DRIVING FORCES OF OFF-FARM INCOME GENERATING ACTIVITIES IN RURAL TANZANIA:

HOW ACCESSIBLE ARE THEY TO POOR HOUSEHOLDS?

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ABSTRACT

This paper focuses on the driving forces of off-farm income-generating activities and the extent to which such forces are accessible to poor households in rural Tanzania. The paper makes use of the utility maximisation theory in which a farmer's decision to offer labour to off-farm employment depends on the utility derived from such employment. Our results show that the decision to pursue off-farm employment is the result of push factors related to the lower incomes from the farm sector. Poor households have relatively higher incentives to offer labour to off-farm employment to complement low farm incomes. However, barriers to entry remain an obstacle to off-farm employments because such employment requires capital up front.

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1.0 INTRODUCTION

The traditional image of rural households in developing countries almost always presents farming and/or animal husbandry as the main economic activities. The image shows few or no rural off-farm activities. This remains true even today. Policy debates also tend to equate rural incomes with on-farm earnings and rural/urban relations with farm/non-farm relations. Industry ministries thus focus more on urban-centred industries and ministries of agriculture tend to focus on rural farming activities. Little attention is paid to off-farm activities in rural settings, even among agriculturalists.

Nevertheless, there is mounting evidence that off-farm income (that is, income obtained through wage-paying activities, self-employment in trade, handicraft, or provision of other services, or even working on other people's farms) is an important resource for farming and other rural households, including the landless poor as well as residents of small towns close to rural areas.[1] Evidence in Africa shows, for example, that the rural non-agricultural economy is sizable and growing. Surveying about 100 farm-household survey-based studies from the 1970s to the 1990s, Reardon et al. (1998) find an average non-farm income share of 42 percent in Africa, followed by 40 percent in Latin America and 32 percent in Asia. However, they point out that the non-farm sector includes a range of activities that are far from homogeneous. Because of the sector's great heterogeneity, policies for a given country must be founded on detailed analysis of the sector in that specific country.

In Tanzania, Ellis (1999) provides a review of the large-scale sample survey evidence on the significance of the non-farm sector in rural Tanzania. While the author acknowledges problems in measuring non-farm income, the results show that non-monetised incomes remain quite important, suggesting that the transition out of subsistence agriculture is far from complete but also that non-farm income shares are fairly low and there is no clear evidence of a marked expansion of these shares over time. Other recent studies, however, give a different story. When studying non-agricultural earnings in peri-urban areas of Tanzania, Lanjouw et al., (2001) find that non-farm income shares rise sharply and monotonically with quintiles defined in per capita income terms. The recent Household Budget Survey (HBS) of 2007 shows also that rural income appears to be increasingly dependent on off-farm sources relative to on-farm sources. For instance, there has been a decline in the proportion of income from on-farm sources from 60 percent in 2000/2001 to 50 percent in 2007

[1] Note that off-farm income includes income earnings from activities outside the farm as well as employment on someone else's farm. On the other hand, non-farm income includes only income earnings from activities outside farm activities. This means that non-farm income is a component of off-farm income.

(NBS, 2009). There are also other signs of increasing non-farm activities in rural areas: 56 percent of food expenditure in rural areas is from purchasing rather than own production.2 Furthermore, overall some 45 percent of rural dwellers reported owning a business in 2007 compared to 40 percent in 2000/2001 (NBS, 2009).

While these studies have examined the presence (or absence) and magnitude of non-farm income in rural Tanzania, they have not considered what determine their presence as well as their potential for increasing income among the poor. This paper redresses part of that knowledge gap by attempting to answer two main questions: first, what are the driving forces of off-farm income-generating activities in rural Tanzania; and second, how accessible are these forces to poor households, particularly the landless and other marginalised social groups?

In dealing with the first question, the paper seeks to quantify determinants of household decisions to participate in off-farm employment. The argument put forward here is that, while farming is the economic mainstay in rural areas, diversification is an important strategy for reducing risk, especially in developing countries where agriculture is vulnerable to weather. While diversification is a risk-reduction mechanism, different social groups diversify off-farm activities differently, implying that they have different incentives for diversifying. In answering the second question, the paper builds on the first by analysing the extent to which the driving forces are accessible to relatively poor households. If it is found that households with relatively lower incomes have relatively more incentive to pursue off-farm activities and that the conditions for entry are difficult to meet, this may partly explain the current low speed of poverty reduction among rural households in Tanzania. If this is the case, then the paper will justify government interventions in promoting off-farm economic activities in rural areas through targeted programmes that help poor households and other marginalised groups participate.

[2] This evidence challenges Ellis, F. (1999), whose findings suggested that the economy was predominantly subsistence with no evidence of change in the near future.

2.0 DYNAMICS OF FARM/OFF-FARM ACTIVITIES IN RURAL TANZANIA

As is the case with other developing countries, farming in Tanzania continues to dominate the working hours of the majority of its rural citizens. A recent survey indicates that three-quarters of the adults in rural areas depend on farming (NBS, 2009). While farming remains the biggest single employer in rural Tanzania, its relative importance has been declining over time. This trend is partly explained by the way in which it is practiced, which is characterised by small-holding cultivation, use of hand tools, and reliance on traditional, rain-fed cropping methods and animal husbandry (URT, 2012). Also, the poor financial status of small-scale farmers is one of the major constraints on agricultural production in Tanzania (NBS, 2005). As a result, farm activities do not provide sustainable livelihoods for a growing number of poor people in rural Tanzania. In addition to farming activities, rural farm households have thus tended to engage in off-farm income-generating activities to supplement their incomes (Mung'ong'o, 2000; URT, 2004). In the decade since 2000, for example, the percentage of households that reported engaging in non-farm income-generating activities increased from 38 percent in 2000/1 to 43 percent in 2007. In rural Tanzania, these households increased from 26 percent to 28 percent during the same period (Table 1).

Table 1: Distribution of main activities of adults by geographical area (HBS 2000/01 and 2007)

Activity	Dar es Salaam		Other Urban areas		Rural areas		Mainland Tanzania	
	2000/1	2007	2000/1	2007	2000/1	2007	2000/1	2007
Farm	3.0	3.1	26.1	27.6	74.1	72.5	61.8	57.3
Non-farm	97.0	96.9	73.9	72.4	25.9	27.5	38.2	42.7
Total	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***

Note: for individuals age 15 to 60

Source: NBS, 2009

In line with the decreased relative importance of farming activities in rural areas is the increase in the households reported to depend on trade for their livelihood. It is reported that households depending on business in general increased from 42 percent in 2000/1 to 48 percent in 2007. Statistics show that in rural areas, the households dependent on trade increased in the same period from 40 percent to 45

percent (NBS, 2009).[3] Off-farm income-generating activities in rural Tanzania have recently provided an important source of capital and help finance social services that the households consume. In his study on survival and accumulation strategies at the rural-urban interface in North-West Tanzania, Baker (1995) observed that while agriculture was a vital element in village economies, the majority (83 percent) of households were also increasingly dependent on a variety of other income-generating activities for survival and wealth accumulation. Other studies point out that such income in rural areas has proved useful in accessing key social services like education and health and in societal customary practices such as paying bride price as well as buying food (Jambiya, 1998; Mwamfupe, 1998; and Mung'ong'o, 2000). In developing countries, it has also been shown that income from rural off-farm activities enables poor households to overcome credit and risk constraints on agricultural innovation (Ellis, 1998).

Despite the apparent importance of off-farm economic activities to rural households in both social and economic terms, there is a lack of policy, financial, and promotional support from the government. Because of broad sectoral diversity, from farm input supply to agro-processing, manufacturing, transport, construction, wholesale, retail commerce, and personal services, no line ministry holds clear responsibility for rural off-farm sector activities (World Bank, 2007). It is also important to note that off-farm economic activities have no specific authority responsible for promoting them because of their diversity and a lack of understanding of their dynamics. As a result, the rural off-farm sector in Tanzania has largely remained independent of government, donor, and NGO professional support for enhancement. Administratively, no single agency assumes responsibility for the welfare and growth of the rural off-farm sector. The resulting lack of understanding leads to little or no discussion at all on off-farm economic activities among decision makers and development practitioners interested in rural development at a policy level. This limited understanding may imply that currently rural off-farm economic activities do not yield their potential benefits to participating rural households.

[3] In rural areas, households still practice farming even when they engage in off-farm economic activities. In that case, these statistics represent the shift in importance of income from farm to off-farm incomes but do not indicate that people completely neglect farming activities.

3.0 MOTIVES TO DIVERSIFY TO OFF-FARM ECONOMIC ACTIVITIES

Rural farm households' motives to diversify to off-farm activities differ significantly across settings and income groups. Generally, the motivation to diversify can be grouped into two categories, namely, push and pull factors (See Evans and Ngau, 1991; Davies, 1993; Francis and Hoddinot, 1993; Webb and Von Braun, 1994; Reardon, 1997; Bryceson and Jamal, 1997; Reardon et al., 1998; Ellis, 2000; Ellis and Freeman, 2004; Senadza, 2011).

Under pull factors, farming households are driven to diversify for reasons that have to do with accumulation. The pull factors include higher payoffs or lower risk to rural off-farm activities than those on farms (given risk preferences). Many studies at a national or regional level show returns to off-farm activities well above returns to farming (Barrett et al., 2001; Reardon et al., 2006; Senadza, 2011). The returns to off-farm activities are highest nearest towns and in more favourable agricultural zones where effective demand is high. These create consumption and production linkages with the off-farm sector and drive up demand for off-farm goods and services. Increased economic activity results in higher demand for labour and rising wage rates. All these factors contribute to stimulating the emergence of high-return rural off-farm activities. The cotton zones of the southern Sahel, the green revolution in Punjab, the fruit-producing zone of Central Chile, and the coffee zones of southern Brazil have all witnessed eras of agriculture-led growth in their rural off-farm economies (Reardon et al., 2001).

Under push factors, farming households normally undertake diversification to manage risk, cope with shock, or escape from agriculture in stagnation or in secular decline. Households are pushed into off-farm activities by factors which can be "idiosyncratic" (related to a single household or group of households) or "common" to all households in a zone or region (Dercon, 2002). Moreover, as Alderman and Paxson (1994) note, there is a fundamental bifurcation of strategies to deal with risk and shocks in income. On the one hand, households pursue "risk management strategies" that involve choosing income diversification strategies that permit income smoothing over time, with the poor choosing to diversify incomes *ex ante*, into activities that have a low positive covariance with the returns to agriculture, and "income skewing", which is choice of activities with low risk (even if they have low returns). On the other hand, households pursue "risk-coping strategies" that involve precautionary savings and asset management, involvement in informal and formal insurance arrangements, and diversifying income *post facto* (after a shock such as a drought). Reardon et al. (2006) shows that a drop in income from farming may be seasonal, thus pushing households into off-farm activities to smooth income and

consumption inter-seasonally, or it may be transitory (in a given year), say from a drought, which forces farmers to need to cope *ex post*. Drops in farming income may also be permanent (inter-year), or farming income may be chronically insufficient, say from physical factors such as environmental degradation, chronic rainfall deficit, and disease (Chase, 1997; Tacoli and Satterthwaite, 2003), or market/policy factors (Bryceson and Jamal, 1997). Finally, farm households may be pushed to off-farm activity where there is strong variation (risk) in farm income (say due to rainfall instability), driving them to engage in off-farm activities with lower risk (even if they have low returns) or with returns that do not vary with farming outcomes (see Reardon et al*.*, 1992, 1998)

Although rural households tend to turn to off-farm activities to meet their needs and offset income shortfalls, participation appears to be constrained by capital assets – human, social, financial, and physical. In their study of off-farm employment participation in Honduras, Ruben and Van den Berg (2001) show that educated and wealthier households take advantage of their human and physical capital by participating more in off-farm activities. In addition, in their study of off-farm employment in Columbia, Deininger and Olinto (2001) show that investment in a single income source is the most beneficial to capital-constrained households with limited education or other human capital. The limitations from low access to credit and lack of education are also highlighted by Escobal's (2001) study of income diversification in Peru. Constraints on physical and human capital are also found to be important in the choice of off-farm activities in many developing countries. Haggblade et al. (2009) argue that poor men and women dominate low-return activities, such as small-scale trading and unskilled wage labour in construction, pottering, and many personal services. Wage labour, in both agriculture and non-farm businesses, also accrues primarily to the poor. In contrast, white-collar jobs in areas such as medicine, teaching, accounting, and administration figure most prominently among higher-income households. Similarly, Lanjouw et al. (2007) show that human and physical capital (education, wealth) have influence in determining access to non-farm occupations. Further, direct contribution of the non-farm sector to poverty reduction is possibly quite muted, as the poor lack assets (Seebens, 2009).

What seems to be the conclusion of the above studies is that, while reliance on off-farm income is quite common among rural households, it is wealthier (and land-owning) households that tend to have easy access to attractive and high-return off-farm activities. Poor households, on the other hand, face significant entry barriers to these high-return activities, causing the off-farm sector to have little or no poverty impact but rather increasing inequality with respect to rural income distribution (see also Barrett et al., 2001). However, other studies argue differently in terms of benefit incidence of off-farm income between the poor and wealthier rural households by

emphasising that very poor households may be pushed into non-farm activities, especially if they are landless and cannot access work in agriculture (Canagarajah et al., 2001). Thus off-farm income may not necessarily have a positive linear correlation with wealth status but rather a U-like pattern may emerge in the distribution of non-farm income whereby the very poor (and landless) and the wealthy (land-rich) receive proportionately more of their total income from off-farm sources. For instance, Barrett and Reardon (2000) find this relationship in Cote d'Ivoire, although the income received by the land-poor came predominantly from unskilled off-farm activities (agricultural wage- and low-skill non-agricultural wage- and self-employment), while the land-rich derived off-farm income from trades and skilled employment.

The inconclusive findings on the benefit incidence of off-farm gains to rural incomes among different social groups provide impetus to examine the off-farm sector in different country contexts (Canagarajah et al., 2001). Adams (2001), for instance, investigates the impact of different sources of income on poverty and inequality in rural Egypt and Jordan. He finds that while off-farm income reduces poverty and improves income distribution in Egypt, in Jordan off-farm income goes mainly to the rich and thus tends to increase rural income inequality. Adams attributes the different findings to land. In Egypt, land is highly productive, but the poor lack access to land and are thus "pushed" to work in the off-farm sector. However, in Jordan, land is not very productive and so the rich are "pulled" by more attractive rates of returns from the non-farm sector, whose entry requires capital that poor households lack.

4.0 REGIONAL SHARE AND NATURE OF OFF-FARM INCOME

Literature provides ample evidence that rural households in developing countries receive quite a significant proportion of their income from off-farm activities. In a review of surveys on rural households conducted between the mid-1970s and the late 1990s, Reardon et al. (1998) show that non-farm income (which is just part of off-farm income) contributes an average of 42 percent (in Africa), 40 percent (in Latin America), and 32 percent (in Asia) to total household income.[4] In terms of the general trend, most of these surveys reported moderate to rapid growth in the share of off-farm in total income over the past two decades. In China, for instance, in 1981 only 15 percent of rural income was sourced from off-farm economic activities, compared to 32 percent in 1995 (de Brauw et al. 2008). In Bangladesh, 42 percent of rural income came from the rural non-farm sector in 1987, and by 2000, the share was 54 percent (Hossain, 2004). Similarly, Africa experiences increasing share of income from off-farm sources. Senadza (2011) reports that non-farm income as a share of total household income in rural Ghana increased from 35 percent in 1998 to 41 percent in 2006. In Botswana, the share of off-farm income in total household income increased from 54 percent in 1984/85 to 77 percent in 1985/86 (Valentine, 1993). Clearly, integrated farm/off-farm households are a common sight across the developing world, and the trend is steep, especially as rural areas become more integrated with urban areas.

While the incidence is high and the trend is steep, the nature of rural off-farm activities in the developing world differs significantly between regions and sub-regions (Lanjouw and Lanjouw, 2001; Lanjouw et al., 2007). The pattern in the level and composition suggests that the regions of Africa and South Asia are in what is considered the first stage of rural off-farm sector transformation. At this stage, rural off-farm activities tend to have production or expenditure linkages with agriculture where farming employs the majority of the rural population directly. At this stage, rural off-farm activities tend to be centred in the countryside itself, with little or no dependence on rural-urban links (Lanjouw and Lanjouw, 2001; Lanjouw et al., 2007; Mduma, 2003). Most of these activities at this stage are mainly home-based and include the small-scale production of goods that are mainly sold in the countryside (rather than emerging rural towns). In the farm/non-farm relations, agriculture tends to depend on local supplies of inputs and services and on local processes and distribution of farm products, which are usually carried out by small- to medium-scale firms (Mduma and Wobst, 2005). Examples of activities include production or mixing

[4] Because these studies come from surveys across the developing world over various years, degrees of coverage, and differences in survey methods and definitions of variables, the results should be taken as broadly indicative.

of fertiliser; rental and repair of animal traction equipment; cart production; tractor services; crop processing; transport; and construction or maintenance of market facilities and commerce.

Latin America is in the second stage (Reardon et al., 2001; World Bank, 2008a). There is a greater mix of activities at this stage compared to the former. Some of these have linkages with agriculture while a few do not. Examples include tourism, mining, and services. The share of Latin America's population that depends on agriculture is lower than in Africa and South Asia (Reardon, 2001; World Bank, 2008a). The rural-urban links are stronger because urban-based or foreign companies sub-contract jobs to rural-based entities (mainly in light durables such as clothing). This stage is also characterised by much commuting of the labour force between the countryside and nearby towns as well as intermediate cities. Another feature is "agro-industrialisation" due to commercial agriculture, which is done at the small scale but particularly at the medium to large scales. Furthermore, there are mixed levels of capital intensity; thus small-scale labour-intensive production in countryside is observed alongside relatively capital-intensive enterprises producing the same outputs in local intermediate cities.

East Asia appears to be in the third stage (Reardon eta al., 2001; World Bank, 2008a). This stage is identified by intensification of characteristics that differentiate stages I and II: more advanced rural-urban linkages with more labour commuting between the two; expansion of sub-contracting beyond light durables to medium durables (e.g. vehicle parts); substantial rural off-farm employment arising outside linkages with agriculture (for example, Taiwan).

5.0 OFF-FARM INCOME-GENERATING ACTIVITIES AND DEMOGRAPHIC CHARACTERISTICS

5.1 Gender and Off-farm Employment

Both men and women play crucial – though different – roles in developing economies. A large body of micro-economic empirical evidence and emerging macroeconomic analysis shows that gender inequality directly and indirectly limits economic growth. The principal policy implication of this analysis is that, because gender inequality acts as a powerful constraint on growth, removing gender-based barriers to growth will make a substantial contribution to turning the growth potential into a reality. Reducing gender inequality in access to and control of key resources necessary for growth is a concrete means of accelerating and diversifying growth, making it more sustainable and ensuring that the poor both contribute to and benefit from it, that is, growth becomes “pro-poor”. However, gender inequality in access to and control of a wide range of economic, human, and social capital assets and resources remains pervasive in Africa, particularly in sub-Sahara, and is a core dimension of poverty in the region.

One area suffering from gender inequality – in both access and ownership – but which is a key ingredient in production, particularly for rural citizens, is access to land. While women appear to be key players in activities related to land, they have limited command over land and output from land. In Kenya, for example, the structural roles of men and women in the agricultural cycle reveal that women are more active in agriculture than men, specifically in crop production, marketing, and processing. Women work 50 percent more hours than men in agriculture-related tasks. This has been discussed extensively in World Bank reports (World Bank 1989, Horenstein 1989). Women provide approximately 75 percent of total agricultural labour, but they own only 1 percent of the land. Building on this, the 2003 World Bank Country Economic Memorandum for Kenya confirmed that inequality, notably gender inequality, is a contributing factor in keeping Kenya’s growth performance below its long-run potential. Other countries in sub-Saharan Africa also experience similar situations in which women have limited control over land as well as outputs from land, even though their engagement in farming is higher than their male counterparts (Nancy and Sun, 2009).

While women are marginalised in resource access, there is increasing pressure, resulting from economic hardship, for women to contribute to ensuring family survival, especially in farm households (Alston, 2003; Jefferson and Mahundra, 2012). This pressure has led to an increased participation of farm women in the paid workforce in recent times (Alston 1995; Feder and Lanjouw 2000; Barret et al., 2001;

T. and A. Mahundra, 2012). In Australia, Alston's (1995) study found that 50 percent of farm women were engaged in off-farm employment, predominantly in part-time work. The Missed Opportunities report (1998) provided insights into the significance of women's off-farm employment when it estimated that over 80 percent of off-farm income was attributable to women's contributions (Alston, 2003). In Tanzania, Seebens (2009) shows that although women entrepreneurs often run enterprises that exhibit low productivity, they provide important supplements to household income. Approximately 39 percent of women who are employed in the informal sector as their main activity report that they do this in order to generate additional income for the family, as opposed to 25 percent of men (Seebens, 2009) with a similar response.

Gender inequality is also reflected in the level of participation in decision making among male and female members of the household. Participation in off-farm activities has been found to empower women, increasing their bargaining power within the household and increasing household welfare (Newman and Canagarajah 1999), indicating relatively higher returns from such participation outside of simple cash earnings. While much empirical work indicates that female household members are relatively less likely than their male counterparts to be involved in off-farm work in Africa in general (Abdulai and Delgado, 1999; Matshe and Young 2004), Ghana has a long tradition of female traders in particular (Canagarajah et al., 2001). Local community-based groups are also pervasive in Ghana, some of which are gender-specific and many of which have mixed membership. Women may also improve their intra-household bargaining position through membership in groups (Weinberger and Jutting, 2001). What we find from these studies is that, even if returns to men's and women's labour in crop agriculture are the same, women are likely to derive higher marginal benefits from participating either in off-farm work or in local community groups.

Gender participation in farming in Tanzania is more or less the same as in other African countries in which more women (75 percent) than men (70 percent) depend on agriculture for livelihood. However, the relative impetus to try and move out of agriculture into off-farm activities seems to be higher for women than men. For example the percentage of rural women who reported depending on self-employment either with or without employees more than doubled, from 2.9 percent in 2000/1 to 6 percent in 2007. Within the same period, the percentage of men increased from 5.2 percent to 10.2 percent (HBS, 2009). While we see an increasing proportion of women in off-farm activities in rural Tanzania, average earning remains higher among men compared to women. Table 2 below summarises the proportion of average earnings of men to women.

Table 2: Ratio of men to women average monthly earnings

Year	Dar es Salaam	Other Urban areas	Rural areas	Mainland Tanzania
2000/1	2.4	2.3	1.7	1.9
2007	2.4	2.4	1.4	1.7

Source: Author's computation using NBS, 2009

Men's average earnings in 2007 are 1.7 times higher than women's, decreased from 1.9 times in 2000/2001. The differences are largest in Dar es Salaam and other urban areas, where men earn 2.4 times as much as women. Inequality is relatively lower in rural areas where men earn 1.4 times as much as women. Over time, there are no changes in the last decade in the ratio of men to women average monthly earnings in Dar es Salaam, though there is a marginal increase in that ratio in other urban areas, implying increased inequality. Improvement is seen in rural areas in which that ratio has decreased from 1.7 times in 2000/01 to 1.4 times in 2007. Earlier we saw that the last decade has witnessed increased percentage of rural households' income from off-farm sources. From Table 3.2 above, we see that over time, income inequality between men and women decreases in rural areas, which may mean that increased off-farm activities in rural Tanzania tends to empower women relative to men.

5.2 Youth and Off-farm Employment

Research on youth is limited. This problem is even more serious when it comes to research that links rural economy and young people (Sumberget al., 2012). Consequently, policy advocates, policy makers, and development planners rely heavily on common knowledge, anecdotal evidence, and narrative to develop and argue policy alternatives for youth. While this may be good from a political point of view, it is unlikely to result in good policy and development outcomes, particularly when the problems being addressed are associated with complex phenomena such as poverty, livelihoods, agrarian transitions, social justice, or sustainability.

In the contemporary context of profound and significant global change, youth unemployment levels have hit historic highs (ILO, 2012a,b,c; OECD, 2012). Despite improved undernourishment estimates in the two decades to 2007, one in eight people suffered chronic undernourishment in 2010–2012 – one in four in sub-Saharan Africa – according to the recent United Nations Food and Agriculture Organisation State of Food Insecurity and Hunger in the World Report (2012). Add to the twin challenges of youth unemployment and hunger and food insecurity, an apparent ageing of the farm population – the average age of farmers is now in the

range of late 50s to early 60s across the globe from the United States to Europe to Africa to Australia – and on the surface the answer seems to be simple enough: encourage young people to farm, and we solve these problems in one fell swoop. Within this context, it can be argued that agriculture will provide under- and unemployed young people with employment and income. This in turn will provide the food we need via increased production, while at the same time ensuring that farming is passed from one generation to the next. This message adds yet another framing of young people as the answer to under-nutrition to the many other framings and narratives that place young people in the role of saviours of the agriculture sector. This is true provided agriculture is perceived by young people to be an activity that can provide them with the lifestyle they need.

Contrary to that, most young people have no interest in agriculture – it is not within their own visions for their future. This is often echoed by even their parents/elders (Leavy, 2012). By agriculture, people invariably think of farming: back-breaking work, low input, 365 days a year for little or low return. Hence, agriculture is not considered to be capable of delivering the type of lifestyle and status that young people desire and expect. These are important dimensions of the attractiveness, or otherwise, of agriculture as an occupation. Agriculture is not considered able to deliver via incomes and working conditions the kinds of lifestyles that young people aspire to in the twenty-first century, lifestyles that are ever more visible thanks to revolutionary advances in communications technology that are accessible to the majority, even people living in remote areas. In this respect, agriculture is regarded as a poor man's activity, going beyond living standards to people's sense of pride and self-respect. These are important dimensions of well-being and take us beyond narrow, one-dimensional conceptions of what it means to be poor, marginalised, and disadvantaged. If agriculture is not able to deliver either desired living standards or prospects for upward mobility, then the likelihood of attracting young people into or retaining them in the sector is low (Leavy, 2012). Those who do see a future for themselves in farming believe it needs to be 'smarter', more productive, and more reliable. This underlines the need to bring about a revolution in agricultural practice.

Within the context of agriculture and youth, education is a double-edged sword. Ideally, it is expected that higher education should be able to transform agriculture from peasantry to modern farming practices, a situation which is not happening in practice, especially in developing countries. With higher levels of education, young people seek jobs that require higher skill levels, and small-holder farming activities do not seem to fit in that category. To put it differently, the more education one gets the more one is detached from the rural setting. Studying young people and farming in Ethiopia, Tadele and Gella (2012) found a negative perception of farming in that life as a farmer is tied to life in a village, which is considered hard, demanding, and

backward. People still do not realise that one can live in a village and yet lead a good life. Even when you find the odd young person who has gone into agriculture after failing to pass the national exams and they succeed and lead a good life, people still refuse to see their success. They don't say "so and so's son has become a good farmer". They rather say, "How come, so and so's son became a farmer after all those years of education?"' (Tadele and Gella, 2012). Agriculture is still seen as a degrading occupation – especially for someone who is educated. On the other hand, education does not yet seem to yield the desired results. Higher unemployment levels, especially among youth, suggest that work and education are failing as key routes by which people move out of poverty and as crucial mechanisms linking economic growth to poverty reduction. There are more children going to school now than ever before, but what they learn appears to be far removed from the skills needed in the twenty-first century (UNESCO, 2012; World Bank, 2012). This is also likely true for agriculture-sector skills.

Literature reveals another important aspect: young people are being "pushed" out of agriculture against their will. Here, the emphasis is on aspects of agrarian structures, economies, and transitions that are barriers to young people's access to productive resources (Tadele and Gella, 2012). At the forefront of these is increasing population density and the resulting pressure on land, to the point where increasing numbers of small-holder farmers in Africa are working plots that are increasingly becoming smaller due to sub-divisions (Jayne et al., 2012). Associated with this is the process of commoditisation that, in Ghana for instance, is increasingly blocking young people's access to family land (Amanor, 2010). In Sierra Leone, grievances around deeply rooted agrarian structures and relations that restricted young people's access to land labour – and thus limited their ability to build a livelihood in rural areas – were fundamental to the dynamics of the 1991–2002 war (Peters and Richards, 2011). In connection to the aforementioned discussion, it is highlighted that in Malawi, young people have expressed feelings of marginalisation leading to powerlessness, alienation, and hopelessness due to land grabs (Sumberg et al., 2012).

These emerging findings suggest the absence of conditions in the agricultural setting that encourage youth to participate in the sector. Consequently, any policy option that addresses rural economy and employment, especially in developing countries, by focusing attention on farming *per se* is unlikely to yield tangible results for youth. Policy makers need to think beyond the conception of (young) people as units of labour to be placed in jobs. To engage and empower young people in agriculture, the sector needs to be able to address young people's aspirations and expectations and offer potential for social mobility. Using the language of the International Labour Organisation (ILO) and FAO, rural employment needs to be 'decent work' – but it also, as the importance people attach to self-respect and status highlights, needs to

address broader conceptions of human well-being. Farming needs a new image to overcome entrenched, though not unfounded, beliefs that it involves dirty, laborious work at low skill levels for low returns. Otherwise, the current urban unemployment, which has a substantial contribution from migration from rural areas, will remain a problem because young people are pushed to seek so-called ‘decent jobs’ in urban areas. Thus, modernising farming by creating an environment considered ‘conducive’ for youth, or creating off-farm employment opportunities within rural areas that youth may consider similar to those available in urban areas, may help to address the problems of unemployment and rural poverty. This paper attempts to determine whether off-farm employment in rural Tanzania may partly address this challenge facing youth.

6.0 FRAMEWORK OF ANALYSIS

6.1 Conceptual Framework

The analytical framework is based on a number of assumptions as follows:

1. Farming households are endowed with labour and land as means of production;

2. At any given time, household labour is fixed. This means that the division of labour among on farm and off-farm activities depends on the opportunity cost of the forgone activity;

3. Entry to off-farm activities is constrained by barriers like capital, skills, infrastructure, and others; and

4. As a measure to address income shocks and smooth consumption, farm households opt to diversify income to off-farm employments.

Given the above assumptions, a rural household i is said to maximise utility from consumption, which is a function of allocating a fixed household labour among on-farm and off-farm activities,

$$U_i = C_i(L_r, L_q) \text{-------} (1)$$

where U_i is utility derived by household i; C_i is the consumption of household i; and L_r and L_q are labour allocation between on-farm and off-farm activities respectively.

In maximising the above utility function, each household faces inter-temporal constraints like budgetary and endowment constraints. The first-order conditions for labour allocation obtained from solving the above programming problem can be used to illustrate how households allocate labour resources in both on-farm and off-farm activities. If the marginal utility of allocating labour to on-farm were greater than the marginal utility derived from off-farm activities, the household would tend to specialise in on-farm production, without any investment in off-farm activities.

Now assuming the returns to the off-farm activities are denoted as:

$$P_q f(L_q \mid M) \text{----------} (2)$$

where P_q and M represent the output price and entry constraint – such as investment capital or skill – respectively, the relationship between the expected marginal utilities can be expressed as:

$$E\left[U'(C_t)P_r\frac{\partial l}{\partial L_r}\right] > E\left[U'(C_t)P_q\frac{\partial f}{\partial L_q}\right], \text{ with } L_r > 0 \text{ and } L_q = 0 --(3)$$

where E is the expectation operator; $U'(C_t)$ denotes marginal utility of consumption; L_r and L_q denote labour allocated to on-farm production and off-farm activities, respectively; and P_q represents output price of goods produced in on-farm activities. According to equation (3), the household does not need to undertake any other activity besides on-farm $(L_r > 0$ and $L_q = 0)$, since the marginal utility of allocating labour to on-farm activities is greater than the marginal utility of allocating labour to off-farm activities.

However, with the near absence of credit and insurance markets, and with severe food-cropping instability, households might invest in a diverse range of activities rather than specialise in on-farm activity in order to diversify some of the income risk. Such measures might reduce expected income but also reduce the variance of income. In particular, poorer households will choose activities that reduce the variance of their incomes, even though this lowers expected income. Given that off-farm activities are normally considered less risky compared to crop production, a risk-averse household would engage in off-farm work relative to a less risk-averse household.

A household-level land constraint might also translate into limited food output, leading to a need for households to pursue other income-generating activities (Reardon et al., 1992). It is worth noting also that only households with access to capital for investment or specific skills for entrance into off-farm sectors might do so. If households choose to allocate labour to other activities besides on-farm, the first-order optimal conditions for labour allocation will be equal to the marginal utility of allocating labour to on-farm and off-farm activities. This can be formally expressed as:

$$E\left[U'(C_t)P_r\frac{\partial l}{\partial L_r}\right] > E\left[U'(C_t)P_q\frac{\partial f}{\partial L_q}\right], \text{ with } L_r > 0 \text{ and } L_q > 0 --(4)$$

Thus, households will allocate labour to on-farm production as well as other activities ($L_r > 0$ and $L_q > 0$). Certainly, it is the poor who need diversification, mostly to defend against entitlements failure and severe food insecurity. However, as pointed out earlier, there can be entry barriers in the off-farm labour market because off-farm activities may require investment in equipment purchase or rent, skill acquisition, and licence fees. If households face binding liquidity and credit constraints, poor households are least able to diversify towards higher-return activities (Reardon et al., 2000; Woldenhanna and Oskam, 2001.). As a result, less wealthy farmers spend most of their time in low-paying off-farm activities that are easy to enter. The actual participation of farmers in off-farm activities (income diversification of household) depends on the incentive and the capacity to participate (Reardon, 1997; Woldenhanna and Oskam, 2001).

In other words, a farming household's decision whether to work off-farm depends on the reservation wage rate and market wage rate. If the reservation wage rate is less than the prevailing market wage rate net of commuting cost, a farm household will choose among the available off-farm activities depending on the relative wage rates. If the farmer faces a liquidity (or credit) constraint, he will prefer the one that requires less initial capital. Most probably, the credit-constrained farm household will choose wage employment above off-farm self-employment. A farm household with a better asset position may face relatively fewer credit constraints and hence may prefer to work in off-farm self-employment.

Empirical studies have shown that the reservation wage rate that determines the households' participation in off-farm activities is an endogenous variable (Lass et al., 1991). It depends on farm characteristics, family characteristics, location, and endogenous and exogenous household sources of income. Farm characteristics include farm size (area of land cultivated), livestock size, and number of animals used for transportation (donkey and horse). Family characteristics include age and educational level of family members and family composition. Endogenous household income consists of farm income, which depends on farm and location characteristics. An exogenous household income source consists of a non-labour income such as transfer income (remittance, gift, and food aid) and rent income from property. Off-farm wage is also an endogenous variable, which depends on individual and location characteristics.

6.2 Empirical Model

Off-farm labour supply of farm households is analysed using the Tobit model, also called a censored regression model. This model is designed to estimate linear relationships between variables when there is either left or right censoring in the

dependent variable (also known as censoring from below and above respectively). Censoring from above takes place when cases with a value at or above some threshold, all take on the value of that threshold, so that the true value might be equal to the threshold, but it might also be higher. In the case of censoring from below, values that fall at or below threshold are censored. In our case, the Tobit model is based on the latent variable expressed as follows: Let latent variable off-farm labour hours be denoted by L_m^* and observed off-farm labour hours by L_m. In a farming household model, an individual is willing to participate in off-farm work when his/her reservation wage (w_{ri}) is less than the off-farm wage net of commuting cost (w_{mi}) offered:

$$D_i = 1 \text{ if } w_{ri} \le w_{mi},\ D_i = 0 \text{ if } w_{ri} > w_{mi} \text{ ------(5)}$$

where D_i is the participation decision of a farm household to work off-farm. Consequently the latent variable off-farm labour hours (L_m^*) and observed off-farm labour hours (L_m) can be expressed by a Tobit model:

$$L_{mi}^* = \beta' Xi + e_i,\ e_i \sim N(0, \sigma_e^2)$$ [5]

$$L_{mi} = \begin{cases} L_{mi}^* & if\ D_i = 1 \\ 0 & if\ D_i = 0 \end{cases} \text{ ----------(6)}$$

where β' is a row vector of parameters; X is a column vector of variables that affect the reservation and market wage; e_i is the error term.

Explanatory variables in this model are farm characteristics, family characteristics, and endogenous household's sources of income. Farm characteristics variables include cattle wealth (raised cattle), goat wealth (raised goat), sheep wealth (raised sheep), pig wealth (raised pigs), and the size of land cultivated. Included also as part of farm characteristics are the types of crops a farmer cultivated, both cash and food crops. Family characteristics include gender of the household head (male); whether the household head can read and write at least one language (literacy); education level of the household's head presented in the form of number of years of schooling (education level), age of the household head (age), total number of dependants in

[5] In particular, the actual dependent variable is $L^* = \max(0, L^*)$. Since L is the off-farm labour hours, given household characteristics X, then $L > 0$ if household has a member in off-farm sector and 0 if not. The Tobit model is a convenient way of modelling this type of data

the household (dependants), household size (household size), and distance from the household to the nearest township (remoteness). Endogenous household's source of income is the household wealth (household wealth), which was generated using household asset ownership.[6] Crop types include both food and cash crops; food crops are maize and paddy and cash crops are coffee, cashew-nuts, tobacco, and cotton.

6.3 Data

The paper uses the agriculture sample survey conducted by the National Bureau of Statistics (NBS) in collaboration with the sector ministries of agriculture.[7] The survey was conducted at the end of the 2008/09 Agriculture Year. It collected data by interviewing a sample of 48,315 small-scale farming households and 1,206 large-scale farming households. The survey covered agriculture in detail as well as many other aspects of rural development and was conducted using three different questionnaires: the small-scale farm questionnaire; the community level questionnaire; and the large-scale farm questionnaire. The small-scale farm questionnaire was the main census instrument and included questions related to crop and livestock production and practices; population demographics; access to services, resources, and infrastructure; and poverty, gender, and subsistence versus profit-making production units. Given the scope of the small-scale farm questionnaire, data were collected at the household/holding level, allowing for sex disaggregation of most variables at the head of household level.

The sample consisted of 3,221 villages. These villages were drawn from the National Master Sample (NMS) developed by the National Bureau of Statistics (NBS) to serve as a national framework for the conducting of household-based surveys in the country. The National Master Sample was developed from the 2002 Population and Housing Census. Nationwide, all regions and districts were sampled, with the exception of two urban districts. A stratified two-stage sample was used. The number of villages/EAs selected for the first stage was based on a probability proportional to the number of villages in each district. In the second stage, 15 households were selected from a list of farming households in each selected village/EA, using systematic random sampling, with the village chairpersons assisting to locate the selected households.

[6] Assets used to create a wealth index were dwelling type, including, roofing material, type of wall, source of drinking water, type of toilet; ownership of other assets including mobile phones, radio, television, wheelbarrow, vehicle, disc plough; and main source of energy for lighting and cooking.

[7] Ministry of Agriculture, Food Security and Cooperatives, Ministry of Water and Livestock Development, and the Prime Minister's Office-Regional Administration and Local Government

7.0 RESULTS AND DISCUSSIONS

7.1 Summary Statistics

We first present the summary statistics of the variables used in the regression analysis of the decision to offer labour to off-farm income-generating activities in rural Tanzania. Table 3 below shows clearly that Tanzanian agriculture is still largely small-holder, with limited use of modern technology. The figures in this table are comparable to others in similar National Surveys, like the Household Budget Survey and the National Panel Survey. The average size of land holding is 2.6 hectares, which is the same as the 2011 figure produced by the National Panel Survey, which suggests that there has been no expansion. Similarly, rural households are characterised by high illiteracy rates among heads of households (21 percent), and generally few years of schooling (4.5). Household size is rural Tanzania is large, with the average level of 5.1 persons per household, which is above the national average of 4.8 in 2012 (NBS, 2013).

Over recent years the number of households headed by women has increased, with the current level being 20 percent. The HBS (2009) shows the level of female-headed households to have increased in recent years overall, mainly accounted for by increased widowhood, separation, and divorce. In rural areas, female-headed households stood at 16.4 percent in 1991/92. Furthermore, we see that very few farmers practice mixed-crop farming and animal keeping. Hardly 30 percent of farm famers raise cattle and goat and less than 15 percent raise sheep and pigs. The average number of dependants, which include elderly people aged above 65 and children below the age of 16, is about 2.6 persons. What is also seen in the table is that, on average, households live 1.4 kilometres away from small townships where they can get their daily needs. But the value of standard deviation, which is well above the mean for this variable, suggests skewed distribution of this variable in that there are some households that live very far from these small townships.

Table 3: Definitions and summary statistics of the variables used in the analysis

Variable	Definition	Mean	Std Dev
Household Characteristics			
Male	Gender of household head (=1 if the household head is male)	0.80	0.40
Literacy	Literacy rate of the household head (=1 if the household head can read and write at least one language)	0.71	0.45
Education level	Years of schooling of the household head	4.51	3.62
Age	Age of the household head	45.18	15.54
Household size	Household size	5.14	2.73
Dependants	Total number of dependants in the household	2.58	1.98
Farm Characteristics			
Raised cattle	Household raising of cattle (=1 if the household raised cattle)	0.26	0.44
Raised goat	Household raising of goats (=1 if the household raised goats)	0.28	0.45
Raised sheep	Household raising of sheep (=1 if the household raised sheep)	0.11	0.31
Raised pig	Household raising of pigs (=1 if the household raised pigs)	0.07	0.26
Cultivated land size	The actual land size (in acre) cultivated by a household in the 2007/8 agricultural season	2.65	3.74
Household Income			
Household wealth	Household wealth index created using type of household asset	18.14	2.57
Proximity to Services			
Remoteness	Distance of the household residence to the nearest township measured in kilometres	1.38	1.80
Crop Type			

Variable	Definition	Mean	Std Dev
Maize	Household growing of maize (=1 if the household grew maize)	0.79	0.41
Paddy	Household growing of paddy (=1 if the household grew paddy)	0.20	0.40
Cotton	Household growing of cotton (=1 if the household grew cotton)	0.08	0.09
Tobacco	Household growing of tobacco (=1 if the household grew tobacco)	0.02	0.13
Cashew nuts	Household growing of cashew nuts (=1 if the household grew cashew nuts)	0.11	0.31
Coffee	Household growing of coffee (=1 if the household grew coffee)	0.10	0.28
Zonal Dummies			
Northern Zone	Farmers in Northern Zone (=1 if the farmer is from Northern Zone)	0.21	0.41
Southern Zone	Farmers in Southern Zone (=1 if the farmer is from Southern Zone)	0.10	0.30
Eastern Zone	Farmers in Eastern Zone (=1 if the farmer is from Eastern Zone)	0.07	0.26
Western Zone	Farmers in Western Zone (=1 if the farmer is from Western Zone)	0.08	0.27
Central Zone	Farmers in Central Zone (=1 if the farmer is from Central Zone)	0.10	0.29
Lake Zone	Farmers in Lake Zone (=1 if the farmer is from Lake Zone)	0.14	0.35
Southern Highlands	Farmers in Southern Highlands Zone (=1 if the farmer is from Southern Highlands Zone)	0.29	0.45
Dependent Variable			
Off-farm incomes	Household with members in off-farm economic activities (=1 if the household has at least one member in the off-farm activities)	0.73	0.45

Note: Means are based on the 40,015 households (out of 48,315 households surveyed by the National Bureau of Statistics) which indicated to have practiced farming in the 2007/8 farming year. The difference between those surveyed and those included in our analysis is those who were raising livestock only.

Another interesting result of the rural households is the high level of diversification among off-farm activities, in which 73 percent of farm households have at least one member in off-farm employment. As discussed earlier, this may be the result of push or pull factors. In any case, it is very clear that moving off the farm is on the higher side in rural Tanzania. However, what is also clear in the attempt to move out of farming is that different social groups are moving out of farming differently. Table 4 shows relatively higher movement to off-farm employment among young and female-headed households than among older and male-headed households. This may imply that agricultural outputs have differential gender and age returns. In other words, agriculture outputs may be more in favour of older and male-headed households than younger and female-headed ones.

Table 4: Off-farm employment participation by gender and age of head of household

	Have off-farm employment	
	Yes	**No**
Age is greater than sample average	65	35
Age is less than sample average	79	21
Male	72	28
Female	74	26

To discover the relationship between off-farm employment and household and farm characteristics, we ran a correlation matrix, which is presented in Table 5. Off-farm employment has positive correlation with household size, implying that engagement in off-farm employment is driven by excess labour in the household. Consistently, land size has a negative correlation with off-farm employment, meaning that more land consumes more household working time, at the expense of off-farm employment. Just as it was shown in Table 4, the correlation matrix in Table 5 also shows that off-farm employment is negatively correlated with the age of the household head, implying that younger families diversify more than older families. Looking at the pairwise correlation between age and land size, we see that the two have a positive and significant correlation. Thus, the seeming higher rate of diversification among young families may be the result of land shortage. This is also the case with female-headed households. As we saw in Table 4, the correlation matrix in Table 5 also shows that male-headed households are negatively, though insignificantly, correlated with off-farm employment, implying that female-headed households diversify more than male-headed households. Again, being a male-headed household has a positive and significant correlation with land size, implying that female-headed households have limited land access.

Another important issue worth mentioning in the correlation matrix is the positive correlation between off-farm employment and household wealth. This means that to engage in the off-farm employment requires capital up front, which wealthier households have access to. Within this discussion of household wealth, we see that male-headed households have a positive correlation with wealth. The household budget survey whose results were earlier reported by the current study shows that men in Tanzania earn 1.7 times the earnings of women. The difference is even worse in urban areas, where such earning is more than two times. Other studies elsewhere have also shown a similar trend. In their study on the effect of gender on adoption of agricultural innovations in Ghana, Doss and Morris (2001) concluded that women had limited access to financial resources compared to men; hence they also had limited capacity to adopt innovations. Similarly, Kaliba et al. (2000) and Odendo et al. (2011) concluded that male-headed households are relatively wealthier and control the financial resources and hence are able to adopted mineral fertilisers more quickly than their female-headed counterparts.

Table 5: Pairwise correlation coefficients of selected variables

	Off-farm employment	Household size	Age of household head	Land size	Male headed household	Household wealth
Off-farm employment	1.000					
Household size	0.0014 (0.7808)	1.000				
Age of household head	-0.0629* (0.000)	0.01118* (0.000)	1.000			
Land size	-0.0369* (0.000)	0.2981* (0.000)	0.0916* (0.000)	1.000		
Male-headed household	-0.0086 (0.0858)	0.1970* (0.000)	-0.1099* (0.000)	0.1280* (0.000)	1.000	
Household wealth	0.0847* (0.000)	0.1751* (0.000)	-0.0681* (0.000)	0.1409* (0.000)	0.1670* (0.000)	1.000

(*) p-value is 0.05 or lower
Figures in parenthesis are p-values

Disaggregating the summary statistics of selected variables by zones gives very interesting findings (see Table 6). The variable for average age of household heads in farming households shows a very high similarity across the country. However, there are strong variations in other variables between one zone and another. Farm

households' involvement in off-farm employment, for instance, shows highest incidence in the Central Zone, where 95 percent of households have at least one member in off-farm employment. This is followed closely by the Eastern Zone (93 percent) and Western Zone (81 percent). The lowest incidence is in the Lake Zone, where only 53 percent households have at least one member in off-farm employment. In the earlier chapter on education and farm productivity, we saw that land productivity was highest in the Southern Highlands and Northern Zones. However, these zones are not in the top position in household engagement in off-farm employment. This may mean that farmers in rural Tanzania are mostly concerned with survival; thus off-farm employment is mainly dominant in those areas with low levels of farm outputs. Some studies have shown highest returns and hence high incidence of off-farm activities in favourable agricultural zones, where effective demand is high, thus creating consumption and production linkages with the off-farm sector and driving up demand for off-farm goods and services (Reardon et al., 2001). This seems not to be the case with rural Tanzania because of the peasantry nature of agriculture.

Table 6: Summary statistics of selected variables by Zones

Zone	Off-farm employment (%)	Average age of household head	Average years of schooling	Household wealth index
Northern	65	46	4.7	18.5
Southern	68	45	4.0	17.5
Eastern	93	46	4.9	18.4
Western	81	46	4.0	17.9
Central	95	45	4.2	17.6
Lake	53	45	4.3	18.1
Southern Highlands	75	43	4.8	18.4

What is also interesting is the varying number of formal years of schooling between zones as well as the variable for household wealth index. The zones with the highest average years of schooling among household heads are Eastern (4.9), followed by Southern Highlands (4.8) and Northern Zone (4.7). These are the zones whose households are wealthier than the rest. Consistently, the Southern and Central Zones have lower level of average years of schooling among their household heads and also are ranked the lowest in the household wealth index. This indicates a strong relationship between household head education and farm productivity and also between household head education and wealth.

7.2 Regression Results

The results from the Tobit model presented in Table 7 show that the main factors determining the supply of labour to off-farm activities are livestock wealth, years of schooling of the household head, location of the household in relation to the nearby township, size of household, land cultivated, household wealth, age of the household head, family size, the number of dependants, crop type, and geographical location of a farmer. For most of the variables, the results obtained meet our expectations. The impact of gender (=1 if male-headed household and 0 if female-headed household) on the supply of labour to off-farm employment is negative but statistically not significantly different from zero. These findings may probably be accounted for by the fact that our data does not allow us to identify the gender of the individuals actually participating in off-farm activities because we only have information on the gender of the household head. While this variable is negative and insignificant, other studies have shown a negative and statistically significant relationship, implying that female-headed households have relatively higher probability than male-headed households to offer labour to off-farm economic activities. Such studies have accounted for that relationship with the fact that female-headed households in developing countries have less access to and control of critical resources, especially land, cash, labour, and information (see also Quisumbing et al., 1995; Kaliba et al., 2000;). Similar findings are also shared by Alston 1994; Feder and Lanjouw, 2000; Barret et al., 2001; and Mahundra, 2012, whose studies showed increased participation of farm women in the paid workforce in recent times, arguing that this is due to the increasing pressure on women to contribute to household income for household survival. Studying non-farm income and gender in rural Ghana and Uganda, Canagarajah et al. (2001) also found that while women earned less than men in both countries, being a female-headed household had a positive effect on non-farm income. It therefore follows that female-headed households in those studies have higher motivation to participate in off-farm employments than male-headed households, even though they only occupy lower-returning off-farm employment. Other studies, however, give contrary findings. Block and Webb (2001), for instance, found that female-headed households have lower levels of income diversification because of the fewer resources needed in off-farm employment.

Table 7: Results of the Tobit model of decision to supply labour to off-farm activities

Variable	Coefficient	T-ratio	P-value
Household Characteristics			
Male	-0.004	-0.47	0.640
Literacy	-0.020	-1.47	0.140
Ln of education level	0.038***	5.12	0.000
Ln of age	-0.032***	-3.43	0.001
Ln of household size	0.118***	13.13	0.000
Ln dependants	-0.037***	-5.01	0.000
Farm Characteristics			
Raised cattle	-0.080***	-9.96	0.000
Raised goat	-0.035***	-4.52	0.000
Raised sheep	-0.086***	-7.79	0.000
Raised pig	0.001	0.09	0.140
Ln of cultivated land size	-0.044***	-11.30	0.000
Household Income			
Ln of household wealth	0.383***	16.19	0.000
Proximity to Services			
Ln of remoteness	-0.005**	-2.76	0.006
Crop type			
Maize	0.038***	5.01	0.000
Paddy	0.023***	3.01	0.003
Cotton	-0.092***	-5.36	0.000
Tobacco	-0.116***	-5.10	0.000
Cashew nuts	-0.116***	-9.28	0.000
Coffee	-0.100***	-8.11	0.000
Zonal Dummies			
Northern Zone	-0.107***	-11.30	0.000
Southern Zone	0.028*	2.21	0.027
Eastern Zone	0.215***	18.94	0.000
Western Zone	-0.273***	-26.01	0.000
Central Zone	0.279***	24.97	0.000
Lake Zone	0.102***	8.53	0.000
Southern Highlands Zone	-0.324***	28.12	0.000

Variable	Coefficient	T-ratio	P-value
Constant	-0.457***	-6.14	0.000
Sigma	0.579		

*** p<0.01, ** p<0.05, * p<0.1

The education variable – which in this context is the number of years of schooling – is positive and significant with supply of labour to off-farm employment (p<0.01). This is so especially the case of self-employment, participation in which requires some levels of formal schooling. Consistently, Zhu and Luo (2006) and Babatunde and Qaim (2009) found that, while schooling does not seem to be important for agricultural wage labourers, it significantly increases the probability of finding work in non-agricultural sectors. Furthermore, Canagarajah et al. (2001) found that primary education leads to a 32 percent higher income than no education, and higher education gives a premium of almost 77 percent in non-farm employment. The literacy variable – which represents whether a household head can read and/or write at least one language – is negative but insignificantly different from zero. The unexpected negative sign as well as insignificance may perhaps be the result of potential multicollinearity between the variable and years of schooling of the household head.[8]

The age of the household head affects the off-farm labour supply negatively, implying that the supply of labour for off-farm activities is higher for younger household heads than for older household heads (p<0.01). The negative impact of age on labour supply to off-farm activities may be explained by the fact that due to traditional ownership of land, young farm household heads cannot access sufficient land to support their livelihood compared to their older counterparts. Hence, these younger heads have to rely on off-farm activities in order to support their households. Besides, the older heads may not have the courage needed to venture into off-farm undertakings, because historically they have been working on farms and have relatively more experience in that direction. This means they are more productive on-farm and less productive off-farm. Bezabih et al. (2011), for instance, shows that older household heads tended to be good matches for agricultural labour jobs. On the other hand, young families may not have an agrarian ethic, as happens in many agrarian societies in the process of modernisation. Hence, when agrarian economies are open for off-farm work, the younger are the first to go. Similar findings are shared by Canagarajah et al. (2001), which show that the effect of age on earnings in non-farm employment has a concave shape, implying that earnings increase early in life as experience increases but then decrease as the individual gets older. However, our results are different from those of Block and Webb (2001), who provide evidence

[8] The variable “literacy rate” of the household head can be correlated with the variable “education level” of the household head.

that income diversification is positively associated with age of household head, arguing that older heads have accumulated capital for a long time and can afford the capital needs of off-farm employment.

Participation in off-farm activities increases with family size ($p<0.01$) and decreases with number of dependants ($p<0.01$). Most previous studies (see, for example, Woldenhanna and Oskam, 2001; Babatunde and Qaim, 2009; Bezabih et al., 2011) have shown a positive relationship between household size and participation in off-farm employment, arguing that participation in off-farm activities is critically dependent on labour availability. In other words, participation in off-farm employment by farm households is possible because larger households can maintain their farm and household activities, while still sending one or more members to work in other activities outside on-farm. This seems also to be the case with rural Tanzania. These results imply that farming households are involved in off-farm activities due mainly to push factors, that is, insufficient farm income as well as surplus labour. In other words, off-farm activities are considered to be a residual employment that absorbs the surplus family labour, which cannot be fully employed on the farm. These results may imply that the association between labour supply and off-farm employment may be suggestive of “coping” responses to stress that are aimed at consumption smoothing, rather than “adaptive” strategies allowing households to accumulate productive assets. Our findings of a negative relationship between the number of dependants in the household and participation in off-farm employment are different from those of Barrett and Reardon (2000) and Block and Webb (2001), who provide evidence that income diversification is positively associated with a higher dependency ratio; that is, households with a lower proportion of working adults (compared with children and non-working elderly) typically derive a larger share of income outside of cropping. They hypothesise that this is so because households with more children have more hands available for income earning off the farm, including the gathering and sale of firewood, management of valuable livestock, daily wage labour, or petty commerce. Such off-farm employment, which has been accompanied by a high incidence of child labour, is more a survival mechanism than an accumulation strategy (Davies, 1993; Dercon and Krishnan, 1996).

Livestock wealth is negatively related to household supply of off-farm activities, implying that as the household engages more in livestock keeping, it finds it difficult to offer its labour to off-farm employment. It can be argued that this relationship is the result of a substitution effect between the labour available for raising animals and that for off-farm income-generating activities. Within the Tanzanian context, this relationship may further be strengthened by the fact that among some pastoral tribes, especially the Maasai, there is some prestige derived from keeping large numbers of animals, and this reduces the labour available to other activities,

including off-farm employment. Studying income divarication and entry barriers in Northern Ethiopia, Woldenhanna and Oskam (2001) found consistent results that hours worked in off-farm employment decrease with an increase in the amount of livestock wealth and horses. However, other studies (see Block and Webb, 2001; Bezabih et al., 2011) have provided evidence that the level of livestock ownership is positively and significantly associated with income diversification. They argue that a rise in the level of livestock wealth is used as capital to invest in off-farm income-generation activities. Off-farm activities arising this way is due to pull factors, which does not seem to be the case with rural Tanzania.

A household's farm size has a negative relationship with the supply of labour to off-farm activities ($p<0.01$). This relationship is explained by both income and substitution effects, in the sense that big farms tend to exhaust all the time available for the household's labour supply at the expense of off-farm activities. But also, the importance attached to expected income resulting from large farm size may be outweighing the expected importance of income from off-farm income-generating activities. Similarly, Zhao (2001) and Chen et al. (2004), for instance, found that farmers in villages that have higher than average agricultural productivity tend to remain on their farms rather than engaging in off-farm work. In other words, farm households who have smaller farms are more likely to opt for off-farm activities to escape from poverty by supplementing farm incomes. These findings are also shared by Woldenhanna and Oskam (2001), who found that farm households who have smaller farms tend to turn to off-farm employment to stabilise their incomes. However, Bezabih et al. (2011) provide results which are inconsistent with ours in that farm size is significantly positive with household labour supply to off-farm employment. The authors support this relationship by arguing that land size could measure household net worth, enabling households to dispose of a portion of their incomes as start-up costs for off-farm employment. Such findings are possible where agriculture outputs and farmers' incomes are very high. This increases aggregate demand for outputs from the off-farm sector. Thus, off-farm employment in this context is the result of pull factors. However, this is contrary to what is predicted by the current study for rural Tanzania, where off-farm employment results from push factors.

Household wealth positively affects the supply of off-farm labour in rural Tanzania. The coefficient of the variable is significant ($p<0.01$) and has a high magnitude in size, suggesting the importance of household initial capital to entry into off-farm activities. Past studies that have examined the role of access to finance and off-farm employment have shown consistent results indicating that, overall, financial constraints have a negative impact on the decision to participate in off-farm employment (Babatunde and Qaim, 2009; Bezabih et al., 2011). Other researchers

have even associated income with the type of off-farm economic activity and provided evidence that better-off farm households prefer working in off-farm self-employment to off-farm wage employment, because the former has highest return although it requires capital up front (Woldenhanna and Oskam, 2001). These results suggest that higher incomes make it easier to pursue off-farm activities, especially riskier, higher-returning activities.

Distance of the household from the nearest township (remote) negatively affects the supply of labour to off-farm activities ($p<0.05$), implying that households living in close proximity to towns have a higher probability of participating in off-farm employment than their counterparts living far away. Babatunde and Qaim (2009) reported similar findings and attributed them to the higher agricultural labour demand in areas close to the market, where farm production is often more commercialised than in more remote settings. Reardon and Taylor (1996), Reardon (1997), and Canagarajah et al. (2001) have emphasised the importance of general infrastructure, agro-climatic conditions, access to markets, and the state of the local economy as important variables in rural diversification. Consistently, Block and Webb (2001) provide suggestive evidence that households located in the highlands tend to be more diversified than in the lowlands thanks to higher density of population, roads, and markets, all of which allow for higher-productivity agriculture and greater variety in employment options.

With respect to crops, we have selected both food and cash crops that are very important in the Tanzanian agriculture. The food crops chosen are maize and wheat, whereas cash crops are cotton, tobacco, cashew nuts, and coffee. Crop affects participation in off-farm employment depending on whether it is a food or cash crop. Food crops (maize and paddy) have a positive and significant relationship with off-farm employment ($p<0.01$), whereas cash crops (cotton, cashew nuts, tobacco, and coffee) have a significantly negative relationship with off-farm employment ($p<0.01$). This suggests that food crop growers have higher incentive to diversify to off-farm employment than their counterparts who grow cash crops. This means that cash crop growers may have a relatively more stable and predictable income than food crop growers; thus the latter opt to diversify to smooth consumption. This may have resulted from selling restrictions being imposed on food crop producers in some parts of the country that were expected to experience food shortages. Moreover, cash crop producers also produce some food crops; thus, they are assured some amount of food crops and cash from the selling of cash crops to pay for other household needs, compared to their food producer counterparts who have to sell part of their food crops and/or engage in off-farm employment in order to buy necessities other than food. It is, therefore, not surprising to see that food crop

growers have a relatively higher incentive to participate in off-farm employment than cash crop producers. Off-farm employment helps to cover the consumption gap.

Zonal dummies also give interesting results. From the previous chapter, we saw that the Northern and Southern Highlands Zones have the highest use of inputs and were associated with higher farm productivity. Both zones have negative and significant relationships with participation in off-farm employment. This may further imply that rural farmers are mostly concerned with subsistence incomes. Thus, once they are assured enough food, they give less attention to other income-generating activities. On the other hand, the Southern, Eastern, Central, and Lake Zones have a positive and significant relationship with the decision to participate in off-farm employment. The Eastern Zone has larger urban areas than other zones; note that Dar es Salaam is located in this zone. Farmers close to urban areas will most likely participate in off-farm employment because of the high demand for off-farm products. Similarly, farmers in the Central and Lake Zones have incentives to participate in off-farm activities. The Lake Zone has a lot of fishing as well as mining activities, which attract demand for off-farm outputs. Similarly, the Central Zone hosts many visitors especially because many national meetings are held in Dodoma, which is located in this zone.

The results from marginal effects presented in Table 8 are similar to those of the Tobit model in terms of trend, signs of coefficients, and significance. The difference occurs in the magnitudes of the coefficients, depending on the strength of the variable in influencing off-farm employment as well as the condition we impose on the expected value of off-farm. Coefficients of the marginal effects when expected value of off-farm supply of labour is above 0, that is, E(y/x,y>0), are roughly one-half of those in the Tobit model. On the other hand, when we condition the value of the off-farm supply of labour to be on the average, that is, E(y/x)*, the magnitude of coefficients are roughly 70 percent of the original Tobit model. Finally, when we condition expected value of supply of off-farm labour to be between 0 and the mean, that is, E(y/x, 0<y< $\bar{y}$), the magnitudes of coefficients are very small due to the small range existing in the dependent variable.

Table 8: Marginal Effects (dy/dx) at various levels of Y

Variable	E(y/x,y>0)[9]	E(y/x)*[10]	E(y/x, 0<y< $\bar{y}$)[11]
Household Characteristics			
Male	-0.002	-0.003	-0.001
Literacy	-0.014	-0.018	-0.003
Ln of education level	0.026***	0.033***	0.005***
Ln of age	-0.022***	-0.028**	-0.004**
Ln of household size	0.080***	0.104***	0.016***
Ln dependants	-0.025***	-0.033***	-0.005***
Farm Characteristics			
Raised cattle	-0.054***	-0.070***	-0.011***
Raised goat	-0.023***	-0.030***	-0.005***
Raised sheep	-0.058***	-0.075***	-0.011***
Raised pig	0.001	0.001	0.001
Ln of cultivated land size	-0.030***	-0.038***	-0.006***
Household Income			
Ln of household wealth	0.260***	0.336***	0.051***
Proximity to Services			
Ln of remoteness	-0.003**	-0.004**	0.001***
Crop type			
Maize	0.026***	0.033***	0.005***
Paddy	0.016***	0.020***	0.003***
Cotton	-0.062***	-0.081***	-0.012***
Tobacco	-0.079***	-0.102***	-0.015***
Cashew nuts	-0.079***	-0.102***	-0.015***
Coffee	-0.068***	-0.088***	-0.014***
Zonal Dummies			
Northern Zone	-0.072***	-0.094***	-0.014***
Southern Zone	0.019*	0.025*	0.004*
Eastern Zone	0.196***	0.256***	0.041***

[9] Expected value of off-farm supply of labour is above 0

[10] Expected value of off-farm supply of labour is at the mean value

[11] Expected value of off-farm supply of labour is between 0 and the mean

Variable	E(y/x,y>0)[9]	E(y/x)*[10]	E(y/x, 0<y< $\bar{y}$)[11]
Western Zone	-0.105***	-0.137***	-0.022***
Central Zone	0.189***	0.245***	0.040***
Lake Zone	0.069***	0.090***	0.014***
Southern Highlands Zone	-0.122***	-0.159***	-0.024***

*** p<0.01, ** p<0.05, * p<0.1

The most important thing in this analysis of the marginal effects is the importance of the variable in influencing off-farm employment. We see that household wealth is very important in the household decision to offer labour to off-farm economic activities. In other words, a household must have a capital up front to enter off-farm employment. Another variable which has a strong positive relationship with off-farm employment is household size. As we pointed out earlier, off-farm employment is taken as a residual activity to absorb excess labour that cannot be fully utilised in on-farm activities. The variables that have a strong negative relationship with off-farm employment are livestock wealth and growing of cash crops. In the case of livestock wealth, this may be because the time necessary to maintain livestock leaves none available for off-farm employment. In other words, expected returns to livestock are higher than expected returns to off-farm employment. For the growing of cash crops, the relationship may have to do with the potential for stable and predictable income from such crops compared to food crops.

7.3 Conclusions and Policy Recommendations

This chapter aims to provide empirical evidence of the driving forces behind off-farm employment and the extent to which such forces are accessible to farming households, especially those with relatively lower incomes in rural Tanzania. From our findings, three main conclusions can be derived: (1) Participation in off-farm activities in rural Tanzania is a result of push factors; that is, potential participants do not realise earnings from on-farm activities and so are pushed to off-farm activities; (2) Households with relatively low incomes and those with limited access to land have higher incentive to diversify so as to bridge the consumption gaps, and (3) While off-farm activities remain the best option for landless and other rural poor households, there are entry barriers resulting from low financing and low educational levels. These entry barriers lead to two things: (i) In the absence of a well-functioning credit market, wealthy households have better chances to participate than less wealthy families. Or, poor households remain more engaged in lower-paying, easy-entry, farm-wage labour and labour-intensive, low-paying, rural off-farm activities, and less in high-paying, rural off-farm self-employments. This is typical in the current study, making off-farm employment an activity for merely meeting survival needs and not accumulation for growth. Thus, our findings show that, as a result of these

barriers, the better-off farm households are able to dominate the most lucrative forms of off-farm activities such as masonry, carpentry, and trading. This is an important point for policy makers to reflect upon deeply. (ii) Lack of formal training hinders rural household participation in off-farm activities. The absence of special entrepreneurial skills makes it difficult for less educated rural farmers to participate in rural off-farm income-generating activities.

Tanzania's current green revolution, known as *Kilimo Kwanza,* seeks to bring about huge transformations of the rural economy. However, attention has so far focused on increasing farming production and thus all effort is geared towards addressing challenges facing on-farm activities. Our findings show that while farming is an important aspect of the rural economy, off-farm activities are equally important in addressing rural transformation, especially through empowering landless households and young families. In light of this, rural transformation policy options should not be limited to farming, but rather must go beyond it. Specifically, promotion of the rural economy should focus on off-farm activities as well as farming. Failure to do so is likely to lead to rural income inequality through increased income to those already with land access, leaving behind landless families such as younger and female-headed households. Similarly, it will worsen the problem of urban migration among youth, since the current nature of subsistence farming does not provide the lifestyle they aspire to. It is, therefore, imperative that policies targeting rural communities consider off-farm income-generating activities as one way of bridging the gap between land owners and landless rural dwellers.

Credit schemes may facilitate off-farm engagement by empowering citizens in rural self-employment activities. It is equally important to implement targeted entrepreneurial skill-development centres focusing on small business and other rural activities. In other words, the establishment of training centres to tackle skill barriers is necessary. These skills should be determined according to comparative advantage, that is, on the basis of resources available in a particular place. For instance, areas rich in natural resources like timber should focus on the training necessary to make furniture. Similarly, areas close to tourist centres should focus on tourist-related business.

Also, as we have seen earlier, being far from small towns also hinders rural household participation in off-farm activities. The development of infrastructure to open up rural areas to markets may be a good option. Rural roads connecting to small towns as well as other infrastructure like hospitals and schools would encourage clustering and hence open up the economy for marginalised groups to participate in off-farm economic activities. In this way, the country will have addressed the problems of rural poverty and inequality as well as current urban

youth migration. At the same time, high-earning off-farm activities can be used to support on-farm ones, particularly the earnings that farmers get from their own farm activities, but they can also create employment for wider groups, especially those that do not have access to land, in our case youth and female-headed households.

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