The Effect of Off-Farm Income Diversification on Households Economic Wellbeing in East Gojjam Zone: An Endogenous Switching Approach

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Abstract

The main objective of the study is to examine the effect of off-farm income diversification on the economic wellbeing of selected rural households' in East Gojjam Zone. To do so, a primary data was collected from 620 selected households using structured, unstructured and focus group discussions. The study employed logit and Endogenous Switching Model to examine the determinants of participation off-farm activities and to examine the effect of off-farm income diversification on the economic wellbeing, respectively. Hence, the result of logit model shows that off-farm income diversification decision significantly depends on household head's educational attainment, age, land size, access to credit, family size, location, distance to market, health status and community level infrastructures. Moreover, the result of endogenous switching model shows that off-farm income diversification has a significant and positive impact on households' consumption expenditure and their food availability. The conditional expected households' consumption expenditure by participant households is approximately 16,245.64 ETH birr, while the same participant households would have enjoyed if they did not participate in off-farm work is approximately 15,273.59 ETH birr. Therefore, when participating in off-farm activities, on average, rural farm households can make consumption expenditure gains of approximately 972.05 ETH birr per household member. Therefore, this study concludes that off-farm income diversification is a true pathway for improving the economic wellbeing of rural farm households in rural areas of East Gojjam Zone.

Keywords: Off-Farm Activities, Average Treatment Effect, Logit Model, Endogenous Switching Model, and East Gojjam Zone.

1.   Introduction

Now a day the changing in the socioeconomic, political, environmental and climatic atmosphere in developing countries across the globe has continued to aggravate the living conditions of most households especially those who are living in rural areas. Explicitly speaking, this problem is more severe in East African countries, where agriculture remains the main way of life and major More pronouncedly, this incapability of agricultural sector to feed its ever increasing population in developing countries; has been increasing the vulnerability of those people who are often poor and deprived with a minimum standard of living (Bezabih et al., 2010). At an upshot, people in rural areas of low and lower middle income countries concentrate on minimizing risks and seeking food security by producing food for self-consumption. Hence, the impetus for achieving sustained rural economic development in rural areas has to pivot around expanding the base of off-farm activities (Escobal, 2001). Subsequently, rural off-farm sector has gained considerable importance as an alternative strategy for generating employment, reducing poverty, increasing the coping

source of employment (Woldehanna, 2000); but characterized by low level of productivity, slow growth, under-performance and high level of land fragmentations. Consequently, in rural economies, agriculture sector as an economic activity has not been consider as a sufficient vehicle for solving household-level malnutrition and food insecurity problems.

mechanisms in case of crop failures, and improving food security in rural economies.

At a snapshot to the Ethiopian economy, the trend in the performance of agriculture sector also indicates that the sector is under-performing and recorded slow growth rate over the past couple of years (Woldehanna and Oskam, 2001). Indisputably, in one hand, the share of gross domestic product (GDP) originating from agriculture has gone down and dawn from year to year in Ethiopian economy (Bezabih et al.,2010), on the contrary; the share of workforce engaged in agriculture, which was about 90 percent in 1990s, still remains at over 70 percent (Raphael and Matin, 2010). Consequently, this has led to widening of gap between incomes in agriculture and

non-agriculture sectors, which is perceived to be one of the major reasons for persistence of poverty in the country. As a result, most rural households in rural areas of all regions in Ethiopia engage in off-farm activities to hedge against both income and non-income poverty.

Hence, equivalent to other zone's in region, factors like a frequent occurrence of floods that annihilating crops, large number of fragmented landholdings, unequal land distribution structure, and low use of modern agricultural inputs are threatening the livelihood sustainability of the rural people in East Gojjam Zone (Nigisti, 2007). Very often some rural households in East Gojjam Zone may not have enough food to consume in the lean season. Henceforth, it is clear that rural households in East Gojjam Zone urgently need ways of creating employment to absorb both the existing surplus labor and new entrants to the labor market. Failure to do so will not only limit economic growth but will also make it difficult to further reduce poverty levels and economic inequalities in the rural area (Holden, 2003). Accordingly, off-farm enterprise can do a better job by hedge against both income and non-income

poverty in rural areas in East Gojjam Zone.

Despite the importance of off-farm economic activities to rural households in both social and economic terms; the sector lacks policy, financial and promotional support from the government, decision makers and development practitioners who are interested in rural development (Schwarze, 2004). As a result, rural off-farm economic activities are not achieving their full potential to provide benefits to participating households. Moreover, with the change in socioeconomic and climatic atmosphere in the country; the livelihood security of smallholder farmers in East Gojjam Zone is in a vulnerable condition (Bezabih et al., 2010), hence the goal of reducing poverty and improving a household's livelihood in the area has remained a challenging task. Consequently, a clear understanding of livelihood strategy, its outcome, and their impact factors is indispensable to unraveling the bottleneck of poverty and to formulate an effective anti-poverty program in the area.

Meanwhile, a lot of empirical studies have been documented on off-farm income diversification across the country,

but there seems to existed dearth of empirical studies on the linkage effects of rural off-farm income diversification on economic wellbeing's among farm households' in East Gojjam Zone. To contribute to the literature, this study is, therefore; examine the factors that determining the participation in rural off-farm activities, and the effect rural off-farm income on the economic well-beings of rural households in East Gojjam Zone. Moreover, the existing literatures employed propensity score matching approach to examine the effect of off-farm income diversification on rural households' economic wellbeing. However, examining the effect of off-farm income diversification on rural households' economic wellbeing using propensity score matching possesses two critical issues. The first issue is self-selection of participation in off-farm which is varying among rural farm households. Untreated to this leads to self-selection problem and creates bias impact estimation. One can also use an instrumental variable or Heckman selection approach or standard treatment effect model to control for this selection bias. Still, these approaches cannot control for the potential systematic differences between the groups due to the

assumption that the consumption functions differ between the participants and nonparticipants by only a constant term. Similarly, participation decision is potentially an endogenous variable and creates an endogeneity problem in the participation model due to unobservable time varying heterogeneity. Therefore, to contribute to the literature this study was employed an endogenous switching regression model to reduce the selection bias via controlling for both observed and unobserved heterogeneity.

2. Conceptual Framework

Literatures in the area provide us ample evidences in favor of the explanations for farm households' motivations to diversify their incomes and its effect on their economic wellbeing. Based on the empirical literatures in the area, we present the conceptual framework that tries to link the major factors that are expected to determine household's decision to participate in off-farm activities and its effect on farmers' economic wellbeing's' below. These factors can be shown by categorizing as factors that influence relative returns to agricultural production and related risks, referred as incentives, and factors that affect the household's capacity of

participation in different off-farm activities (Reardon et al., 2001).

Incentives allow farm households to participate in farm and off-farm wage employment, off-farm self-employment and social and community service activities to generate incomes. While the factors that limit the capacity of households to participate in off-farm work includes such as education, access to credit and age. Involvement of rural farm households in either farm activities or both farm and off-farm activities will increase the households' income and hence increases HHs consumption expenditure and improving their food security status. This conceptual framework, which established as a foundation for the factors that determine off-farm employment participation and income is presented in the figure below
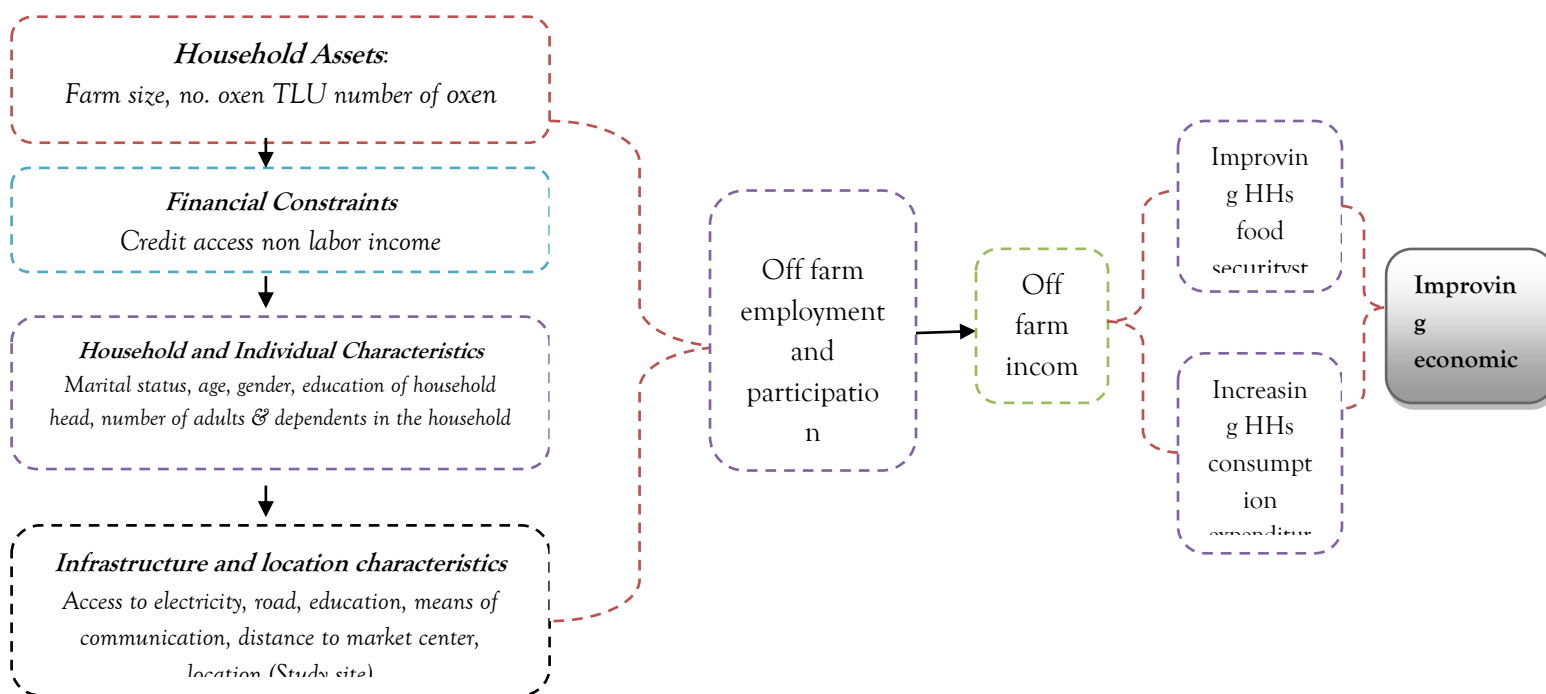
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Figure 1: Conceptual framework for the determinants of rural households' off-farm income diversification and effect on their economic wellbeing's

3. Methodology

3.1. Profile of the Study Area

The study was conducted in Shebel Berenta and Dejen district of East Gojjam zone in Amhara regional state. According to the traditional climate zone classification, two major vertically stratified temperature zones are found in the districts. These are Woina Dega (sub-tropical) and Kolla (tropical) having elevation 1500-2500m and 1000-1500m respectively. The altitude of the study area ranges from 776 meters to 2220 meters above sea level. Small scale mixed agriculture is the dominant source of livelihood to the local people in the districts. As well, Teff, Wheat, Barely, and Maize are the principal crops, and from the livestock cattle, sheep and Goats are the dominant animals in the districts (Central Statistics Agency, 2020). Moreover, cultivation is done only in one season and during the agricultural peak season people involved in agricultural activities was highly engaged in laborious farm activities. But during off-season they search for alternative employment opportunities in both rural and urban areas. Meanwhile more and more emerging non-farm activities are coming up in Shebel Berenta and Dejen distrect with increase in urbanization, diminishing agricultural productivity, and growing infrastructure which are creating avenues of non-farm employment.

3.2. Data type and source

The data type of the study was primary data and sourced from a cross-sectional data of 620 farm households surveyed in 2019 production season from rural East Gojjam Zone. All households in the sample are landholders and farming is the main source of livelihood (crop and livestock production).

3.3. Sampling design

To get representative households, samples were drawn by following a multi-stage sampling technique using both purposive and random methods of sampling. The stages that were involved in the selections are:

Stage 1*:* This involved the purposive selection of two districts from all districts in East Gojjam Zone. These districts were Shebel Berenta and Dejen Woredas. The selection of two districts as the study area was based on two facts. First, these districts are characterized by low agricultural production levels with erratic rainfall; thus, rural off-farm activities are important economic activities for participating households. Second, these districts are listed areas with high poverty levels in East Gojjam Zone.

Stage 2: From the two purposively selected districts, four Kebeles [1] each were purposively selected to give a total of eight (8) Kebeles.

Stage 3: From the eight (8) Kebeles that were selected, two Blocks [2] were randomly selected to give a total of 16 Blocks.

Stage 4: From each of the randomly selected sixteen (16) Blocks, two (2) circles [3] were randomly selected to give a total of thirty (32) circles.

Stage 5: From the randomly selected 32 circles, twenty (20) farming households each were randomly selected. Thus, a total of 640 farming households were used as the sample size for the study. Households who has select in the survey include those that are participating and those not participating in off-farm activities.

3.4. Methods of Data Collection

Data collection for this study was involved in three major methods: a document review, interviews and discussions with key informants. Household interviews in this study were administered using a semi-structured questionnaire, while interviews with key informants were conducted using an unstructured, open-ended checklist. A document review was also used to collect secondary data. The documents read included books, journals, manuscripts, and research and official reports.

3.5. Method of Data Analysis

Data compilation and processing was started immediately after field work. Data processing involved editing, coding, classifying and entering data by using the Statistical Package for Social Sciences (SPSS) and STATA. Quantitative and qualitative data were generated and presented via frequencies, and descriptive and multi-response statistics in SPSS. Inferential statistics was also present to scrutinize the effect of rural off-farm activities on households' economic wellbeing's.

3.5.1. Empirical framework

3.5.1.1. Modeling Off-farm Activity Participation

A farm household's decision to either participates in off-farm work or not is assumed to be the outcome of a vector of factors related to the farmers' resources and constraints. As noted by, a positive number of off-farm hours will be observed for an individual if the potential market wage is greater than the

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[1] A **kebele** *is the smallest administrative unit in District.*

[2] *A **Block** is the smallest administrative unit in Kebele*

[3] *A **Circle** is the smallest administrative unit in Block.*

reservation wage. However, these differential wages are not observable. What is observed is the decision to participate, or not to participate in off-farm work. This study postulates that a farm household will only engage in off-farm work when it gains extra income to complement its farm income (reservation wage). The study begins by observing participating and non-participating households, as to whether they differ significantly in terms of household characteristics, farm characteristics and assets. Thus, Logistic regression model is employed to estimate the determinants of off-farm work participation. Based on theoretical and empirical considerations, we specify the following model for non-farm employment participation:

$$I_i{}^* = \alpha Z_i + v_i \quad \text{.. (1)}$$

$$I_i = 1 \qquad if I_i{}^* > 0$$

$$I_i = 0 \qquad otherwise$$

where $I_i{}^*$ is the probability that a farm household works off-farm in addition to its primary farm work (also known as the latent variable), which is observed through the choice to participate in off-farm work. The observed dichotomous choice to work off-farm is given by I_i, which is equal to 1 for a farm household that engages in at least one off-farm work activity and 0 for a farm household that does not engage in any off-farm work activities. α is the vector of parameters to be estimated, and v is the error term under the assumption that $v \sim N(0,1)$. Z [4] includes household characteristics, farm characteristics, agro-ecological risks and public transportation condition, which are expected to determine the likelihood of engaging in off-farm activities.

3.5.1.2. Estimation of the Effects of Off-Farm Participation on Household Economic Wellbeing's'

The particular interest of the current study is to quantify the effects of off-farm activities on farm household economic wellbeing i.e. proxy by food consumption expenditure and food availability. Household's food consumption expenditure measured as the annual consumption expenditure by the household on food items. Moreover, food availability is a dummy measured as 1 if household had experienced food shortage in last six months, 0 otherwise [5]. Thus, one needs to compare the participants'

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[4] Detail measurement of variables are presented in annex 6

[5] Detail measurement of variables are presented in annex 6

conditional expected consumption derived from the endogenous switching regression model with the counterfactual case that the same participants have chosen not to participate. The conditional expected value :

$$E(y_1/I = 1) = \beta_1 X_1 + \delta_{u1v}\lambda_1 \ldots \ldots \ldots \ldots \ldots (2)$$

where $\delta_{u1v}\lambda_1$ accounts for sample selection arising from the fact that a farm household participating in off-farm activities differs from other households with characteristics X[6] and Z because of unobserved characteristics. The conditional expected value of food consumption that the same farm household would enjoy without participation is derived from the following:

$$E(y_0/I = 0) = \beta_0 X_1 + \delta_{u0v}\lambda_1 \ldots \ldots \ldots \ldots \ldots \ldots \ldots (3)$$

The consumption gain, which is defined as the change in per capita food consumption expenditure and food availability due to off-farm participation, can then be computed as follows:

$$E(y_1/I = 1) - E(y_0/I = 0) = (\beta_1 - \beta_0) X_1 + (\delta_{u1v} - \delta_{u0v})\lambda_1 \ldots \ldots \ldots (4)$$

of food consumption expenditure and food availability by a farm household with characteristics X and Z that participates in off-farm activities is derived as follows

In the literature on impact assessment, this consumption gain is called the average treatment effect on the treated (ATT), which accounts for all factors potentially leading to consumption differences. This treatment effect on the treated results from the differences in the coefficients in Equations (2) and (3) $i.e. (\beta_1 - \beta_0) and (\delta_{u1v} - \delta_{u0v})$. If a farm household self-selects to participate in off-farm activities or not participate based on the comparative advantage, $(\delta_{u1v} - \delta_{u0v})$ would be positive, and participation in off-farm activities would produce bigger benefits in terms of food consumption expenditure and food availability under self-selection than under random assignment. In this case, a simple comparison between mean consumption in the participant group $E(y_1/I = 1)$ and that in the nonparticipant group $E(y_0/I = 0)$ would result in an upward bias of the treatment effect, which is accounted for in Equation (4).

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[6] Detail measurement of variables are presented in annex 6

4. Results and Discussion of Findings

4.1.1. Diagnostic test

Before performing the econometric estimation, it is extremely important to test different econometric assumptions using appropriate statistical methods (i.e. model specification test, heteroscedasticity test, multicolinearity test…). The result of the diagnostic test was discussed below.

4.1.1.1. Model specification test

Testing the model specification (ovtest) is very important to check out whether one or more relevant variables are omitted from the model or one or more irrelevant variables are included in the model. There are different methods to check specification error of the model. The Ramsey reset test for omitted variables are commonly used in the test. Annex 4 in the appendix shows the result of ovtest. According to Ramsey reset test, a model specification is said to be fit if the p-values stated in P>F is greater than the chosen level of significances i.e. 1%, 5% and 10%. The Prop> F in the result is 46.52% which is greater than any of the significance levels of the specified model. Therefore, the model has no relevant omitted variable which means the model under consideration has no specification error.

4.1.1.2. Test of heteroscedasticity

In the classical linear regression model, one of the basic assumptions is that the probability distribution of the disturbance term remains same over all observations of X; i.e. the variance of each u_i is the same for all the values of the explanatory variable. Symbolically,

$$\text{var}(u_i) = \text{E}[u_i - \text{E}(u_i)]^2 = \text{E}(u_i^2) = \sigma_u^2;$$

This feature of homogeneity of variance (or constant variance) is known as homoscedasticity. It may be the case, however, that all of the disturbance terms do not have the same variance. This condition of non-constant variance or non-homogeneity of variance is known as heteroscedasticity. Thus, we say that U's are heteroscedastic when:

$$\text{var}(u_i) = \sigma_{ui}^2$$

Thus in order to test whether there is a heteroscedasticity or not, the study employed Breushpogan test. The result of Breushpogan test presented in annex 5 in the appendix. The decision rule is, if the p-value of the Breushpogan test is greater than any of the chosen significance levels i.e. 10%, 5% and 1% which indicates that there is no probable problem of heteroscedasticity. Therefore, as reported the p-value is greater than 0.05 (i.e. 0.1200>0.05) then the null hypothesis is

accepted and there is significant evidence that there is no heteroscedasticity problem.

4.1.1.3. Test of Multicollinearity

Multicollinearity meant the existence of a "perfect" or exact, linear relationship among some or all explanatory variables of a regression model. For k-variable regression involving explanatory variables $x_1, x_2,......, x_k$, an exact linear relationship is said to exist if the following condition is satisfied.

$$\lambda_1 x_1 + \lambda_2 x_2 + ... + \lambda_k x_k + v_i = 0$$

where $\lambda_1, \lambda_2,.....\lambda_k$ are constants. To test the existence or not-existence of multicollinearity problem VIF test was applied. The result of the test indicates that the mean VIF of the model is 2.86 this shows that there is no strong correlation among all or some explanatory variables in the model.

4.2.

4.3. Determinates of household off-farm income diversification

The main purpose of this section is to present the analysis and discussion of the findings of the study. The researcher distributed a total of 640 questionnaires, out of the total 640 questionnaires, 620 useable questionnaires were obtained to enable a meaningful analysis of the data, while 20 questionnaires remain uncollected and not relevant for analysis due to negligence of the respondents in filling the questionnaires. STATA 14 software was used to analyze both the descriptive and inferential statistics of the study. The analysis is also done in line with the objectives.

The descriptive statistics of the study indicates that 58% of the households were diversified and 42% of the population was non-diversified households that depend solely on farming as means of livelihood. The mean family size of off-farm diversified and non-diversified households for this study was 7.33 and 4.44 respectively. 72% of the respondents were male household heads while the rest of the respondents were female. The mean age of diversified and non-diversified respondents was 48 and 50 respectively. 78% of the respondents acquired at least basic education. The average land size owned by diversified and non-diversified households in this sample was 1.71 and 2.05 hectares respectively. 57.6% of the households accessed credit while 42.4%

of the households could not access credit.

On gender perspective the logit model shows that, male headed households are more likely to diversify into off-farm income diversification activity than their female counterparts (*See annex 1*). Female headed households are less likely to participate in off-farm activities than the male headed counterparts, and the corresponding marginal effect indicates that male headed households are 2.29 percentage points more likely than female headed households to participate in off-farm self-employment activities, holding other covariates at their mean.

On age perspective, the age of household head has a significant influence on off-farm income diversification decision hence; households with younger heads are more likely to diversify into off-farm income diversification activities. The marginal effect for age implies that as age of the household head increases from its mean value 48 to 49 years, the chance of being involved in off-farm activities will increase by 4.13 percentage points, while other variables are kept at their mean. On the contrary, households with ageing heads are less likely to diversify into off-farm income diversification activities due to productivity decline associated with old age. This can be seen in annex 1 as age square has a negative figure. The marginal effect for age square implies that as age of the household head increases from its mean value 48 to 49 years, the chance of being involved in off-farm activities will decrease by 12.99 percentage points, while other variables are kept at their mean.

Regarding to educational attainment, the positive coefficient 0.0784 (*in annex 1*) implies that holding all other factors constant, lack of education has a potential of influencing households to move from on-farm livelihood strategy to off-farm livelihood strategy. A 1 level drop in the level of education attained by a household head from the highest expected level of education (i.e. tertiary level) will result in a 7.84% increase in the chance to shift from on-farm livelihood strategy to off-farm livelihood strategy. The results indicate that uneducated household heads have a positive probability of shifting from on-farm to off-farm livelihood strategy although De Brauw *et al.,* (2002) highlighted that households' knowledge, skill and attitude are shaped through education on how to diversify livelihood strategies.

There was a significantly positive relationship between household livelihood off-farm diversification strategies and the increase in family size as indicated by the positive coefficients of 0.2593 *in annex 1*. This indicates that family size has a potential of influencing households to shift from on-farm livelihood strategy and engage in off-farm livelihood strategies. Holding all other factors constant, an increase in the size of the household by one member will result in a 25.93% increase in chances of a household to shift from on-farm livelihood strategy to off-farm livelihood strategy. On farm size perspective, farm size does show a significant effect in off-farm income diversification decision at 10% significant level. A unit reduction in the farm size what the households have, will increases the probability that the households participate in off-farm income diversification activities by 0.74%, holding other covariates constant.

Regarding to HHs access to credit, holding all other factors constant, an increase in access to credit by 1 extra source will result in 22.18% increases in chances to shift from on-farm livelihood strategy to off-farm livelihood strategies respectively.

Most households in the study areas have a poor resource base; therefore providing credit to these households will improve their livelihoods. On the perspective of cooperatives, the coefficient 0.2478 indicates that cooperatives have a potential of influencing households to move from on-farm livelihood strategy to off-farm livelihood strategy. Holding all other factors constant, a 1 unit increase in the number of cooperatives per individual household will result in a 24.78% increase in the probability of a household to shift from on-farm livelihood strategy to off-farm livelihood strategy.

Predictably, the findings on health status of the households have shown that household heads having any form of health disability are less likely to be involved in off-farm income diversification activities. This implies the importance of health to off-farm income diversification activities. Accordingly, the result of logit model reveals that the probability of participation in off-farm income activities will increases by 0.52% when households' health status become more and more healthy, holding other covariates at their mean. Holding all other factors constant, a 1km increase in the distance from a given rural household to the closest market centre will result in a

21.17% decline in the probability by a household to shift from on-farm livelihood strategy to off-farm livelihood strategies. The probability of the respondents to shift from on-farm livelihood strategy and engage in off-farm livelihood strategies decreases as the distance from a specific household to the market centre or town increases.

Location dummy has also included as explanatory variable to capture other factors that create differences in participation decision of households in the two sample sites. An individual in Dejen districts' has high probability of participation in off-farm activities over those who live in, Shebel Berenta districts'. The estimates for marginal effects shows that keeping all variables at their mean, individuals in Dejen districts' have 6.94 percentage points more chance of participation in off-farm income diversification activities than its counterpart, Shebel Berenta districts'. This is reasonable as Dejen districs' is along the main road from Addiss Ababa to Bahirdar town which have relatively wider market than Shebel Berenta districts'.

4.4. Effects of off-farm participation on household's economic wellbeing in the study areas

To evaluate the effects of the off-farm participation on household economic wellbeing, the conditional expected both households' consumption expenditure and food shortage status by the off-farm participant households $E(y1|I = 1)$ is compared to what they would have enjoyed if they did not participate in off-farm activities $E(y0|I = 0)$. The difference in households' consumption expenditure and food shortage status conditional on off-farm participation is computed following equation (4) in methodology part and reported in annex 3 and 4. It is also possible to compute the counterfactual hypothetical effects for the nonparticipants. However, due to the absence of a selection effect for the nonparticipants, that is, the nonparticipants are not different from random farmers; the counterfactual hypothetical effects are not taken into account.

The conditional expected households' consumption expenditure by the off-farm participant households $E(y1|I = 1)$ is approximately 16,245.64 ETH birr, while the conditional expected households' consumption expenditure that the same participant households would have enjoyed if they did not participate in off-farm work $E(y0|I = 0)$ is

approximately 15,273.59 ETH birr. Therefore, when participating in off-farm activities, on average, rural farm households can make consumption expenditure gains of approximately 972.05 ETH birr per household member (*See annex 2*). This result reveals that participation in off-farm activities can allow rural farm households to increase their consumption expenditure. This finding is consistent with the widely held view in the literature that income from off-farm activities plays a vital role to smoothen household consumption expenditure.

Similarly, the endogenous switching model result shows that diversified households are more food secured than undiversified households. This implies that the increased household income from off-farm income diversification assist in significant reduction in food shortage experienced by the diversified households (*See annex 3*). Because off-farm employment generates supplementary household incomes, it can provide participants with additional capital for investments in agricultural technology, which is a productivity-enhancing factor. In addition to income generation, the farm households' engagement in off-farm employment can

reduce the possibility of disguised unemployment as a result of excessive labor force on the farm, improving farm productivity and, thus, increasing the farm's output level. This finding is consistent with the widely held view in the literature that income from off-farm activities plays a vital role in improving food security status.

5. Conclusions and Recommendation

5.1. Conclusions

The research was conducted with the objective of examining and studying the effect of off-farm income diversification on the economic wellbeing of selected rural households' in East Gojjam Zone. To do so, a primary data was collected from 620 selected households using structured, unstructured and focus group discussions. We employed a logit model to examine the determinants of participation off-farm activities and hence, the result of the model illuminates that off-farm income diversification decision significantly depends on household head's educational attainment, age, land size, access to credit, family size, location, distance to market, health status and community level infrastructures. Likewise, the result of endogenous switching model reveals that off-farm income diversification has a

significant and positive impact on households' consumption expenditure and their food availability. Therefore, this study concludes that off-farm income diversification is a true pathway for improving the economic wellbeing of rural farm households in rural areas of East Gojjam Zone.

5.2. Recommendations

The findings of the study imply that any projects undertaken by the government and NGOs in aiming at sustainable improvement of poor rural households' livelihood in East Gojjam Zone should give attention to the following issues:

✓ Diversification of off-farm livelihood strategy needs to be strengthened in rural farm households in the study areas. One way to strengthening the diversification of off-farm income activities to through education, training and awareness; therefore, rural farm households in East Gojjam Zone should acquire formal and informal education, vocational training and awareness on how they can venture into, run businesses and engage on better income generating livelihood activities to cope with economic constraints in the area.

✓ While this paper is not advocating for off-farm income activities as a substitute to farming, off-farm work could be a reliable complement to farming activities. Policy should therefore focus on making off-farm work opportunities available to rural households and help them overcome entry barriers. Such measures may include increasing the access of rural households to physical, financial, social and human capital. Physical capital measures such as good roads, dependable electricity supply and general infrastructural development will help to reduce production and transportation costs. Improving access to education in rural communities would also enhance off-farm employment opportunities, particularly, off-farm wage employment.

✓ The study shows that membership of a village group and rural cooperatives have a positive association with off-farm work participation in the study areas. Thus, promotion of the formation and participation in village groups and associations (i.e. cooperatives, women associations, business associations, and farmer-based organizations), will go a long way in enhancing off-farm employment opportunities for rural farm households in the study areas. Therefore, these types of associations should be encouraged among the rural farm households.

5.3. Areas of further research

Although we find that off-farm income diversification has positive effects on consumption expenditure and food security status of rural farm households in the study areas, we cannot conclude whether it is the poor or the non-poor that benefits from off-farm livelihood strategies in rural economy. Thus, further research is still needed to fill this gap. Moreover, rural households engaged in similar household livelihood strategies differ in terms of levels of wealth. Hence, the causes of and wealth value margins need to be assessed both at household levels and at community levels. Therefore, further research is still needed to fill this gap. Finally, in this investigation we didn't examine the impact of the heterogeneity in terms of the economic activities to spell out the effect of off-farm income diversification on the economic wellbeing of rural households' in the study areas. Therefore, further research is still needed to fill this gap.

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