

**DETERMINANTS OF PARTICIPATION IN NON-FARM
ECONOMIC ACTIVITIES IN RURAL ZANZIBAR**

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ABSTRACT

This study set out to examine the determinants of participation in non-farm economic activities by farming households in rural Zanzibar, using data from the Agriculture Census of 2003. The study goes beyond the traditional focus of non-farm studies that focus on analysing geographical and socio-economic variables on decisions to participate in non-farm activities and in so doing, fills an information gap and contributes to the understanding of determinants of farm household participation in non-farm activities in rural Zanzibar.

The survey from which data were drawn, included surveys of 4755 household heads. Descriptive statistics and logistic regression model were applied to investigate the effect of individual characteristics on the decision to participate in non-farm economic activities. Gender, age, family size and level of education were used as variables to explain individual preference with regard to the decision to undertake non-farm economic activities. The analysis also included farm production factors including farm size, planted area and the main source of household income.

The results show that gender, age, household size and income sources outside agriculture are the key factors that influence farming household's decisions to participate in non-farm activities. Women and young farmers were more likely to participate in non-farm activities. Heads of larger households were also more likely to participate in non-farm activities, and undertake more than one activity in this sector. The type of activity engaged in also seems to have a positive influence on the decision to participate in the non-farm sector, with selling of agricultural products, fishing (including seaweed farming and selling of fish), wage employment and petty trade being more popular and attractive activities. Factors like education, landholding size and area of land planted were less important in influencing participation in non-farm activities.

All sampled households participated in non-farm economic activities, with 70 per cent of the participants undertaking more than four activities simultaneously. This points to the importance of non-farm economic activities in providing opportunities to sustain household food security and increase the capacity for households to mitigate shocks. However, a strong relationship was found between participation in non-farm activities

and the use of forest resources, as a significant number of activities depend on forest resources. The forest-based non-farm activities reported were: beekeeping, charcoal making and tree logging for poles, timber and firewood. This raises significant concern over the over-utilization of forest resources and subsequent sustainability of the related activities.

It is recommended that efforts towards promoting non-farm economic activities should be directed towards developing non-farm activities that are not dependent on forest resources. Interventions enabling increased farm productivity or non-forest activities are important in ensuring food security in Zanzibar. More policy and programme attention should be given to the role of women in non-farm activities.

DECLARATION

I, Mansura Mosi Kassim hereby declare that:

- The research presented in this mini-dissertation, except where otherwise indicated, is my own original work and has not been submitted to any other university.
- This mini-dissertation does not contain data or information from other persons' work, unless specifically acknowledged as being sourced from those persons.
- This mini-dissertation, unless specifically acknowledged, does not contain other authors' writing and where other written sources have been quoted:
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Date.....

As Supervisor, I agree to submission of this mini-dissertation for examination.

Signed.....

Date.....

Prof Sheryl L Hendriks

As Co-Supervisor, I agree to submission of this mini-dissertation for examination.

Signed.....

Date.....

Dr. Edilegnaw W. Zegeye

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DEDICATION

To my mother and my father: you have been great source of blessing for this attainment.
Thank you very much, may God bless you and give you eternal peace.

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CHAPTER 1: INTRODUCTION

1.1 Background

This study assessed the determinants of non-farm participation in rural Zanzibar. Specifically, the study aimed to explore the effects of individual characteristics, household structure and farm characteristics on the decision of farming household heads to participate in non-farm economic activities. The non-farm sector in Zanzibar has not received much research or policy attention (Ministry of Finance and Economic Affairs (MOFEA), 2007). Therefore, this study seeks to fill a gap in knowledge in rural Zanzibar.

In recent years, the non-farm economy has received considerable attention from both policy makers and development practitioners. Non-farm activities are all economic activities undertaken in rural areas and that fall outside of agriculture itself (Lanjouw and Feder, 2001). These activities may include self-employment, wage-employment and seasonal employment. Growing interest in understanding the rural non-farm sector reflects increasing evidence that rural livelihoods are constructed from diverse income sources rather than an often assumed overwhelming reliance on agriculture (Davis and Bezemer, 2004).

Traditionally, the overwhelming majority of Zanzibar's population was dependent on agriculture for employment and livelihoods (Ministry of Agriculture, Livestock and Natural Resources, 1996). However, in recent years, the share of the rural labour force that directly depends on agriculture for their livelihoods has gradually decreased from 70 per cent in 1999 to 45 per cent in 2004 (Office of Chief Government Statistician (OCGS), 2005). This decline is evident in a diminishing contribution of the agricultural sector to the Gross Domestic Product (GDP) - a drop from 43 per cent in 1996 to 27.3 per cent in 2008 (OCGS, 2009). Like many developing countries, reduced agricultural production in Zanzibar is perceived as inevitable due to increasing tourism and service sectors and growing non-farm employment opportunities.

Generally, agricultural sector performance in Zanzibar is low and production levels are far below potential yields (Ministry of Agriculture, Livestock and Environment (MALE), 2006). Agriculture is predominantly smallholder farming, characterised by the use of

rudimentary equipment. The annual agricultural growth rate is a meagre 2.4 per cent (MALE, 2006). With a population growth rate of 3.1 per cent per annum, the country needs at least 6 per cent growth rates in agriculture to keep abet of consumer demand (MOFEA, 2007). According to data from the 2002/03 Agricultural Census, productivity of the major food crops is below potential yields (OCGS, 2003). For example, rice productivity (a staple food) under rain-fed production produces only 0.8 tons/ha, against a potential of 2.5 tons/ha (OCGS, 2003). Productivity under irrigated systems is 4.0 tons/ha compared to a potential of 8 tons/ha (OCGS, 2003). Similarly, the productivity of cassava which is considered as food security crop-given the fact that it is cultivated by most farming households in Zanzibar - is 5 tons/ha, against a potential yield of 25 tons/ha (OCGS, 2003). This implies that for most crops, the volume of production could most likely be increased without necessarily increasing area of land under cultivation.

The main factors contributing to low productivity and production are: recurrent droughts (which have increased both in frequency and severity); low input use; weak support services (research and extension); degradation of natural resources; low labour productivity; high post-harvest losses and crop theft; limited adoption of improved agricultural technologies and farming practices in the small-scale farming; and inadequate capital investments in farm improvements (OCGS, 2003; MALE, 2006).

Based on data from Food Security and Nutrition Situation Analysis (MALE, 2006), Zanzibar produces an estimated 59 per cent of its expected annual requirements. Low levels of production have translated into high dependency on food imports for fulfilling basic food requirements. Therefore, Zanzibar depends heavily on imports from the Tanzanian mainland and abroad. Most rural households in Zanzibar are net food purchasers, with a food purchase dependency ratio range between 35 to 60 per cent of households (MOFEA and World Food Programme (WFP), 2003). This implies that household resource levels are critical in sustaining household food security. Poverty is wide spread in Zanzibar with about 49 percent of the population cannot meet their daily basic needs with 13 percent fall below food poverty line (i.e. they cannot earn amount of money to purchase basic food items which is Tanzanian Shilling 12,573¹) (OCGS, 2007).

¹ 1 US\$ is equivalent to Tanzanian Shilling 1540 (as of October 2010).

With high levels of poverty, high dependency on food purchases can potentially push the majority of poor households into chronic food insecurity.

The significance of non-farm sector to rural economy is well established in international literature in terms of its impact in reducing rural employment especially to economies with rural surplus labour. It also helps to diversify household income sources and reduce the effect of poverty through providing alternative sources for generating income and slowing rural-urban migration (Collier and Lal, 1986; Reardon et al., 1994; Islam, 1997; Gordon, 1999; Lanjouw and Lanjouw, 2001; Lanjouw and Feder, 2001; Gordon and Craig, 2001; Davis and Bezemer, 2004; World Bank, 2007). This implies that the non-farm sector contributes significantly to sustainable livelihoods and the wellbeing of rural populations.

The low agricultural productivity and high food purchase dependency implies that the sector is not generating sufficient returns for smallholders to meet their basic needs. The non-farm sector provides opportunities for income-generation for rural households in Zanzibar, with potential spill-over effects on employment in other sectors such as agriculture, manufacturing, services and tourism (MOFEA, 2007). An information gap on the non-farm sector raises the need to improve the understanding of the role of rural non-farm activities for improving policy support.

1.2 Introduction to the research problem

The Revolutionary Government of Zanzibar (RGoZ) recognises the importance of the non-farm sector in rural economic development and poverty reduction. This is reflected in government commitment to assisting the sector and it has been spelt out in the key government policy framework for combating poverty (eg. the Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP), MOFEA, 2007) in which various strategic interventions for promoting the non-farm sector are identified. This situation reflects government's departure from a previous narrow approach to agricultural development to a broader rural development agenda that promotes agricultural development as a way to reduce rural poverty, food insecurity and achieve sustainable economic growth in rural areas in both the farm and rural non-farm sectors.

Furthermore, government's attention to non-farm economic activities is as well reflected on its devotion to understanding the contribution of non-farm income in total household income in Household Budget Survey (HBS) of 2004/05 (OCGS,2005). The 2004/05 HBS was the first national survey to provide information on non-farm economic activities. From this survey, it was shown that about 24 per cent of rural labour force is employed in the non-farm sector, and represents about 31 per cent of total household income. However, information provided in this report was only confined on revealing the significance of non-farm economic activities in household economy rather than providing comprehensive information on the nature and structure of rural non-farm sector in Zanzibar. This situation point to the need for more research so as to fill information gap hence results to the availability of vital information to inform the decisions to promote the development non-farm sector.

1.3 Significance of the study

The 2004/05 Household Budget Survey is presently the latest study that provides data on non-farm economic activities in Zanzibar. Most rural development studies conducted in Zanzibar have concentrated primarily on agricultural production, food security, agricultural credit, and marketing. Experiences in other developing countries in Africa, Asia, and Latin America suggest that socio-economic factors and household characteristics determine the rural household participation in non-farm economic activities (Lanjouw and Lanjouw, 1995; Berdegue et al., 2001; de Janvry and Sadoulet, 2001; Lanjouw, 2001; Woldehanna and Oskam, 2001; Ellis and Mdoe, 2003).

Notwithstanding, available studies were confined mainly to analysing geographical and socio-economic variables. Likewise, a number of farm-related factors such as farm size, farm enterprises and level of farm income have not been adequately addressed in these studies, especially in the African studies, where farm-related factors are seldom included in the analysis, even though farming is a primary economic activity. Only a few studies conducted in Europe and Asia have taken farm factors into consideration in the analyses (Mishra and Goodwin, 1997).

In view of the above, therefore, the findings of this study could play an important role in filling the existing knowledge gap, providing information regarding the nature of rural

non-farm employment and the determinants of farm household participation in non-farm activities in Zanzibar. The findings could also be used in designing rural development interventions aimed at promoting attractive non-farm economic activities as effective pathways out of poverty, specifically for poor farm households.

1.4 Problem statement

This study set out to investigate what factors influence individual decisions to participate in non-farm activities? To answer this, the study investigated the following sub-problems:

Sub-problem one: Do individual characteristics motivate household heads' decisions to participate in non-farm economic activities?

Sub-problem two: Does family structure influence the likelihood of household head engagement in non-farm activities?

Sub-problem three: Do farm characteristics affect decisions to engage in non-farm activities?

1.5 Study scope and limits

The study focused on the household head only. The study used secondary data from the Agriculture Census of 2002/03 conducted by the Office of Chief Government Statistician (OCGS, 2003). The data used for the analysis in this study was not initially collected to explore the non-farm sector, but focused on agricultural issues. This limited the scope of factors explored. As the data was several years old, the outcomes may not reflect current conditions. No substantial research in the area of non-farm activities has been conducted in Zanzibar and this has led to scarcity of adequate reference materials for comparisons and examination of historical trends. However, the findings provide an essential baseline for further investigation in the area of non-farm sector in future analyses of census data.

1.6 Assumptions

This study relied on secondary data collected for the Agriculture Census conducted in 2003. The study assumes (given the sample methodology and considerable homogeneity

in culture and socio-economic characteristics of rural households in Zanzibar), that the sample was a fair representation of the rest of the population.

1.7 Organisation of the mini-dissertation

This mini-dissertation is organised into six chapters. The first chapter had introduced the research problem and explains the importance of the study. The second chapter provides a review of relevant literature related to the problem. Chapter three provides the methodology. A description of the study area and the sample are presented in Chapter 4. Chapter five presents the findings of the analysis of data and interpretations of results. Chapter six presents conclusions and recommendations based on the major findings of the study.

CHAPTER 2: REVIEW OF LITERATURE

This chapter reviews existing literature on non-farm activities and determinants of farm household participation in non-farm economic activities. The review is presented in six sections. The first section provides an overview of non-farm activities around the world. The second section presents role of non-farm activities in the rural household economy. This section highlights the impact of non-farm activities in sustaining rural livelihoods. Section three provides information on characteristics of non-farm activities, while section four reviews the determinants of involvement in non-farm activities. The fifth section provides the status of non-farm activities in Zanzibar, and the sixth section provides a synthesis.

2.1 Introduction

There is increasing evidence that non-farm economic activities are important components of rural livelihoods in Africa, Asia and Latin America. Several studies show the dependence of rural people on non-farm economic activities and have highlighted the importance of these activities in sustaining rural livelihoods (Hazell and Haggblade, 1993; Lanjouw and Lanjouw, 1995; Reardon et al., 2001; Barrett et al., 2001; Lanjouw and Shariff, 2004; Davis, 2004). Rural household participation in non-farm economic activities reflects the reality of necessary economic diversification as a potential pathway out of rural poverty (Davis, 2001; Davis, 2006; World Bank, 2007).

2.2 Overview of non-farm economic activities

Existing literature on rural livelihood diversification suggests that engaging in non-farm activities is the most commonly adopted livelihood strategy engaged in by the majority of rural households and individuals in developing countries regardless of their wealth, gender and geographical condition (Ellis, 1999; Hussein and Nelson, 1999; Niehof, 2004). This is so because of the sector's ability to accommodate both skilled and unskilled labour, increasing accessibility for various segments of rural populations (Hussein and Nelson, 1999; Ellis, 1999, World Bank, 2007).

Non-farm employment is broadly divided into two groups: wage employment and self-employment. Whereas wage employment is temporary, self-employed individuals seek more long-term livelihoods (Davis, 2006; Reardon et al., 2007). Non-farm self-

employment is reported as widespread among family-based and one or two person enterprises. However, this generates lower earnings than non-farm wage employment - a large contributor to rural non-farm income (Reardon et al., 2007). Findings from studies conducted in developing regions show that non-farm wage employment is more common in areas with better infrastructure and higher population density such as rural towns, while self-employment is more important in rural remote areas (Reardon, 1997; Haggblade, Hazell and Reardon, 2007; Reardon et al., 2007).

Many authors have acknowledged that there are two major motives for diversification - “pull diversification” and “push diversification” - into multiple economic activities, including non-farm economic activities (Islam, 1997; Keeney and O’Brien, 2000; Barrett et al, 2001; Gordon and Craig, 2001; Reardon et al., 2001; Reardon et al, 2007; Sharad, 2006). “Pull diversification” is adopted as a result of increases in resource endowment (such as land, livestock and savings), that provide households with resources to investment in productive non-farm economic activities that lead to asset accumulation or living standard improvement. Flexibility of resources through increased household resource endowments provide individuals with capability and options to engage in various high return non-farm economic activities (Barrett et al., 2001 Gordon and Craig, 2001; Davis and Bezemer, 2004). On the other hand, “push diversification” is adopted out of necessity - usually a response to shocks or a downward trend in the household economy (Ashely, Start, Slate, and Deshingkar, 2003). Significant studies have highlighted positive correlations between the adoption of push diversification and low resource endowments. Low resource endowments are entry barriers to higher return non-farm economic activities, as such the poor accessing low returns activities that provide capabilities for managing risk, coping with shocks, reducing poverty and preventing destitution (Cousins, 1998; Barrett et al., 2001, Gordon and Craig, 2001; Reardon et al., 2001; Carletto et al., 2007). These activities are, however, unlikely to provide reasonable livelihood outcomes to escape poverty (Barrett et al., 2001; Gordon and Craig, 2001; Davis and Bezemer, 2004).

Rural non-farm economic activities undergo different stages of development. In each development stage, activities respond to the structure and performance of rural economy. Reardon et al. (1998) described three stages of non-farm development. The first stage is

characterised as a traditional agricultural subsistence sector - the main “driver” of non-farm sector growth. In this stage, non-farm economic activities mainly operate as small home-based production activities, using labour-intensive traditional technologies that offer low returns; produce traditional non-traded goods sold to the local market; are highly seasonal and in which production fluctuates with availability of agricultural raw materials. The expansion of activities is restricted by low rural purchasing power and weak rural-urban links that restrict the movement of goods and services.

The second stage of rural non-farm sector development is associated with a modernising agricultural sector where agro-industries grow rapidly although farming remains important (Reardon et al., 1998). In this stage, the non-farm sector includes a wide range of activities such as production and services that are produced using modern production techniques and methods, and traded in urban and export markets. Growth of non-farm economic activities in this stage is driven by external and local markets, and that can, but are not necessarily linked to agriculture.

Stage three of rural non-farm sector development is characterised by a large share of the rural population being employed in non-farm sector; rapid agro-industrialisation and commercial agriculture; and increased rural-urban links that foster the emergence of advanced forms of business linkages between rural and urban, such as subcontracting arrangements and commuting labour.

The above description indicates that in the first stage of non-farm sector development, agriculture is a key aspect that fosters the emergence of non-farm economic activities. This suggests that a growing non-farm sector depends entirely on the performance of the agricultural sector. This observation correlates with a view of a number of authors that growing agricultural sector motivates rural household engagement in non-farm economic activities. Similarly, if the agriculture sector is stagnant, non-farm economic activities are undertaken to generate extra income as a means to smooth household consumption (Islam, 1997; Food and Agricultural Organization (FAO), 1998; Davis and Bezemer, 2004).

Furthermore, Reardon et al.'s (1998) description indicates that in the second and third stages of rural non-farm sector development, advanced technologies transform the structure of rural economies whereby the share of agriculture in the total rural labour force declines, although agricultural production continues to promote non-farm sector development through agro-industries (Hazell et al., 2007). From the above description, it is apparent that the growth of non-farm economic activities in these two stages is fueled by:

- increasing farm production and productivity resulting in increases in farm income and make resources available for investment in non-farm economic activities;
- raising labour productivity through a modernised agricultural sector that releases household labour to undertake non-farm economic activities; and
- rural-urban linkages that increase market access for the rural population i.e. trade between rural areas with larger urban centers expands and as well enables rural people to commute to work in other areas probably urban, where potential for engaging in high productivity non-farm economic activities are higher.

2.3 The role of non-farm economic activities in the household economy

Literature on the non-farm sector has shown that non-farm economic activities play different roles in the rural household economy (Corral and Reardon, 2001; Adams, 2002; World Bank, 2007). Non-farm economic activities employ a significant proportion of the rural labour force, especially in land-constrained areas. This has been demonstrated in Nicaragua by Corral and Reardon (2001) who showed that the landless earned 65 per cent of their income from non-farm sources, while small and medium farmers earned between 30 per cent and 10 per cent of their income from non-farm sources. This suggests that non-farm economic activities can provide a means for coping with the scarcity of agricultural resources such as land (Adams, 2002; World Bank, 2007).

When land (a key agricultural resource) is being used to the maximum, this resource can no longer sustain a growing population, and surplus human capital exists (Rief and Cochrane, 1990). Surplus human capital - as a result of scarcity of land - is commonly found in sub-Saharan Africa, North Africa, South Asia and Middle East where a wide gap exists between the actual numbers of people joining the rural labour force every year and the number of new jobs created in agricultural sector (World Bank, 2007). This gap

is expected to widen, given the fact that most developing countries have experienced rapid population growth that has caused a severe reduction of land under cultivation due to the expansion of human settlements. The non-farm sector, therefore, is a potential source of employment to the surplus rural labour, and may serve to encourage landless rural households to stay in rural areas and seek work in non-farm sector rather than migrating to urban areas (Rief and Cochrane, 1990; Adams, 2002).

Women's traditional roles such as child rearing, cooking, and household chores are among the limiting factors undermining their potential to undertake economic activities outside home - such as income generation activities and migration opportunities (World Bank, 2007). The emergence of non-farm economic activities has created opportunities for women to engage in economic activities and generate incomes. For example, in Sub-Saharan Africa, home-based cottage industries are commonly undertaken by women and dominated by activities such as beer brewing, fish processing, edible oil processing, pottery, rice husking, groundnut shelling, sale of prepared foods, and other small trading activities. These activities enable women to work from their homes, combining income generating activities with other household tasks such as cooking, caring for children and performing other household routines (Lanjouw and Lanjouw, 1995; Gordon and Craig, 2001). Such activities, despite being regarded as activities of low productivity, returns and quality, help empower women economically.

Non-farm economic activities have potential to reduce income uncertainty and improve the ability to cope with shocks through diversification of livelihoods and provide opportunities for undertaking various activities with differing degrees of risk, smoothing income and spreading risks across several activities (Delgado and Siamwalla, 1997; Gordon, 1999; Davis, 2001; Reardon et al., 2001). Reardon, Delgado and Matlon, (1992) found that in Burkina Faso, household capacity to cope with droughts was associated with the extent of engagement in non-farm employment.

The role of non-farm economic activities in promoting the growth of the rural economy and reducing poverty is well documented (Islam, 1984; Reardon, 1997; Gordon and Craig, 2001; Lanjouw and Lanjouw, 2001; Reardon et al., 2001). Literature suggests that non-farm economic activities play an important role in reducing extreme poverty and

helps the poor smooth inter and intra-year variations in incomes and reduces vulnerability to extreme poverty (Reardon, 1997; Gordon and Craig, 2001; Lanjouw and Lanjouw, 2001). However, there are disagreements among authors in empirical literature on the impact of non-farm income in poverty reduction, income inequality and income inconsistencies in developing regions. For example, studies conducted in Asia and Latin America indicate that non-farm income reduces rural poverty and contributes to greater equality, while empirical evidence in Africa suggests that non-farm income has a negative impact on rural income distribution as it mainly benefits large landowners (Reardon and Taylor, 1996; de Janvry et al., 2005 Lanjouw, 2001). This inconsistency justifies the need for further empirical investigation to shed light on how non-farm activities can reduce poverty and inequality.

Despite this inconsistency, the potential contribution of non-farm economic activities on reducing vulnerability to food insecurity and poor living conditions should not be undermined, especially where labour shortages exist in the agricultural sector. Lanjouw (2001) argues that even if income inequality increases as a result of incomes gained from non-farm economic activities, the possibility for the poor to avoid falling into destitution and consequently facing chronic food insecurity exists if these people are able to engage in non-farm economic activities. Similarly, Berdegue et al. (2001) note that levels of poverty for poor households could be worse in the absence of non-farm engagement. These arguments acknowledge the “safety net” role played by non-farm activities. However, the challenge is to increase access of the poor to highly productive non-farm activities to provide a path out of poverty and reduce vulnerability.

Non-farm activities have positive effects on maintaining household food security. Ruben and van den Berg (2001) found that in Honduras, wage employment for non-farm economic activities played an important role in enhancing food security for poorer rural households as income gained enabled rural household to buy food and farming inputs. Similarly, in missing credit markets non-farm earnings are crucial to overcoming constraints to accessing inputs such as fertilizer, equipment and seed (Reardon et al., 1999).

2.4 Characteristics of non-farm economic activities

Extensive theoretical and empirical studies have identified a number of factors used to describe characteristics of non-farm economic activities in the developing world. Factors like size of non-farm economic activities, composition and proportion of non-farm income in total household income are among the factors used to provide a distinctive overview of the non-farm economic activities in different contexts.

There are considerable variations across regions on the proportion of rural labour force employed in the non-farm sector and the share of household income coming from non-farm activities. However, available data indicates that non-farm employment and income shares are significant across developing regions, suggesting that non-farm activities are a fundamental way to increase household earnings and are intensifying as a strong alternative source of generating income (Haggblade et al., 2005; World Bank, 2007). By contrast, proportions of rural people employed in the non-farm sector and its contribution to household income across developing regions are as presented in Table 2.1

Table 2.1: Rural non-farm employment in developing regions

Region	% of rural population employed in non-farm sector	% of non-farm income share
Africa	11	42
Asia	24	32
Latin America	35	40

Source: Haggblade et al., 2005, page 151.

As shown in Table 2.1 above, the Africa region has a higher proportion of income from the non-farm sector relative to Asia and Latin America despite the fact that this is a small proportion of Africa's rural labour force. Reardon et al. (1998) argue that strong incentives to diversify could be among the reasons why non-farm economic activities in Africa contribute proportionally more to household income than other regions. This argument concurs with Lanjouw and Feder's (2001) statement that rural production systems are associated with low returns and higher risks that lead to rural households engaging in multiple activities to manage risk, cope with shocks and build resilience. Furthermore, Reardon et al. (2001) argue that the likelihood of a rural household in Africa earning income from multiple sources is higher than in other regions. This is consistent with Barrett and Reardon's (2000) observation in Côte d'Ivoire, Kenya and Rwanda, where the prevalence of rural households having more than one source of

income is 33 per cent, 94 per cent and 37 per cent respectively. There is no empirical evidence that critically disagrees or agrees with these arguments, providing strong justification for a more intensive study on this issue.

Notwithstanding the need for further investigation, it is worth pointing out that non-farm activities in Africa exist in a largely agricultural-based economy with low levels of technology, capitalization and returns (Start, 2001; World Bank, 2007). Farming in Africa is risky given the rain-fed nature of farming and the frequent occurrence of drought and floods. These shortcomings make investment in farming more risky relative to non-farm economic activities. As a result, strong incentives exist to invest in non-farm activities in Africa (Reardon, et al., 2001; World Bank, 2007).

The composition of non-farm economic activities is very heterogeneous, comprising of a wide range of activities of different scale, sector and spatial classification (Hazell et al., 2007). The scale of non-farm economic activities varies from small-scale, part-time self-employment in home-based cottage industries to large-scale firms operating at commercial levels. Small-scale non-farm economic activities are more commonly found in agriculture-based economies (i.e. Sub-Saharan Africa), and are commonly undertaken by the majority of rural labour force. The activities tend to fluctuate seasonally and the type of activity undertaken depends on the availability of agricultural raw material, household labour and resource endowments (Barrett et al., 2001; Haggblade et al., 2005).

Non-farm activities concentrate more on services and commerce. These generally account for 50 to 75 per cent of rural non-farm employment, while manufacturing accounts for about 20 to 25 per cent (Haggblade et al., 2005). A spatial classification non-farm activity is divided into two broad categories: home-based non-farm economic activities that mostly operate in rural and urban areas and, those activities practiced away from home, commonly in rural towns and urban areas (Barrett et al., 2001; Haggblade et al., 2005).

2.5 Determinants of participation in rural non-farm economic activities

Theoretical and empirical studies have highlighted various demographic and socio-economic factors influencing farm household participation in non-farm employment

(Huffman and Lange, 1989; Woldehanna et al., 2000; Goodwin and Mishra, 2004). These include household size, age, level of education, gender and location. In addition, farm characteristics also influence farm household participation in non-farm employment (Mishra and Goodwin, 1997; Chaplin et al., 2003).

Household size plays a significant role in influencing farm household participation in non-farm activities. An empirical investigation by Mishra and Goodwin (1997) has shown that a large family size increases the participation in non-farm activities. This finding relates to arguments by Woldehanna et al. (2000) and O' Brien and Hennessy (2006) that show that large family size increases the necessity to participate in non-farm economic activities to generate additional income to meet consumption needs.

Education forms the basis for acquisition of skills and knowledge necessary to pursue livelihood strategies that broaden employment opportunities for individuals and may enable households to be more aware of non-farm employment opportunities in their surroundings (Davis and Bezemer, 2004; Sharad, 2007). Education improves access to income employment opportunities and determines the category of employment individuals engage in. This is evidenced by a number of country-level studies, for example de Janvry and Sadoulet (2001), in a study of income strategies among rural household in Mexico showed that level of education has positive and significant effects on the tendency to participate in non-farm economic activities and influences participation in more lucrative activities. This is confirmed by several other similar studies (Berdegue et al., 2001; Corral and Reardon 2001; Lanjouw, 2001; Woldenhannaa and Oskam, 2001; Chaplin et al., 2003; Ellis and Mdoe, 2003).

Berdegue et al. (2001) present substantial detail concerning the effects of education by looking at the impact of these effects on different levels of economic development in Chile. Highly educated people in poorer zones tend to engage in low productivity non-farm activities compared to people of the same education levels residing in more developed areas. This indicates that in developed areas there are more opportunities for non-farm activities than in poorer areas. In areas where the economy is dynamic, higher levels of education increase the capability of the household and individuals to respond to the incentives offered.

Smith et al. (2001) disaggregated study findings by the type of non-farm activity and showed that low productivity non-farm activities are negatively correlated with levels of education. They reason that such a situation occurs because most low productivity non-farm activities require traditional skills that can be acquired through informal learning and do not necessarily require educational achievements. This line of reasoning suggests that education has little effect on participation in low productivity non-farm activities, and therefore, illiterate people who are poor would find it attractive to engage in non-farm activities since such activities have low entry barriers.

There are mixed results with regard to the influence of gender on the level of participation in non-farm activities. Lanjouw et al. (2001) and Smith et al. (2001) found that the engagement in the non-farm sector is higher for men than for women. Newman and Canagarajah (1999) found that increased participation of women in non-farm activities was often as a secondary activity, with agriculture being the primary economic activity. Studies by Hussein and Nelson (1999), Smith et al. (2001), Haggblade et al., (2005) and Hazell et al., 2007, report gender segregation by type of activities. Women are commonly involved in self-employment non-farm activities relative to men who tend to dominate wage employment and largely work in the manufacturing sector.

The common features characterising women's non-farm economic activities as put forward by a significant number of authors (Newman and Canagarajah, 1999; Hussein and Nelson 1999; Lanjouw et al., 2001; Smith et al., 2001), are that the majority of women work at home and undertake activities that require minimal capital investment and limited skills. Although there are no empirical comparative investigations on the impact of home-base non-farm activities versus outside employment on women's economic status, given the biological, social and cultural role assigned to women it may be assumed that home-based non-farm economic activities are an important employment opportunity for the majority of women who are normally occupied with household tasks and restricted in their freedom to find wage employment outside their homes.

Locations in which non-farm economic activities are undertaken play an important role in driving the participation in, and success of, non-farm activities. Kueper et al. (2006) in

their analysis of the role of non-farm employment in rural livelihoods covering seven countries in Africa and two in Asia, found that there is a positive correlation between involvement in non-farm activities and household location. Households located in remote rural areas were less likely to be employed in the non-farm sector than those close to urban areas. In a related study, Deichmann et al. (2008) found that in Bangladesh, proximity to large cities was an important determinant of non-farm income levels. These findings show that the likelihood of being engaged in high-return non-farm activities increases with proximity to markets. The empirical results stress the need to improve rural-urban linkages to stimulate the growth in high return wage and self-employment non-farm economic activities.

Household resource endowments (land, livestock, tools and equipment) play significant roles in determining the participation of rural households in non-farm activities. Sharad (2006) pointed out that the extent of participation in non-farm economic activities between landholding and landless households differ. Based on Sharad (2006), landholding households typically engage in non-farm activities as secondary employment, while rural landless households see non-farm activities as primary sources of income. Sharad (2006), concluded that limited access to land makes non-farm activities important sources of livelihoods and income for landless households and so play a significant role in reducing poverty for these households. This argument partly relates to Ellis's (1998) study, which presents mixed results regarding the importance of non-farm activities to rural landless households in Asia and Sub-Saharan Africa. Ellis's (1998) findings show that in Asia, a prevalent feature of rural poverty is landlessness, while in Sub-Saharan Africa this is not the case. Based on Ellis's (1998) findings, the reliance on non-farm income for rural landless households in Asia and Sub-Saharan Africa is 60 and 40 per cent respectively. These findings suggest that the effect of landholding on participation in non-farm activities is probably context specific.

Findings from China and Nicaragua in studies conducted by de Janvry, Sadoulet, and Zhu (2005) and Corral and Reardon (2001), show a negative correlation between non-farm economic activities and farm acreage. These analyses found that households with large farms are less likely to work off-farm. Corral and Reardon (2001) disaggregate their findings into wage employment and self employment non-farm activities and

showed that the share of non-farm income from wage employment decreases with increases in landholdings. Generally, these findings indicate that high landholdings do not influence household and individual decisions to participate in non-farm activities. However, these analyses do not give information on the size of land required for farming to be a viable enterprise on the area on which farm households can solely rely on agriculture for their livelihoods. Therefore, more studies need to be conducted in this area to classify landholdings according to the economic status.

2.6 The status of non-farm economic activities in Zanzibar

Participation in non-farm economic activities is one of the livelihood strategies among rural farming households of Zanzibar (OCGS, 2005). This is explained by the sector contribution to total household income, which in 2003, registered as 31 per cent as opposed to 21 per cent of rural household income which come from farming activities (OCGS, 2005). Despite this importance, little is known with regard to the status of non-farm economic activities in Zanzibar as the non-farm sector has not received much attention. However, the evidence of non-farm engagement among farm household livelihood portfolios suggests that the non-farm sector has a significant contribution in sustaining the livelihood of rural farming households in Zanzibar.

Existing literature elsewhere in the world has established context specific evidence of the importance of non-farm income in reducing poverty and sustaining rural farm household livelihoods. Generally, empirical findings have shown that non-farm economic activities have a positive influence on poverty alleviation and food security. There is currently not enough information to extrapolate the effects of non-farm income on poverty reduction in Zanzibar. However, existing information on livelihood patterns in Zanzibar can be extrapolated to provide the effects of non-farm income on food security.

Based on the findings from Household Economy Analysis-HEA, there are high food purchase dependencies across different livelihood patterns in Zanzibar (Ministry of Finance and Economic Affairs and World Food Programme, (MOFEA and WFP), 2003). Whilst most rural households in Zanzibar grow some proportion of their annual food requirements (35 to 60 per cent of household food consumption in rural areas), there is a heavy dependence on food purchases from local markets (MOFEA and WFP, 2003).

This could be an indication that without non-farm activities, the possibility of significant vulnerable to food insecurity exists.

2.7 Synthesis of the review and the relationship with the current study

Empirically, non-farm economic activities are very heterogeneous, comprising a wide range of activities that differ in terms of field of work, resource required and returns offers. Broadly, these activities are divided into two groups of occupation: wage employment and self-employment. The existing literature shows variations in the trends of non-farm activities across regions and at different stages of rural development, and points to the strong relationship between types of non-farm activities and the level of assets or resource endowments.

The reviewed literature emphasises the importance of non-farm activities in the rural household economy. Significant numbers of studies present evidence of the importance of non-farm activities in sustaining rural household livelihoods and reducing vulnerability to poverty. There is growing consensus among authors that engaging in non-farm activities is an attempt to manage risk, enhance livelihood security or to respond to new opportunities and generate wealth.

Generally, the studies reviewed above have shown that non-farm activities can be important sources of cash income, which can potentially reduce extreme poverty and help the poor smooth inter and intra-year variations in incomes and improve overall household livelihood security and wealth. The review has established that motives to participate in non-farm economic activities depend on social, economic and demographic influences. However, the extent to which these factors influence individuals to engage in non-farm activities is a context specific, i.e. it differs between countries and within a country. This suggests that findings from one area cannot be generalised. Therefore, given the existing information gap with regard to the non-farm sector in Zanzibar, the non-farm sector in the isles deserve an investigation to establish information on non-farm activities participation. Therefore, this study is aimed at investigating the determinants of participation in non-farm activities in rural Zanzibar.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter describes the methodological procedures employed in the study to answer the research questions. The chapter also provides a description of the procedures used for construction and specification of subset and variables included in the analysis. The description of methods and techniques used for data analysis and justification are also given.

3.2 Survey and data used for the empirical analysis

The data source used for this secondary analysis of data was the Agriculture Census of 2002/03, conducted by the office of Chief Government Statistician. The Agriculture Census provides essential baseline information on the state of agriculture in Zanzibar. Structured questionnaires were administered to generate the data. The survey covered data from the nine rural districts to collect data on agriculture and related aspects (see the outline of the questionnaire in the Appendix A). A sample for the Agriculture Census was extracted from the Zanzibar National Master Sample.

As shown in Table 3.1, the Agriculture Census covered a sample of 4,755 small scale households (the whole sample was used in the analysis of this study), consisting of 317 Enumerated Areas (EAs) which spread over nine rural districts of Zanzibar. A stratified two stage sample was established and the number of Enumerated Areas was selected at the first stage with a probability proportional to the number of households in each EA. At the second stage, 15 farming households were selected from each EA using systematic random sampling.

Table 3.1 Census Sample Size for the Agriculture Census (2003)

Description	Number
Households	4,755
Enumerated Areas	317
District	9
Regions	5

Source: OCGS, 2003.

3.3 Design of the current study and construction of subset

3.3.1 Design of the study

This study used secondary data from the national Agriculture Census of 2002/03, conducted by the office of Chief Government Statistician. Further analysis of the secondary data has opened the opportunity to answer research questions not posed in the original study (Kiecolt and Nathan, 1985) enabling the generation of new information that had not been produced in the original study. The use of secondary data also allows for systematic investigation of the effects of different variables that are focused in this study against the participation in non-farm activities.

3.3.2 Construction of subset

This study used selected information from the Agriculture Census of 2002/03. From the original Agriculture Census dataset, required information was extracted to construct a sub-dataset with the household head of the farming household as the unit of analysis. To avoid bias, the whole Agriculture Census sample which comprised 4,755 household heads was used in the analysis. The variables included in this study are elaborated in more details in the following section.

The study analyses individuals who were heads of households engaging in non-farm activities. A binary or dummy dependent variable was created with two possibilities of individual participation in farm and non-farm activities. Non-farm participation was defined as participation by the head of a household in non-farm activities as primary or secondary income activities. Participation in farm activities was defined in this study as participation of individuals in farming as their only activity with no secondary or additional activities.

Table 3.2 below provides the description of variables for non-farm participation. The independent variables in this study were the determinants of non-farm participation. Three groups of independent variables were included in this study. First, individual characteristics (gender, age in years and the level of education) represented commonly known influences on engagement in non-farm economic activities. In this study, if the gender of individual is male, GENDER=1 and if individual is female, GENDER=0. The variable predicted parameter was expected to have negative regression sign to indicate

that females were less likely to participate in non-farm activities than males. Age was a demographic characteristic of individual household head in years. This variable was expected to have a negative sign to indicate the decline of the tendency to participate in non-farm activities with age. The level of education was represented as the last grade completed at school and represented human capital endowments. It was expected that increases in individual levels of education will increase the tendency to participate in non-farm activities. Therefore, the positive sign of regression coefficient was expected.

Second, household structure was represented as household size, i.e. the number of individuals who lived in a household. It was expected that larger household size would increase the propensity to participate in non-farm activities. Having a large number of people living in the same household means that more resources are required to sustain basic needs and the labor endowment of the household is larger than the absorptive capacity of the farm. Consequently, the likelihood to participate in non-farm activities should increase. With this assumption, the variable household size was expected to have a positive impact on the likelihood of household head participating in non-farm activities. Therefore, a positive regression coefficient was expected for this variable.

Last, farm characteristics were included as landholding size (size of the farm land in hectares (ha) under customary law or title deed accessed through borrowing or rent from others), size of land area planted (in ha) to cultivate crops, and the main source of household income. Land is an important physical farm asset. The size of land or farm owned or accessed by the household heads could, therefore, be taken as a reflection of the relative wealth of the owner. It was assumed that access to small farm size increases the likelihood to participate in non-farm activities. A negative regression coefficient was expected. Large land areas under crops were likely to mean lower engagement in non-farm activities. Therefore, a negative regression coefficient was expected to indicate the decline of the tendency to participate in non-farm activities as a size of land areas under cultivation increased.

The type of primary economic activity in which household head engaged (i.e. the type of activity in which household undertakes regularly) was considered to have an impact on the level of household resources and, consequently, on the decision to engage into

multiple livelihood activities. Depending on agriculture as the main economic activity was assumed more likely correlated with a higher level of engagement in non-farm activities. A positive regression coefficient was expected to indicate the increase of the tendency to participate in more than one non-farm activity as the dependency on farming as a main source of income increased.

Table 3.2: Description of variables for the analysis of participation in non-farm economic activities

Variables	Definition	Expected sign
Dependent		
Non-farm activities	(Binary) Participation in non-farm economic activities Yes = 1; No = 0	
Independent:		
Individual characteristics		
Gender	(Dummy) Gender of individual household member Male = 1; Female = 0	-
Age	Age of the individual household member (in years)	+
Education level	Level of education	+
Family structures		
Household size	Household size (number of household members)	+
Farm characteristics		
Farm size	Size of landholding (in hectares)	-
Planted area	Size of land area under crops (in hectares)	-
Main activity	type of main economic activity	+

3.4 Methods of data analysis

3.4.1 Descriptive statistics

Statistical Package for Social Scientists (SPSS) computer software version 12 was used to analyse the data. To augment the regression analysis, descriptive statistics such as frequencies and percentages were generated. This analysis was used to study the status and structure of participation in non-farm activities in rural Zanzibar by farm household heads.

3.4.2 Binary logistic model

A binary logistic model using cumulative normal function and relying on maximum likelihood in estimation was employed to identify the factors influencing individuals from farm households to participate in non-farm activities. This model was selected because of its suitability for the analysis of a dummy response variable. Moreover, the

choice of the model was based on the assumption that the disturbance (error) component of the response follows a binomial distribution and the logistic distribution of the error term (Liao, 1994). When errors of the linear regression are normally distributed, data can be replicated to apply maximum likelihood estimation. Furthermore, logistic regression can be used to determine the attributes of those who participate in non-farm activities and, in this case, the results generated through logistic regression can also be used to predict the future of the non-farm activities. The estimated empirical logistic regression model is specified in equation (1). The explanatory variables are as described in Table 3.3.

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1\text{GENDER} + \beta_2\text{AGE} + \beta_3\text{EDUCLEVEL} + \beta_4\text{HHSIZE} + \beta_5\text{FARMSIZE} + \beta_6\text{PLANTEDAREA} + \beta_7\text{MAINACTIVITY} + \epsilon$$

Table 3.3: Specification of variables included in the logit model for participation in non-farm economic activities

Variables	Explanation
$\ln\left(\frac{p}{1-p}\right)$	Household head participation in non-farm economic activities (Dummy)
GENDER	Gender of the household head (Dummy)
AGE	Age of household head (in years)
EDUCLEVEL	Number of years of completed education
HHSIZE	Family size or total household members
FARMSIZE	Size of the farm land owned by household head (hectares)
PLANTEDAREA	Size of the farm cultivated by household head (hectares)
MAINACTIVITY	Type of main economic activity
β_i	Vector of parameters to be estimated
ϵ	Error term

The next chapter (chapter 4) reports demographic characteristics of the sample drawn from the national sample to help the reader understand the context of the study. This chapter will be followed by Chapter 5 which presents the results and discussion of the analysis of the secondary data employed in this study.

CHAPTER 4: CHARACTERISTICS OF THE STUDY AREA AND THE SAMPLE

4.1 Introduction

This chapter presents the background information on the location, geographical features, population and household characteristics of the study area. The chapter also provides clarification on the socio-economic activities of the population studied by highlighting the profile of farming activities in the study area.

4.2 The study location

The study was conducted on the island of Zanzibar and included nine rural districts. Zanzibar is a semi-autonomous state within the United Republic of Tanzania, comprised of two main islands – Unguja and Pemba. The two islands are located about 40 and 60 kilometers off the east coast of mainland Tanzania, respectively (refer to figure 4.1). The total land area of Zanzibar is 2,643 km² (Unguja 1,658 km² and Pemba 985 km²).

Zanzibar's climate is characterised as tropical lowland and humid. The mean maximum annual temperature is 23.5⁰C and 21⁰C for Unguja and Pemba, respectively. The average total rainfall received in Zanzibar is about 1700 mm per annum, distributed in two main rainy seasons: the long rain season or Masika (March - June) and the short rain season or Vuli (October- December).

Zanzibar comprises two major agro-ecological zones, namely the plantation zone which is the most fertile area in both islands and accounts for 53.9 per cent of the total land area, and the coral rag zone which is marginal and occupies 12.7 per cent of the total land area (Ministry of Agriculture and Livestock, 1982). These zones have different characteristics in terms of soils, farming systems, resources and socio economic patterns. About 64 per cent of the land is predominantly used for agriculture in Pemba compared to 40 per cent of the land area in Unguja (Ministry of Agriculture and Livestock, 1982).

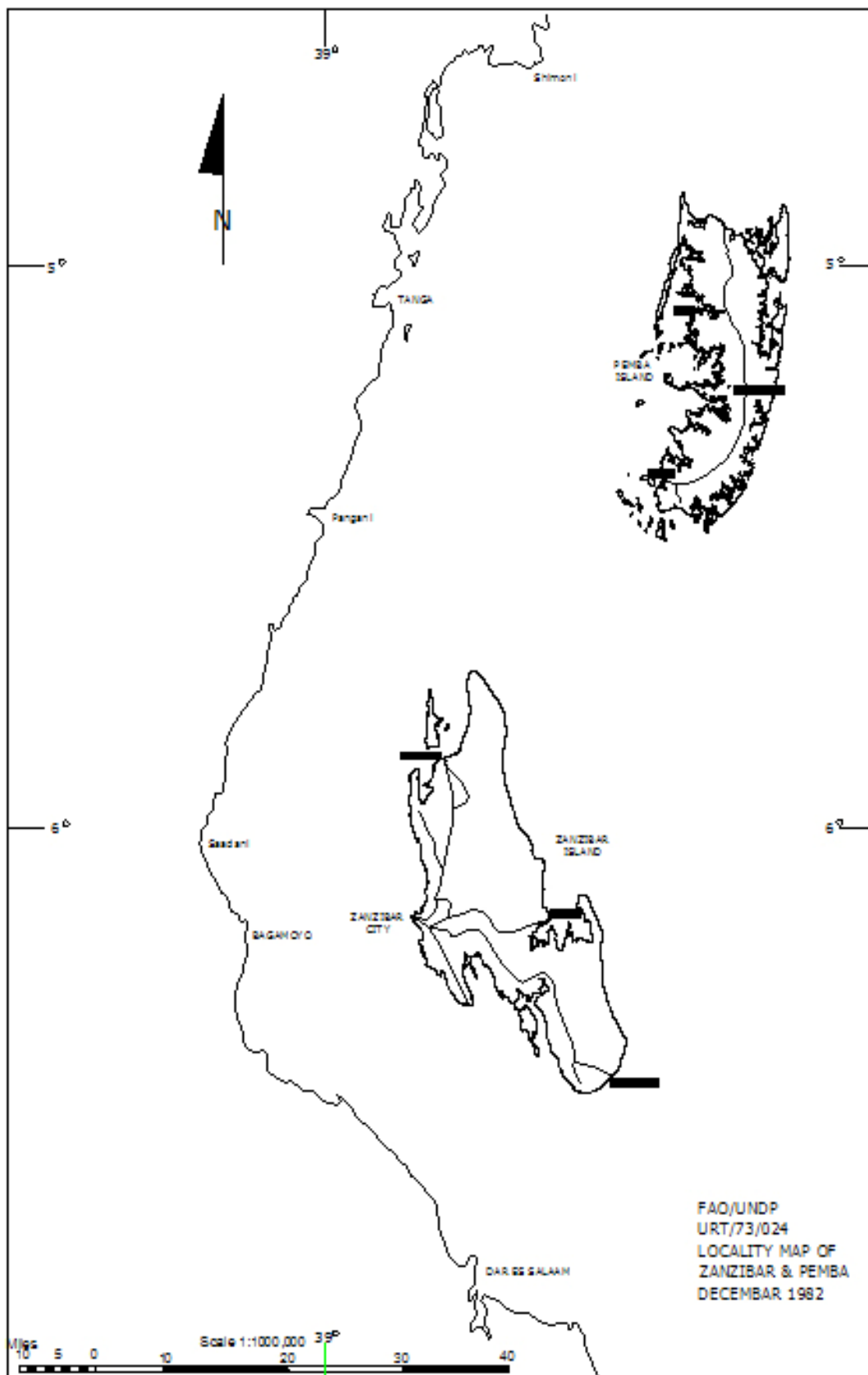


Figure 4.1: Location of Zanzibar

Source: Ministry of Agriculture and Livestock, 1982: page 10.

Administratively, Zanzibar is divided into five regions; three in Unguja (Urban and West; South Unguja; and North Unguja) and two in Pemba (South Pemba and North Pemba). Each region is divided into two districts, totaling ten districts for the whole of Zanzibar. Districts are subdivided further into Shehia, and each district contains a number of Shehia. The Shehia is the lowest official administration unit in the country and each Shehia consists of a number of villages and households.

Based on the 2002 National Population Census, Zanzibar had a population of 984,625 people, of whom 49 per cent are male and 51 per cent female (OCGS, 2002). In 2002, the population growth rate was estimated at 3.1 per cent per annum. Population density per square kilometer is around 400 persons, making Zanzibar the most densely populated part of East Africa in comparison with Tanzania Mainland (30 persons per km²) and Kenya (54 persons per km²). However, the population is not evenly distributed. Unguja Island (with 63 per cent of the total land area), accommodates 60 per cent of the population. The Pemba population is much more evenly distributed compared to Unguja and is relatively more rural.

4.3 Demographic and socio-economic characteristics of the sampled households

Table 4.1 below presents the distribution of sampled population (which comprised 4755 households) by demographic and socio-economic characteristics. About 50.7 per cent of sampled household heads were female and the remaining 49.3 per cent were male. On average, household size in the study area (which is rural) is 5.31 members. This size is slightly below the urban and national average of 5.94 and 5.54 members, respectively. However, the majority of the households in the study area (70.9 per cent) have bigger household sizes i.e. above the national average, while 29.1 per cent have smaller household sizes. Regarding the level of education attained by household heads, almost 64 per cent can read and write in at least one language as a result of participating in adult education programmes. Moreover, in the study sample, 36.2 per cent of household heads reported no formal education. Of the previously mentioned study sample, 20.2 per cent attended primary education, 6.1 per cent attended secondary education and 9.9 per cent attended post-secondary education.

Table 4.1: Demographic characteristics of sampled households in Zanzibar in 2003 (n= 4755)

	Frequency	Per centage of sampled population
Gender		
Female	2411	50.7
Male	2344	49.3
Household size		
Larger family size ¹	3369	70.9
Smaller family size ²	1386	29.1
Level of education		
At least adult education	3037	63.9
Primary school education	960	20.2
Attended vocational training	372	7.8
Secondary school education	288	6.1
Attended college education	98	2.1

¹ the household size is above the national average household size of 5.54

² the household size is below the national average household size of 5.54

Source: OCGS, 2003.

The average farm size was 1.2 hectares. The majority of respondents (66.6 per cent) had farm size of less than 1.0 ha; 33 per cent of the sampled households were found to own farms which ranged in size from 1 to 3 ha, while the remaining 0.4 per cent had between 4 ha and over 5 ha (Table 4.2). The proportion of farm households in the sample who owned the land was 81 per cent while 19 per cent rented in land. However, a significant difference was evident regarding the status of land ownership by gender of the household heads. For those who owned land, men constituted 61 per cent as compared to 39.1 per cent of women. Similarly, those who rented land were all women (100%) and men never rent.

The highest proportion of sampled population (68 per cent) cultivated less than one hectare annually while 28.1 per cent cultivated between one and 1.5 ha. Only 3.9 per cent cultivated more than 1.5 ha. The study found that as the size of land area planted increased, the proportion of female farmers decreased. This indicated that women had limited access to larger tracts of land. However, the data cannot substantiate the reasons why women have limited access to land.

Table 4.2: Household land holding and type of ownership in Zanzibar in 2003 (n= 4755)

	Total number of respondents	Percentage	Percentage of male-headed households	Percentage of female-headed households
Land holding				
Less than 1 ha	3166	66.6	48.5	51.5
1 to 3 ha	1570	33.0	50.7	49.3
4 to 5 ha	12	0.3	58.3	41.7
Above 5 ha	7	0.1	100	
Type of land ownership				
Owned land*	3850	81.0	60.9	39.1
Borrowed land	905	19.0		100
Size of land area planted				
Less than 1 ha	3235	68.0	40	60
1 to 1.5 ha	1334	28.1	71	29
Above 1.5 ha	186	3.9	91	9

* land ownership is described as having legal permission to occupy the land

Source: OCGS, 2003.

Farming activities in the sampled area were characterised by mixed farming - crop production and livestock keeping. Crop production was predominantly smallholder subsistence farming using traditional technology. About 93 per cent of the total planted area was cultivated using hand tools. The most commonly grown crops were cassava, rice, sweet potatoes, bananas, plantains, yams and vegetables. Crop production fell into two categories: production of fruits and vegetables for household consumption (where surpluses may be sold) and crops primarily cultivated for household consumption and very little was sold. Cash crop production typically included cloves, hot chilies and an assortment of spices.

The majority of farmers in Zanzibar do not use improved agro-inputs despite major efforts by the government aimed at developing efficient and effective technologies to improve farm productivity (OCGS, 2003). This could be due to the higher costs associated with the adoption of improved agricultural inputs. In table 4.3, it is clear that only 23 per cent of the sampled household heads used fertilizers and that only three per cent used pesticides. Similarly, there was low use of improved seed varieties and limited access to credit. The proportion of households using improved seed varieties and having access to credit in 2003 were 22 and 0.2 per cent, respectively.

Table 4.3: Use of different agro-inputs by sampled households in Zanzibar in 2003

Type of agro-inputs	Percentage of farmers (n = 4755)
Households using improved seed varieties	24
Households using fertilizers	23
Households using non plough/ ox for soil preparation	6
Households growing irrigated crops	6
Households using herbicides	3
Households using pesticides	3
Households receiving credit	0.2
Households using fungicides	0.1

Source: OCGS, 2003.

Rain-fed agriculture is predominant in Zanzibar. Only three per cent of the total area planted is under irrigation, of which about 60 per cent is used to produce vegetables and rice. Wells and piped water are the main sources of water for irrigation. Manual distribution is the most common means of field application (OCGS, 2003).

Livestock keeping is an important economic activity in Zanzibar. The main types of livestock raised were cattle, goats and poultry that account for 71 per cent, 26 per cent and 69 per cent of agricultural households engaged in livestock keeping, respectively. Animal production was generally characterised by low inputs and low productivity. Zanzibar is not self-sufficient in either milk or animal products (OCGS, 2003). Indigenous livestock species were dominant and accounted for 95 per cent of cattle, 99.5 per cent of goat and 89 per cent of chicken stocks. There is interest in increasing livestock production and productivity. However, development of the livestock industry is constrained by climatic and ecological conditions as Zanzibar does not have large semi-arid areas naturally suited to grazing and competes with land required for expanding human settlements (OCGS, 2003). Fodder shortages and disease outbreaks are also major constraints to the livestock industry in Zanzibar (OCGS, 2003).

CHAPTER 5: RESULTS AND DISCUSSIONS

5.1 Participation in non-farm activities in Zanzibar

The study found that all sampled household heads participate in non-farm activities, despite being involved in farming as a primary activity. The study identified eight non-farm occupational categories in which household heads were engaged. These categories were fishing (including seaweed farming and selling of fish); wage employment (rural workers employed in non-farm sector); beekeeping; charcoal making; tree logging for poles; tree logging for timber; tree logging for firewood; and petty trade. Within these categories of non-farm employment, the study results showed that household heads simultaneously participated in more than one occupation, but to varying degrees.

As shown in table 5.1 below, 70 per cent of sampled household heads participated in more than 50 per cent of the listed non-farm activities. More female respondents participated more than 50 per cent of the listed non-farm activities (83.5 per cent) relative to male respondents (57.4). These results indicated that a significant proportion of rural farming household heads in Zanzibar had a diversified livelihood portfolio and were not exclusively dependent on agriculture. Moreover, the results suggested that diversifying into non-farm employment was an important livelihood strategy for women than for men.

Table 5.1: Status of participation in non-farm activities by gender of the respondents in Zanzibar in 2003 (n=4755)

Level of participation	Male household heads		Female household heads		Total	
	No.	Percentage within gender of the respondent	No.	Percentage within gender of the respondent	No.	Percentage out of total sampled population
Low participation ¹	998	42.6	397	16.5	1395	29.3
Medium participation ²	1346	57.4	2014	83.5	3360	70.7
Higher participation ³	0	0	0	0	0	0
Total	2344	100	2411	100	4755	100

Notes:

¹Individual undertake less than four activities

²Individual undertake between four and six activities

³Individual undertake seven to eight activities

Participation across the non-farm activities was fairly even but showed a specialisation between male and female respondents. Male household members dominated activities such as tree logging for timber and charcoal, while female household members dominated activities such as tree logging for firewood, wage employment and petty trade. From these results, it is clear that females were more focused on activities that somehow gave them a chance to work in or close to their home surroundings (e.g. selling of firewood and petty trade). This result is supported by the studies conducted by Canagarajah, 1999; Hussein and Nelson, 1999; Lanjouw *et al.*, 2001; Smith *et al.*, 2001). Men dominated activities that are more physical in nature (e.g. tree logging for timber and charcoal).

With regard to the types of non-farm employment (wage vs self-employment), the fact that only 15.6 per cent of the respondents identified wage employment as the main non-farm engagement pointed to the predominance of non-farm self-employment as a type of non-farm occupation in rural Zanzibar.

Table 5.2: Distribution of main non-farm economic activities conducted by sector and gender in Zanzibar in 2003 (n= 4755)

Type of work	Total number of respondents	Percentage	Percentage of male-headed households	Percentage of female-headed households
Tree logging for poles	541	11.4	57.4	42.6
Tree logging for firewood	638	13.4	16.9	83.1
Tree logging for timber	423	8.9	100	0
Tree logging for charcoal	690	14.5	68.9	31.1
Beekeeping	426	9.0	48.1	51.9
Wage employment	744	15.6	25.0	75.0
Petty trade	791	16.6	30.7	69.3
Fishing (including seaweed farming)	502	10.6	78.2	21.8
Total	4755	100		

Based on the results from the analysis, it became evident that a substantial number of non-farm activities were linked to the use of natural resources in a sense that these activities were dependent on the harvesting of forest resources. Forty-eight per cent of respondents were engaging in tree logging related activities.

The cross tabulation outputs presented in table 5.3 shows a positive relationship between the tendency to undertake forest-related nonfarm activities and land holding size. The results showed that farmers who held between one and three hectares of land were more likely to undertake forest-related nonfarm activities relative than those who held more than three hectares of land.

Table 5.3: Distribution of respondents undertaking forest related activities by size of land holding in Zanzibar in 2003 (n=2292)

Size of land holding (ha)	Tree logging for firewood	Tree logging for poles	Tree logging for timber	Tree logging for charcoal
Less than 1 ha	66	65	63	65
1 to 3 ha	34	34.5	36.2	34.6
4 to 5 ha	0	0.5	0.3	0.4
Above 5 ha	0	0	0.5	0
Total	638	541	423	690

Generally, these results confirm the extent to which rural livelihoods are linked to natural resources. The existence of forest-related non-farm activities points to weak compatibility or synergy among the identified activities. For example, activities like beekeeping that depends on the robustness of forest resources is not compatible with tree logging-related activities that deplete and compete for forest resources. If the decision to undertake forest-related activities is sustained, additional use of forest resources induced by higher logging-related activities may lead to over-utilisation of forest resources. This will not only affect sustainability of forest resources, but will also negatively impact on the income earning potential for a significant number of rural people and reflects weak enforcement of existing laws and regulation related to the use of natural resources in Zanzibar.

Analysis of the main sources of income for the sampled population (as shown in table 5.4) showed that selling of food crops was the main source of income for respondents. Fifty-one per cent of respondents identified selling of agricultural products (crops and livestock) as the main source of household income. Other sources of income such as cash remittance and business income were less important given that only a few respondents identified them as the main source of income. These results indicate that despite the fact that rural livelihoods in Zanzibar are diversified, agriculture remains the

key source of income in rural Zanzibar. This could indicate that non-farm activities in Zanzibar play an important complementary or supplementary role to agricultural income. However, the secondary data used for the analysis did not contain information on the level of household income came from non-farm economic activities. Therefore, with this limitation it became impossible to analyse the effect of non-farm economic activities on increasing household income levels.

Table 5.4: Household heads main source of income in rural Zanzibar in 2003 (n=4755)

Activity	Frequency	Percentage
Sales of food crops	1057	22.2
Wage employment	891	18.7
Sales of forest products	756	15.9
Fishing	704	14.8
Sales of cash crops	479	10.1
Cash remittance	459	9.6
Business income	250	5.3
Sales of livestock and livestock products	159	3.4
Total	4755	100

5.2 Regression analysis

5.2.1 Regression model and variables for non-farm economic activities participation

The data used did not give information on the economic reasons that motivate rural household heads to participate in non-farm economic activities. It is unclear whether rural people in Zanzibar are engaging in non-farm economic activities as a result of being motivated by pull factors (where non-farm activities are undertaken merely for asset accumulation or to improve living standard) or push factors (whereby diversification to non-farm activities is adopted out of necessity as a response to shocks or downward trends in household economy as suggested by, for instance (Ashely et al., 2003). Therefore, more studies need to be conducted in these areas to better understand farmers' incentives to engage in non-farm economic activities and the effects of these activities on household economy.

However, from the descriptive statistics elaborated above, it became evident that significant proportions (80 per cent) of farm household heads in Zanzibar participate in non-farm activities. This situation indicated the presence of factors that influence farm

household heads to simultaneously engage in more than one sector. Regression analysis was used to determine the effect of independent variables on the decision to participate in non-farm activities.

The participation in non-farm economic activities was the dependent variable while the explanatory or independent variables were gender (GENDER), age of respondent (AGE), level of education (EDUCLEVEL), household size (HHSIZE), size of landholding (FARMSIZE), size of land area under crops (PLANTEDAREA) and type of main economic activity (MAINACTIVITY). The logistic regression results are summarised in table 5.4.

According to table 5.5, the model rightly predicted the response variables in about 73 per cent of the cases. The results in Table 5.5 show that out of seven variables, four had a significant influence on the decision of household heads to participate in non-farm activities. These are gender (GENDER), age (AGE), household size (HHSIZE) and type of main economic activity (MAINACTIVITY). The variables whose coefficients were non statistically significant were size of landholding (FARMSIZE), size of land area under crops (PLANTEDAREA) and level of education (EDUCLEVEL).

Three groups of determinants were used as predictors as shown in the logit model presented in Chapter 3. These are individual characteristics, family structure and farm characteristics. The results above show that individual characteristics strongly affect household heads' decisions to participate in non-farm economic activities followed by family structure. However, education level is not significant. Farm characteristics have shown weak influence on the decision of household heads to participate in non-farm economic activities. The results will be discussed further below.

Table 5.5: The regression results for participation in non-farm economic activities in rural Zanzibar in 2003 (n=4755)

Variable	Coefficient	Standardized Error	Wald Beta	df	Significance
CONSTANT	-44.80	1187.540	0.001	1	0.000
<i>Individual Characteristics</i>					
GENDER	3.607	0.344	110.239	1	0.000***
AGE	-0.156	0.010	61.395	1	0.000***
EDUCLEVEL	20.607	437.962	0.002	1	0.962 ^{NS}
<i>Family structure</i>					
HHSIZE	3.100	0.214	209.721	1	0.000***
<i>Farm Characteristics</i>					
FARMSIZE	20.343	1103.829	0.000	1	0.985 ^{NS}
PLANTEDAREA	-0.127	0.274	0.216	1	0.642 ^{NS}
MAINACTIVITY	0.161	0.054	8.931	1	0.003***
-2 Log likelihood value		1507.866			
Cox & Snell R Square		0.429			
Per cent correctly predicted		73.4%			
Note:					
R-square: 73.4%					
***= Significant at 1%					
NS = Not significant					

5.2.2 Individual characteristics and their impact on participation in non-farm economic activities

Three variables were used to represent individual characteristics of the household heads. These were gender, age and level of education of the respondents. Generally, the influence of individual characteristics on the likelihood of participation in non-farm activities was in line with expectations and the results from similar studies.

The logit regression result suggested that gender was an important determinant of non-farm participation. The coefficient of GENDER was positive and statistically significant at the probability level of $p \leq 0.001$. The positive sign of the coefficient suggests that women were more likely to participate in non-farm activities than men.

The results may reflect gender inequality in the ownership of resources such as land and landholding size relative to farm profitability. Figure 5.1 shows that a significant proportion of women respondents had limited land access, working small, borrowed

plots. Customary agreements, under which women often exist, dictate that the borrower is only allowed to cultivate annual crops, limiting engagement in cash crops (mostly biannual or perennial crops such as coconut trees, cloves, some spices and fruits with higher demand and prices in local and international markets). All male respondents reported farming perennial crops, compared to 62 per cent of female respondents. Combined with the limited use of improved agricultural inputs and low productivity (see section 4.3), women's smaller plots are likely to have been less productive and profitable and may explain the comparatively higher level of female participation in non-farm activities. Engaging in non-farm activities could have been a strategy to generate extra income to purchase food to satisfy household needs.

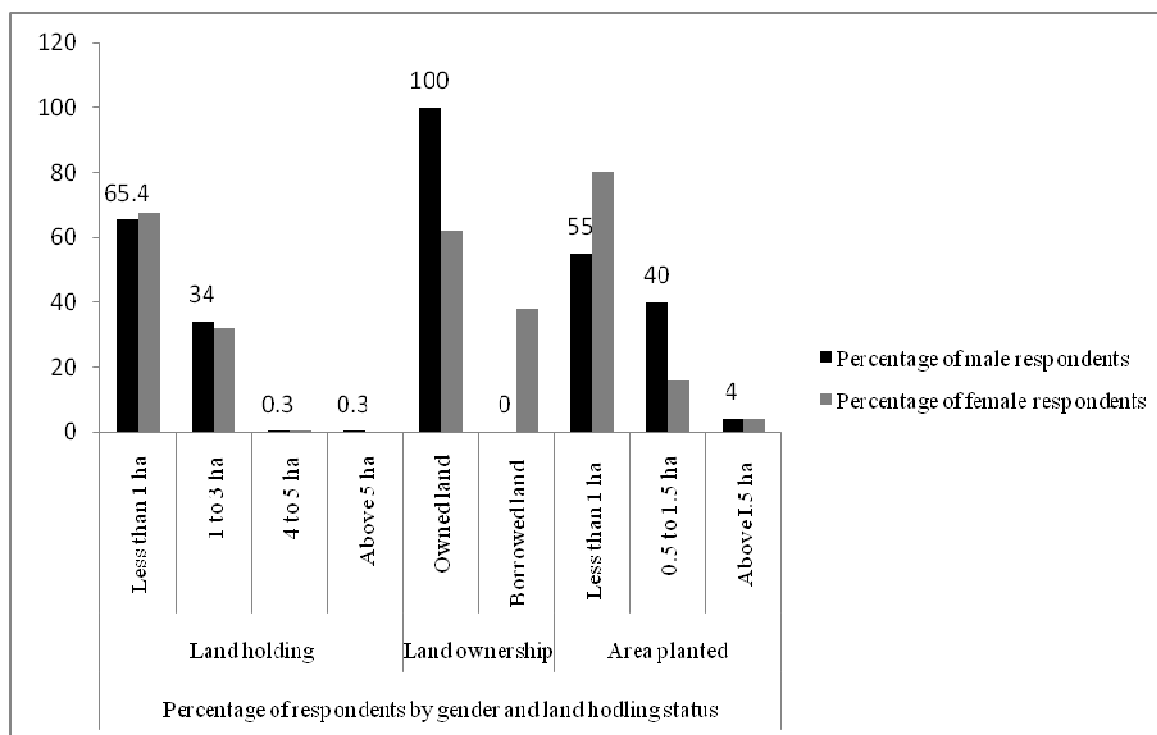


Figure 5.1: Distribution of land ownership by gender of the respondents in Zanzibar in 2003

The coefficient AGE produced a negative sign and was statistically significant at the $p \leq 0.001$ level of probability. This finding indicates that age had an influence on household heads' decisions to participate in non-farm activities. Cross tabulations (table 5.6) showed that the majority of household heads who participated in non-farm activities were between 35 and 60 years - the most economically active age group. The negative sign suggests that individual participation in non-farm activities declined as age increased i.e.

as individuals got older, the probability of participation in non-farm activities declined. This result could be expected.

A significant proportion of respondents had large households (i.e. above the national average 5.54 members) and undertook more than four listed non-farm activities simultaneously. This finding seems logical, given family and kinship systems in Zanzibar whereby a household typically consists of extended families. A larger household would need more income or resources. This could necessitate engagement in non-farm economic activities.

Table 5.6: Age attributes of household heads who participate in non-farm activities relative to household size in Zanzibar in 2003 (n= 4755)

Age of respondent (years)	Total number of respondents	Percentage of respondents by household size		Percentage of respondents by the level of participation in non-farm economic activities	
		Smaller family size	Larger family size	Low participation	Higher participation
Younger than 35	1253	25.1	74.9	16.9	83.1
Between 35 and 45	1484	26.8	73.2	14.6	85.4
Between 46 and 60	1040	26.4	73.6	15.8	84.2
Over 60	978	73.5	26.5	82	18
Total	4755				

The reason for lower participation in some activities by older household heads may have been related to the nature of the activities. Some activities were very laborious and required physical capability and skills (i.e. the person involved has to be strong and active). Older people were less involved in tree logging related activities relative to younger individuals. More older people engaged in petty trade.

The coefficient of education (EDUCLEVEL) had a positive but statistically non-significant effect on participation in non-farm activities. This result may have implied that education was not an influencing factor, but as the result was not significant, this cannot be established. Cross tabulation (table 5.7), showed a negative relationship between education level and the number of non-farm economic activities engaged in simultaneously – mostly at least four activities.

Table 5.7: Participation in non-farm economic activities by level of education in Zanzibar in 2003 (n= 4755)

Education level	No. of respondents	Percentage of total population	Low participation		Medium participation		Total (%)
			No. of respondents	%	No. of respondents	%	
At least adult education	3037	63.9	968	32.0	2069	68.0	100
Primary education	960	20.2	102	11.0	858	89.0	100
Secondary education	288	6.1	68	24.0	220	76.0	100
Post secondary education	470	9.9	257	54.7	213	45.3	100
Total	4755	100	1395		3360		

No specific trends in the activities engaged in compared to levels of education (figure 5.2). All sampled household heads undertook almost all the listed activities. The results suggest that education did not pose an entry barrier to non-farm economic activities in rural Zanzibar. Therefore, rural farm household heads (regardless of the level of education) have equal opportunity to participate in the activities of their choice. However, the result suggests that education is likely to have different effects to different non-farm economic activities. This evidenced by the result presented in figure 5.2, which the higher tendency of highly educated responded in participating in non-farm economic activities compared to the less educated.

The findings were not expected, given that similar studies (de Janvry and Sadoulet (2001); Berdegue et al., 2001; Corral and Reardon 2001; Lanjouw, 2001; and Woldenhannaa and Oskam, 2001), showed that education played a significant role in determining the category of employment individuals engage in and educated that people are more likely to engage in higher return activities.

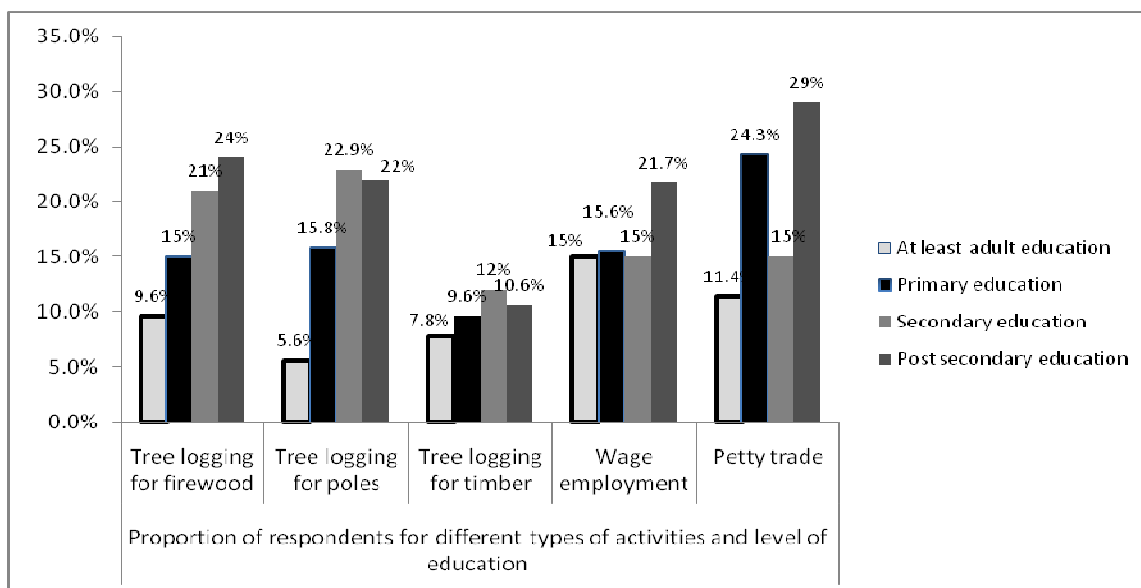


Figure 5.2: Distribution of individuals with different levels of education and tendency to participate in main non-farm economic activities for selected non-farm activities in Zanzibar in 2003

5.2.3 The effects of family structure on participation in non-farm economic activities

The effect of household structure on the probability of participation in non-farm activities was consistent with expectations and the results of other studies (Mishra and Goodwin, 1997; Woldehanna et al., 2000; O'Brien and Hennessy, 2006). The coefficient for household size (HHSIZE) had a positive effect and was statistically significant. Cross tabulation (table 5.8) showed that as household size increased, the level of participation (i.e. individuals undertake more than four activities simultaneously) increased. This indicated that larger household size increased the likelihood of participation in non-farm activities and the probability of engaging in multiple activities.

The share of household income from non-farm activities was not known from the available data. However, the possible explanation from this result is that larger family size has relatively higher consumption needs, supporting the notion that participation in non-farm activities could be a strategy that enables household heads to increase the financial capacity to sustain family basic needs.

Table 5.8: Participation in non-farm activities by household size in Zanzibar in 2003 (n= 4755)

Household size	Total no. of respondents	Percentage of total population	Low participation ¹		Higher participation ²		Total (%)
			No. of respondents	%	No. of respondents	%	
1 to 3 persons	532	11.2	194	36.5	338	63.5	100
4 to 5 persons	2620	55.0	652	24.9	1968	75.1	100
6 to 8 persons	1598	33.6	549	34.4	1049	65.6	100
More than 10 persons	5	0.2	0	0	5	100	100
Total	4755	100					

Notes

¹Individuals who undertake less than four activities

²Individuals who undertake between four and six activities

5.2.4 The effects of farm characteristics on participation in non-farm economic activities

The coefficient for landholding size (FARMSIZE) had a positive but statistically non-significant effect on participation in non-farm activities. This was confirmed through cross tabulation (table 5.9).

Table 5.9: Participation in non-farm economic activities by size of land holding in Zanzibar in 2003 (n= 4755)

Land holding status of respondent	No. of respondents	Percentage of total population	Low participation		Higher participation		Total (%)
			No. of respondents	%	No. of respondents	%	
Less than 1 ha	3166	66.6	937	29.6	2229	70.4	100
1 to 3 ha	1570	33.0	455	29.0	1115	71.0	100
4 to 5 ha	12	0.3	2	16.7	10	83.3	100
More than 5 ha	7	0.1	1	14.3	6	85.7	100
Total	4755	100	1395		3360		

These results could partly be explained by the fact that (table 5.10), the majority of the respondents (66.6 per cent) had access to less than one hectare of land. The land fragmentation and ownership structure in Zanzibar does not readily provide opportunities to increase landholdings (OCGS, 2003). Therefore, the majority of farming activities are confined to small farms that are not economically viable, compounded by the limitations and insecurities of customary tenure. As such, non-farm economic activities become a possible option for farm households to increase their earnings.

Table 5.10: Size of landholding with respect to land ownership status in Zanzibar in 2003 (n= 4755)

Size of land holding	Total no. of respondents	(% of total respondents	Land ownership status			
			No. of respondents who own land	%	No. of respondents who borrow land	%
Less than 1 ha	3166	66.6	2768	87.4	398	12.6
1 to 3 ha	1570	33.3	1077	68.6	493	31.4
4 to 5 ha	12	0.3	4	33.3	8	66.7
Above 5 ha	7	0.1	1	14.3	6	85.7
Total	4755	100				

The land area under cropping (PLANTEDAREA) was not significant but negatively related to the probability of participation in non-farm activities, suggesting no influence on decisions to participate in non-farm activities in Zanzibar. This may be due to the high risk associated with agriculture as an enterprise. Zanzibar's agriculture is traditional characterized by higher dependency of rain-fed production system, and limited use of improved agricultural inputs. This situation indicates that the probability for smallholder farmers to produce sufficient amount of food is not only influenced by the size of land cultivated, rather it depends on factors beyond the farmer's control (such as drought and outbreak of pests and diseases). Therefore, farmers may opt to undertake non-farm activities to mitigate risk and diversify livelihoods.

The coefficient for the main economic activity of the household (MAINACTIVITY) was positive and statistically significant, implying that the type of activity in which the household head engaged as the main economic activity had a positive effect on their decision to participate in non-farm activities. The results confirm *a priori* expectations. Cross tabulation (figure 5.3) showed that activities like petty trade, wage employment, sales of agricultural products and fishing had a positive influence on the decision to undertake more than one activity simultaneously. Eighty per cent of respondents who engaged in at least four activities sold agricultural products and fished. Respondents who sold forest products were likely to engage in fewer other activities.

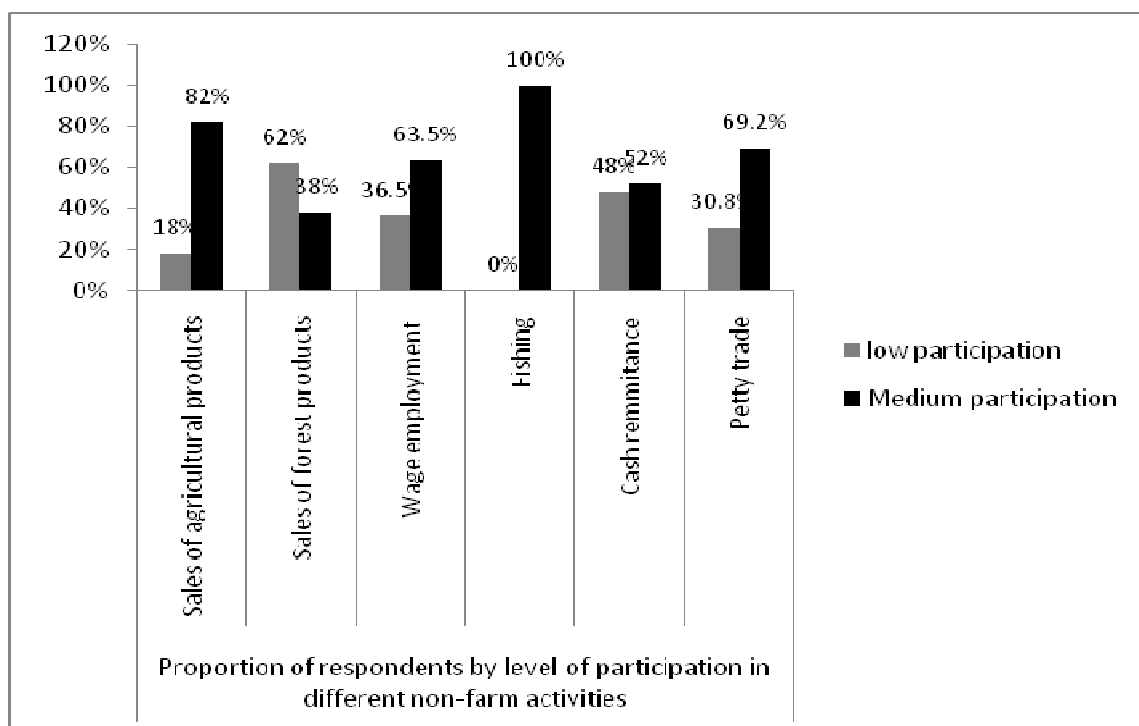


Figure 5.3: Status of participation in non-farm activities by the type of main economic in Zanzibar in 2003 activities.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the conclusions and recommendations based on the major findings of the study. The main purpose of this study was to analyse the determinants of participation in non-farm economic activities in rural Zanzibar. Secondary data from the Agriculture Census conducted by the OCGS during the period of 2002/03 were used to construct sub-dataset used for the analysis. Data from a total of 4755 smallholder household heads were included.

The study explored three sub-problems. The first sub-problem explored the effects of individual characteristics on motivating household head participation in non-farm economic activities. Three variables were used in this analysis: age, gender and level of education. The second sub-problem explored the effects of family structure on the likelihood of participation in non-farm economic activities using household size. The third sub-problem explored the of farm characteristics on the decision to participate in non-farm economic activities. Three variables were used to represent farm characteristics: farm size, planted area and type of main economic activity. Descriptive statistics were used to explore the status of participation in non-farm economic activities and a logistic model was used to test the effects of variables on the decision of household heads to participate in non-farm activities.

The study results showed that all sampled household heads participated in non-farm economic activities. Age, gender, household size, and income source were found to be the key determinants of participation in non-farm economic activities in rural Zanzibar. The results showed that women are more likely to participate in non-farm activities and engagement decreases with age. Household heads of larger households were also more likely to engage in non-farm activities. Furthermore, the type of main economic activity which the household relies on also is evident to have effect on the decision to participate in non-farm economic activities. Activities such as petty trade, wage employment, sales of agricultural products and fishing had a positive influence on the decision to undertake more than one activity simultaneously. Eighty per cent of respondents who engaged in at least four activities sold agricultural products and fished. Respondents who sold forest products were likely to engage in fewer other activities.

The analysis demonstrated that non-farm occupational categories in which household heads engaged were fishing (including seaweed farming and selling of fish); wage employment (rural workers employed in non-farm sector); beekeeping; charcoal making; tree logging for poles; tree logging for timber; tree logging for firewood; and petty trade. Seventy per cent of the sampled household heads were engaged in more than four identified non-farm economic activities simultaneously. These findings suggest that non-farm employment is a common feature of rural households in Zanzibar.

Male household members dominated activities such as tree logging for timber and charcoal, while female household members seemed to dominate activities such as tree logging for firewood, wage employment and petty trade. Similarly, participation in agriculture, fishing and petty trade increased the likelihood of non-farm engagement.

A strong relationship was found between non-farm economic activities and the use of forest resources. A significant proportion of the reported non-farm economic activities (five out of eight) were linked to the use of forest resources. This raises a significant concern given that 48 per cent of respondents depended on forest-based non-farm economic activities as their main economic activity. There was also a positive relationship between land holding size and participation in forest-based non-farm activities. Household heads with less than three hectares of land were more likely to engage in forest-based non-farm activities than household head with larger landholdings.

6.1 Conclusions

The study found that all household heads in the sample participated in non-farm economic activities, but that age, gender, household size, and the main household income source were key determinants of the nature and extent of participation in non-farm economic activities in rural Zanzibar. More younger and female household heads participated in non-farm activities. Larger household sizes and households drawing on agriculture as a main economic activity were more likely to engage extensively in non-farm economic activities. While landholding size was not significantly related to participation in non-farm economic activities, customary practices meant women often worked on borrowed land and had smaller plot sizes, growing seasonal crops.

These results suggest that non-farm economic activities provide rural households in Zanzibar with an opportunity to manage household food security, reducing vulnerability to food insecurity and improve living conditions. Income from the non-farm sector is likely to enable rural households to increase their purchasing power, enabling increased expenditure on food and consequently increasing access to food.

Non-farm income clearly provided much needed supplementary income to agricultural income (especially for women and large households), ensuring food security and mitigating future shocks through livelihood diversification (both between farm and non-farm sectors as well as providing diversification within the non-farm sector). As data on income levels and profitability of the various activities in both sectors were not available, it is not known if such diversification was due to low productivity (a known factor in Zanzibar's agriculture) and profitability or due to deliberate diversification to mitigate risk. It is possible that individual activities were not lucrative enough to provide the necessary income. This is evident in the case of household heads who engaged in the sale of forest products, whose non-farm mix was considerably lower than for heads relying on other non-farm activities as the main economic activity. Household heads with smaller landholdings were also more likely to rely on forest-based non-farm economic activities, suggesting that small farms were less profitable and unable to meet the food security needs of households.

However, this raises a concern over the sustainability of natural resources and the livelihoods that depend on them. The regulation and enforcement of regulations to protect forest resources are clearly needed, but any restriction on access to these resources would affect the viability of forest-based livelihoods. A delicate balance exists.

6.2 Recommendations

These results revealed promotion of non-farm economic activities are critical element for reduction of poverty and fighting food insecurity in rural Zanzibar. However, it should be noted that the nonfarm sector in the Isles faces the problem of higher dependence on forest resources. The dependency on forest resources not only placing formidable pressure on sustainability of these resources but also undermines the sustainability of

related activities. Therefore, promotion of non-farm activities should be designed with special consideration of reducing the dependency of forest resources as a basis for non-farm economic activities. In particular, such interventions should be primarily focused on exploring the options for improving farm productivity or non-forest activities. Such interventions should go hand in hand with capacity building programmes specifically focused on building technical and managerial skills necessary to rural people, to enable them realize their potential and effectively undertake new types of activities. Provision of credit schemes by the government to stimulate investment in non-farm sector is deemed necessary in order to provide rural people with access to capital investment to start sustainable, competitive and high return non-farm economic activities.

To address low productivity and profitability of small farms and reliance on unsustainable forest-based non-farm activities, government should take actions to facilitate the transition of agricultural sector from a traditional agricultural system (based on rudimentary technology, locally grown seeds, rain-fed dependency and traditional knowledge) to a modern agricultural system (based on improved seeds, tractors, irrigated water and technical assistance), strongly supported by an extension support system to foster farm and non-farm enterprise development.

Given the key role of women in food security and household well being, specific policy and programmes that are particularly aimed at empowering women economically are required. This should include interventions towards increasing women's access to larger plots and land tenure security to maximise production. Similarly, provision of skills training and special credits schemes that address particular financial needs of women are necessary to encourage the undertaking of technical and higher return activities.

6.3 Recommendations for future research

This study has shed light on the determinants of farm household participation in, and characteristics of, rural non-farm activities in rural Zanzibar. To deepen the understanding and provide valuable evidence-based decision-making support, time series data are necessary. This is possible through revision of the section of the census and other related surveys and a commitment to monitoring these elements. Future research should also focus on deepening the understanding of the effect of land tenure and use (as

a factor of production) on gender disparity. For example, it was found that women were more likely to cultivate annual food crops rather than perennial cash crops. Understanding such dynamics would inform programme and policy design.

The available data did not permit full exploration of the economic impact of non-farm activities on the livelihoods of rural household heads in Zanzibar. Information on the level of income generated from each activity would add considerable value to understanding the impact of such activities on rural livelihoods and so help identify the most profitable enterprises to promote and develop. Similarly, information on the motive behind participation in non-farm economic activities (are people influenced to participate in non-farm activities by pull factors i.e. for asset accumulation or improving the living standard; or by push factor i.e. non-farm activities undertaken out of necessity as a response to shocks or managing risk) would also deepen the understanding of non-farm engagement.

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Appendix A

Outline of questionnaire for the agricultural census of 2003 (Selected information for the analysis)

1. Household information (location, name of head of the household and gender).
2. Information of household members (gender, level of education).
3. Status of land ownership.
4. Land utilisation
5. Ownership of other resources
6. Information on farming activities (land under cultivation)
7. Information on post harvest issues
8. Crop protection issues
9. Marketing issues
10. Investment in agriculture
11. Information on access to inputs.
12. Household economic activities (main farming activities, source of income).
13. Information on non-farm activities.