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ROLE AND DETERMINANTS OF SMALLHOLDER FARMERS SAVING: THE CASE OF ABOBO DISTRICT, GAMBELLA REGION, ETHIOPIA

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ABSTRACT

Saving can be an important support scheme for smallholder farmers this is because as a tool of financial security, risk management and growth saving is essential instrument which has the potential to affect individual's wellbeing. A two-stage simple random sampling method was used to select 206 sample respondents. Then primary data were collected through interview schedule and FGD. The study employed descriptive statistics and double hurdle model for data analysis. Based on descriptive analysis results, saving plays a meaning full role for farm households by being a financial means to deal with unexpected issues, acquiring assets, providing basic needs, to have access to different agricultural inputs, to expand their agricultural activities and for their children education. In line with this; as a result of first stage of double-hurdle model educational status, farm-income, total land owned, age of the household head and household expenditure are significant factors which affect farmers saving decision while according to the result of the second hurdle farmers level of saving significantly affected by gender, education status, farm income, off-farm income, marital status, family size and distance to financial institution of sample households. Then the study suggests the concerned body should be focused on improving farmers' education, production, infrastructure and financial service provision.

INTRODUCTION

Saving is undeniably strategic variable in the theory of economic growth which determines national wellbeing. Likewise it play an enormous role in economic development as a key for capital formation and its significance influence on the circular flow of income in the economy and enable the conversion of resources into capital (Zegeye, 2018). Similarly, according Sibomana (2016) savings and their effective utilization for investment are a means of economic capacity building and change of livelihood for smallholder farmers. According to Chuol, (2023) in developing nations, especially in Sub-Saharan Africa, saving of rural households still very low and comparing to other parts of the world it is lagging behind their saving performance. This poor saving rate in developing nations, especially in Sub-Saharan Africa, has been attributed to a number of factors which includes low and irregular income and limited access to financial services. Likewise, rural households saving in Ethiopia are also discovered to be in its infancy (Aron et.al, 2013).

Based on the USAID (2018), and CSA (2018), in Ethiopia, smallholder farmers are the main actors of the agricultural sector; who are responsible for the cultivation of 95.9 percent of the total area under agriculture and these farmers are responsible for more than 90 percent of the total agricultural output. In line with this, smallholder farmers in Ethiopia owned 0.95 ha of land on average and practice rain-fed mixed farming by employing traditional methods of cultivation. Because of the small average holdings, most rural households cannot survive on farming alone. They are obligated to find alternative sources of income and effectively net consumers in the market. Within this policy and institutional support necessary to allow smallholders and rural economies to thrive is beyond rare (Sergio et.al, 2020).

So an understanding of what makes them more diverse and useful can help to identify appropriate support schemes set up by all public and private institutions. Among them, focusing on improving productivity and marketing of smallholder farmers to reduce rural poverty, and participating on non-farm activities; saving can be used as a supporting means of enhancing the performance of smallholder farming because the saving of smallholder farmers is used for both agricultural and non-agricultural purposes (Odoemenem et al, 2013).

Farmer's agricultural related activities and decisions, especially farmer size and the likes, highly affected by their ability to save and the amount of their savings this is as a result of savings serving as a means of accruing many agricultural resources in terms of quantity and also quality. Likewise, farmers with the ability to make more savings are more likely to have the potential to have access to and implement different agricultural factors of production in their agricultural production and create conditions to produce quality products, adapt to climate change issues and improve their arable land conditions, as

well as ensure efficiency in resource utilization. Additionally, saving for smallholder farmers is an important instrument for risk management as a self-financing for losses which are the product of various risks and uncertainties (Karlan et al, 2020).

Likewise, farmers' resilience to various climatic threats, economic, social and environmental shocks is enhanced by their saving capacity (Defaru, 2020). This is what makes the capacity of generating savings an important factor in decision making about farm-related issues. Also, the amount of saving determines several decisions related to the activity conducted by farm households. According to Nwibo et.al (2017), capital accumulation represents the main condition for farm development, and if the amount of saving is insufficient to meet income requirements, serious bottlenecks in the process of capital formation and growth efforts are likely to emerge. This problem has become supremely critical for farmers. This is because saving in line with improved access to micro loans, durable income stabilization and growth systems increase the capacity of farmers, thus driving sustainable change.

The existing financial institutions in Gambella Region do not address the financial needs of rural households. This is as a result of limited accessibility and existence of formal financial institutions in rural areas of the region (Choul, 2023). Relating with this like different areas in Ethiopia, subsistence farming has been the main source of income for farm households in the study area Chuol and Adan (2023); while this subsistence farming challenged by different factors and it is characterized by low income; also farmers in the study area have below limited access to credit; so farm households mobilization of their own saving could be the main financial source for different purpose in the study area.

The main focus of previous literatures on saving of rural households which were conducted in different parts of Ethiopia mainly focus on saving behavior, status and determinants of rural community only and they fail to show the situation of farm households saving, in terms of its role played by saving and volume of saving specifically in the study area (Tsega and Yemane, 2014; Halefom, 2015 and Abdela, 2018). In line with this, the saving status of farmers in the study area is not clearly identified through previous studies, so, with the understanding of the role of saving dealing with the factors which affect the saving decision and volume of saving in the study area was essential because predictors of it have to be identified through studies. Relating with is another reason which differentiate this study from other were its analysis was conducted using double-hurdle model unlike OLS, Tobit and Binary logistic models which are used by others frequently.

In general, this study will be an important source of information to policymakers at different level whom will focus on design a strategy which will be effective in addressing problems related to smallholder farmers saving.

Likewise this study will be essential document for researchers who will be interested in related areas of research. Therefore, the purpose of this study was to assess the role of saving, and investigate the major determinant factors of smallholder farmers saving in Abobo district of Gambella Region.

RESEARCH METHODS

Study Area Description

The study was done in Abobo district, one of the districts of the Agnwa zone of Gambella regional state, found 45km south of Gambella town. The terrain of the district can be mostly characterized by a vast flat landscape and the altitude ranges from 460 to 1650 meters above sea level. The aggregate population of the district is 31,209, of which 15,292 of them are males and 15,917 of them are female. Within this, Abobo has 16 rural kebele administrations and one urban administration (Asmelash et.al, 2020). In Abobo district there are two major types of farming systems. These are mixed farming and shifting cultivation. In line with this, farmers rear cattle.

Sampling Procedure

Households were the basic sampling units so that, after purposely selecting the study district, two stages of simple random sampling technique were employed to get the required household sample for this study. At the first stage, out of 16 rural kebeles existing in the district, four kebeles, those are shebo kirr, shebo mender 7, shebo mender 11&12 and shebo mender 13, were randomly selected. Then, in the second stage, a probability proportion to size (PPS) was employed to determine the sample size of each kebele. Accordingly, 206 households were selected for the survey. In line with this, in order to collect reliable and representative samples out of the target population, the sample size was decided or determined by applying the scientific formula of (Yemane, 1967) = $n = \frac{N}{1+N(e)^2}$. Where N is total farm households taken from the selected kebele with the support of the agriculture office of the district, n is the sampled households which are selected randomly at 94% confidence level and e represents the error term at 6% precision level. $n = \frac{792}{1+792(0.06)^2}$ = 206

Methods of Data Collection

This study used household survey data collected from Abobo district for the year 2021. The research is basically relied on quantitative and qualitative types of data collected from both primary and secondary data sources. To address the stated objectives of the study, primary data was collected from 206 sampled household in the selected kebeles using an interview schedule through

semi-structured questionnaire and focus group discussions. The questionnaire was designed to capture all the necessary variables and also focus group discussions (FGDs) were carried out to collect data that served as a supplement to the primary data got from sampled households. Checklist questions were prepared to obtain ideas for a collective purpose, and the focus group discussions were held with four groups having six members, one in each kebele. Besides to primary data, this study used secondary data collected from district offices records, different journal, internet, published research, and books.

Method of Data Analysis

To examine the role of saving descriptive statistics such as mean, minimum, maximum, standard deviation and percentage analysis were carried out. Regarding the econometric model, the double-hurdle model which was developed by Cragg (1971) is used for this study because the model deals with the assumption that households face two hurdles/stages in their activities which require making two decisions separately, in this case, decisions made regarding whether they save or not in formal financial institution or in informal way and about the amount of saving, each of which determine by a diverse set of explanatory variables and expected signs. According to Cragg (1971), a numerous latent variable used to model each decision process, the Probit model was applied to find out factors that determine a household's probability of saving in the first stage of the model and a truncated regression model was applied to determine the amount of saving in the second stage.

The double- hurdle model was specifying as a two-step decision process as follow:

First hurdle for saving decision:

$$d_i^* = W_i'\beta + v_i v_i \sim N(0,1) \quad \ldots\ldots (1)$$

$$d_i = \begin{cases} 1 \text{ if } d_i^* > 0 \\ 0 \text{ if } d_i^* \leq 0 \end{cases}$$

Second hurdle for amount of saving:

$$y_i^* = X_i'\delta + u_i \ , \qquad u_i \sim N(0, \sigma^2) \quad \ldots\ldots (2)$$

$$y_i = \begin{cases} 1 \text{ if } y_i^* > 0 \text{ and } d_i^* > 0 \\ 0 \text{ if } y_i^* \leq 0 \text{ and } d_i^* \leq 0 \end{cases}$$

Where, $d_i^*$is a latent or unobservable variable describing i^{th} households' decision to save as a sever in formal or informal institution (d_i), $y_i^*$is a latent or unobservable variable describing i^{th} household amount of saving, $y_i$is the observed variable or actual amount of saving saved by household(i), W_i' and $X_i'$are vector of variables explaining the saving decision and amount of

saving respectively, β and δ are vectors of parameters to be estimated, $v_i$and $u_i$are respective error terms assumed to be independent and normally distributed.
The model shows the relationship between the saving of smallholder farmers and its determinants.

Step 1: The probability of household's saving decision

Savdeci = β_0 + β1 age + β2 Gender + β3 Mari + β4 Income + β5 Educ + β6 Offin + β7 Famz + β8TLU+ β9 Expn + β10 Tland + β11Dist + e

Step 2: The households' amount of saving

Savamu = β_0 + β1 age + β2 Gender + β3 Mari + β4 Income + β5 Educ + β6 Offin + β7 Famz + β8TLU+ β9 Expn + β10Tland + β11Dist u_i

Table 1: Description of the variables used in the analysis

Variables	Type	Measurement	Hypothesis
Dependent variable			
Decision of Saving	Dummy	1=Yes & 0=No (saving decision)	-/+
Amount of saving	Continuous	Amount of Birr saved	
Independent variable			
Age	Continuous	Year	_
Gender	Dummy	1=male & 0=female	+
Marital statuses	Categorical	0=single,1=married,2=divorced 3= widowed	_
Education level	Continuous	Year of schooling	+
Household agricultural income	Continuous	Birr	+
Off-farm income	Continuous	Birr	+
Household family size	Continuous	Number	_
Number of livestock	Continuous	Number	+
Total land holding	Continuous	Hectare	+
Distance to financial institution	Continuous	Kilometer	_
Households expenditure	Continuous	Birr	_

RESULTS AND DISCUSSION

It is believed that descriptive results for different aspects of sampled households were pertinent in providing insights and an overview about the general features of a certain issues under analysis of the study. Hence, an

attempt has been made to describe some important characteristics of sample households and variables used in analysis.

Household Demographic and Social characteristics

The descriptive analysis results for dummy variables which show the demographic and social characteristics of the respondents by gender and marital status and the chi-square test indicates that there was a significant mean difference at 1% level of significance between saver and non-saver respondents. The proportion of male headed and female headed households among the total sampled households was 73.79% and 26.21% respectively. While the proportion of male headed and female headed households among sample households those save money and other assets was 87.59% and 12.42% respectively. This indicates that male headed households were relatively good in their saving than female headed households in the study area.

As shown in the table 2 below, among the total sampled households 84.47 % of respondents were married, 3.4 % were single while the rest 6.31% and 5.83% were divorced and widowed respectively. This showed that married households on average save more parts of their disposable income than single, divorced and widowed households. Likewise among saver households 92.7% of them are married while the rest 1.46%, 2.92% and 2.92% of them are divorced, widowed and single respectively.

Table 2: Demographic and social characteristics of sample households for dummy variable

Characteristics		Total sample (206)				Save (137)		Not-save (69)		χ2-value
		N	%	Mean	SD	N	%	N	%	
Gender	Female	54	26.21	0.74	0.44	17	12.41	37	53.62	40.3***
	Male	152	73.79			120	87.59	32	46.38	
Marital status	Married	174	84.47	1.28	0.72	127	92.70	47	68.12	24.74***
	Divorced	13	6.31			2	1.46	11	15.94	
	Widowed	12	5.83			4	2.92	8	11.59	
	Single	7	3.40			4	2.92	3	4.35	

Note: *** implies statistically significance at 1% level. Source: Own survey result, 2021

Regarding the continuous variable's which shows demographic and social characteristics of sampled respondents; which are age, education and family size. The average age of total sampled household heads was 41.3 years with the minimum and maximum ages of 24 and 80 years. While the average age of sampled households who had saving was 37.6 with the minimum of 25 and maximum of 65 years. There is a significance mean difference between the age of households who save and those who are not save at 1% level. This indicates that in the study area individuals save more in their early age or as the age of the household increase their saving performance decreases.

According table 3 below, the average schooling years of the total sampled household head was 5; while for households who save and not save was 7 and 2 years of schooling respectively. There is a significance mean difference between households who save and not save at 1% level. The result of study showed that as education level of sampled respondent's increases the probability and level of households saving increase. This finding is in line with the finding of (Temam and Feleke, 2018) which states that as the level of education increased the awareness of households concerning saving also to increase.

With regard to household family size, the average family size of total sample household was 5 with the minimum of 1 and maximum of 11 family members. This indicates that increase to households' family size lead to decreases in household saving because the more the number of the family the high will be the dependence ratio on the household. In the study area a household head was the one who was responsible for the overall expense of his/her family member; which were the individual source of household income.

Table 3: Demographic and social characteristics of sample households for continuous variable

	Total sample(206)				Save (137)		Not-Save (69)		t-value
Characteristics	Mean	SD	Min	Max	Mean	SD	Mean	SD	
Age of HH	41.3	11.6	24	80	37.6	8.5	48.6	13.5	7.2***
Education	5.4	4.2	0	15	7.03	3.7	2.13	3.1	-9.5***
Family size	5.2	2.3	1	11	5.1	2.1	5.3	2.5	0.69

Note: *** implies statistically significance at 1% level. Source: Own survey result, 2021

Resource Ownership and Economic Characteristics of Farm Households

Regarding the resource ownership of total sample household table 4 below indicates on average the households own 1.84 total lands with the minimum of not having any land and the maximum of 4 ha. While the average land owned by sampled households who save was 2.04 and 1.44 for those who are not save and there is a significance mean difference between households who save and not save at 1% level. Relating with this sampled household in the study area own 2.7 livestock with the minimum of not having any livestock and the maximum of 12.75. While owning a lot of different livestock by sampled households lead to increase their probability of saving and amount of saving in the study area.

Regarding farm income of the total sampled households, they got 7745.3 birr within the production period of 2020/2021. There is a significant mean difference between households who save and not save in terms of their farm income at 1% level; with having 9201.1 birr for those who save and 4854 for those who are not saving. Regarding the non-farm income sample households, those who saved got an average income of 6976.3 birr and 224.6 birr for non-

severe which shows the significance mean difference between those who save and not save money in terms of off-farm the income they generate at 1% level of significance.

Table 4: Resource ownership, economic characteristics and distance to financial institution

	Total sample(206)				Save (137)		Not-Save (69)		t-value
Characteristics	Mean	SD	Min	Max	Mean	SD	Mean	SD	
Total Land	1.84	0.93	0	4	2.04	0.95	1.44	0.74	-4.5***
Livestock	2.7	3.1	0	12.75	3.2	2.97	1.72	3.0	-3.3
Farm Income	7745.3	4465.4	0	20000	9201.1	4165.8	4854.7	3557.4	-7.4***
Off-farm Income	4714	10956.95	0	66000	6976.3	12843.9	224.6	1109.9	-4.4***
Distance	37.1	11.8	8	47	35.13	12.8	40.99	8.4	3.45***

Note: *** implies statistically significance level at 1% level. Source: Own survey result, 2021

As the descriptive statistics showed, on average, it requires 35.13 kilo meters for sampled households, those who saved money in formal financial institutions to reach a formal financial institution like a bank, while for those who did not save it requires 40.99 kilo meters, respectively. It was revealed that there was a significance mean difference between savers and non-savers at 1% level in terms of the kilometers required to reach formal financial institutions.

Problems which affect farm households saving

Beside different explanatory variable which are hypostasized to have effect on smallholder farmers saving there were different problems raised by respondents during the survey time which reduce their decision of saving and amount of saving. Among them the general rise of price (inflation) of different goods and services takes the largest proportion with 54.01% of the total response by saver households. Transportation problem also another problem that affects their saving by accounting 17.52% this is because due to lack of banks and other formal financial institutions near to their area they incur transportation cost to reach such institutions. While facing all of these problems at once, lack of bank in near place, and high expenditure for household and different activities takes the proportion of 9.49%, 8.76%, 8.76% and 1.46 respectively.

Table 5: Problems which restrict households saving

Problems	**Frequency (№)**	**Percentage (%)**
Lack of bank in near place	12	8.76
Shortage of income	12	8.76
Inflation	74	54.01
High expenditure	2	1.46
Transportation	24	17.52
All of them	13	9.49

Total	137	100

Source: own survey result, 2021

Role of Saving for Smallholder Farmers

The result of the pie chart below showed that among the total sampled farm households, 66.5% of them saved money and other valuable assets in different places, like in formal institutions, homes and with their relatives and friends' houses. According to the respondents, saving money and other valuable assets benefits them in an indifferent way; which includes a means to deal with unexpected issues (40.5%) saving allows them to deal with emergencies and unforeseeable events such as loss of production, medical emergencies and many others. Relating with this, in the study area, because of the absence of adequate micro and above-level debt service provision which can be a means of support for smallholder farmers during their hard time, always having their own means of dealing with all kinds of life issues, is essential in this case, saving being a means of support and risk management tool for the livelihood of farmers in the study area. This is in the same vein with the findings of Manh (2023) who found that improving saving as the absorptive capacity helps farm households have better ex ante preparation to reduce the negative effects of shocks.

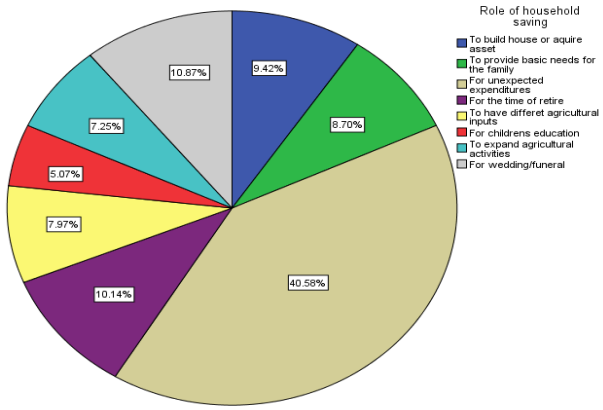

Figure 1: Pie chart representing role of saving for smallholder farmers
Source: own survey result, 2021

According to Kindineh (2023) at the household level, savings have benefits which includes being a backup plan during emergency time, to accumulate different assets, means of cash for own investment, for time of retirement. It can also help households to attain their dreams, to acquire house and many others; this result is in consistence with the finding of this research. 10.87% of saver sampled respondents in study area used their saving as a means of finance to conduct different social events like funeral and weeding, 10.14% of saver farmers used their saving during the time of retirement, while

the remaining to acquire asset (9.42), to provide basic needs (8.70), to acquire different agricultural input (7.97%), to expand their agricultural activities (7.25%) and for children's education (5.07%).

Determinants of smallholder farmers' saving decision

This part shows the result of the first hurdle or probit model estimation, which was the probability of households saving decision; the model estimate result revealed that among eleven hypothesized explanatory variables six of them are significantly influenced the probability of households saving decision as presented in table 6 below. The Wald chi-square value of 74.94 for farmers saving decision model is statistically significant at 1% indicating that the explanatory variables included in the model jointly explain the probability of the households saving decision.

Age of the sampled respondents was a variable which significantly and negatively influences households saving decision at 1% level of significance. This showed that as the household head gets older by one year, his/her decision to save decreases by 0.62%; this is due to that when the household head becomes old, the possibility of getting more income decreases as their participation in agriculture and non-agricultural activities decline this is in line with the findings of Tsega and Yemane, (2014); Temam and Feleke (2018) also found similar results. While Tohib *et.al.* (2018) discovered that age of the household positively influence saving decision of rural households this is because savings capacity is enhanced as age increases. Old people tend to be more frugal and thrifty. This may be due to the facts that middle aged people are required to save more, owing to the financial obligations for their immediate families.

The education level of household head was the other variable which positively and significantly affects the probability of household saving decision at 5% level of significance. This is due to that as a result of an increase in educational status of sampled households the probability of their saving decision increases by 1.55%. This indicates that when farm household's education status increases their understanding about issues like the importance of saving, how to save, where to save and other related issues. This is in line with Girma *et.al,* (2013) and Ejigu (2019) who find a positive effect of education on saving decisions of farm households. According to them education helps making rational decisions about saving and increase agricultural and non-agricultural skills of the farmers that have a positive influence on their farm output and farm income which in turn would increase their saving; while this result was in contrast with Shahab et.al, (2016) who finds a negative effect of education on saving of rural households.

The income farmers obtain from farm activities positively and significantly affects the probability of households saving decision at 1%

significance level. Due to this, when the amount of farm income of sampled households obtain increases, the probability of a household saving decision increases by 0.0033%. As it is known, income is the main source of saving, so that when households get enough income from their agricultural activities they are able to save more this finding is in the same vein with the findings of (Amsalu and Melkamu, 2017).

The amount of land owned by the respondents also another factor which had positively and significantly affects the probability of households saving decision at a 1% level of significance. According to the marginal effect of the probit model, if household heads own one additional hectare of land, their probability of saving increases by 5.65%. This showed that with other factors of production, having a large land size leads to having more output as compared to a smaller land size. Consequently, producing more leads to more farm income, which may result in more savings. This is in line with ((Defaru, 2020). However, Melsew et.al (2022) found opposite result about the association of farm land and saving, they justify about their finding by saying that lack of awareness about role of saving in the study area households with more land holdings may not decide to save through the year. They have less capacity to save in response to more land holdings.

Off-farm income the sampled household gets positively and significantly affects a household's probability of a saving decision at 1% level of significance. Due to this, having a greater amount of income from non-farm activities increases the probability of a household savings decision by 0.0018%. This finding is supported by the findings of (Kindineh, 2023). But Obsa and Bekele (2021) finds a negative influence of income generating from off-farm activity on saving of farm households; according to them this may be as a result of the poverty status of farmers who participate on off-farm activity and generate only a few income. The expenditure made by the household was a variable which affecting the probability of households saving decision negatively and significantly at 1% level of significance. As the model result showed that if the household head expends one additional birr, the probability of their saving decision decreases by 0.011%. This indicates that meeting basic needs and having the required resources for agricultural activities for farm households make them share their total income obtained from on-farm and off-farm activities for different purposes and by this, it reduces the income that will be left for saving. This is in line with (Genemo et.al, 2021).

Table 6: Determinants of smallholder farmers' saving decision

Saving	Dy/dx Coef.	Robust Std. Err.	Z	P>z	[95% Conf.	Interval]
Age	-.0062195***	.0123362	-3.14	0.002	-.0629663	-.0146094
Gender	.06516	.3241633	1.25	0.210	-.2289821	1.041715
Marista	-.0183173	.1645764	-0.69	0.488	-.4367988	.2083289
Educa	.0155359**	.0403765	2.40	0.016	.017752	.1760249

Famsiz	-.0059017	.063914	-0.58	0.565	-.162075	.0884632
Farminc	.0000334***	.0000473	4.40	0.000	.0001156	.000301
Tland	.0565537**	.167627	2.10	0.035	.0241507	.6812367
Offfar	.000018***	.000041	2.74	0.006	.0000321	.000193
Expen	-.0001123***	.0001993	-3.51	0.000	-.0010909	-.0003096
TLU	.0037326	.0472703	0.49	0.622	-.0693699	.1159263
Dista	-.0021049	.0106613	-1.23	0.218	-.034023	.0077685
_cons		.8303005	1.60	0.109	-.2981682	2.95655
Number of obs = 206		Wald $chi^2(11)$ = 74.94			Prob > chi^2 = 0.0000	
Pseudo R^2 = 0.5482		Log pseudolikelihood = -59.342				

Note: ** & *** implies statistically significance at 1 and 5% level respectively. Source: Own survey result, 2021

Determinants of smallholder farmers' level of saving

On the second hurdle (truncate regression model), the analysis result showed that out of eleven explanatory variables used for the analysis, seven of them significantly affect the household's level of saving and they are discussed in detail below. Wald chi-square value 60.63% which is significant at 1% is strongly and significant indicate acceptance of alternative hypothesis explanatory variable in explaining the amount of farmers saving.

As the model result showed that gender of the sampled household head was a variable which significantly and positively affects the amount of household saving at, a 1% level of significance, this expressed that when the household head was male headed the amount of savings increased by 8.04 birr than female counter part this is in line with Temam and Feleke (2018) but this finding is in contrast with the finding of Halefom (2015), that women save more than men as women's are good in managing their saving actively than their men counter parts. Marital status of the household head had a negative and significant relation with the household's amount of saving at 1% level of significance. Due to this, in the study area, being married leads to decrease the households saving by 1166.9 birr. This can described as after marriage, his/her daily expenditures will increase, especially if there are a lot of dependents in that household; this is in line with (Alebachew and Yohanes, 2018).

The education level of household heads positively and significantly affects the amount of saving at 10% level of significance. When the education level of household's increases by one year, it results in an increase in the amount of household savings by 78.5 Birr; this is in line with (Defaru, 2020). Whereas; Alebachew and Yohanes (2018) finds an opposite association between education and household saving, according to them as an increase in the level of education of the farm household their saving decrease. According to truncated model estimation, the effect of family size was negative and significant at 1% level of significance. As a result, of adding one new family member to the family, the amount of savings decreased by 267.7 birr, according

to Birhanu (2015), who also find similar results showed that having more dependent family members in households, which requires more income for fulfilling their needs. This leads to a decline in income that will be left for saving, whereas this finding is in contrary with the finding of Osondu, et.al. (2015) according to them when households become economically active there will be high probability of saving more and more amount of income.

Farm income was a variable which affects both savings decisions and the amount of savings. In this case, the annual farm income of the household had a positive significant effect on the amount of saving as predicted in different empirical and theoretical literature. As a result of having one birr additional as a farm income, the household's amount of savings increased by 13.9 birr. Amsalu and Melkamu (2017) and Alebachew and Yohanes (2018) also found similar results; while Osondu, et.al (2015) finds contrary result of negative association of farm income and level of saving. This may occur when a farmer uses his/her farm income for other activity than saving.

Off-farm income was also one among the cross-cutting variables which affect the probability of a saving decision and the amount of saving. Similar to the saving decision, off-farm income positively and significantly affects the amount of saving at 5% level of significance. This finding is in consistence with the findings of (Tohib et.al, 2018). Household's residence to financial institutions like that of bank had a significant and negative effect on the amount of saving at 1% significant level. As a result of this, if the household heads live one additional kilometer away from financial institutions like banks, their saving amount decrease, this implies that due to the in adequacy of rural infrastructure farm households need to travel long distance to reach formal financial institutions due to this it discourages them to save more. This is in line with (Genemo et.al, 2021, Birhanu, 2015 and Tohib et.al, 2018). However, this finding is in contrary with the finding of Ajah et.al (2017) as they find that positive association between saving and distance to financial institution. For this they said that people want to save more where they are sure that their savings will be safe.

Table 7: Determinants of smallholder farmers' level of saving

Amountsa	Coef.	Robust Std. Err.	Z	P>z	[95% Conf.	Interval]
Age	8.046509	17.45882	0.46	0.645	-26.17215	42.26516
Gender	1045.035**	482.2701	2.17	0.030	99.80326	1990.267
Marista	-1166.925***	438.2769	-2.66	0.008	-2025.932	-307.9184
Educa	78.5153*	44.38196	1.77	0.077	-8.471742	165.5023
Famsiz	-267.7075***	91.4142	-2.93	0.003	-446.876	-88.53891
Farminc	.1391303***	.0364877	3.81	0.000	.0676157	.2106448
Tland	368.1165	236.6391	1.56	0.120	95.68754	831.9206
Offfar	.0284872**	.0136212	2.09	0.036	.0017902	.0551843

Expen	.1563005	.2026221	0.77	0.440	-.2408315	.5534325
TLU	-5.619377	50.32483	-0.11	0.911	-104.2542	93.01547
Dista	-36.64947***	10.16709	-3.60	0.000	-56.5766	-16.72234
_cons	1564.947	1319.025	1.19	0.235	-1020.294	4150.188
/sigma	1121.278	104.942	10.68	0.000	915.5951	1326.96
Number of obs = 137		Wald chi2(11) = 60.63			Prob > chi2 = 0.0000	
Log pseudo likelihood =-1074.558						

Note: *, ** &*** implies statistically significance at 1, 5 and 10% level respectively.
Source: Own survey result, 2021

CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

Improving the saving performance of farmers is needed to be taken as a high priority among development specialists and policy makers as a means of changing the livelihood of farmers, besides improving their productivity, which in turn, will make a positive contribution to the growth and development of a nation. This study was focused on investigating the role of saving and factors affecting smallholder farmers saving. Relating the role of saving; saving same items in a side is crucial for the livelihood of sampled households who save in different ways at household and farm level, which includes dealing with unexpected expenditure, building houses and acquiring different assets, having different agricultural inputs, expanding agricultural activities etc. Besides this, smallholder farmers' saving decision is explained by age of the household head and expenditure negatively, while education, total land owned and off-farm income are variables which positively explain the probability of a saving decision. Likewise, the amount of smallholder farmers saving is determined by gender of the household head, education level of the household head, farm income and off-farm income positively. While marital status of the household head, family size and distance to a financial institution negatively influence the amount of saving.

Suggestion

After analysis of the factors which affect smallholder farmers saving in Abobo district, I am suggesting the things below to be considered as an intervention mechanism to enhance smallholder farmers saving and livelihood improvement. Firstly, there is a need to strengthen adult education to improve farmers understanding of saving and related issues. Likewise, there is a need of providing training and acquisition of necessary skills for equipping smallholder farmers with the skill of finances and resource management. Additionally, high emphasis should be given to increasing smallholder farmers' agricultural production and marketing activities, which are a means of

high farm income and a reversely a means of high saving. Relating with this, there is a need for identifying, establishing and expansion of alternative income sources for rural households through different income diversification options so as to mobilize more saving for economic growth. Finally, making available and accessible of financial institution near rural areas is needed to promote saving.

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