

The Role of Social Capital in a Household's Choice to Engage in Off-farm Employment in Kilombero Valley, Tanzania

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Abstract

Off-farm employment can be an effective strategy to deal with uncertainty of household income associated with subsistence farming, and thus improving the welfare of households. This however, depends on a households' ability to overcome barriers associated with engagement in off-farm employment. Recognising these barriers, this paper examines the relative importance of off-farm income and investigates households' capacity and constraining factors that undermine engagement in off-farm employment. The paper is based on household survey data from a randomly selected sample of 309 households in Kilombero Valley; Tanzania. Descriptive statistics was used to examine the relative importance of off-farm income. A Logit regression model was then used to identify determinants of engagement in off-farm employment. Findings show that off-farm income contributes more significantly towards the income of well-off households than poor households. The low level of off-farm income contribution to poor households tends to reduce income risk associated with farming. The results further show that, social capital is a key variable that influences a household's decision to engage in off-farm activities. Social trust and group membership as social capital dimensions are positively associated with engagement in off-farm employment. Other statistically significant variables that explain off-farm engagement were age of the household head, credit access, education and access to tarmac road. Based on these findings, it is recommended that decision-makers and scholars, who are concerned with increasing rural households' engagement in off-farm employment, should recognize the need for rural policy strategies that take into account household social capital. Such recognition will improve farmers' successful engagement in off-farm employment and hence their household income.

Key words: Social capital, Off-farm employment, Off-farm income, Kilombero valley

Introduction

Income from farming activities in rural areas of developing countries has been declining due to various risks affecting rural households. It is now recognised that total households income is not exclusively derived from agriculture, the traditional source of employment in rural areas. One strategy that can be employed to deal with inadequate income from farming is to diversify into off-farm or non-farm activities (Reardon *et al.*, 2000; Ellis, 2000). Accordingly, studies in developing countries have reported a rising trend of off-farm income to total household income. A more recent survey set the contribution of non-farm income to be roughly 35% of rural households' incomes in Africa, and 50% in Asia and Latin America (Haggblade *et al.*, 2007). Despite its increasing importance, only 9% of rural households engage in rural off-farm employment sector in Africa compared to Asia and Latin America with participation rate of 24% and 36% respectively (Haggblade *et al.*, 2007).

According to Haggblade *et al.* (2007) off-farm employment involves income earning activities that take place 'off' the owner's own farm and broadly includes wage employment in other people's farms along with non-farm activities from the owner's nonfarm enterprises or from non-farm wage employment. Off-farm employment is conceptualised to include both non-farm-self-employment and wage earnings in agriculture and non agriculture activities (De Janvry and Sadoulet 2001). However, in some literature the term has been synonymously used with non-farm employment (Ellis, 2000: Ruben and Van den Berg, 2001).

Off-farm employment enables households to lower risk and smooth consumption in situations where agricultural activities are associated with higher levels of risks and income uncertainties (Bryceson, 1999; Ellis and Freeman, 2004; Kazungu and Guuroh, 2014). Off-farm employment has also been recognised to enhance acquisition of farm input among farming households (Reardon *et al.*, 1994; Ruben and van den Berg 2001, Pfeiffer *et al.*, 2009). Despite these potential benefits, poor households face challenges that constrain their engagement in some high return off-farm activities due to their limited financial, human and physical assets. For example, having the right skills is important for earning income from skilled rural wage employment. In addition, poor credit access may impede rural households from taking up activities that require initial investment and working capital (Ellis, 2000; Reardon *et al.*, 2000; Barrett *et al.*, 2001).

In Tanzania, poverty reduction strategies that address rural livelihoods do not actively enhance the growth of diverse activities (Ellis and Mdoe, 2003)

including those related to off-farm employment. For instance, even the Tanzania development vision 2025 does not explicitly describe the role of the off-farm sector in fostering rural development (URT, 2011). This probably suggests the need for more empirical evidence to create more awareness on the importance of off-farm sector. In terms of the rural development policy, a better understanding of determinants of off-farm employment may yield useful insight in designing pro-poor poverty alleviation strategies in an attempt to enable households to successfully diversify their income sources. For example, to identify policies that may favour growth of the off-farm sector even in regions that are considered to have favourable agro-climatic conditions for farming such as the study area (Kilombero). In an attempt to address these relevant policy issues, the study on which this paper is based focused on two related objectives: The first was to assess household income distribution and its relative importance across households' income strata. The second was to examine factors that determine a household's decision to engage in off-farm employment.

Literature Review

According to Reardon *et al.* (1992), a household's decision to participate in rural off-farm employment may be examined based on two sets of factors; individual or households incentives and household capacity variables. Household incentive factors are triggered by intrinsic individual motivations, which relate to household survival or accumulation needs such as response to agricultural shocks or income accumulation (Barrett *et al.*, 2001; Reardon *et al.*, 2000). Household capacity variables, which are the focus of this study, consider households' possession of a number of physical, social and capital assets that determine the ability to partake in off-farm employment.

The role of human capital variables such as education has been recognised in a number of studies (Yunez-Naude, and Taylor, 2001; Fafchamps and Quisumbin, 2003; Nagler and Naude, 2014). For example, education enhances entrepreneurship skills which broaden opportunities for engaging in off-farm employment (Fafchamps and Quisumbin, 2003). Yunez-Naude and Taylor (2001) observed positive association between secondary education of a household head and engagement in both non-farm self-employment and wage employment in Mexico. The authors observed the same relationship when education was measured in terms of years of schooling. In another study conducted in Asia, Fafchamps and Quisumbin (2003) observed that, individuals who are better educated are more likely to work off-farm as self employed and less likely to work as farm casual labourers. This indicates that, rural farm wage employment is negatively associated with education. Findings on age as

another individual level variable yields mixed results; while some studies noted positive effect of a household head's age on off-farm participation (Beyene, 2008), others, for example Ruben and Van den Berg (2001) and Nagler and Naude, (2014) in Honduras and Malawi respectively reported aging to be negatively associated with off-farm engagement.

Off-farm employment engagement is not only explained by household capacity factors, but can also be influenced by some location characteristics that may go beyond the control of household members. In studies conducted in Tanzania, Lanjouw *et al.* (2001) and Mduma (2014) established that households close to a tarmac road and those located in villages with electricity were more likely to engage in non-farm business. However, Lanjouw *et al.* (2001) observed these location factors did not have any influence whatsoever on engagement in wage related off-farm employment.

Generally, rural households are poorly endowed with capacity variables including education, income and other tangible assets, which limits their ability to invest in off-farm employment. As a result, poor households may not benefit and earn significant income from off-farm activities. Nonetheless, social capital can be an important asset for the rural poor. According to Narayan and Pritchett (1997), social capital means 'the quantity and quality of associational life and related social norms'. Membership to associations and adherence to norms can enhance a household's engagement in different off-farm employment in terms of access to credit or information. A review of studies conducted in Uganda and India (Wandsschneider 2003) has shown the useful role of social capital in enabling individuals to access relevant market information and link with buyers, secure wage employment and business opportunities, access formal and informal loans, cash advances, inputs on credit, acquire skills, shared resources for production and marketing and in identifying migration opportunities. Positive roles of social capital have also been reported elsewhere (Narayan and Pritchett 1997; Lanjouw *et al.*, 2001; Isham *et al.*, 2002).

While the role of other capacity variables is well documented, data on social capital are rarely available, and hence few studies have tried to measure quantitatively the impact of social capital on rural off-farm employment and Income (Lanjouw *et al.*, 2001; Wandsschneider, 2003). Therefore, this paper assesses the role of social capital based on the theory of social capital (see Coleman, 1988; Narayan and Pritchett, 1997), which purports that in rural areas of developing countries such as Tanzania, social capital in terms of association and social norms is critical. It is through these associations in the form of group membership for example, that households can access credit to finance off-farm enterprise. A handful of studies have examined off-farm employment

elsewhere in sub-Saharan Africa (e.g. Ellis and Freeman 2004; Beyene, 2008; Nagler, and Naudé, 2014; Nasir, 2014) and Tanzania in particular (e.g. Katenga and Lifuliro, 2014; Mduma, 2014), nonetheless, empirical evidence on the effect of social capital on off-farm employment is scarce. One available study so far that paid attention on social capital in Tanzania (Lanjow *et al.*, 2001) was conducted in the peri-urban areas. Yet it is an established fact that social capital is strongly rooted in rural areas which are deprived of financial assets. This paper thus contributes to the understanding the determinants of off-farm employment by paying particular attention to social capital, describing both its structural and cognitive domains.

Description of the Study Area and Methodology

The study was conducted in Kilombero Valley, which is located in Kilombero and Ulanga Districts in Morogoro region, Tanzania. The study area is one of the largest flood plains in Africa (Kangalawe and Liwenga, 2005). Subsistence farming is the main source of income, paddy being the main cultivated crop. Despite being in a productive wetland, income among paddy farming households in Kilombero Valley is comparably lower than in other wetlands in Africa (McCartney *et al.*, 2010). Farming activities are severely affected by factors such as rainfall variability, poor infrastructure and lack of market opportunities leading to uncertainties in crop production. Examining off-farm employment options may probably enable rural households to counteract the effect of various risks and uncertainties associated with farming in Kilombero Valley. The study area was also selected because it represents areas of high agricultural potential in Tanzania. In addition the area has received little attention in relation to studies on off-farm employment perhaps due to the wrong assumption that on-going activities that are not related to farming are irrelevant in such areas.

The paper is based on primary data collected in a survey from February 2014 to May 2014 through interviews with household heads. The sample consisted of 324 households selected using a multi stage, purposive and random sampling. Purposive selection was used to select five villages that represent diverse socio-economic and land resource endowment characteristics of the study area. Then, two villages of Mwaya and Lumemo were chosen to represent accessibility in terms of a good road infrastructures (tarmac road), whereas, the other three villages, Mngeta, Lupilo and Malinyi represented poor infrastructure with poor seasonal roads. Using the village register as a sampling frame, random sampling was then used to select households in each village. At this stage of household sampling, sampling an intensity of 5% was used. In this sampling procedure, 5% of households in each village were randomly selected. Due to

missing information for 15 households, this analysis is based on 309 households, which were distributed in the five villages as follows: Mwaya (54), Lumemo (69), Lupilo (67), Mngeta (56) and Malinyi (63).

Generally, a household's ability to engage in off-farm employment is determined by its capacity and constraints in terms of number of assets (Ellis, 2000; Reardon *et al.*, 1992). Therefore, the paper uses a numbers of variables representing different kinds of assets in accordance with the sustainable livelihood framework (SLF). The variables used include the age of household heads, education (schooling year), a household's land ownership (ha), and access to credit. As in Beyene (2008), a dummy variable for the presence of a tarmac road in a village is included to capture for differential in opportunities of engagement in off-farm employment.

Social capital, which was the main explanatory variable was represented by three separate indicators; membership density, social cohesion and social trust. Membership density represents structural social capital and it was measured by the number of associations the households head and spouse belonged to. This indicator as other social capital measures focuses on the household head and spouse due to their relatively more contribution to household welfare. For social cohesion and social trust, the tool developed by the World Bank (WB, 2004) for measuring social capital in developing countries was used. Social trust in the paper refers to a household head's perception of trust towards fellow villagers and government leaders; three items representing indicators of trust were used: The first item measured villagers' trust towards village leaders while the second and the third items represented trust towards and central government leaders respectively. Each of the items had a score ranging from the highest level of trust '5' to the lowest level of no trust '1'. Then three items were aggregated to form a single household's level index for social trust. The total index accumulation of the social trust score as additive of the highest level scored on all the three items was thus 15, and the lowest was 3. The same procedure was used to measure household heads' perception of social cohesion which was also captured by three items. For each item a score of '5' meant their perception was high while '1' represented perceived extreme conflict in the village.

In this paper, if the head or the spouse is engaged in any off-farm employment activity apart from 'own' farm work the household is considered engaging in off-farm employment. Hence, off-farm employment was modelled based on the two binary choices which are 'engaging' or not engaging or the so called 1-0 dependent variable. (i.e. '1', household engage in off-farm employment and 0 no engagement in off-farm employment). This being the case, as in Ruben and

Van den berg (2001) and Yunez and Taylor (2001) the Logit model was used to model the probability of a household engaging in off-farm employment. Three separate models each representing one category of dependent variable, which are; non-farm self employment, farm wage and nonfarm wage employment were run. The model for non-farm wage did not yield any statistically significant results, as the variable used had little explanatory power as far as nonfarm wage is concerned. The overall p-value of the model was not significant and discussion of the model was thus left out from further analysis.

The model is represented by;

$$\log \left(\frac{p}{1-p} \right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon$$

Where; $\log [p/(1-p)]$ = Natural logarithm of the odds of the probability of a household engaging in off-farm employment; β_0 is the intercept term, β 's are parameters to be estimated and ε is the error term. The explanatory variables x_1 , x_2 , x_3 and x_4 represent vectors of human, physical, financial and social capital respectively. Village location attributes were represented by x_5 .

Results and Discussion

Pattern and Rate of Engagement in Off-farm Employment

This sub-section presents a broad pattern of off-farm employment and individual activities within each off-farm employment sub category. The description of activity types is shown in Table 1. Generally, the data shows that about 71% of households had at least a household head or spouse engaged in one of the three off-farm employment categories. This percent is close to the rate of participation of 69.5% reported by Katega and Lifuliro (2014) in the semi arid region of Tanzania. Most of the households (58.2%) engaged in non-farm self-employment activities (which includes; petty trading, including selling processed foods, brewing local alcohol and selling grain (rice) (Table 1). Other non-farm self employment activities were selling fuel wood, making and selling bricks and charcoal. Others owned shops and engaged in skilled handicrafts work.

About 18% of the households were mainly engaged in non-farm wage employment whereas, farm wage constituted 23.6% of all off-farm employment. Activities under non-farm wage employments, were further categorised into salaried professional employment (Teacher, government worker and administration), skilled labourer, such as those employed in manufacturing enterprises including carpentry and rice milling machines. There are also unskilled wage employees including night security guards. As presented in Table 1, the share of farm wage employment could not be

separated between farm wage in plantations and farm work on other people's farms due to a high rate of switching between these activities during farming season. For example in a single day one may start as hired labourer in a plantation and move to another farmer's farm as a casual labourer late in evening. This was particularly observed in Mngeta village where the Kilombero Plantation Limited (KPL), a rice farm is in close proximity to the village. In addition there are two other large scale plantations that employs farm labourer in Kilombero valley, these are; Kilombero Sugar Company (located close to Mwaya village) and Kilombero Valley Teak Company (Lupilo village).

Table 1: Off-farm employment Activity Types (n=220)

Activity Type	Frequency	Percent
Petty trading	19	8.6
Agricultural trading	15	6.8
Kiosk and shop keeping	14	6.3
Fish product selling	12	5.4
Fuel wood/charcoal making and selling	10	4.5
Masonry	10	4.5
Commercial motorcycling	8	3.6
Bicycle renting	7	3.2
Handcraft	8	3.6
Food processing and selling	8	3.6
Carpentry/tailoring	7	3.2
Hair dressing /barber	5	2.3
Others	5	2.3
Total Non-farm self employment (n=128)	128	58.3
Unskilled labourers (e.g. security guards)	15	6.8
Skilled workers (e.g driver)	14	6.3
Professional worker (e.g teacher)	8	3.6
Others (e.g..village administrative leaders)	3	1.4
Total Non-farm wage employment (n=40)	40	18.1
Farm wage employment (n=52)	52	23.6
Grand total	220	100

Income Distribution and Relative Importance of Off-farm Income

This section examines the income⁶ structures of households disaggregated by income quartiles. The interest is on the relative contribution of various off-farm income sources. Overall results from Table 2 show that close to half (46.4%) of

⁶ All income measures consider the estimated average income obtained in 2013. It was computed as gross revenue minus costs for inputs and external labour for farm and self-employment income. For other incomes computation was based on the yearly averaged of monthly earning obtained over the same period.

the surveyed household income is earned from off-farm activities. This value is comparably higher than the contribution of between 30-35% reported in developing countries (Haggblade *et al.*, 2007). Since the study was cross-sectional, the higher off-farm share may not necessarily reflect prosperity from off-farm employment. It may entail poor market for the main crop (paddy) which is the source of farm income in the study area. Hence, the higher off-farm income level could be a reflection of the low earning from paddy whose market price was relatively low in 2013 compared to 2012 and 2011. Moreover, yearly fluctuation of paddy market price is common in Kilombero Valley. Consequently, the share of off-farm income for 2013/2014 was higher than it would have normally been. The results in Table 2 further show that the share of income from non-farm self-employment was 34.8%. This was nonetheless higher compared to other off-farm categories. Income from farming had the smallest contribution. Generally, income from paddy was higher than income from other crops and livestock earnings combined. The above reflects the dominance and importance of paddy as a cash crop in the study area.

Table 2: Income Portfolio by whole sample and Income Quartiles (%)
Composition of Household Incomes)

Income category	Whole Sample	Income quartiles			
		First (n=78)	Second (n=77)	Third (n=77)	Fourth (n=77)
Income from paddy	42.6	67.1	47.6	37.8	27.2
Income from other crops	6.5	11.9	9.1	7.4	5.5
<i>Total farm income</i>	<i>49.1</i>	<i>79.1</i>	<i>56.8</i>	<i>45.2</i>	<i>32.7</i>
Farm wage income	1.6	6.4	7.0	3.3	0.1
Non- wage farm income	10.00	0.3	6.4	6.8	11.9
Self employment income	34.8	6.0	19.5	37.3	52.6
<i>Off-farm employment income</i>	<i>46.4</i>	<i>12.8</i>	<i>32.8</i>	<i>47.4</i>	<i>64.6</i>
Remittance income	2.2	7.10	6.4	5.2	0.5
Other income	2.3	1.0	4.0	2.2	2.1
<i>Total income (%)</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
Total income (mean)	1,137,046	178,065.1	458,259	877,511	3,046,966

Note: income computation is based on Tanzanian shillings (Tshs) per adult equivalents: The first income quartile represents the poorest income group and the fourth, the richest. The second column shows proportion of income from each income portfolio for the whole sample (N=309).

The results in Table 2 show income disaggregated by wealth quartile of the surveyed households. There are marked differences in the contribution of off-farm income across income groups. Three important patterns can be observed from Table 2: First, for poor households, the relative importance of farm

income was much higher than for richer households, suggesting that for relatively poor households, engagement in off-farm employment may simply be a survival strategy, and not geared toward income accumulation. Conversely, compared to the higher wealth quartiles (third and fourth), the lower income categories (first and second quartiles) have a relatively higher income share from farm wages. However, there is no perfect linear increase for the relative importance of farm wage income across the quartile groups as was similarly observed by Lanjouw and Shariff (2004) in their study of rural India. The second quartile has relatively a higher proportion (7.0%) of farm wage income than the first quartile (6.4%). The second notable observation is that, income from non-farm self-employment seems to dominate income of the highest income quartiles. This difference was expected since off-farm income involves business operations that require higher levels of start-up capital as a capacity variable, which the poor cannot afford. This may suggest that, capital is a barrier for the poor to exploit opportunities and benefit from diversification activities in rural areas as it has also been observed in rural Tanzania (Ellis and Mdoe, 2003) and rural Ethiopia (Nasir, 2014).

Overall, the share of off-farm income increases with increasing household total income, implying a linear relationship, similar to observation made by Van de Walle and Cratty (2004) in Vietnam using panel data. A different trend of relationship though, was reported in cattle dominated livelihoods in Western Tanzania by Dercon and Krishna (1996) who found the proportion of non-farm self-employment income to be higher for income poor groups than for relatively richer farmers within the same group. This is probably because the rich livestock owners have more access to livestock product markets and thus they earn more cash income from selling cattle and cattle products, which is a fundamental asset for investing in non-farm economic activities. Other studies conducted in rural Asia such as by Adams (1994) and Lanjouw and Shariff (2004) found a U-shaped relationship between non-farm income share and asset indicators.

Generally, data on income distribution indicates different strategies according to income categories households in the Kilombero Valley. Households in the low income quartile appear to obtain the greatest proportion of their income from farm activities rather than from off-farm activities, whereas richer households earn relatively more income from off-farm incomes. Thus, it is important to investigate the determinants off-farm employment engagement since they may have implication on the households' share of off-farm incomes

The Influence of Capacity Variables and Location Factors on Off-farm Employment

This section provides a detailed analysis of the factors influencing households' engagement in off-farm employment. At first all three off-farm categories were set as dependent variables using the same set of vector covariates described under the methodology section. The model for non-farm wage employment, however, was not statistically significant and thus dropped from further analysis. The results for the other two models are displayed in Table 3 with model diagnostic test presented in the last two rows. These diagnostic generally confirms the appropriateness of the Logit regression model used for the two estimations. A Logit model involves a non-linear estimation technique, and thus estimated coefficients do not have a direct interpretation in terms of causality. Their interpretation is rather based on the marginal effect which is a post-estimation procedure after running the Logit model using STATA software (Version 13). The findings show that the probability level ($P \leq 0.001$) indicates the overall models are significant at 1% level of significance.

The results in Table 3 show that social capital variables were generally useful in explaining a household's participation in off-farm economic activities. Social trust was positive and significant at ($P \leq 0.078$) for non-farm self-employment (NFSE) and at ($P \leq 0.006$) for farm wage (FW) models. The effect of social capital is much higher for farm wage with a margin of 25% than non-farm self-employment with a much lower estimated value of 10%. This implies that, social trust is relatively more relevant for farm wage. The perception of how an individual feels about whether other villagers and leaders are trustworthy or not may create a conducive environment for working as a farm labourer on other farms.

It should be noted that, in the study villages one may work on someone's farm based on a non-binding agreement of being paid for one's labour after harvesting. Some of the remuneration may involve payment in kind. All these require a high level of perception regarding trust, particularly, for farm wage labourers. This form of labour may sometimes also be a mechanism that villagers use to help one another to overcome periods of labour shortage. This finding is consistent with similar findings from a study conducted in the peri-urban areas of Tanzania by Lanjouw *et al.* (2001), which established that trust towards village officials and other public servants had a positive impact on participation in non-farm activities.

Table 3: Factors Determining Engagement in Off- Farm Employment (n=309)

Variable	Non-farm self employment (NFSE)			Farm wage employment (FWE)		
	Estimate	Std. Error	P> z	Estimate	Std. Error	P> z
age of household head	-0.00628	0.00217	0.004	-0.0005	0.00063	0.385
Household size	-0.00478	0.02083	0.819	0.0053	0.00604	0.375
Secondary education	0.197754	0.07142	0.006	-0.0271	0.01866	0.147
Number of working adult	0.012241	0.02686	0.649	-0.0065	0.00805	0.421
Access to credit	-0.00441	0.00717	0.539	-0.0673	0.01451	0.000
Land cultivated	0.032959	0.03263	0.312	-0.0220	0.01433	0.162
Land owned	-0.01038	0.02576	0.687	-0.0058	0.00895	0.517
Group membership	0.061828	0.01963	0.002	0.00492	0.00552	0.373
Social cohesion	0.02077	0.01598	0.194	-0.0008	0.00447	0.859
Social trust	0.021438	0.01218	0.078	0.02582	0.00935	0.006
Electricity in the village	0.095036	0.07324	0.194	-0.0384	0.02957	0.194
Tarmac road	0.121432	0.07183	0.091	-0.0082	0.02286	0.718
Mcfadden pseudo R ²		0.11	0.000		0.24	

Note: Estimates are based on marginal effects.

The estimate of membership density in the non-farm self-employment model was positive and statistically significant at 1% level of significance implying that, joining extra groups is associated with increased probability of engagement in non-farm self-employment. This is consistent with the fact that, most of the respondents (69.2%) reported being members of VICOBA⁷ and other self-help groups. As members, they were more likely to benefit from credit from these groups, thereby providing capital for operating off-farm business enterprises. In the prevailing environment where credit from rural credit institutions is in short supply, these village based organisations serve as reliable sources of financial capital that enhances the ability of households to take up off-farm opportunities. Group membership however, could not predict participation in farm wage activities as the p-value for the coefficient ($\beta = 0.00492$) was 0.373, being higher than 0.05 or even 0.1 level of significance (Table 3). Although group membership is not significant for farm wage, it is worth understanding that, individuals engaging in farm labour are the poorest in the village and are unlikely to meet financial savings required for

⁷VICOBA is an abbreviation for Village Community Banks. These are village based informal credits and savings groups to which majority of households associate with, and one can be a member of several such groups depending on his/her ability to pay weekly or monthly contributions.

participation in groups such as VICOBA. The other cognitive indicator of social capital is social cohesion. This variable ($\beta = 0.02077$ & $\beta = -0.0008$) was not significant for both models ($P = 0.194$ and $p = 0.859$ respectively) in predicting participation in off-farm employment among respondents in this study.

Variables representing human capital had different results between the two employment categories. First, the results show that a household head's secondary education had a positive and significant effect on participation in off-farm activities at 10% level of significance. Thus, keeping other variables at their mean values, secondary education (dummy) was associated with an increased the likelihood of engaging in non-farm self employment, suggesting that a high level of skills is required to operate some of the off-farm activities, in particular business enterprises. However, the variable was not significant in predicting farm wage employment and its effect is negative. Hence, the observation shows that the effect of education was not uniform across strata of off-farm employment.

Second, the estimate of age in Table 3 was negative and significant ($p \leq 0.004$) in the NFSE model, suggesting that ageing has a negative impact on engagement in non-farm self employment. The observation conforms to findings by Ruben and Van den Berg (2001) in rural Honduras as well as a cross country study by Davis *et al.* (2007) who found that age was negatively associated with non-farm self-employment but positively associated with farm wage. A similar effect of age in non-farm self employment was noted by Nagler and Naude (2014) in rural Tanzania. However, in the current study, the influence on age on farm wage employment is not statistically significant. Other vectors for human capital, such as household size and the number of working adults are not significantly related to either non-farm self-employment or farm wage models. Access to credit was negative and significant ($P \leq 0.000$) for the farm wage model with a coefficient estimated at -0.0673 . The coefficient is negative (-0.00441) but it is not significant ($p = 0.539$) in predicting non-farm wage. The negative sign is contrary to expectation. It may be explained by possible endogeneity between access to credit and the respondents' personal traits. The interpretation here is that, keeping other variables at their means, compared to households with access to credit, those without access had a 6% higher probability of engaging in farm wage. This may be expected as farm wage employment is largely a refuge for the poor who are usually marginalised when it comes to access to credit. Credit is a critical financial asset necessary to engage in more lucrative high paying off-farm activities.

Two variables representing physical capital (farmland owned and farmland cultivated), were both not significant with negative coefficient estimates (Table 3). This observation merits some explanations as it does not support commonly held hypothesis of positive effect of farmland ownership on off-farm participation reported elsewhere in Tanzania (Mduma, 2014). The negative effect of land ownership in this study (-0.01038 and -0.0058 for the farm employment and non-farm employment models respectively) probably supports the labour allocation theory whereby households with large farms need more labour. Hence, households with large farms are less likely to engage in off-farm employment particularly farm wage, considering the prevailing labour scarcity in the study area. Lastly, the results in Table 3 reveal the role of road infrastructure in influencing off farm participation. Being located in a village with asphalt roads has a positive and significant association with engaging in non-farm self employment. This finding is similar to that by Nagler and Naude (2014) who found 1km increase of distance to the main road decreased the probability of non-farm enterprise by 0.2% in rural Uganda. This may plausibly be explained by increasing connectivity with other urban areas, which provides opportunities for non-farm self employment activities. Transport infrastructure acts as a 'demand pull' factor as described Bryceson (1999).

The results presented so far provide evidence to support the theoretical conception that household level social capital has a direct effect on households' members' participation in off-farm employment. Nevertheless, the effect is not uniform, varying according to functional categories of off-farm employment. While some dimensions of social capital may be relevant for rural wage related employment, others may play a dominant role in non-farm self employment. However, there is potential endogeneity of access to credit, which may be correlated with someone's entrepreneurial traits that can also determine their engagement in off-farm employment. This is particularly the case for non-farm self employment. In such a case there would be correlation between independent variable (access to credit) and the error term, hence no strong claim of causality can be observed.

Conclusion

The paper has shown that, farming households in Kilombero Valley behave much like elsewhere in rural areas of developing countries with regards to off-farm income options and engagement. Households that are well-off benefit more from self employment activities, while the poorer ones depend much more on farm wage employment and their own farm earnings. Income poor households seem to utilise off-farm activities merely as a risky reducing

strategy rather than an income accumulation strategy. This pattern can be attributed to structural factors related to endowments of key livelihood assets.

Evidence from the econometric model underscores the role of social capital which seems to be the most important non tangible asset that the rural poor households can possess. The impact of social capital is however, not uniform across all categories of off-farm employment. Membership density and social cohesion are positively linked to participation in farm wage employment whereas a respondent's perception of trust is positively linked to participation in non-farm self-employment. The effect of group membership is only significant for non-farm self employment. Other variables that explain off-farm engagement are age, education, number of dependants, access to credit and size of farmland owned. However, these variables had different effects on the two categories of off-farm employment. For example, access to credit had much stronger negative effect on engagement in farm wage, than on non-farm self-employment.

From a practical perspective, two sets of recommendations are offered at the District Council and village administrative levels. First, efforts should be made to remove entry barriers that limit poor households from high earning off-farm activities. This can be achieved by enhancing the formation of social groups through which members can access capital and build networks for off-farm employment. This role falls largely on the Community Development Department in Kilombero District Council, which deals with registration and monitoring of village based self-help groups. Other stakeholders such as NGOs can also enhance their support in forming such village based social groups.

Likewise, it is critical to impose mechanisms that will increase village leaders' responsibility as this will raise the level of trust. Trust between villagers and leaders create a conducive atmosphere for running rural businesses smoothly, a condition that determines prosperity of off-farm employment. Second, it is important to improve the rural infrastructure such as roads thereby improving connectivity and reducing the cost of engaging in rural off-farm business. Moreover, efforts should be directed at creating a conducive environment for rural off-farm enterprises development. This requires more intervention from the ministries responsible for facilitating trade as well technical aspects of businesses, as well as Local Government departments responsible for developing such infrastructures.

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