the oldest in the house, the son assumes the household headship. It is therefore expected to have very few households of the sample having heads less than 30 years in age i.e. only 3.3 percent of the total sample.

### *Years of education of household heads*

The educational level of an individual is an indication of his/her propensity to obtain wage-earning jobs (Bennel, 1996). It is also an index for measuring the cognitive skills of the individual, which is an important characteristic of people who employ themselves in nonfarm activity, and hence their propensity to be pluriactive as defined in this study. The distribution of education level is therefore a criterion for assessing the probability of a population to participate in pluriactivity. The level of education is measured as the number of years of education i.e. the total number of years an individual has spent in school. In Ghana, less than ten years implies the person ended at elementary school. Zero years of education implies the person is illiterate or has not been to formal school. Figure 4.2 shows the distribution of the sample in terms of household heads' years of education. More than 88 percent of the sampled household heads had zero years of education (illiterate). Only 5 percent had above basic education i.e. more than 9 years of education. This confirms the national survey's assertion that, illiteracy is a primary problem in the study area (Ghana Statistical Service, 2000). This suggests that if household heads were pluriactive, they would engage in nonformal activities, which might not bring in enough income. It is



therefore not surprising that wage employment is not a dominant nonfarm activity in the study area. The focus group discussions held with the communities pointed out farming as the main activity in the area. However, the vagaries of weather sometimes force farmers to engage in other activities such as firewood gathering, charcoal production, hunting and petty trading as coping measures for shortfalls in food crop production.

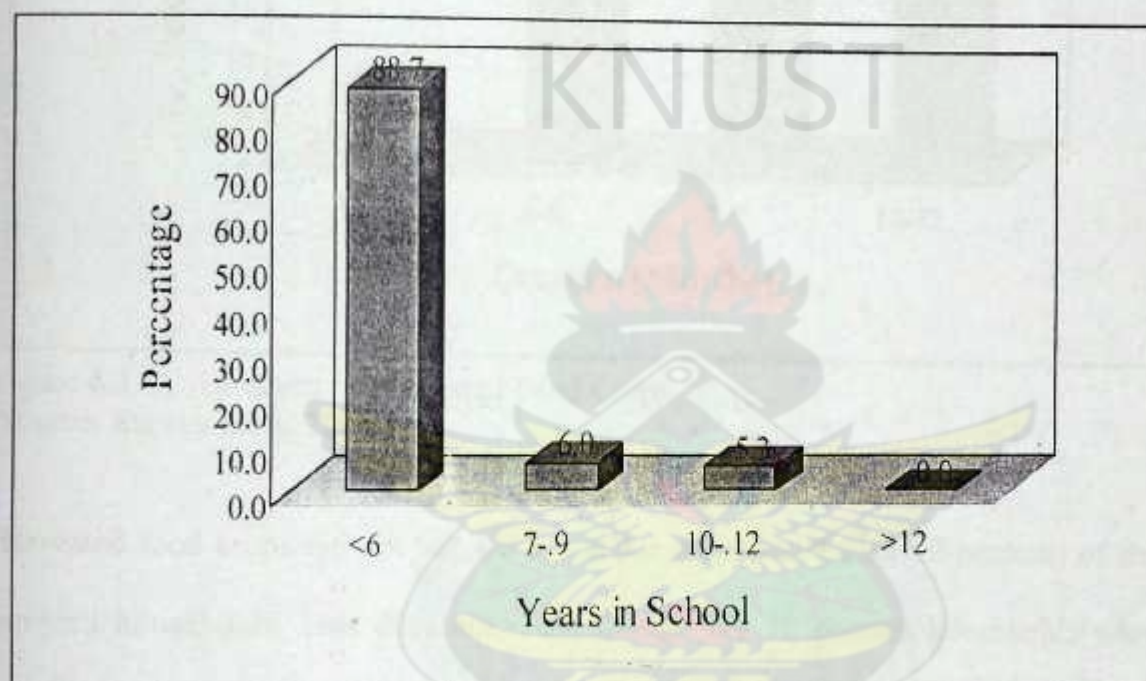


Figure 4.2 Years of Education of Household Heads  
Source: Survey Data, 2007.

#### 4.1.2 Duration of Harvested Food Crop

The focus of every household is to provide the necessary food requirement all year round. In order to achieve this goal, all households cultivate food crops for consumption and if possible for the market when there is surplus. How far the available harvested food crop take a family is very crucial in determining its decision

to participate in other income generating activities. Figure 4.3 illustrates the distribution of the sampled households in terms of duration of harvested food crops.

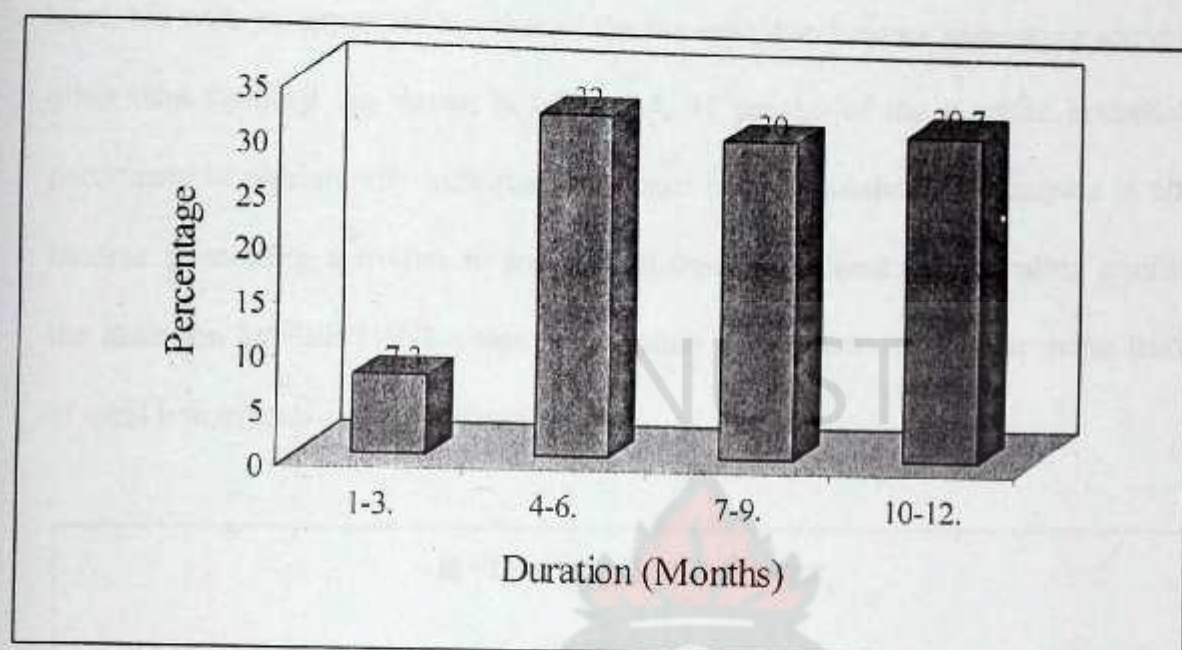


Figure 4.3 Duration of Harvested Food Crops  
Source: Survey Data, 2007

Harvested food crops did not last for a year for most (more than 70 percent) of the sampled households. This does not mean that all the 70 percent households were unable to go through the year with their own household supply of food. Some of them practiced mixed farming that is a combination of animal rearing and crop production. They therefore used proceeds from livestock sales to supplement food crops. Other households as well used income from other activities to access food by participating in the market. The figure shows the potential hunger gap faced by households without access to alternative sources of income.



### 4.1.3 Participation in Pluriactivity

#### *Household pluriactivity*

General household pluriactivity is described as the participation of the household head, his wife or any other member of the household in income generating activities other than farming. As shown in figure 4.4, 91 percent of the sampled households participate in pluriactivity indicating that most of the households participate in other income generating activities to supplement on-farm income. This finding confirms the assertion by Ellis (1998a) that participation in pluriactivity is a surviving feature of rural households in sub-Saharan Africa.

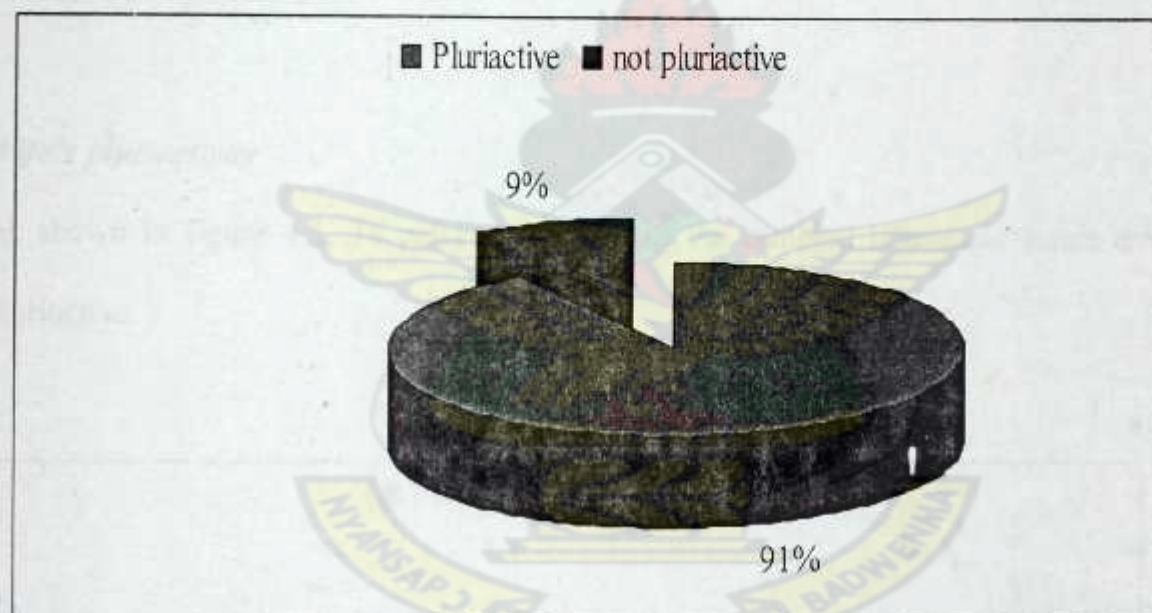


Figure 4.4: Household Pluriactivity  
Source: Survey Data, 2007

#### *Husband's pluriactivity*

The traditional activity of men is farming. The low level of education of household heads probably limits the participation in pluriactivity particularly in the formal wage sector. Table 4.1 illustrates the distribution of household heads' participation in

pluriactivity. Seventy percent (70 percent) of the household heads are not pluriactive i.e. their source of income is primarily agricultural. The occurrence of this high proportion can be attributed in part to the traditional land tenure system, which favours men. Lack of other opportunities also implies that they go into agriculture.

Table 4.1 Husband's Pluriactivity

Participation in Pluriactivity	Frequency	Percentage
Yes	45	30
No	105	70
<b>Total</b>	<b>150</b>	<b>100</b>

Source: Survey Data, 2007

#### *Wife's pluriactivity*

As shown in figure 4.5, 78 percent of wives of the sampled household heads are pluriactive.

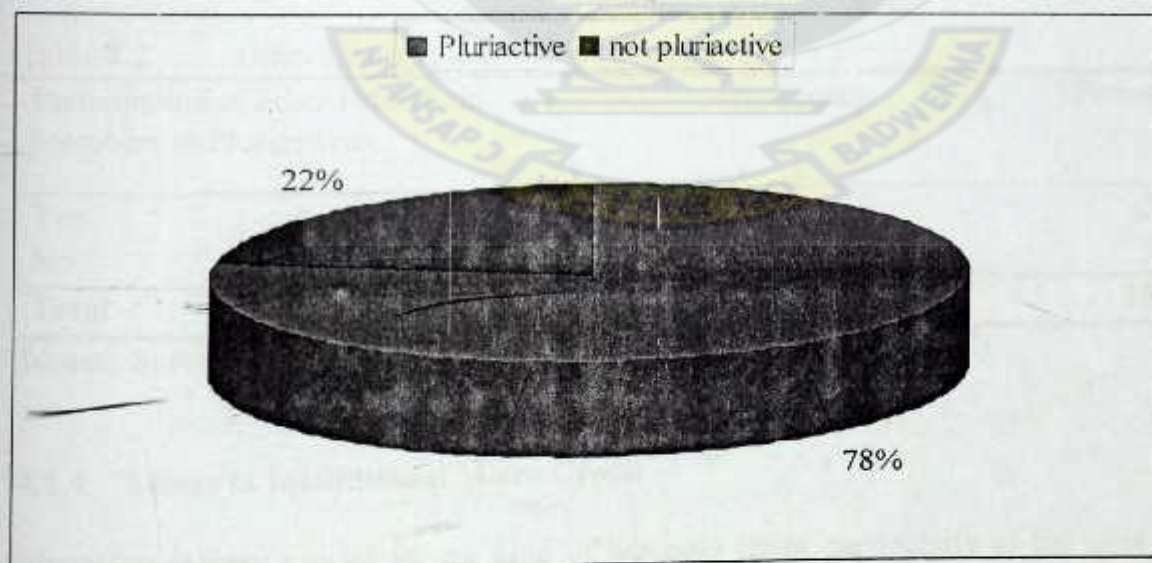


Figure 4.5 Wife's Pluriactivity

Source: Survey Data, 2007.



The nonfarm activities that wives mostly engage in are agro-processing i.e. groundnut processing, sheanut processing, and small chop bar operations. Agro processing is considered to be the preserve of women. This explains the distribution of household heads wife's participation in pluriactivity. The prevalence of various NGOs also complements income generating activities of women as part of their women empowerment programs.

#### *Other household members' pluriactivity*

Apart from the household head and his wife, other members of the household including children, cousins, brothers and sisters of the spouses might also engage in non-farm income generating. As shown in table 4.2, 50 percent of the sampled households have other members other than the household head or his wife participating in pluriactivity. This reflects the level of employable hands in the households. Most of them particularly females engage in agro processing and petty trading.

Table 4.2 Other Household Members Pluriactivity

Participation of other Household Members in Pluriactivity	Frequency	Percent
Yes	75	50
No	75	50
<b>Total</b>	<b>150</b>	<b>100</b>

Source: Survey Data, 2007

#### **4.1.4 Access to Institutional Micro Credit**

Financing is very crucial in any kind of business entity particularly at the time of commencement. Access to credit therefore assists household members to become

pluriactive. Table 4.3 details out access to micro credit package by household members.

Table 4.3 Access to Credit

Access to Credit	Frequency		Percent	
	Husband	Wife	Husband	Wife
Yes	60	83	40	55.3
No	90	67	60	44.7
<b>Total</b>	<b>150</b>	<b>150</b>	<b>100</b>	<b>100</b>

Source: Survey Data, 2007

Husbands of 43 percent of the sampled households had access to credit. Majority of the household heads (60 percent) do not have access to credit. This could be explained by the limited availability of formal or institutional credit sources in the study area. Although a number of NGOs with microfinance packages operate in the study area, their targets and coverage tend to be limited and focus on women reflect in their percentage access of over 55 percent. However, it was revealed through the focus group discussions that members of households do fall on informal credit from traders at interest rates above 50 percent. Such credit worsens the financial woes of households.

#### 4.1.5 Group Membership

Group membership is one of the social networks that households exploit to construct their livelihood. Hence belonging to such groups enhances the ability of households to negotiate idiosyncratic problems relating to access to participation in pluriactivity. It also enhances household members to access pluriactive opportunities.



Table 4.4 Group Membership of Household Member

Group Members	Frequency	Percent
Yes	88	58.7
No	62	41.3
<b>Total</b>	<b>150</b>	<b>100</b>

Source: Survey Data, 2007

Fifty-nine percent of the households have at least one of their members belonging to a group as illustrated in Table 4.4. From the focus groups discussions, such groups include social groups, financial groups and working groups. Membership of such groups facilitates the household access to means of obtaining assistance to participate in alternative income generating activities when the need arises. Hence, they have high propensity to participate in pluriactivity.

#### 4.1.6 Household Food Security

Food insecurity is the dependence of households on proceeds from mortgaged field crops in order to complete current year's consumption.

Twenty-six percent of the sampled households were food insecure (Figure 4.6). The main activity in the study area is agriculture. So every household undertakes food crop production throughout the year. Mortgaging standing field crops for current consumption threatens households' future food access and sufficiency hence, affecting household members' physiological development. Considering the seriousness of the effects of food insecurity on life parameters such as growth rate, and health status, 26 percent prevalence should be considered alarming.

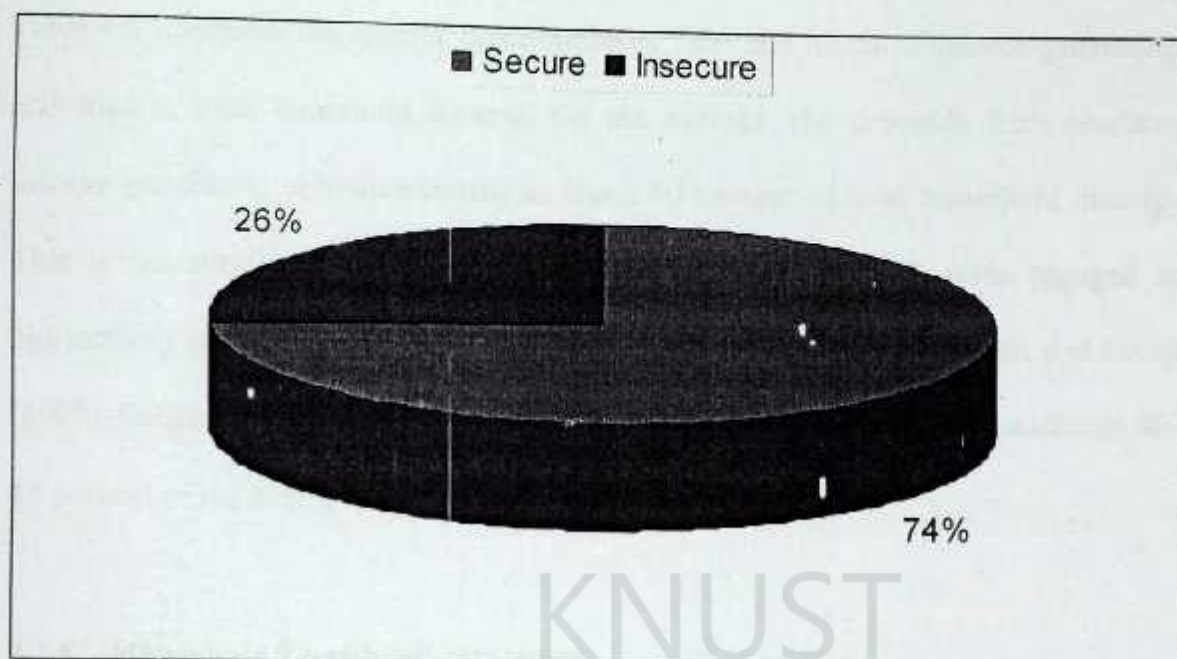


Figure: 4.6 Food Security  
Source: Survey Data, 2007

#### 4.1.7 Relative Contribution of Farm and Non-farm Income to Total Household Income

Decomposition of total household income into various sources gives an idea of the level of diversification or pluriactivity of households. The proportion of any particular income source in total household income portrays its importance in the livelihood of the household.

Table 4.5 Distribution of Farm and Nonfarm income

Source of income	Mean Household Income (¢)	Percentage of Total Income
Farm income	¢3,342,993.00	40.47
Non-Farm Income	¢4,917,086.00	59.53
<b>Total</b>	¢8,260,079.00	100

Source: Survey Data, 2007



Table 4.5 illustrates the relative contribution of farm and nonfarm income generating activities to total household income. On the average, the proceeds from nonfarm income generating activities constitute about 60 percent of total household income. This is not surprising as 90 percent of the sampled households were engaged in pluriactivity (see table 4.5). This finding confirms the study by Bryceson and Jamal (1997), Delgado (1989) and Reardon (1997) in which nonfarm income constituted 40-45 percent of the average household income.

#### 4.1.8 Household Livelihood Strategies

The focus group discussions held at the selected villages elicited the livelihood strategies adopted by the households. It was revealed that the strategies adopted are not very much different from those found in other sub-Saharan African countries such as Burkina Faso (Delgado, 1989).

Generally, the main economic activity is agriculture, which involves crop and animal production. Farm animals are normally kept as a form of savings from surplus crop production. The wealth of a household is normally assessed based on the number of farm animals it possesses including fowls, guinea fowls, goats, sheep and cattle (UNICEF, 1999). Households with farm animals normally rely on the proceeds from the sale of these animals when there is crop failure. Cattle are sold only when small ruminants such as goat and sheep are exhausted. Therefore, poultry and small ruminants are the most liquid asset for the households.



Crops that are normally cultivated include maize, yam, sorghum, millet, soya beans, cowpea, groundnuts and cotton. Cotton is the major cash crop grown in the area. Companies are involved in the coordination of the production and marketing of cotton. These companies include, Ghana Cotton Company Limited and Nulux Plantations. They usually provide inventory credit to the farmers in the form of farm inputs such as fertilizer and pesticides. Sheanut trees although not cultivated by farmers are protected by farmers as they farm around them for their nuts, which is very important in the lives of the inhabitants. Women are actively involved in the picking and processing of the nuts. Sheanut is an export product.

At the household level, women normally undertake other income generating activities to supplement the proceeds from the farm. They normally undertake agro-processing activities as well as some commerce. Although agriculture is the mainstay of the local economy, it is still rainfed with few irrigation facilities for production of vegetables and rice in the dry season. These irrigation schemes are the canal type located at Bunlung, Libga and Nasia in the Savelugu-Nanton district.

The other income generating activities among the households were mainly wage employment activities and self-employment activities. About 95% of the households engaged in self-employment activities. These include sheanut processing (40%), groundnut processing (17%), rice processing (5%), petty trading (8%) –marketing of farm produce and provisions, soap making (2%), firewood gathering (8%), basketry and weaving of mats (2%), bicycle fitting (2%), charcoal production (3%), carpentry



(2%), dressmaking/tailoring (2%), butchering (1%), food processing (3%), blacksmithing (1%), cotton yarning (1%), driving (3%) and baking (1%). The wage employment activities were teaching (45%), masonry (25%), and construction labour (30%).

## 4.2 EMPIRICAL RESULTS

The empirical results are presented in this section. The bivariate probit analysis results are presented in Table 4.6. The McFadden  $R^2$  of 0.71 indicates that the model correctly predicts household participation in pluriactivity for 71% of the sample. The variable representing the ratio of working household members to non-working household members significantly influence participation in pluriactivity by both husband and wife. While an increase in the dependency ratio increases the probability of husbands to participate in pluriactivity, the opposite is the case for wife's participation in pluriactivity. Since higher ratio implies more labour for food production, the husband can relocate his labour into other off-farm income generating activities. As pointed out by Abdulai and Delgado (1999), women participation in nonfarm income generating activities is driven by non-availability of food for household consumption. Therefore available household labour for food crop production will reduce the probability of wife's participation in pluriactivity.

The effect of household size on pluriactivity is significantly positive for wives but insignificant even at 10% level for husbands. This empirical result confirms the earlier assertion that women are driven by food supply needs of the household. All the human



capital variables capturing the experience and educational level of spouses significantly influenced household pluriactivity and had the correct expected signs as well. The marginal effect of 0.026 for husbands and 0.0515 for wives implies that the effect of education on husbands' pluriactivity is less than that of wives'. The distance of home from village market, although not significantly different from zero at 10% level, had the correct *a priori* sign for the husband's pluriactivity.

Household probability of participating in pluriactivity was expected to decrease if the household is further away from the village market. Credit access to wives significantly increased their participation in pluriactivity a result which confirm an assertion by Evans and Ngau (1991) that credit facilities provided by microfinance institutions to women increases pluriactivity. The effect of credit access on husbands' pluriactivity was not significant even at 10% level but had the expected sign. Household group membership is supposed to encourage pluriactivity if groups work towards accessing microfinance packages. The group membership variable did not have any significant impact on the probability to participate in pluriactivity although it had the expected relationship. The number of out-migrants had a significant negative relationship with the wife's pluriactivity, a result which shows that as the social network relations fall, wives have no option but to increase their pluriactivity in order to meet the consumption shortfalls in the household.



Table 4.6 Bivariate Probit Estimates of Household Pluriactivity

Variable	Husbands			Wives		
	Coeff	t-value	Marginal effect	Coeff	t-value	Marginal effect
CONSTANT	-1.6270	-0.86		0.6725	0.30	
DEPRATIO	0.4364	2.01**	0.1349	-0.3786	-1.75*	-0.0920
HHSIZE	0.0310	0.97	0.0096	0.1120	2.88**	0.0291
AGEHH	0.1572	1.65*	0.0486	-0.1370	-1.60*	-0.0333
AGEHH2	-0.1582	-1.81*	-0.0489	0.1254	1.82*	0.0304
AGEWIFE	-0.1644	-1.61*	-0.0508	0.2027	1.66*	0.0492
AGEWIFE2	0.1569	1.23	0.0485	-0.2791	-2.05**	-0.0677
HHYREDUC	0.0735	1.71*	0.0227	-0.0017	-0.03	-0.0004
HHWYREDU	0.0845	1.38	0.0261	0.2122	2.06**	0.0515
CRDACCES	-0.0354	-0.13	-0.0109	0.4743	1.66*	0.1112
DISTNBTN	-0.0595	-0.61	-0.0184	0.0170	0.18	0.0041
GRPMEMSH	0.3728	1.34	0.1122	0.1769	0.60	0.0436
MMIGRATN	-0.0523	-0.58	-0.0162	-0.2350	-2.18**	-0.0570
CATTLE	1.2828	4.05***	0.4140	0.0962	0.31	0.0231
DURCRP	-0.0026	-0.06	-0.0009	-0.0735	-1.76*	-0.0178
McFadden R <sup>2</sup>		0.71		Observations		150
Chi <sup>2</sup>		68.64				
Prob > Chi <sup>2</sup>		0.0000				

\*\*\*Significant at 1% level, \*\*significant at 5% level, \*significant at 10% level

Source: Author's Computation

*STATA 10.1 program was used for the estimation of the bivariate probit model.*



Possession of cattle significantly increases the husband's probability to participate in pluriactivity but not wives. Animal wealth in northern Ghana is an asset commonly held by male household heads. The positive significant marginal effect indicates that animal wealth reduces liquidity constraints needed to enter into pluriactivity. Duration of harvested food crop had significant negative impact on the probability of wives to participate in pluriactivity. The empirical result confirms the theoretical believe that the motive behind wives' participate in pluriactivity is to supplement the food needs of the household. Thus the longer the duration of household harvested food crop, the lower the probability to participate in pluriactivity.

#### 4.3 PLURIACTIVITY AND FOOD SECURITY

The relationship between household pluriactivity and food security is investigated with the probit analysis. This analysis was employed to determine the effect of household members' pluriactivity on the probability of a household to be food secured. The results of the probit analysis are presented in Table 4.7.

The overall empirical model that was set out to examine the decision behaviour of the household to mortgage their standing field crops or otherwise was found to be significant as shown by the chi-square and the probability ( $P = 0.0000$ ). From this inference it was concluded that the entire variables included in the model influenced the probability of the household food security. Pluriactivity of the household head had significantly positive effect on the probability of household food security. This is a confirmation of the hypothesis that households which engage in other income generating activities are able to finance their food supply without mortgaging their field



crops (IFAD, 1992). However, the pluriactivity of the wife of the household head had a negative relation with household food security. The implication is that women in Savelugu-Nanton District participate in income generating activities which do not yield enough earnings to avert household food crises hence household went ahead to mortgage their standing field crops for current consumption rendering them food insecure. The variables, animal wealth and duration of harvested food crops, included in the model gave the expected positive effects on household food security. Duration of harvested food crops was significant at a level of 1% in its influence on food security.

Table 4.7 Probit Estimates of Household Food Security

Variable	Coeff.	Std Error	t-values
CONSTANT	-0.6863	0.4253	-1.61
HHPLURI	0.7685	0.2973	2.58**
HWPLURI	-0.2083	0.3047	-0.68
ANMLWTH	0.0217	0.0165	1.31
DRNFDCRP	0.1637	0.0464	3.53***
Sample size	150		
Chi-square	29.95		
Prob. > Chi <sup>2</sup>	0.0000		

NB: \*\*\*Significant at 1% level, \*\*significant at 5% level,

*STATA 10.1 program was used for the estimation of the bivariate probit model.*

Source: Author's Computation

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 SUMMARY AND CONCLUSION

This study has examined the determinants of household pluriactivity and its effect on household food security among 150 farm households in Savelugu/Nanton districts of northern region of Ghana. The survey data show that rural households in Savelugu-Nanton District are pluriactive with 91 percent of them participating in pluriactivity. However, their pluriactivity is the distress-push type. The activities they undertake enable them to cope with shocks in food supply from their farms. Even though pluriactivity is adopted as a coping strategy its sources of income is substantial in household total income, constituting about 60 percent of total household income. Pluriactivity income is therefore important in total household income since it forms a major proportion.

Due to food insecurity in the district, about 26 percent of the households mortgaged their field crops for current consumption. Only about 31 percent of them were able to rely on their own produced foodstuff for more than nine months indicating a wide hunger gap which households fill through various coping strategies. The households then participated in agro-processing and wage employment activities to raise additional income while some household members migrate to the southern part of Ghana in search of jobs.



The empirical results revealed that education and animal wealth significantly increase the probability of husbands' participation in pluriactivity. Access to institutional credit significantly increases the probability of wives to participate in pluriactivity. Wives participate in pluriactivity to supplement the husbands' effort in overcoming food shortage. Duration of harvested food crop of household significantly reduces the probability of wife's participation in pluriactivity.

The probit analysis of food security indicates that husband's pluriactivity had significant positive effect on the probability of household food security. It however portrays that pluriactivity of wives does not have positive effect on the food security of the household as literature suggests. Although the women engaged in other income generating activities to supplement their husband income, they did not earn enough so their field crops were mortgaged in order to meet the households' consumption needs. Pluriactivity is then more of coping strategy than economic diversification for women in the Savelugu-Nanton District.

The probit results also showed duration of harvested food crops and animal wealth to have positive effect on the probability of household food security.

## **5.2 POLICY RECOMMENDATIONS**

Since household food security is very crucial in the development of any community, steps must be taken to ensure its existence. To enhance food security in the area, the following policies must be pursued:

- Since nonfarm income forms the major proportion of total household income, efforts must be geared towards the expansion of markets for the products from pluriactivity.
- Microfinance with low interest rates must be given by local credit institutions to assist households that want to enter into pluriactivity.
- Entrepreneurial training must be provided to improve the productivity of pluriactivity of households.
- Children's education must be encouraged to enable them participate in wage employment such as teaching and other viable pluriactivity.
- From the study, animal wealth is observed to be very important in the maintenance of household food security. Households with high level of animal wealth are able to sell some of the animals for the purchase of foodstuff. It is therefore recommended that small ruminant development scheme should be evolved for the area in order to tackle their food insecurity concerns.
- Drought resistant variety of various crops should be bred for the area to enhance their food crop productivity.
- Due to the long dry season in the study area, spanning from November to March, it is recommended that there should be an expansion and creation of irrigation projects in the area to absorb the idle labour of farmers during this period.



## REFERENCES

- Abdulai, A. and Delgado, C. L. (1999). "Determinants of nonfarm earnings of farm-based husbands and wives in northern Ghana". *American Journal of Agricultural Economics* 81 (1): 117-130.
- Ashong K. and Smith R. D. (2001). Livelihood of the Poor in Ghana: A Contextual Review of Ghana Definitions and Trends of Poverty and the Poor with those of Peri-urban Kumasi
- Bateman, D. and Ray, C. (1994). Farm pluriactivity and rural policy: Some evidence from Wales, *Journal of Rural Studies* 10 (1): 1-13.
- Bebbington, A. (1999). Capitals and capabilities: A framework for analyzing peasant viability, rural livelihoods and poverty. *World Development* 27(12): 2021-2044.
- Benjamin, C (1994). 'The growing importance of diversification activities for French farm households' *Journal of Rural Studies* 10 (4): 331-342.
- Benjamin, C. and Guyomard, H. (1994). 'Off-farm work decisions of French agricultural households' in *Agricultural Household Modelling and Family Economics*. France Caillavet, Herve Guyomard and Robert Lifran eds. Amsterdam: Elsevier.
- Bennel, P. (1996). Rates of returns to education: Does the conventional pattern prevail in Sub-Saharan Africa? *World Development*, 24 (1): 183-199.
- Bernstein, H., Crow, B. and Johnson, H. (eds) (1992). Rural livelihoods: Crises and responses. Oxford. Oxford University Press and The Open University.

- Bigsten, A. (1996). 'The Circular Migration of Smallholders in Kenya', *Journal of African Economies* 5(1): 1-20.
- Bryceson, D. F. and V. Jamal (1997). *Farewell to Farms: De-Agrarianisation and Employment in Africa*. (Aldershot, UK: Ashgate).
- Chambers, R. and G. R. Conway (1992). Sustainable Rural Livelihoods: Practical Concepts for the 21<sup>st</sup> Century. Discussion Paper 296. Institute of Development Studies, London.
- Connel, J. B. Dasgupta, R. Laishley, and M. Lipton (1975). Migration From Rural Areas: The Evidence from Rural Studies. Brighton: Village Studies Programme, University of Sussex, U.K
- Davis, J. and Pearce, D. (2001). The Rural Non-Farm Economy in Central and Eastern Europe. In: *The Challenge of Rural Development in EU Accession Process*. Lerman, Z and Csaki, C. (eds). *World Bank Technical Publication*. Washington DC: World Bank.
- Davis, J. R. and Bezemer, D. (2004). The Development of the Rural Non-Farm Economy in Developing Countries and Transition Economies: Key Emerging and Conceptual Issues. Chatham, UK: Natural Resources Institute.
- Delgado, C. L. (1989). 'The Changing Economic Context of Mixed Farming in Savanna West Africa: A Conceptual Framework Applied to Burkina Faso', *Quarterly Journal of International Agriculture* 28 (3-4): 351-365.
- Dercon, S. and Krishnan, P. (1996). 'Income Portfolios in Rural Ethiopia and Tanzania: Choices and Constraints'. *Journal of Development Studies*, 32(6): 850-875.



- Dunn, E., Kalaitzandonakes N., and Valdivia, C. (1996). Risk and the Impacts of Micro-enterprise Services. Assessing the Impacts of Micro-enterprise Services (AIMS). MSI. Washington DC.
- Ellis, F. (1993). Peasant Economics: Farm Households and Agrarian Development. Second Edition. Cambridge University Press.
- Ellis, F. 'a'(1998). "Household Strategies and Rural Livelihood Diversification." *Journal of Development Studies* 35(1): 1-38.
- Ellis, F. 'b'(1998). *The Determinants of Rural Livelihood Diversification in Developing Countries (Draft Paper)*. Agricultural Economics Society Annual Conference 25-28 march 1998. University of Reading.
- Ellis, F. (1999). 'Rural Livelihood Diversity in Developing Countries: Evidence and Policy Implications'. *Natural Resource Perspectives*. Number 40. ODI.
- Ellis, F. (2000). *Rural Livelihood and Diversity in Developing Countries*. Oxford: Oxford University Press.
- Ellis, F. (2001). 'Rural Livelihoods, Diversity and Poverty Reduction Policies: Uganda, Tanzania, Malawi and Kenya', LADDER Working Paper No. 1
- Evans, H. E. and Ngau, P. M. (1991). 'Rural-urban relations, household income diversification and agricultural productivity', *Development and Change* 22(3): 519-545.
- Evans, N.J. and B.W. Ilberry (1993). 'The pluriactivity, part-time farming, and farm diversification debate', *Environment and Planning A* 25: 945-959.

- Ferguson, A. E. (1992). Differences Among Women Farmers: Implications for African Agricultural Research Programs. Proceedings A Workshop on Social Science Research and the CRSP's June 9-11, 1992. Lexington Kentucky. INTSORMIL Publication No. 93-3. pp.47-62.
- Fuller, A. M. (1990). From part-time farming to pluriactivity : A decade of changes in rural Europe, *Journal of Rural Studies* 6(4): 361-373.
- Gasson, R. (1986). *Farm Families and Other Gainful Activities*, Department of Agricultural Economics, Wye College, UK.
- Ghana Statistical Service (GSS). *Ghana Living Standard Survey Report of the Fourth Round (GLSS 4)*. October 2000.
- Ghana Statistical Service (2000). Population and Housing Census 2000. Accra, Ghana
- Hearn, D. H., K.T. McNamara and L. Gunter, (1996). 'Local economic structure and off-Farm labour earnings of farm operators and spouses', *Journal of Agricultural Economics* 47(1): 28-36.
- Hill, M (1973). "Diversity and evenness: A unifying notation and its consequences." *Ecology* 54: 427-32.
- Hirway, I. and Terhal, P (1994). Towards Employment Guarantee in India: India and International Experiences in Rural Public Works Programmes, New Delhi: Sage.
- Huffman, W. E. (1980). Farm and off-farm work decisions: The role of human capital, *Review of Economics and Statistics* 62(1):14-23.



- Huffman, W.E and Lange, M.D. (1989). Off-farm Work Decisions of Husbands and Wives: Joint Decision Making, *Review of Economics and Statistics* 71: 471-480
- International Fund for Agricultural Development (1992). Rural Poverty Alleviation and Nutrition: IFAD's Evolving Experiences. A Technical Paper. Rome: IFAD, Technical Advisory Division, 1992.
- Islam, R. (1986). Non-farm Employment in Rural Asia: Issues and Evidence, in Shand, R.T.(ed.), *Off-farm Employment in the Development of Rural Asia* Vol.1, The Australian National University.
- Korboe D. (1998). Handing Over the Stick: Synthesized Report on the Ghana Social Assessment, Study Commissioned by the World Bank in Collaboration with the National Development Planning Commission, Faculty of Environmental and Development Studies. University of Science and Technology, Kumasi, Ghana.
- Kusterer, K. (1989). Small Farmer Attitudes and Aspirations. USAID Program Evaluation Discussion Paper No. 26. USAID, Washington, DC.
- Lanjouw P., J. Quizon and R. Sparrow (2001). "Non-agricultural earnings in periurban areas of Tanzania: Evidence from household survey data", *Food Policy* 26(4): 385-403.
- Low, Allan (1986). *Agricultural Development in Southern Africa*, London: James Currey Ltd.
- McDowell, C. and A. de Haan (1997). Migration and Sustainable livelihoods: A Critical Review of the Literature. IDS Mimeo.
- Mishra, A. K. and Goodwin, B. K. (1997). Farm Income Variability and the Supply of Off-Farm Labour. *American Journal of Agricultural Economics* 79: 880-887.



- MoFA. (2001). *Agricultural Facts and Figures*. Ministry of Food and Agriculture, Ghana.
- MoFaEP (2003). *The Growth and Poverty Reduction Strategy Paper II (GPRSP II)*
- Morduch, J. (1995). Income Smoothing and Consumption Smoothing, *Journal of Economic Perspectives* 9: 103-114.
- Moser, C. O.N. (1998). 'The Asset vulnerability framework: Reassessing urban poverty reduction Strategies', *World Development* 26 (1): 1-19.
- Muyanga, M. (2004). 'Insights to rural household food insecurity in Kenya', *Uganda Journal of Agricultural Sciences* 9(1): 791-796.
- Newman, C. and Canagarajah, S. (1999). 'Non-Farm Employment, Poverty, and Gender Linkages: Evidence from Ghana and Uganda' Policy Research Working Paper, 2367. The World Bank Development Research Group, Rural Development and Human Development Network, Social Protection Team.
- Olfert, M. R. (1993). Off-farm labour supply with productivity increases, peak period production and farm structure impacts, *Canadian Journal of Agricultural Economics* 41(4): 491-501.
- Oshima, H. T. (1986). Off-farm Labour Employment and Incomes in Post-war East Asian Growth, in Shand, R.T. (ed.), *Off-farm Employment in the Development of Rural Asia*, Vol. 1, the Australian National University.
- Reardon, T., Delgado, C. and Matlon, P. (1992). 'Determinants and effects of income diversification among farm households in Burkina Faso', *The Journal of Development Studies* 28 (2): 264-296
- Reardon Thomas (1997). "Using evidence of household income diversification to



inform study of the rural nonfarm labour market in Africa," *World Development* 25(5): 735-747.

Reardon, T., J. E. Taylor, K. Stamoulis, P. Lanjouw, A. Balisacan (1998), 'Effects of Nonfarm Employment on Rural Income Inequality in Developing Countries: An Investment Perspective'. An Invited Paper for the Symposium "Rural Diversification in the Developing World," Agricultural Economics Society Annual Conference, 25-28 March 1998, at the University of Reading, U.K

Saunders, M., Philip L. and Adrian T. H. (1997). 'Research Methods for Business Students'. Pearson Professional Ltd. UK.

Savelugu/Nanton District Profile. (2006). [www.ghanadistricts.com/districts/](http://www.ghanadistricts.com/districts/)

Sharma, R. P. (1992). Monitoring access to food and household security. *Food Nutrition and Agriculture*, 2(4): 2-9.

Shand, R.T. (1986). Off-farm Employment in the Development of Rural Asia: Issues, In Shand, R. T. (ed.), *Off-farm Employment in the Development of Rural Asia*, Vol. 1, The Australian National University.

Shucksmith, D. M., J. Bryden, P. Rosenthal, C. Short and D. M. Winter (1989).

"Pluriactivity, farm structures and rural change", *Journal of Agricultural Economics* 40(3): 345-360.

Siamwalla, A. and Valdes (1984). Food Security in Developing Countries:

International Issues: In: Eicher, C. K. and J.M. Staaz. (eds), *Agricultural Development in the Third World*. Baltimore: Johns Hopkins University Press.

Stark, O. and R. Lucas (1988). 'Migration, Remittances, and the Family', *Economic Development and Cultural Change* 36: 465-481.

- Taylor, E. and T. Wyatt (1996). 'The Shadow Value of Migrant Remittances, Income and Inequality in a Household-Farm Economy' *Journal of Development Studies* 32(6): 899-912.
- Tockle, J. G. and Huffman, W. E. (1991). Local Economic Conditions and Wage Labour Decisions of Farm and Rural Non-farm Couples, *American Journal of Agricultural Economics* 73: 652-670.
- UNICEF (1999) District Level Household Baseline Survey - Savelugu - Nanton District, Tamale, pp 75 - 78
- Valdivia C., G. D. Elizabeth, and J. Christian. (1996). "Diversification as a Risk Management Strategy in an Andean Agropastoral Community", *American Journal of Agricultural Economics* 78 (5): 1329-1334.
- Valdivia, C. (2001). Household Economic Diversity and Coping Response to a Drought Year at San José Llanga. Chapter 6 in Coppock D. L. and Valdivia C (Eds). 2001. *Sustaining Agropastoralism on the Bolivia Altiplano: The Case of San Jose Llanga*. Department of Rangeland Resources, Utah State University, Logan, Utah, USA.
- Weersink, A. (1992). Off-farm labour decision by Ontario swine producers, *Canadian Journal of Agricultural Economics* 40(2): 235-251.
- World Bank, World Development Report 2000/2001. *Attacking Poverty*. pp 135-159. Oxford University Press (for the World Bank).



Date .....

Village.....

Number.....

- 1) Sex of the household head? Male ☐ female ☐
- 2) Age of household head?.....
- 3) What type of material are the house walls built with?
  - a) Mud
  - b) Straw
  - c) Landcrete blocks
  - d) Sandcrete blocks
- 4) What is the total number of bedrooms in your house? .....
- 5) How many of the rooms are roofed with 'zinc'? .....
- 6) Indicate the number of any of the following possessed by your household.

Animal	Number
Cattle	
Sheep	
Goat	
Fowls	
Guinea-fowls	
Donkeys	
Horses	

- 7) Do you (household) have bullocks and ploughs? Yes ☐ No ☐
- 8) Do you (household) have bullocks and cart? Yes ☐ No ☐
- 9) Do you (household) have a tractor? Yes ☐ No ☐
- 10) If yes in (9) when did you purchase it? .....
- 11) What tractor implements do you have? .....

12) How many of the following are possessed by your household?

Item	Number
Car	
Motor bike	
Grinding mill	
Bicycle	

13) Income sources and individual characteristics

No.	Relation to household head	Age	Sex	Educational level	Income generating activities			
					1	2	3	4
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								



14) Farm income

Product	Total production for last year	Cost of production	Price/unit	Revenue	Net income

15) Income from other activities.

Activity	Net income per week	Number of months of activity for last year

16) Did you borrow money for your income generating activities? Yes ☐ No ☐

17) If (No) in (16), why?

.....

.....

.....

.....

18) If Yes in (16), what was the source of the credit/loan?

- a. Friends/relatives
- b. Money lenders
- c. Financial institutions
- d. NGOs

19) Under what conditions did you obtain the credit?

.....  
.....

20) Why do some members of your household undertake activities other than farming, which is the main occupation of the area?

.....  
.....  
.....  
.....  
.....

21) How many of your household members migrated for work within the past year?

.....

22) Migration for work during last year.

Sex	Age	Education al level	Destination	Type of work	Duration/ Period	Estimated income

23) Do your household members belong to any association /group? Yes ☐ No ☐

24) If no in (23), why? .....

.....  
.....

25) If yes in (23), name them. ....

.....

26) During the past year, how long did your harvested foodstuff last?

.....

27) Did you mortgage your field crop for consumption? Yes ☐ No ☐



28) If no in (27) How did you (household) manage the remaining months?

.....

.....

.....

.....

29) What are the major problems associated with your farming activities?

.....

.....

30) How do you think the above problems could be solved?

.....

.....

