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Determinants of Livelihood Diversification Decision of Small Holder Rural Farmers: Case of Sadi Chanka District, in Oromia, Ethiopia.

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ABSTRACT

Livelihood diversification is the no more a choice but a must in developing countries. Diversification of farmers towards non- farm and off-farm activities as a source of income and employment is a way out of poverty in these countries. Farm households should engage in diverse livelihood strategies away from purely crop and livestock production towards other non-farm and off-farm activities in order to broaden and generate additional income for their households. This study attempts to analyses the determinants of livelihood diversification decision of small holder rural farmer households. Two stage sampling procedure was employed and 351 respondents were selected from four kebeles of Sadi chanka District. Multinomial logistic regression model was used to examine the determinants of livelihood diversification decision of the smallholder farmers. The regression result showed that out of the 16 hypothesized variables, ten were found to be significantly influencing the livelihood diversification of the smallholder farmers. Accordingly, age of household head, sex of household head, education level of household head, access to credit, irrigation facilities, urban linkage and crop production risk influenced the livelihood diversification decision positively and significantly, while farm-land size, market distance and dependency ratio affected the decision to diversify negatively and significantly. Thus, the findings from this study can be used by policy makers to design policies that will reduce poverty by way of making the smallholder farmers diversify their income generating activities.

***Key Words**: Diversification decision, Multi nominal logistic regression, Nonfarm, off farm activities*

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1. INTRODUCTION

Agriculture is an important sector for majority of the rural households in developing countries. It provides employment for a large number of workers and provides livelihoods for more than 70 percent of the rural population, including a large share of the country's poorest households (World Bank, 2016).

However, farming as a primary source of income has failed to guarantee sufficient livelihood for most farming households in developing countries and the agricultural development policies have largely produced little improvement, especially in sub-Saharan Africa (Babatunde Ro, 2013).

Thus, the expectation that achieving the goal of reducing poverty only through increasing agricultural productivity and redressing the issues of access to key agricultural resources without non/off-farm livelihood diversification could not be successful in the sub-Saharan African countries(Emmanuel ,2011). For these reasons here is a strong consensus that any development intervention to improve the livelihood and food security situation of the rural poor need to take agriculture along with the non/off-farm livelihood diversification, without undue preference being given to farming as the unique solution to rural poverty.

Thus rural economy is thus, not based solely on agriculture but rather it depends on diverse array of activities and enterprises. Livelihood diversification into non/off-farm activities are an important way of reducing poverty. Non-farm activity is typically positively correlated with income and wealth (in the form of land and livestock) in rural Africa, and thus seems to offer a pathway out of poverty if non-farm opportunities can be seized by the rural poor (Barret et al., 2001).

Agriculture serves as the primary means of rural households' livelihood in Ethiopia, which contributes 27.5 billion dollars or 34.1% to the GDP, employs some 79% of the population, accounts for 79% of foreign earnings, and is the major sources of raw material and capital for investment and market (MoPED, 2020). However, due to the smaller farm size and low return from farming activities, majority of rural households are exposed to food insecurity and chronic poverty. In rural Ethiopia the prevalence of extreme land pressure has resulted in vast deforestation and cultivation of unsuitable slopes, causing sever environmental damages, which make the future prospects of agriculture look bleak without generating non-agricultural activities (Degefa, 2003).

Hence, it recognized that rural people have their own strategies to secure their livelihoods which vary from household to household depending on numerous factors such as their socio-economic status, education and local knowledge, ethnicity, and stage in the household lifecycle. Even in some locality there can be a bid distinction between the strategies of those with different socioeconomic background, for example, for those with more land and those who are with less land or landless (Wagayehu B, 2004). In line with this view, this study was intended to identify the existing livelihood strategies, and assess the contextual and location specific determinants of livelihood diversification strategies in *Sadi Chanka* district.

2. Research Problem

Rural households' livelihood in Ethiopia depends on agriculture which is dominated by smallholders, the majority cultivating less than 0.5 ha and producing mostly basic staples for the subsistence of their households. Furthermore, their agricultural activities are characterized by backward production technologies, small fragmented land size, irregular rainfalls, increasing soil erosion land degradation, aridity in some regions and pervasive tropical diseases in others (Arega et al., 2013). The limited opportunity for livelihood diversification, due to absence of supplementary income from other non-farm activities has made the Ethiopian rural poor more vulnerable. Given the inability of most Ethiopian smallholders to make a living from agriculture, because of resource constraints and recurrent shocks, increasing policy attention has turned to supporting alternative livelihood activities (Devereux, et al, 2005).

Livelihood diversification is the norm in developing countries. Very few people or households derive all their income from a single source. Diversification has increasingly turned towards non- farm and off-farm activities as a source of income and employment (Haggblade S, 2007).

The primary categories of livelihood diversification are farm, off-farm, and non-farm income sources (Ellis, 1998). Ellis (1998) explained the farm, off-farm and non-farm diversification. According to Ellis, farm income includes livestock as well as crop income and comprises both consumption-in-kind of own farm output and cash income from output sold. Off-farm income typically refers to wage or exchange labor on other farms (i.e. within agriculture). It also includes labor payments in kind, such as the harvest share systems and other non-wage labor contracts that remain prevalent in many parts of the developing world. Non-farm income refers to non-agricultural income sources. Different literatures note the reason for livelihood diversification. According to (Ellis, 2000) reasons for livelihood diversification in to two broad categories which are necessity or choice. He further elaborates Necessity as involuntary and desperation reasons for diversifying. Choice on the other hand, refers to voluntary and proactive reasons for diversification for instance, seeking out seasonal wage earning opportunities, travelling to find work in remote locations, educating children to improve their prospects of obtaining non-farm jobs, saving money to invest in non-farm businesses such as trading and etc.

Rural people on their side partake in a number of strategies, including agricultural intensification, and livelihood diversification, which enable them to attain food security goal, however, still unable to escape food insecurity. The rural poor struggle to ensure food security status by participating in diversification activities. However, the contribution to be made by livelihood diversification to rural livelihoods has often been ignored by policy makers who have chosen to focus their activities on agriculture (Carswell, 2007). Thus, a thorough understanding of alternative livelihood strategies of rural households and communities is indispensable in any attempt to bring improvement. This is important not to commit a limited resource available for rural development based on untested assumption about the rural poor and its livelihood strategies (Tesfaye, 2003).

The extent to which farm households are able to feed themselves often depends on off/non-farm income as well as their own agricultural production. Many households to purchase grain use off/non-farm income and the concept of „subsistence" farmers needs to be understood in this context of diversified income sources (Chapman and Tripp, 2004 as cited in Daniel, 2009). Limited off-farm economic activities characterize livelihood insecurity. These conditions are exacerbated by climactic variability. Over successive poor harvests,

households‟ asset base is steadily depleted to the extent that they have nothing left to cope with another shock (CARE international, 2001). Smallholder households and those vulnerable due to limited agricultural inputs are most often victims of low agricultural production and the production is unable to satisfy the food needs of these people. Therefore, these households are often forced to complement and supplement their income from different nonfarm and off farm income generating activities such as selling of fuel wood, charcoal, trading, handcrafting and engagement in wage labor (Yared, 2002). Even though, the greater contribution of diverse livelihood portfolios in ensuring household food supply by generating income that agriculture cannot provide and the inability of agriculture alone as a sole source of broad household demands, there is limited studies that have been conducted in relation to the contribution of livelihood diversification strategy in Ethiopia broadly and in *Sadi Chanka* district particularly. As consequence, there is a wide knowledge gap on the livelihood diversification of rural households in Ethiopia. Therefore this study was contribute to the literature for the better understanding of livelihood diversification strategy and options among rural households of Ethiopia, the case of *Sadi Chanka* district. In the study area land scarcity, land degradation, population pressure, lack of resources like irrigation, depend only rain etc. the main problem of the area.

However, governmental organization and NGOs with permanent and pilot project in *Sadi Chanka* district had been spending many resources from year to year but they were not able to bring a feasible change on the livelihood diversification strategy of the rural community. This was may be because lack of information on what exactly constitutes the livelihood diversification strategy of different socio-economic groups and the reason behind household livelihood strategies choices and natural factors such as land degradation and others. The lack of such information and wrong approach in turn was constraining effective decisions on the type and nature of interventions and the target beneficiaries.

In line with this, different households adopt different livelihood diversification strategies according to their particular asset and asset status their perceptive towards specific livelihood strategies. But, there was no empirical research which has been conducted concerning this issue in the study area. Therefore, this study was focused on assessing existing livelihood diversification strategy choices and identifying the determinants of rural livelihood diversification strategies are not the task that to be left to tomorrow. In addition, this research was important and helpful to explain why people are choose existing livelihood diversification strategies and staying as a poor over time.

Finally, it is possible to generate information for policy makers and executive officials for an intervention that can facilitate, achieve, and bring nationally and locally the study area household to middle-income generating community. It is useful for advancement of rural communities and design policies and strategies, which can foster poverty alleviating process.

3. Objectives of the Study

The general objective of this study was to examine the determinants of smallholder farming households‟ livelihood diversification strategies in Sadi Chanka district.

Specifically, the study aims at:

i. Assessing the existing livelihood strategies pursued by the smallholder farming rural households.

ii. Examining the determinants of livelihood diversification strategies among smallholder farmers.

iii. Assessing the contribution of non-farm and off-farm activities to the total household income.

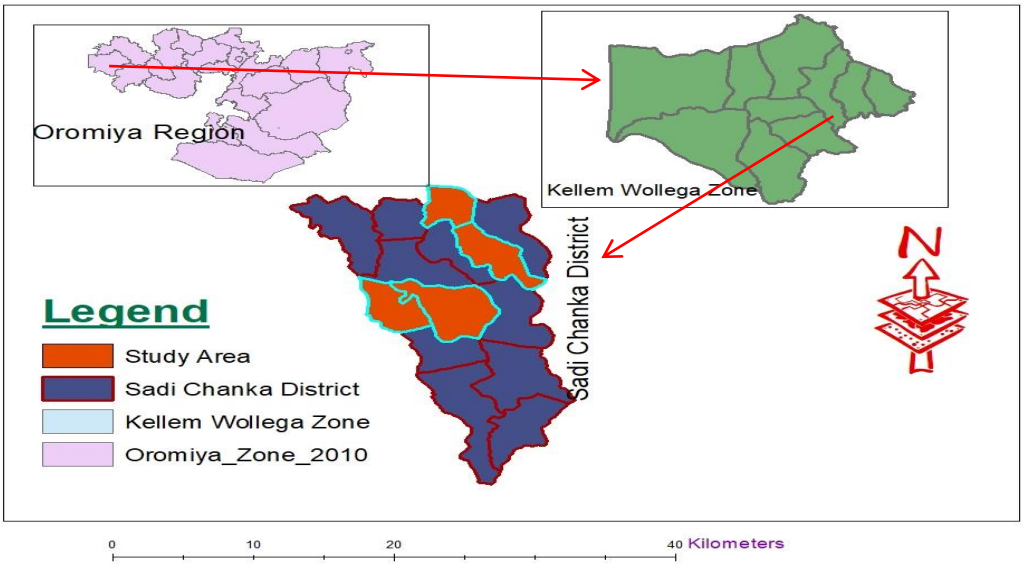
4. Materials and Methods

4.1. Descriptions of the study area

Sadi chanka district is one of the 12 districts which are found in kelem Wollega zone, Oromia National Regional State of Ethiopia. The district located 572 km from Addis Ababa. The district is located in the south eastern part of kellem wollega zone at a distance of 63 km away from zonal capital (i.e. Dembi Dollo town). Astronomically, the district is located between 7^{o} 41^{1} north latitude and 33^{o} 71^{1} east longitude. It is bounded by Dale Wabara woreda in the north, Yemalogi Walal woreda in the west, Dale sadi woreda in the east and Ilubabor zone in the south. The district has a total area of 493.51 km^2.

The district has 15 administrative subdivisions (kebele), out of which 13 are rural kebeles and the remaining 2 are urban kebeles. From 13 rural kebeles administration, 4 kebeles namely Igukofale, mender-5, Dogano- adami and Komboo was the study sites.

Figure 2.2. Map of *Sadi Chanka* district



Source: Kelem Wollega planning and Economic Development, 2021

4.2. Research Design

In this study, a quantitative research design is employed. The data collected and utilized for this study to achieve its objectives was a cross-sectional primary data. The collected data

were then coded in such a way that they can be used in quantitative regression analysis. Besides, quantitative secondary data were also utilized to make descriptive analysis of the subjects under study and the study area.

4.3. Data Types and Sources

Regarding data source, both primary data and secondary data is collected in order to meet the objectives of this study.

Household Survey: Information related to household demographic and socio-economic characteristics, access to land, livestock, household assets, livelihood strategies, income, access to social and economic infrastructures, social support networks, access to credit, challenges to livelihood diversification strategy and the like is collected through household survey from 351 sample households. This household survey is undertaken first by preparing structured questionnaire in English and translated in to the local language (Afan Oromo) for smooth communication and understanding. Household survey is conducted through hiring and giving training for enumerator living and working as development agent in the study area. Enumerators have collected data by door to door visiting of smallholder rural households.

Key Informant Interview (KII): One key informant interview at woreda level and three at kebele level is held, to collect primary data. These Key informant interview is very important in supporting the data collected by household survey. Participant of key informant is selected based on their knowledge of the study area as well as their age and educational status. Accordingly, four key informant interviews were held with literate and well informed persons of the study area. At woreda level one key informant interview is held with senior expert of the sadi chanka Agricultural Development Office. At kebele level three key informant interviews was held with three elders who have better knowledge about the study area as well as who have better years of schooling as compared to others.

4.4. Sampling Technique and sample size determination

The two stage sampling design was used to select the sample households. In the first stage, 4 kebeles (namely Igukofale, Mender-5, Dogano-adami and Komboo), where the large number of small holder farmers are rampant, purposively selected by the help of *Sadi Chanka* district Land use Administration office workers. In the second stage, according to the number of total households in each kebele, probabilistic proportionate to size technique was applied to determine the total sample households size from each *kebele.* Ultimately, a total of **351** sample household heads will be selected.

The sample size was determined using statistical formula (Yamane formula) as follows:

$n = \frac{N}{1+N(e)^2}$ ---------- 3.1

Where, N is the total population, *e* (margin of error) is 0.05(5%) while the confidence level is 95%. Using the total population of selected kebeles and error margin of 0.05, the sample size is calculated as follows.

$$n = \frac{N}{1 + N(e)^2}$$

N= Number of Total Households (2884)

n= Number of HH heads selected (351)
e = allowable error (%) or Sample of error (0.05)

$$n = \frac{2{,}884}{1 + 2{,}884(0.05)^2}$$
$$n = \frac{2{,}884}{1 + 7.21}$$
$$n = \frac{2{,}884}{8.21}$$
$$\boldsymbol{n = 351.27 \cong 351}$$

Proportional sampling technique was used to select the sample from each of the three kebeles. The sample selected from each selected kebeles was proportional to the sample population in each kebele and the formula for this purpose was determined by formula.
$ni = (Ni(n))/(\sum Ni)$ Where ni - the sample to be selected from i's kebele, Ni- the total population living in selected i's kebele. $\sum -$ The summation sign, $\sum Ni$ – The sum of total population in the selected four kebeles and n – Total sample size

Table.3.1. Sampled Peasant Associations and Number of Households Selected From Each Sampled Peasant Associations

S. No	Name of kebeles	Total HHs(Ni)	Number of HH heads selected	Proportion (%)
1	Igu-kofale	804	98	28
2	Mender- 5	813	99	28
3	Dogano- adami	470	57	16
4	Komboo	797	97	28
	Total	$(\sum \boldsymbol{Ni})$ **=2,884**	$(\sum \boldsymbol{ni}) =$ **351**	**100**

Own computation 2021

4.5. Data Collection Techniques and Procedures

Data collection method utilized for this study is survey questionnaire and review of different published and unpublished sources. Survey questionnaire is used to collect both quantitative and qualitative data by household survey. On the other hand review of published and unpublished sources was undertaken to collect the required data for this study.
All the above-mentioned tools are used to collect primary data. Besides this primary data, secondary data from reports of various offices is utilized.
Household survey was conducted by using structured questionnaire with 351 rural households of the study area by trained enumerators, who are working as development agent. Data relating to households demography, socio economy, livelihood activities as well as livelihood strategies, access to and ownership of livelihood assets and the like were collected by these enumerators.

4.6. Methods of Data analysis

To analyze the data, both descriptive and inferential statistics was used. The types and levels of assets a household own, types of shocks household faces, and constraint of livelihood diversification strategy choice was analyzed through descriptive statistics like maximum, minimum, mean, percentage, and was presented by using table and graph. To analyze the determinants of livelihood diversification multinomial logit model was used. The descriptive and inferential data analysis was conducted using latest version 13.

4.6.1. Econometric model specification

In this study there were four mutually exclusive livelihood diversification strategies. These include on-farm only, on-farm plus non-farm, on-farm plus off-farm, and on-farm plus off-farm plus non-far. According to many literatures multinomial logit model is a widely used technique in applications that analyze polychromous response categories in different areas of economic and social studies. (Wassie, 2008) stated that multinomial logit model is an important model to examine the determinants of household livelihood strategy choices among the alternative livelihood strategies. Thus, to identify determinants of smallholder farming rural householder farming rural households' decision to choose which livelihood diversification strategy should follow multinomial logit model was used. The assumption is that in a given period at the disposal of its asset endowment, a rational household head choose among the four mutually exclusive livelihood strategies that could offer the maximum utility.

Following (Greene, 2003), suppose for the $\mathbf{i}^{th}$ respondent faced with **j** choices, the utility choice **j** can be specified as:

$$\mathbf{U_{ij} = Z_{ij}\beta + \varepsilon ij} \quad \mathbf{3.2}$$

If the respondent makes choice **j** in particular, the $\mathbf{U_{ij}}$ is the maximum among the **j** utilities. Do the statistical model is derived by the probability that choice **j** is made, which is:

$$\boldsymbol{Prob(U_{ij} > U_{ik}) for\ all\ others\ K \neq j} \quad \mathbf{3.3}$$

Where; $\mathbf{U_{ij}}$ is the utility to the $\mathbf{i}^{th}$ respondent from livelihood strategy **j**; and $\mathbf{U_{ik}}$ is the utility to the $\mathbf{i}^{th}$ respondent from livelihood strategy **K**. Thus, he $\mathbf{i}^{th}$ household's decision can be modeled as maximizing the expected utility by using the $\mathbf{j}^{th}$ livelihood strategy among **J** discrete livelihood strategies, i.e.:

$$\boldsymbol{Max j = E(U_{ij}) = \int j(x_i) + \varepsilon_{ij}, j = 0} \quad \mathbf{3.4}$$

In general, for an outcome variable with **j** categories let the $\mathbf{j}^{th}$ livelihood strategy that the $\mathbf{i}^{th}$ household chooses to maximize its utility could take the value **1** if the $\mathbf{i}^{th}$ household chooses $\mathbf{j}^{th}$ livelihood strategy and **0** otherwise. The probability that a household with characteristic **x** chooses livelihood strategy **j**, p_{ij} is modeled as:

$$\boldsymbol{P_{ij}} = \frac{\exp(X'_i\beta_j)}{\sum_{j=0}^{J}\exp(X'_i\beta_j)}, \mathbf{J=0} \quad \mathbf{3.5}$$

With the requirement that $\sum_{j=0}^{J} \boldsymbol{p_{ij}} = \mathbf{1}$ for any **i**

Where; $\mathbf{P_{ij}}$=probability probability representing the $\mathbf{i^{th}}$ respondent's chance of falling into category **j**; $\mathbf{X_i}$ =predictors of response probabilities; and $\boldsymbol{\beta_j}$= Covariate effects specific to $\mathbf{j^{th}}$ response category with the first category as the reference. A convenient normalization that removes indeterminacy in the model is to assume that β_1 =0 (Greene, 2003). So that $\exp(X_i\beta_j)$=1, implying that the generalized equation (4) above is equivalent to:

$$\boldsymbol{Pr(y = j/Xi \;=\; Pij = \frac{\exp(X'_i\beta_j)}{1+\sum_{j=0}^{J}\exp(X'_i\beta_j)}}\textbf{, for J=0, 1…J and}$$

$$Pr(yi = 1/Xi) = Pij \;= \frac{1}{1+\sum_{j=0}^{J}\exp(X'_i\beta_j)} \text{ –} \mathbf{3.6.}$$

Where, y=A polychromous outcome variable with categories coded from 0---J

Note: The probability of $\mathbf{P_{i1}}$ is derived from the constraint that the **J** probabilities sum to**1.**

That is $\mathbf{P_{ij}=1-\Sigma P_{ij}}$. So similar to binary logit model it implies that we can compute **j** log-odds ratios which are specified as:

$$ln[P_{ij}/piJ] = x'\,(\beta_j - \beta_J) = x'\,\beta_j, if\ J = 0 \text{ – – – – – – – – – – – – – – – – – – –} 3.8$$

4.6.2. Dependent and Independent Variables

In this study livelihood diversification is a polychromous dependent variable which takes the value Y=0 if the household livelihood strategy is on-farm only; Y=1 if the households livelihood strategy is on-farm plus non-farm; Y=2 if the households livelihood strategy is on-farm plus off-farm; and Y=3 if households livelihood strategy is on-farm plus off-farm plus non-farm activities.

The independent variables that expected to affect diversification of livelihood strategies of rural household in the study area are discussed below.

Age of household head (AGHHS): Age is continues variable and reflects the age of the household head in years. It is assumed that non/off-farm activities require active labor force and those young age households relatively have active labor force which enable them to participate on non/off-farm activities. Thus, as the mean age of the household heads increases their ability to engage into different off-farm and non-farm activities decreases (Gebrehiwot and Fekadu, 2012) and (Adugna, 2005). On the other hand, it is obvious that experience increases with age and hence, age old persons have more prospects of getting jobs in the non-farm sector. In relation to this idea (Khatun and Roy, 2012) found that age have a significant and positive influence on farmers' livelihood diversification options. In this study, it was hypothesized that the age of household head expected to have positive or negative influence on livelihood diversification to non/off-farm activities.

Education level of the household head (EDCTN): Education refers to the education level of the household heads. Education is a dummy variable which could take 0 for illiterate and 1 for literate. (Tesema, 2009) found that there is a positive association between more years of schooling and non-farm plus on-farm livelihood diversification at less than 1% of level of significance. Literate people are always coming up with better off strategies and often they engaged in better remunerated non/off-farm occupations. This variable is thus, was expected

to have a positive impact on engagement of households in the diversified livelihood strategies.

Land size (LAND):land size refers to the total size of cultivated land which may obtained from own land, crop sharing land, and rented land in hectare in 2019/20 production year. It is a continuous variable. The amount of land cultivated can affect the decision to participate in non/off-farm activities. A smaller amount of cultivated land may not allow households to make a sufficient living from farm production alone, causing them to look for supplementary income but those households who have large farm land holding would have better probability to rely on cop production only without any non/off-farm activities (Abera and Zeller, 2012; and Gebrehwot and Fekadu, 2012). On the other hand, those farmers who cultivate large land size have the capacity to produce more and that would enable them to accumulate startup capital for participation in non/off-farm self-employment income at 1% probability level (Amare and Belaineh, 2013). Therefore, in this study positive/negative relationship was expected between total land size and household non/off-farm livelihood diversification.

Sex of the household heads (SEX): It is a dummy variable which would take the value 1 if the household head is male and otherwise. Male headed households are able to participate in non/off-farm employment activities compared to female headed households at 1% significant level (Amare and Belaineh, 2013). This is because female major activities are mostly confined at home, their access to credit is limited due to cultural and transportation problem. Therefore, in this study it was expected that male headed households are able to participate in non/off-farm livelihood diversification than female headed household.

Market distance (MARKET): Market distance is a continuous variable and which refers to the amount of kilometer that the household's home away from the surrounding area local market. It is assumed that the further a household is far from the local market, the lower the likelihood of participation in non/off-farm sector. (Amare and Belaineh, 2013) found that distance to the main market determine the participation of farm households into non/off-farm study therefore, negative relationship was expected between non/off-farm livelihood diversification and longer market distance.

Livestock holding (LIVESTOCK): Livestock is a continuous variable which refers to the total number of household's livestock holding in TLU. Larger house holing generates household's income through sale of animals and animal products (milk, butter etc.) and enables them to accumulate more capital and thereby investing in different non/off farm activities. TLU per sample household is found to be the significant and positive determinant of off-farm self-employment income at 95% level of significance (Amare and Belaineh, 2013). Thus, it was hypothesized that those households having large livestock holding are most likely to participate in non/off-farm activities and positive relationship is expected.

Access to Irrigation (IRRIGATION): It is a dummy variable which will take 1 if there is access to irrigation and 0 otherwise during 2019/2020 production year. Irrigation in this context refers to the use of irrigation services for crop and/or vegetables production during the dry season. An irrigation opportunity makes multiple cropping possible which in turn will create agricultural surplus. This surplus can be used for doing non-farm activities, particularly self-employment activities (Khatun and Roy, 2012). In this study positive relationship was expected between access to irrigation and non/off-farm livelihood diversification.

Credit Access (CREDIT): Credit access refers to the household's opportunity to get credit service from formal and/or informal institutions. It is a dummy variable and takes 1 if there is

credit use by rural farm households and 0 otherwise. (Khatum and Roy, 2012) found that both the availability of and access to formal credit had a positive and significant effect on the level of livelihood diversification. Because, without access to institutional credit rural farming households are not able to undertake any non-farm income-generating activities which requires some initial investment. Similarly, in the study area providing credit to smallholder farming households expected to improve their non-farm livelihood diversification. Therefore, positive relation was expected between utilization of credit and livelihood diversification.

Dependency Ratio (DPNR): It refers to the ratio of the dependent age groups (below 15 and above 65) to the working age groups (age groups from 15 up to 65). It is a continuous variable. According to (Adugna, 2005) dependency ratio is found to have a significant ($P<0.10$) positive correlation with choice of agriculture and non-farm livelihood strategy. He justified that with increase in dependency ratio the ability to meet subsistence need declines and the dependency problems make it necessary in the household to diversify their income source. On the other hand, (Gebreiwot and Fekadu, 2012) argue that a higher dependency ratio undermines the economic and potential of the farmer to invest in non/off-farm activities. Thus, dependency ratio is found to have negative and significant relationships with the participation of rural households into non-farm activities. Therefore, from this study positive or negative relationship was expected between dependency ratio and non/off-farm livelihood diversification.

Membership of cooperatives (COOP): Cooperatives in this context defined as members to an organized farmers' cooperative association which gives different services to the members. It is dummy variable that takes1if they are member to the cooperative organization otherwise 0. (Kharun and Roy, 2012) found that livelihood diversification and membership of cooperative society have positive and statistically significant relationship with livelihood diversification. Thus, it was expected that positive relationship between membership to cooperative organization and non/off-farm livelihood diversification.

Extension Contact (EXTENSION): Extension contact is the number of times the household head contact with the extension personnel during the last 2020/2021 production year. It is a continuous variable. (Adugna, 2005) result revealed that there is a significant relationship between extension contact and livelihood diversification into agriculture plus off-farm. This is because the message/contents that the farmers gain from extension agents help them to initiate to use risk aversion strategies that seek diversification of income sources. Thus, in this study positive relationship was expected between extension contact and livelihood diversification.

Urban Linkage (URBLNK): In this study urban linkage refers to smallholder's rural farm households having relation/connection with their urban friends and/or relatives. It is a dummy variable which takes1 if there is urban linkage and otherwise 0. Having a relative or friend who are acting as a liaison between the farm household and an employer in town or abroad, or the development of cooperative enterprise in the community play a positive role in the participation of rural households in non-farm activities and they will have a chance to start new non-farm business (Warren,2002). Therefore, it was hypothesized that those farm households having relations/friendships with urban dwellers have more probability to engage in non/off farm livelihood diversification strategies.

Access to Mass Media (MASMEDIA): Mass media refers to farmers' access to watching television and/or listening to radio at least once a week during the survey year 2020. It is a dummy variable which would like 1 for households access to television and/or radio at least once a week and 0 otherwise. It is expected that those farmers having access to mass media at least once a week would likely to diversify their income sources because they will have information to different potential non/off-farm opportunities. Households who listen to radio and television at least once a week were found to have greater likelihood to engage in non-farm activities (Emanuel, 2011). Therefore, positive relation was expected between accesses to mass media and non/off-farm livelihood diversification.

Total Annual Household Income (TOTICM): Total income refers to the amount of money in ETB that a household accumulated until 2020/2021. (Tezera, 2010) indicated that the amount of money in hand can determine rural household's capability to start a new business, whether in the farm or non-farm sectors. Without start-up funds, or with only little cash available for investment, households are limited to a small number of activities. Thus, the larger amount of total income of a household could have positive relation with non-farm livelihood diversification.

Crop Production Risks (CRPRSK): It refers to the households' crop production failure due to different emergencies like snow, crop diseases and shortage of rainfall during 2020/2021 production year. It is dummy variable which takes 1 if there was crop production risk and o otherwise. The occurrence of different hocks like animal and crop disease increases the probability off-farm households' participation into non-farm and off-farm activities (Woinishet, 2010). When there is crop production risk farm households are compelled to engage in non/off farm activities diversification to reduce the risk effect. Thus, in this study positive relationship was expected between livelihood diversification and the occurrence of production risks.

Road Distance (Road): Road refers to the distance between the household home and nearest road in km. (Khatum and Roy, 2012) stated that those households who have not easy access to roads cannot travel to urban centers easily. As a result, household found far from roads are not engage in non-farm activity. Hence, in this study longer distance to the nearby road was negatively related to non-farm livelihood diversification.

Conceptual framework of the study

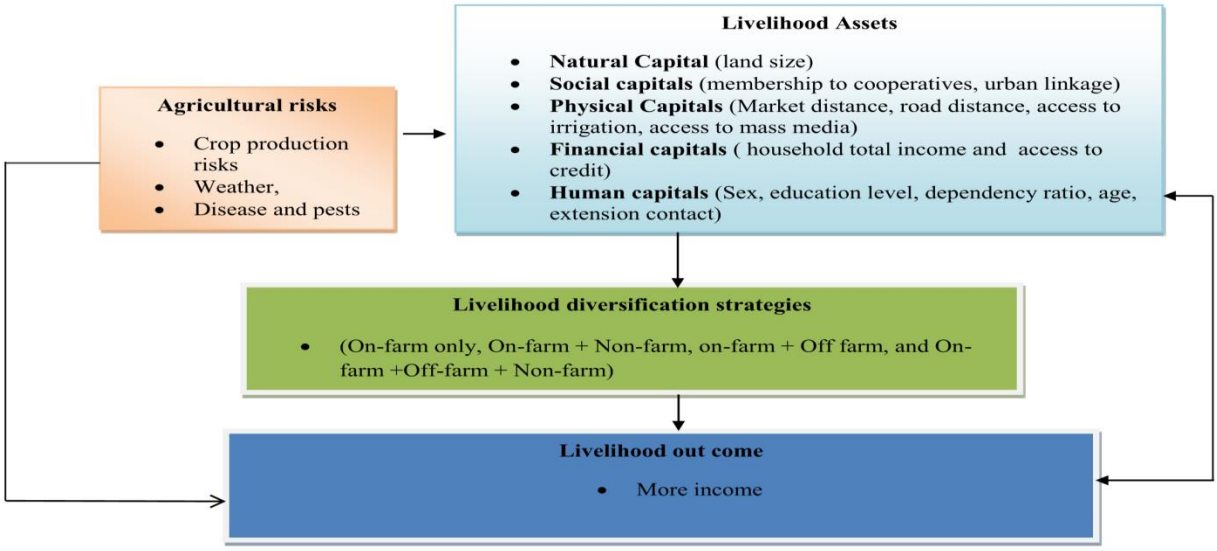


Figure 2.1. Conceptual framework of the determinants of livelihood diversification strategies; *adapted from Emanuel (2011)*

4. Results and Discussion

4.1. Socio-Economic and Demographic characteristics of the Respondents.

Socio-economic and demographic characteristics of the study area sample respondents was presented in table 4.1. Among the interviewed 351 rural households of the study area respondents 317 (90.31%) were male-headed, while 34 (9.69%) were female-headed households. As it is indicated in the table age of sample respondents was range from 30 – 70 years. Furthermore about 207(58.97%) of the respondents were between 30 to 45age category, 140 (38.89%) of sample household ages were from 46 to 65 age category and also 4(1.14%) households were above 65 years. This indicates that from the total sample respondents of the study area 95% were economically active smallholder farmers.
According to the collected data from the study area 189(53.85%) sample respondents were literate and 162(46.15%) respondents were illiterate. This data reveals that the number of respondents who can read and write is greater than that of who are unable to read and write.
Regarding family size of respondents, about 131 (37.32%) of households have less than five family size and about 200 (56.98%) of respondent households have family size which range between 6 – 10 individuals. Households who have family member greater than 10 is about 20 (5.7%) of respondents. In general the average family size of respondent's households is about 5 individuals.

Table 4.1 socio-economic and demographic characteristics of the respondents.

Characteristics		Frequency	Percent	Cumulative percent
Sex	Male	317	90.31	90.31
	Female	34	9.69	9.69
	Total	351	100.00	100.00
Age Category	From 30 to 45	207	58.97	58.97
	From 46 to 65	140	39.89	39.89
	Above 65	4	1.14	1.14
	Total	351	100.00	100.00
Household Family size	<5 Family size	131	37.32	37.32
	6 to 10 Family size	200	56.98	56.98
	>10 Family size	20	5.70	5.70
	Total	351	100.00	100.00

Source: Own survey, 2021

4.2. Livelihood Assets of Respondents

According to various scholars there are about five assets or capitals that are to be utilized to lead living and that are useful in choosing livelihood strategies and activities (Ellis, 1999). Accordingly they are Natural Capital, Human Capital, Social Capital, Financial Capital and Physical Capital. So the assets that rural landless households of the study area owns and have access to is presented in what follows.

4.2.1. Natural Capital

Land sizes: The amount of land a farmer owns can be associated with the amount of produce obtained in a season ceteris paribus. It should, however, be acknowledged that it is not always the case that the available land will be fully utilized for farming. The average land size owned by households in this sample was 2.909 hectares (table 4.2). Land sizes ranged from 0.5 to 6 hectares per household.

4.2.2. Social Capital

Cooperative membership: Membership to cooperatives is a means of building social net-works that enable households to obtain updated information in sharing pooled labor, farm equipment, cash credit usage and other non-farm income generating activities (Gebru and Beyene, 2012). The results of the survey indicate that, out of the total of 351 sample respondents, 252(71.97%) were active cooperative members while about 99(28.21%) of them were no longer willing to participate in some of these cooperatives (Table 4.2.1). Here, most of the farm households involved in cooperatives was diversifying their livelihood strategies into off-farm plus non-farm, on-farm plus non-farm plus off-farm strategies.

Urban Linkage: With regard to urban linkage, the respondents were enquired as to whether they have friends and relatives in the town, among the sample 351 sample respondents 278

(79.20%) of the respondents confirmed that they have friends and/or relatives in the town and the rest 73(20.8%) of the respondents have no relatives neither friends' in the town.

4.2.3. Human Capital

Age of the households: It is assumed that non/off-farm activities require active labor force and those young age households relatively have active labor force which enable them to participate on non/off-farm activities. Thus, as the mean age of the household heads increases their ability to engage into different off-farm and non-farm activities decreases (Gebrehiwot and Fekadu, 2012) and (Adugna, 2005).In this study the mea age of the sample respondents were 44.57 and ranges from 30 to70 years.

Education: Education is one of the major determinants of households' choice of livelihood strategy in *Sadi Chanka woreda* as indicated by the results in Table 4.3. According to the collected data from the study area 189(53.85%) sample respondents were literate and 162(46.15%) respondents were illiterate. This data reveals that the number of respondents who can read and write is greater than that of who are unable to read and write. Literate people are always coming up with better off strategies and often they engaged in better voluntary non/off-farm occupations.

Dependency Ratio: It refers to the ratio of the dependent age groups (below 15 and above 65) to the working age groups (age groups from 15 up to 65). According to (Adugna, 2005) increase in dependency ratio the ability to meet subsistence need declines and the dependency problems make it necessary in the household to diversify their income source. According to the data collected from the study area the mean dependency ratio of the farmer's households were 1.805 and the minimum and the maximum households dependency ratio was 0.1 and 4.3 respectively.

Extension Contact: Extension contact is the number of times the household head contact with the extension personnel during the last 2020/2021 production year. (Adugna, 2005) result revealed that there is a significant relationship between extension contact and livelihood diversification into agriculture plus off-farm. This is because the message/contents that the farmers gain from extension agents help them to initiate to use risk aversion strategies that seek diversification of income sources. As indicated in (table 4.2) below the average number of times the household head contact with the extension personnel was 2.29 and the minimum and maximum extension contact was 0 and 5 respectively.

4.2.4. Financial Capital

Access to Credit: Rural people need money for a variety of activities, including purchasing ox or other cattle, purchasing agricultural inputs such as fertilizer and seed, farm tools; or to engage in non-farm activities. However, they may lack sufficient money for the activity they plan. Access to credit service, thus, becomes a means to obtain money. As indicated in the table 4.3.below Out of the total sampled households, 2016 (61.54%) reported that they had access to credit and about 135(38.46%) households had no access in the study area.

Total Household Income: Total income refers to the amount of money in ETB that a household accumulated until 2020/2021.As indicated in table 4.3.Out of the total sampled households the mean average household income of the study area was 57,178.7 ETB and the minimum income was 10000 ETB while the maximum house hold income of the respondents was 140,000ETB.

4.2.5. Physical Capital

Access to Irrigation: Irrigation in this context refers to the use of irrigation services for crop and/or vegetables production during the dry season. An irrigation opportunity makes multiple cropping possible which in turn will create agricultural surplus. In this study from the sample respondents 290(82.62%) households were had access to irrigation and 61(17.85%) had no access to irrigation.

Access to Mass Media: Mass media refers to farmers' access to watching television and/or listening to radio at least once a week during the survey year 2020.Regarding mass media from the total respondents of the study area 218 (62.11) households had access while133(37.89%) had no access to mass media.

Market distance: Market distance refers to the amount of kilometer that the household's home away from the surrounding area local market. It is assumed that the further a household is far from the local market, the lower the likelihood of participation in livelihood activity. (Amare and Belaineh, 2013) found that distance to the main market determine the participation of farm households diversification strategy. According to the data collected in the study area the average market distance of the respondents were 5.22 KM and the minimum maximum market distance were 2 KM and 6 KM respectively.

Distance from main road: Road refers to the distance between the household home and nearest road in km. (Khatum and Roy, 2012) stated that those households who have not easy access to roads cannot travel to urban centers easily. As a result, household found far from roads are not engage in non-farm activity. Hence, in this study the average distance between the household home and nearest road 0.98Km and the minimum distance between the household home and nearest road was 0.1 KM and the maximum distance was 3.5KM.

Livestock holding: In rural community livestock ownership is considered as measure of wealth and status. In the study area mixed farming is practiced i.e. households engage both in growing crops and raising livestock. Households which own large number of livestock, can benefit a lot besides direct consumption they can gene rate income from the sale of milk, egg, by products, and direct sale of animals. This implies that livestock ownership had effect on rural livelihood (Amare and Belaineh, 2013).In this research the average livestock holding size of the sample respondents were 7.38 and the minimum holding size and the maximum holding size was 0.5 and 18.8 respectively.

4.3. Agricultural Risks

Crop production Risk: It refers to the households' crop production failure due to different emergencies like snow, crop diseases and shortage of rainfall during 2020/2021 production year. The occurrence of different hocks like animal and crop disease increases the probability off-farm households' participation into non-farm and off-farm activities (Woinishet, 2010).In this study among the sample respondents in the study area the farmers households who faced challenges/risks of crop production during the last production year 2020/21 were 37.04% and who do not faced any risks were 62.96% (table 4.2).

Table 4.2 Description of Categorical Variables of the respondents.

Characteristics		Frequency	Percent	Cumulative percent
Education	Literate	209	59.54	59.54
	Illiterate	142	40.46	40.46
	Total	351	100.00	100.00
Cooperative membership	Yes	206	58.69	58.69
	No	145	41.31	41.31
	Total	351	100.00	100.00
Urban Linkage	Yes	278	79.20	79.20
	No	73	20.80	20.80
	Total	351	100.00	100.00
Access to Credit	Yes	147	41.88	41.88
	No	204	58.12	58.12
	Total	351	100.00	100.00
Crop production Risk	Yes	130	37.04	37.04
	No	221	62.96	62.96
	Total	351	100.00	100.00
Access to Irrigation	Yes	189	53.85	53.85
	No	162	46.15	46.15
	Total	351	100.00	100.00
Access to Mass Media	Yes	188	53.56	53.56
	No	163	46.44	46.44
	Total	**351**	**100.00**	**100.00**

Source: Own survey, 2021

Table 4.3 Descriptions of Continues Variables of the Respondents.

Variable	Obs	Mean	Std. Dev.	Min	Max
Age of the households	351	44.58	7.41	30	70
Extension contact	351	2.29	1.21	0	5
Land holding size	351	2.909	0.95	0.5	6
Road distance	351	0.98	0.67	0.1	3.5
Market distance	351	5.22	0.73	2	6
Livestock holding size	351	7.38	3.08	0.5	18.8
Household Income	351	57,178.7	31858.12	10,000	140,000

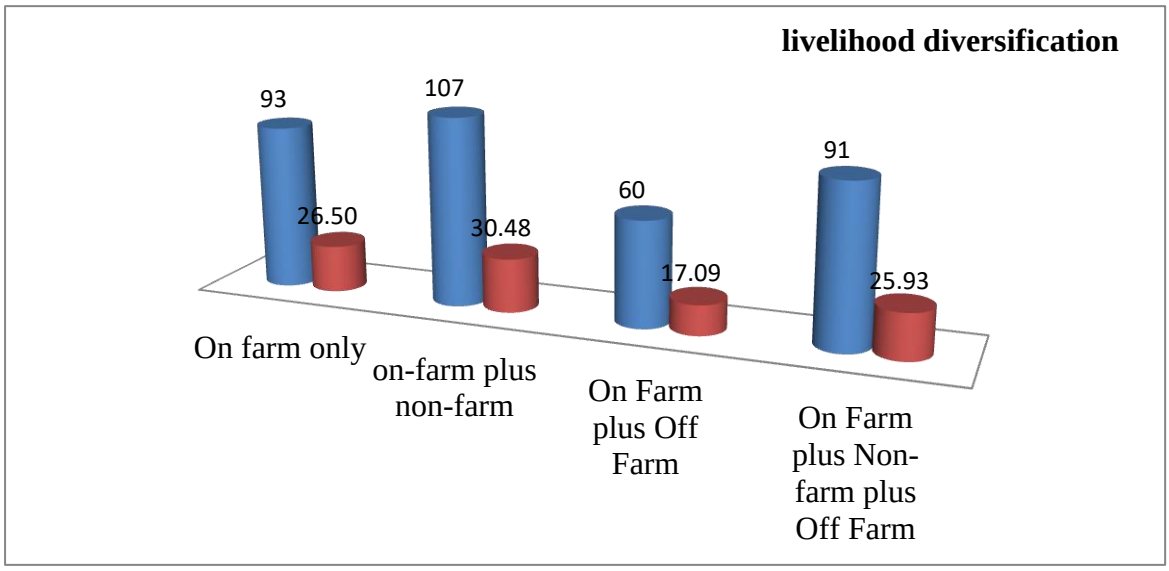
Dependency Ratio	351	1.805	1.055	0.1	4.3

Source: Own survey, 2021

4.4. Distribution of households by livelihood strategies adopted

Rural households in the study area engaged into different combination of livelihood diversification activities. Agricultural land is declining from time to time, because of this a significant part of the sampled respondents engaged into on farm +non-farm activities. As it can be seen from the survey results on figure below, in the study area out of 351 sampled respondents,93(26.5%) participated into on-farm activity and 60 (17.09%) respondents participated in both on-farm +off-farm, 107 (30.48%) respondents participated into on-farm + non-farm diversification strategy and the rest 91 (25.93%) respondents engaged into on farm + off farm + non-farm diversification strategies.

Figure 4.1.Distribution of households by livelihood strategies



Source: Own survey, 2021

4.5. Econometric Model Results

As specified in the methodology part of this research, multinomial logistic regression model was used to identify factors affecting livelihood diversification strategies in the study area. Under this section important variables (demographic, socio-economic, institutional and land characteristic) which were hypothesized to influence the households' decision to participate into different livelihood diversification strategies are considered. The analysis was made by using; STATA 13 version. The hypothesized explanatory variables were tested for the existence of Multicollinearity and degree of association.

4.5.1. Multicollinearity and degree of association

Before conducting econometric analysis it is vital to look into the problem of multicollinearity among the continuous explanatory variables and verify the degree of associations among dummy explanatory variables which otherwise, the parameter estimate would seriously be affected by the existence of multicollinearity among variables. To this end, the variance inflation factor (VIF) and contingency coefficients were used to test the degree of multicollinearity among the continuous variables and to check the degree of association among the discrete variables. The values of VIF for continuous variables were found to be small (i.e. VIF values less than 10). As a rule of thumb, if the VIF of a variable exceeds 10, that variable is said to be highly collinear (Gujarati, 2004).Based on the VIF result, in this study the maximum VIF value 1.04 indicated that there is no problem of multicollinearity among the variables in this study. Also, according to (Gujarati, 2004), contingency coefficient is a chi-square based measure of association where a value 0.75 or above indicates a stronger relationship between explanatory variables. Accordingly, the results of the computation revealed that the maximum value of Contingency coefficient was 0.72 indicating no serious problem of association among discrete explanatory variables.

Table 4.4. Multinomial Logistic Regression results for household livelihood strategies.

Variable	livelihood strategies					
	on-farm plus non-		On Farm plus Off		On Farm plus Non-	
	B	*P-Value*	*B*	*P-Value*	*β*	*P-Value*
AGE	.0834292	0.013*	.058397	0.076	.0668974	0.035*
SEX	2.093012	0.034*	-.3640885	0.568	.5484606	0.443
EDCTN	1.433378	0.004*	.9002779	0.073	1.328307	0.004*
LAND	-2.107227	0.000***	-.5743073	0.092	-1.524512	0.000***
MARKET	-.2125207	0.517	-.1466717	0.653	-.7499196	0.011*
LIVESTOCK	.0872969	0.272	.0334645	0.691	-.0131415	0.869
IRRIGATION	-.0032455	0.996	1.922691	0.016*	.8877092	0.160
CREDIT	3.0758	0.000***	2.238894	0.000***	2.987724	0.000***
DPNR	-.8837937	0.000***	-.5422511	0.018*	-.0839422	0.692
COOP	.6241862	0.235	.6561768	0.213	.4516271	0.364
EXTENSION	.2804606	0.173	.3137562	0.133	.1854377	0.337
URBLNK	-.7536376	0.208	-.2740371	0.655	1.65833	0.019*
MASMEDIA	-.3691662	0.506	1.067221	0.056	.0136129	0.980
TOTICM	4.77e-06	0.513	-2.10e-06	0.776	2.53e-06	0.705

CRPRSK	2.637688	0.000***	17.24785	0.972	.5958276	0.253
ROAD	-.6400996	0.089	-.5815214	0.112	-.5244912	0.152
Base Category				On farm only		
Number of observations				351		
LR chi2(48)				388.74		
Prob > chi2				0.0000,		
Pseudo R2 (Nagelkerk)				0.4054		
Log likelihood				-285.09421		

Source: Own survey, 2021. ***, * indicates significant at 1% and 5% probability levels respectively.

Age of household head (AGHHS): As expected, age was found significant at 5% probability level and positively influence smallholder farmers' livelihood diversification into on-farm plus nonfarm income-generating activity. The positive coefficients of on-farm plus non-farm and on farm plus non-Farm plus off farm livelihood strategy implies that if other factors are held constant, as the age of the household increases by 1 year, the probability of the household to choose income-generating livelihood strategies increases by 0.83 and 0.07 factors for households who rely on-farm plus non-farm and on farm plus non-Farm plus off farm activity. In relation to this idea (Khatun and Roy, 2012) found that age have a significant and positive influence on farmers' livelihood diversification options.

Sex of the household heads (SEX): Gender affects diversification options, including the choice of income-generating activities of both farm and non-farm due to culturally defined roles, social mobility limitations and differential ownership or access to assets (Galabet al, 2002). In this study, as expected sex of household head is found to positive and significant at 5% probability level. The likelihoods of using a combination of strategies both farm plus non-farm activity is highly adopted by male headed households. Thus, keeping other factors constant, the likelihood of male headed household choice on farm plus non-farm combination livelihood strategies rise by 2.09 units as we shift from female headed household to male headed household. The opposite is true for the Female counterparts. This result is in agreement with previous studies conducted by Adugna (2005) and Berhanu (2007).

Education level of the household head (EDCTN): In line with prior expectation, education had positively and significantly influenced the household choices of farm + non-farm and On Farm plus Non-farm plus Off Farm activities at 5% probability level. These indicate that literate farmers households are more likely diversify their livelihood strategies into farm + non-farm and On Farm plus Non-farm plus Off Farm activities than illiterate farmers. From the model result, the likelihood of a household diversifying into the farm + non-farm activities increase by 1.43 factor and also likelihood of a household diversifying into On Farm plus Non-farm plus Off Farm activities increase by 1.32 factor for those farmers who were literate. In other words, literacy of the farmer household head can increase the chance of choosing farm plus non-farm and On Farm plus Non-farm plus Off Farm activities. This study was consistency with (Tesema, 2009) found that there is a positive association between more years of schooling and non-farm plus on-farm livelihood diversification at less than 1% of level of significance.

Land size (LAND): As expected, Land holding size significantly affects at 1% probability level farmers who rely on farm plus non-farm and farm plus off farm. In this study the relationship between farm land size owned by the household and livelihood diversification was found to have negative relationship with farm plus non-farm and farm plus off farm livelihood diversification strategy. According the above result the coefficient of farm plus non-farm and farm plus non-farm plus off farm livelihood activity was -2.10 and -1.52 respectively. The negative sign indicates the household with small land size tend to shift from farm plus non-farm activity to farm plus non-farm plus off farm livelihood activity. On the other hand having large land size decreases the probability of farmers household diversification in farm plus nonfarm and farm plus nonfarm plus off farm activates. A smaller amount of cultivated land may not allow households to make a sufficient living from farm production alone, causing them to look for supplementary income but those households who have large farm land holding would have better probability to rely on cop production only without any non/off-farm activities (Abera and Zeller, 2012; and Gebrehwot and Fekadu, 2012).

Market distance (MARKET): As expected, distance to market center was found to have negative relationship and statistically significant at 5% probability level with household's likelihood of livelihood diversification into on-farm plus non-farm plus off-farm income-generating activities. According to the beta coefficients distance from nearest market center indicates that keeping other factors constant, the smallholder farmers to choose farm plus off-farm + non-farm livelihood diversification strategies decreases by factor of 0.011 as the distance from the household's home to market center increases by 1 km. It is clear that the more households are distant from market center, the more disadvantaged from diversifying their livelihood income into farm + off-farm + non-farm options. This study is consistence with (Amare and Belaineh, 2013) found that distance to the main market determine the participation of farm households into non/off-farm.

Access to Irrigation (IRRIGATION): As expected, access to irrigation has found positively and significantly affected households' livelihood diversification strategy into on-farm plus off-farm at 5% level of significance. Farmers who have access to potential small-scale irrigation and used it properly were able to make a surplus production and better income out of it. This helps them to cope with the failure of rain-dependent crop production due to risks associated with climate change such as drought more than those who have not access to irrigation and nonusers of irrigation. In addition, the surplus income gained from irrigation helps them in strengthening their economic capacity to participate in different farm plus off farm livelihood diversification activities to improve their livelihood and food security level in the study area. This study is consistence with (Khatun and Roy, 2012).

Credit Access (CREDIT): As expected statistically significant coefficients of 3.08,2.23 and 2.98 (Table 4.5) indicate a positive relationship between the increase in the number of sources of credit and the probability of the households to diversify their livelihood strategies into farm plus non-farm , farm plus off farm and on-farm + off-farm + non-farm. Credit access has a potential of influencing households in the study area to shift from on-farm plus non-farm livelihood strategy to farm plus off-farm and on-farm + off-farm + non-farm livelihood strategies. As the chances to access credit and the number of credit sources increases, the probability of households to engage into these livelihood strategies increases. Holding all other factors constant, an increase in access to credit by 1 extra source will result in 3.08,2.23 and 2.98 units increase in chances to shift from farm plus non-farm , farm plus off farm and on-farm + off-farm + non-farm livelihood strategies respectively. (Khatun D,

2012) found that both the availability of and access to formal credit had a positive and significant effect on the level of livelihood diversification. Because, without access to institutional credit rural farming households are not able to undertake any non-farm income-generating activities which requires some initial investment.

Dependency Ratio (DPNR): As expected, the coefficient of dependency households was found to have negative relationship with on farm +non-farm and on-farm + off-farm choices of household livelihood diversification strategies and statistically significant at 1% and 5% probability level respectively. This implies that households with high dependency ratio have low probability level to participate in on farm +non-farm and on-farm + off-farm income-generating livelihood diversification strategies. The possible explanation for this could be attributed to the fact that the availability of increased number of individuals whose age is below 15 and above 64 implies that the availability of large number of dependents who are unable to engage themselves in on farm +non-farm and on-farm + off-farm income-generating livelihood activities. The result of this study is consistent with the finding obtained by (Gebreiwot and Fekadu, 2012) argue that a higher dependency ratio undermines the economic and potential of the farmer to invest in non/off-farm activities. Thus, dependency ratio is found to have negative and significant relationships with the participation of rural households into non-farm activities.

Urban Linkage (URBLNK): The result of the model shows that, this variable has positive and significant effect on likelihood of choosing on farm plus non-farm plus off-farm livelihood strategies. Urban and Market proximity affect the choice of diversification and nonfarm livelihood strategies at 5 % significant level. This implies that, households who are very near to market and urban choose more likely diversification and nonfarm livelihood strategies than farming livelihood strategies, because they have more access to market linkage and different livelihood activities. In other words the possible reason for households who are near to market is, they have quick physical access to the market, to transport output and input from and to their residence and there is increased chance of participation in wage labor, small business (petty trade) and other on farm plus non-farm plus off-farm activities. Furthermore those who are more near to market have access to different infrastructures that directly and indirectly support the choice of diversification and nonfarm livelihood strategies. This finding is consistent with (Eneyew, 2012) which says that the larger the distance to market the lesser is diversification of livelihood strategies. According to (Nigussie, 2017), household who are nearer to the market have more propensity choice to be engaged in agriculture plus off-farm livelihood strategy diversification compared to alternative agriculture only.

Crop Production Risks (CRPRSK): As hypothesized, coefficients of crop production risk was found to have positive relationship with on farm plus non-farm choices of household livelihood diversification strategies and statistically significant at 1% probability level. This implies that households with high occurrence of different hocks like animal and crop disease increases the probability households' participation into farm plus non-farm activities. This study was consistence with (Woinishet, 2010) when there was existence of crop production risk farm households are compelled to engage in non/off farm activities diversification to reduce the risk effect.

5. CONCLUSIONS

From the finding of the research, it is clear that the agricultural sector alone cannot be relied upon as the core activity for rural households as a means of improving livelihood, achieving and reducing poverty in the study area. Livelihood diversification is gaining/playing prominent role in rural household's income and food security. Even though, regarding the rural economy in Ethiopia, policy makers give almost full attention to agricultural sector. Nevertheless, there is a growing evidence that rural sector is much more than just farming. The result of this study indicated that low resources endowments was main characteristics of livelihood diversification strategies and this meager resource could not enable them to generate sufficient livelihood outcome. To overcome the situation, majority of poor households depend on other livelihood options rather than agriculture, which is not worthy. Results suggest that different livelihood diversification strategies are influenced by different factors. The model result indicated that out of the 16 hypothesized variables in the model, 10 were found to be significantly influenced households adoption of alternative livelihood strategies at less than 5% probability levels. These variables include land size, membership to cooperatives, urban linkage, Market distance, road distance, access to irrigation, access to mass media, household total income, access to credit, Sex, education level, dependency ratio, age, extension contact, crop production risk and. Accordingly, the model result indicated that the age of household head, sex , education, credit, crop production risk influenced positively and significantly the choice of farming plus non-farming, while the land size and dependency ratio were negatively and significantly affected the diversification of livelihood into farming plus non-farming activities. On the other hand irrigation and credit access had positively and significantly influenced the household choices of farm plus off-farm activity and dependency ratio had negatively and significantly affect the household choices of farm plus off-farm activities, Similarly, education, credit and urban linkage had positively and significant influence on the household decision of selecting diversified livelihood strategies into farm plus non-farm plus off-farm activities, while land size had negative and significant influence on livelihood strategies choice of farm plus non-farm plus off-farm activities.

6. Recommendation

The regional as well as the federal government and other concerned NGOs should take into consideration the following factors when trying to eradicate poverty and improve the livelihood condition of the smallholder farmer households in the study area:

Those with no much farm resources are ready to diversify their livelihood activities. They are ready to take risks and try other non-farm and off-farm activities. Besides, the following are the very crucial factors affecting the livelihood diversification decision of the households and should be taken seriously while dealing with poverty reduction in the study are:

Among the variables irrigation, education, urban linkages, and credit access had positively and significantly influenced the household choices of farm plus off-farm activity while dependency ratio had negatively and significantly affect the household choices of farm plus off-farm activities. Thus, all concerned should provide irrigation facilities, should provide education for all, increase modernization and provide access to credit. Farmers can then diversify their activities and improve their living standards.

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