

**Research Article**

**Land certification and farmers' decision on long term investment in Jimma Zone, Southwest Ethiopia**

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**Abstract:** The impacts of land tenure security on investment have long been recognized. Land certification has been undertaken in most zones of the region including Jimma zone. Therefore this study assesses farmers' perception on land certification and factors affecting long term land related investments specifically tree, fruit tree and coffee planting. It was conducted in three Woredas of Jimma Zone namely Omonada, Limmu Kossa and Seka Chekorsa. Multi-stage sampling techniques were employed to select respondent farmers from each Woreda and a total of 200 household heads, of which 79.5% are them secure land certification, were selected for the analysis. The findings' indicates that most of the respondents have positive and strong agreements with different attributes of land certification. These are land certification encourage investment activities, soil conservation measures, and farmers to venture in area that could enhance productivity, provide increased land tenure, feel sense of ownership and current system is satisfactory, have lifelong use right and support both woman and man to share equally. There is significant relationship between land certification and long term land related investments specially tree and fruit planting. In addition long term land related investments are influenced by total land holding, land certification, oxen ownership, extension service and annual income. Thus, land certification and other socio-economics and institutional factors need to be considered to encourage farmers' involvement in long term land related investments

**Keywords:** *Ethiopia, farmer perception, Jimma, land certification, long-term investments*

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**Introduction**

Land is one of the basic factors of production that the rural community utilizes it for production and investment purpose. The impacts of land tenure security on investment have long been recognized. Tenure security increases access to credit, facilitate transfer of production factor to more efficient user, and thereby contributing to economic growth. De Seto (2000) argues that providing secure property rights is important for economic development.

In Ethiopia, land is still the main source of livelihood and investment, for majority of the population. However, studies have indicated that among many factors degradation; land

fragmentation, tenure insecurity, landlessness are causes of food insecurity in Ethiopia. Of all the factors, land degradation was found to be increasing as a result of poor practices and weak sense of ownership mainly due to the absence of secured land use right. Land tenure systems affect rural farmers not only in the ability to produce for subsistence and for the markets but also their social and economic status, in any way of their incentive to work hard and use land in a sustainable way (Desalegn, 1994). Tenure rights are subjects of hot debate in the theoretical and policy analysis on how to foster economic, social, and environmental goals (Deininger and Binswanger 2001). Moreover, the land holding system in Ethiopia and the region is

not purely an economic affair rather it is much intertwined with people's culture and identity, and land related issues that may generate intense emotional reactions particularly in rural areas (EEPRI, 2002). In many circumstances, a variety of measures increasing security and productivity of land users are available without the need of major legislative changes, which include the introduction of simple system of land rights: boundary definition, titling, support for the resolution of disputes etc. at community/individual level (Toulmin and Quan, 2000). Several studies indicate that tenure security enhances investment and vice versa (e.g. Besley 1995; Sjaastad and Bromley, 1997). Individuals may invest on their land, for example by fencing and planting trees, to enhance their tenure security. In Burkina Faso, for example, land related investment is undertaken in order to secure land rights rather in response to more secure rights (Brasselle et al., 2002)

Land issue in Africa is much more complex, due to various socio-cultural, institutional, economic, and environmental factors associated to the definition of land tenure security or insecurity than just the presence or absence of private property rights (Adams and Howell, 2001). Land is one of the most critical assets to the livelihood of rural households in developing countries. In Ethiopia, until recently, rural households' access to land was met through regular government sponsored land redistribution and informal land transactions.

In the past Ethiopian context, the state-interventions on land were more of redistributive than geared towards one of introducing formal title or individualization (Atakilte, 2001). Moreover, in 2003, a study on the status of land tenure security and land-related investment was undertaken in most regions of Ethiopia. The study noted that in Ethiopia land tenure appears to be quite insecure and the rights to transfer land permanently or for longer time were severely restricted (Binswanger, 2003). Accordingly, for the benefit of appropriate formulation and implementation of land policy in Ethiopia, there is a need for more empirical studies to assess the effectiveness and nature of different land tenure arrangements in solving land tenure constraints in relation to the inherent conditions of regions or farming systems. In some part of the country, the impact of land certification on long term investment has been assessed, e.g. in Tigray (Dagne Menan et al., 2008), Oromia and southern Ethiopia (Amare, 2013).

Land registration and certification in Ethiopia started in 1998. However, land registration and certification program was implemented in Oromia Regional state since 2004. In Oromia region Article 15(4): says "Any holder of rural land shall

be given a holding certificate by Oromia Agricultural and Rural Development Bureau describing the size of holding use and coverage, fertility status and boundary, and also the right and obligation of the holder. Accordingly, land certification has been undertaking in most zones of the region including Jimma zone. In this connection, assessing farmer's perception about the certification believed to guide their action towards long term land related investments on their holding and thereby land management. However, no research had been initiated in this regard in the study area. Therefore this research has been initiated to assess farmers' perception on land certification and its attributes and, their subsequent actions on long-term land related investments on their holding in selected *woredas* of Jimma Zone.

## **Methodology**

### ***Description of the study area***

The study was conducted in Omonada, Limmu Kossa and Seka Chekorsa Woredas of Jimma Zone that are located near and around the capital city, Jimma a place that is 350km far from Addis Ababa. Jimma Zone reliably receives good rains, ranging from 1,200-2,800 mm per annum. In normal years, the rainy season extends from February to October. Based on CSA population projection, the zone has a total population of 2,986,957 of whom 50.15% are men and 49.85% are women; 93.54% of its population were rural dwellers in 2014. Moreover, the temperature of the Jimma zone varies between 8 and 28°C with an annual average of 20°C. The area experienced an annual average rainfall of 1000 mm for 8 to 10 months (Jimma Zone Agriculture Office, 2013).

### ***Omonada Woreda***

Omonada is one of the one of the Woredas in the Jimma zone. Based on CSA population projection, a total population for this Woreda is 297,846; of whom 49.94% were men and 50.06% were women; 94.26% of its population were rural dwellers in 2014 The major crops produced in the Woreda are maize, sorghum, and teff while the common cash crops are coffee, chat and honey. The agro-ecology is entirely midland with undulating and plain topography. The main rainy season stretches from March to September, and the area receives an average annual rainfall of 900-1300 mm. Temperature is moderate ranking from 20-28°C (Jimma Zone Agriculture Office, 2013).

### ***Limu Kossa***

Limu Kosa Wereda is one of the eighteen weredas found in the Jimma zone. It borders Goma Wereda

in the west, Tiro Afeta Wereda in the south, North Shewa in the north, east and west, Wellega in the northwest and Welkete town in the east. The total area size of the Wereda is estimated at 277,052 hectares. The Wereda has a total population of 182,160; of which 171,019 or 94 % live in rural areas, and 11,141 or 6% live in urban areas (CSA 2007). The Wereda is divided into 58 rural kebeles and 2 urban kebeles. In rural areas, the size of the kebele ranges from 180 households to 800 households, with an average of 360 households. The average rainfall is 1516.30 mm. The altitude of the Wereda ranges from 1590 m to 1850 m above sea level. The average maximum temperature is 27.34°C degrees centigrade while the average minimum temperature is 11°C.

The land use in the Wereda is dominated by forestland accounting for 35.38% of the land. Natural forest is dominant, accounting for 34% of the area. The area is one of the few places in the country where the natural forest is known to exist in tact. Grazing land forms about 20% of the area. Land under annual accounts for 12%, while land under perennial accounts for 10%.

#### *Seka Chekorsa*

Seka-Chekorsa is one of the major maize producing Woredas in the Jimma zone. It is bordered on the south by the Gojeb river, on the west by Gera, on the northwest by Gomma, on the north by Mana, on the northeast by Kersa, and on the east by Dedo. Based on CSA population projection, a total population for this Woreda is 249,066 of whom 50.19% were men, and 49.81% were women; 96.05% of its population was rural dwellers in 2014 (CSA, 2013a). The agro-ecology is entirely midlands with undulating and plain topography. The main rainy season stretches from March to September and the area receives an average annual rainfall of 900-1300 mm. Temperature is moderate ranking from 20-28°C (Jimma zone agriculture office, 2013).

#### *Sampling design*

The study employed a multi-stage mixed sampling technique to select sample respondents. From Jimma Zone three woredas namely Omonada, Limmu Kossa and Seka Chekorsa were selected purposely based prevailing land certification practices and accessibility. Sample respondents were selected from 9 kebeles of the selected woredas (three from each), stratified as certified and not certified. Since majority of the farmers in the area secure land certification almost all farmers who didn't have land certification were included in the study. Finally a total of 200 respondents farmers were randomly selected from each stratum

based on proportional to the size of the population in each Woreda and kebele.

#### *Data collection*

The study uses both primary and secondary sources. Primary data were collected from sampled households using semi-structured questionnaire. Demographic, socio-economic, and institutional data, perception of farmers on land certification attributes were obtained. To supplement primary data and triangulation purpose secondary data were gathered from relevant sources as literatures and document from various offices.

#### *Data analysis method*

To meet the objectives of the study, both descriptive and econometric analysis were employed. The data collected were cleaned, entered into Statistical Package for Social Sciences (SPSS) version 20 and analyzed. Descriptive statistics such as percentage and frequency of occurrence were employed to assess demographic, socioeconomic issues. Likert scale was used to analyze farmers' perception on the attributes of each land certification practices. In addition, T-test and Chi-square were used to see the significances of continuous and discrete variables respectively.

Binary logistic regression model was employed to identify factors affecting long term investments decision based on Gujarati (1988) and Hosmer and Lemeshow (1989) which is mathematically described as indicated below.

$$Z_i = \beta_0 + \sum \beta_i x_i + U_i;$$

Where  $\beta_0$  is the constant,  $\beta_i$ ,  $i = 1, 2, \dots, n$  are the coefficients of the independent variables to be estimated.  $X_i$  is a vector of independent variables;  $U_i$  is the error term with zero mean and constant variance. The dependent variable in this case is dummy ( $Z_i$ ), which takes a value of 1 if a given farmer had invested in their land, otherwise 0.

#### *Definition of variables and working hypothesis*

**The Dependent Variables of the Model:** The dependent variable for the logistic regressions has dichotomous nature, taking the value 1 with a probability of (Yes), when invested on trees, fruit tree and coffee, or the value 0 when a given farmer did not invest (No).

**The Independent Variables of the study:** The independent variables that will be expected to influence farmers' investment decision can be diverse. Eleven hypothesized explanatory variables were considered for this study. These are demographic and socio-economic characteristics such family size, age, sex, educational level active

labor forces, land size and income, institutional factors such as access to agricultural extension, access to nearest market, access to credit service as

well as land entitlement/land certification. Explanatory variables and expected sign is presented in Table 1.

Table 1. Explanatory variables and expected sign.

Variable code	Description	Types of variable	Unit of measurements	Expected sign
<b>Dependent</b>				
LONGINVEST	Participating in long term land related investment	Dummy	1=participating, 0=non-participating	
<b>Independent/explanatory</b>				
SEX	Sex of household head	Dummy	1=Male, 0=Female	+/-
AGE	Age of household head	Continuous	Measured in years	-
EDU	Education level of the respondent	Continuous	Years of education	+
TOTACTIVE	Total active labor in the family	Continuous	Number	+
LANDHOL	Total land holding of household head	Continuous	Measured in hectare	+
OXEN	Number of oxen the household owned	Continuous	Number	+/-
LANCERT	Land certification possession	Dummy	1. Certified 0. Non certified	+/-
AVEANINCOM	Total household income	Continuous	Measured in Birr	+
CREDIT	Access to credit	Dummy	1=Yes, 0=No	+
EXTENSION	Access to extension service of household head	Dummy	1=Yes, 0=No	+

## Result and Discussion

### *Household socio economic and institutional characteristics*

#### *Household characteristics*

Majority (97.5%) of the respondents was found to be male headed households. The minimum, maximum and mean age of the respondents was 20, 76 and 43.23 respectively. The mean age of farmers who invested in tree planting were 44.2 whereas those didn't invest was 41.1. There is no statistically significant age difference between those investing and not investing in their lands.

The average educational level of the respondents was 4<sup>th</sup> grades. In the study area, 25.5 per cent of the sample household heads are unable to read and write (illiterate) whereas 74.5% of them have attended grade 1 and above. The t-statistics showed that there is a significant mean difference

between the two groups (only for those who had been investing and not investing) in coffee plantation with respect to educational level at 10% significant level.

The family size in the study area ranges from 2 to 15 persons with an average of 6.7 persons per household. If we consider family size focusing on economically active groups i.e. members whose age is between 15 and 64, on average there are about 3 economically active members per a family. T-test result showed that the mean difference for family size between investing and non-investing was significant for tree (p<1%) only and not significant for fruit tree and coffee investor.

Farm experience was also considered as independent variable that may determine for farmers decision on long term land related investments. Accordingly, the minimum and maximum farm experiences among the respondents were 2 and 55 years, respectively, and

the mean farm experience was 21 years. Respondents have maximum, mean and minimum farm experiences of 55, 21 and 2.

#### *Landholding and oxen ownership*

Land is one of important factors of production for rural households. The survey result indicates that the average landholding was 1.9 hectares per household. More than half (52%) of the households average holding lies between 0 and 1.5 hector. The average landholding of participant and non-participant in tree planting were 1.54 and 1.1 hectar, respectively. Moreover, those who have been participating and not participating in fruit tree owned 2 and 1.6 hectares respectively. The result shows that there is a statistical significant difference at 1% and 5% between participant and non-participant for tree and fruit tree investment with respect to landholding.

As this study was concerned mainly on land related investment, it focused on the ownership of oxen than on total livestock numbers. Number of oxen was hypothesized to affect long term investment. The study showed that the average oxen ownership among the households was 1.4 per household. Majority (44.5%) of the respondents own two oxen, 22.5% of the respondent own one

ox and 23% of them do not possess ox at all whereas 10% of the sampled household own more than 2 oxen. Oxen ownership was hypothesized to be related with investing in long term land related investment. Accordingly, the t-test shows that there is statistically significant difference for tree, fruit tree and coffee at ( $p>0.01$ ) with respect to oxen ownership.

#### *Annual income*

The major sources of income for livelihood in the study area were farm, non-farm and remittance. About 88% of the respondent's main source of income was farm income followed by remittance (5.5%). The average income of the respondents was estimated to be 10,144 ETB. Mean annual income of participants was 10,631 ETB and non-participant in tree planting was 9,109 ETB. The independent t-test result shows there is no statistical significant difference between the two groups. The average annual income of coffee investor and non-investor was 10865 and 7166.7 ETB. The independent t-test revealed that there is a statistical significant difference between the two groups with respect to annual income at less than 1% significant level.

Table 2. Demographic and Socioeconomic characteristics of respondents.

Variable	Tree		T statistics
	Tree Investor Mean (SD)	Non Investor Mean (SD)	
Age	44.2	41.1	-1.6
Education	3.96	3.91	0.11
Family size	7.1	5.7	-3.6***
Active family (15-64)	3.5	3.1	-1.61
Farm experience	22.2	20.6	0.39
Total landholding	2.12	1.51	3.21***
Number of oxen	1.7	0.9	5.28***
Annual income	10,631	9,109	1.63

\*, \*\*, and \*\*\* represent statistical significance at 10, 5 and 1%, respectively

#### *Access to agricultural extension, credit and market services*

Out of the total respondents 82.5% (165) had access to extension in related to land investments, tree planting, and 27.5% don't have access to extension. The major sources of extension for the respondents were extension agent, cooperatives, other farmers (friends and/or neighbors) and mass media mainly radio and TV. The chi-square result indicated that there is a statistically significant difference between who investing in tree and not investing at less than 5% significant level (Table 3). However, there is no significant difference

between those groups of fruit tree and coffee investor.

Majority of respondents (74.5%) did not take loan from any sources mentioned below where as 25.5% received credit from different sources. The main sources of credits for those who received loans were microfinance, Banks, traders and relative with. Farmers utilized the borrowed money for different purpose. Accordingly, majority respondents used the credit to buy agricultural inputs like seed, fertilizer followed by buying livestock and livestock inputs (feed). Only 5.5% used their credit to invest in long term related

investment. There is no significant different between groups of farmers participating in tree and coffee investment and who do not. In contrast the statistical analysis indicated there is significant difference ( $p < 0.1$ ) in access to credit of investor versus non-investor of fruit tree. Access to market is expressed with respect to the distance of nearest market from the respondent's house. Hence 41%

of the respondents have access to the nearest market. On the other hand 58 % of the respondents have no access to market. Farmers were also asked about major type of marketing problem. Accordingly lower price, lack of transport, distance from the market, and lacks of standard weighing balance/deceiving were found to be the major marketing constraints among the respondents.

Table 3. Distribution of respondents based on access to extension, credit and market.

Variable	Category	Tree investor		Non tree investor		X <sup>2</sup> test
		Number	%	Number	%	
Access to extension	Yes	117	71	48	29	3.667*
	No	19	54.2	16	45.8	
Access to Credit	Yes	36	70.5	15	29.5	0.211 (NS)
	No	100	67	49	33	
Market access	Yes	52	62.6	31	37.4	1.87 (NS)
	No	84	71.8	33	28.2	
Land certification	Yes	120	75.5	39	24.5	19.9***
	No	16	39	25	61	

#### **Land certification**

The survey showed that out of the total sampled households 79.5% of the respondents have secure land certification. They received land certification between the years 2005 to 2014. Absence of own land (5%), lack of readiness (6.5%), and certification process taking long process (5.5%) were the major reasons for not receiving land certification. There is statistical significant difference between certified and non-certified farmers with respect to participating in long term land related investments such as tree, fruit tree and

coffee planting at less than 0.001 significant levels. The result is in line with both Gadisa (2012) and Deininger *et al.* (2007) The former result indicated that certified respondents were more participated in tree planting than others. Similarly the later also found that land certification in Ethiopia has contributed to increase investment in trees. However, the finding is not consistence with Sabita (2010) who found no statistically significant relation has found between the perception of farmers after getting certificates and the tree plantation.

Table 4. Distribution of respondents by their status of participation in long term investments activities and land certification.

		Have you participated in long term investment (Tree planting)?		Total	X <sup>2</sup> test
		No	Yes		
Do you have certificate for your land?	no	25	16	41	19.89***
	yes	39	120	159	
Total		64	136	200	

\*, \*\*, and \*\*\* represent statistical significance at 10, 5 and 1%, respectively.

#### **Perception of farmers towards land certification and its attributes**

This study assessed farmer perception on several issues related to their land and intention to invest on their land. As it can be depicted from Table 5 several item questions were presented to the farmers so that to rate at scale of 5 where 1

represents strongly disagree and 5 as strongly agree. Majority (76.5%) of the respondents replied that they strongly agree about the benefits of land certification. Very few respondents (4%) are not sure of the benefits of land certification. The survey result also indicated that only 1% of the respondents strongly disagree about the benefits of land certification (Table 5).

Table 5. Farmers' perception towards land certification attributes.

Attributes	Strongly disagree (%)	Disagree (%)	Uncertain/ Indifference (%)	Agree (%)	Strongly agree (%)
Land certification has benefits	1	0	4	18.5	76.5
Land certification encourage investment activities in my land	0	1.5	1.5	26.5	70.5
Land certification encourage soil conservation	0	2	0.5	33.5	64
Land certification provide increased land tenure	0	1	3	34	62
Land certification enable me to use different conservation measure to land	0	2	1.5	45	51
Land Certification would encourage farmers to venture in areas that could enhance productivity	6	2	2	33.5	56.5
I feel sense of ownership and the current system is satisfactory	1	1	6	33.5	58.5
Land certification have lifelong use right and are able to inherit to their descendants	0	1	2	39.5	57.5
Currently having use rights, but are not sure about the future	8.5	11	7.5	30	43
Land certification has reduced land related disputes	0	1	2.5	33.5	63
Land certification law supports both man and woman to share use rights equally	0.5	1.5	1	42	55
Feel can share equally (for man and woman) in case of divorce	1	1.5	8	32.5	57

Most of the respondents (70%) strongly agreed that land certification encourage investment activities and soil conservation in their land. On the other hand, 1.5% respondents express their disagreement with land certification encourage investment activities and soil conservation in their land. In the other way, 56.5% of the respondents totally agree that land certification encourage farmers to venture in areas that could enhance productivity (Table 5).

Moreover respondents were asked about whether land certification law support both man and women to share use rights equally. Hence 55 and 42% of the respondents strongly agree and agree, respectively that 'land certification support both man and women share use rights equal'. Similarly 57 and 32.5% of the sampled households strongly agree and agree they feel can share equally in the case of divorce, respectively.

The survey finding revealed that currently, 43 and 30% of the respondents are strongly agree and agree, respectively and they are confident about use right of their land but, it seemed that they are uncertain about the future. However, some (8.5% and 11%) of the respondents expressed their perception that they strongly disagree and disagree, respectively about the current existence of use right

but are uncertain/ not sure about the future respectively. Therefore, from the analysis it is possible to conclude that majority of the respondents are not sure about future use right.

#### ***Factors affecting farmers participation in long term land related investment***

Households participated in long term land related investment activities such as tree, fruit tree as well coffee plantation. Accordingly, 68, 74 and 80.5% of the respondents have been involving in tree, fruit tree and coffee planting respectively. However, 32, 26 and 19.5% of the sampled households didn't participate in any of long term land related investment indicated above respectively.

Both certified and non-certified respondents have been participating in long term land related investments activities however majority of whom were participating in fruit tree (78.6%) and tree planting (75.5%) are those who secured land titling. Dagneu et al. (2008) indicated that the number of farmers involved in land investment interventions was increasing at progressive level when we observe the six consecutive year data after land titling (2000-2005),

*Participating in tree plantation*

An important indicator of land tenure security is farmers' decision to grow trees. The investments in tree plantation are considered as a long term investment in land management. Thus it is expected to be influenced by the certification program. Eleven explanatory variables were

hypothesized to affect long term investment activities (tree, fruit tree and coffee planting. Out of these variables three of them significantly affect long term investment (tree). These are oxen ownership ( $p < 0.01$ ), land certificate ( $p < 0.01$ ) and access to extension service ( $p < 0.05$ ). The chi-square test showed that the overall goodness of fit of the model at 1% significant level (Table 6).

Table 6. The maximum likelihood estimates of the binary logit model for tree plantation investment.

Explanatory variables	Coefficient	S.E.	Wald	Exp(B)
SEX	-.236	1.176	.040	.790
AGE	.018	.026	.494	1.018
EDU	-.019	.060	.097	.981
TOTACTIVE	.126	.111	1.282	1.134
FARMEXP	-.032	.029	1.213	.968
TOTLAND	.162	.161	1.007	1.176
OXEN	.748***	.199	14.075	2.113
LANCERT	1.276***	.432	8.739	3.581
AVEANINCOM	.000	.000	2.677	1.000
ACCSEXT	.957**	.455	4.413	2.603
ACCSCREDIT	.670	.427	2.466	1.955
Constant	-3.148	1.437	4.798	.043

-2 Log likelihood = 203.88

Omnibus Tests of model coefficients: chi-square = 46.873\*\*\*

\*, \*\*, and \*\*\* represent statistical significance at 10, 5 and 1%, respectively

*Participating in fruit tree investment*

Likewise out of selected variables entered in the model three of them found to be significantly affecting long term investment, fruit tree planting at a different significance level. These are size of total landholding, oxen ownership and land certification (Table 7). Both findings are not consistent with Dagnew *et al.* (2008), except

landholding, who found farmers' long-term land investment decision on trees and fruit trees was significantly influenced by access to credit, availability of active labor at household level and size of landholding after land titling, at varying significance levels. In other way Amare (2013) on his study indicated that land certification significantly increases the probability that individuals will plant trees on their land.

Table 7. The maximum likelihood estimates of the binary logit model for fruit tree plantation investment.

Explanatory variables	Coefficient	S.E.	Wald	Exp(B)
AGE	-.034	.026	1.727	.967
EDU	-.049	.061	.654	.952
TOTACTIVE	-.062	.105	.351	.939
FARMEXP	-.016	.029	.291	.984
TOTLAND	.312*	.172	3.273	1.366
OXEN	.740***	.206	12.971	2.097
LANCERT	.849*	.442	3.683	2.338
AVEANINCOM	.000	.000	.428	1.000
ACCSEXTCLIM	.308	.464	.440	1.361
ACCSCREDIT	-.332	.412	.652	.717
Constant	1.279	1.341	.908	3.591

-2 Log likelihood = 192.92

Omnibus Tests of model coefficients: chi-square = 36.3\*\*\*

\*, \*\*, and \*\*\* represent statistical significance at 10, 5 and 1%, respectively



### *Participating in coffee investment*

Coffee production is a major economic activity and major source of income for people living in Jimma zone directly or indirectly. Those respondents engaged in coffee production allocated land from 0.01 to 6 hectares for coffee. Similarly logistic regression model was applied to assess factors affecting farmers' probability of participating in long term investment, coffee planting. Accordingly

three explanatory variables namely total land holding, oxen ownership and average annual income were significantly affects coffee planting investment (Table 8). However, long term investment, coffee planting, are not significantly different between those who possess land certification and those who do not have. This may be due to the reason that since coffee is the main source of income for farmers in the study area they produce it regardless of land certification.

Table 8. The maximum likelihood estimates of the binary logit model for coffee plantation investment.

Explanatory variables	Coefficient	S.E.	Wald	Exp(B)
SEX	-1.275	1.374	.861	.279
AGE	-.006	.030	.042	.994
EDU	.084	.070	1.462	1.088
TOTACTIVE	-.032	.116	.077	.968
FARMEXP	.006	.033	.032	1.006
TOTLAND	.573**	.246	5.420	1.774
OXEN	.521**	.225	5.350	1.683
LANCERT	-.024	.499	.002	.976
AVEANINCOM	.001**	.000	6.416	1.000
ACCSEXTCLIM	.296	.506	.342	1.344
ACCESCREDIT	-.297	.471	.397	.743
Constant	-.074	1.568	.002	.928

-2 Log likelihood = 161.92

Omnibus Tests of model coefficients: chi-square = 35.44\*\*\*

\*, \*\*, and \*\*\* represent statistical significance at 10, 5 and 1%, respectively.

### **Conclusion and Recommendation**

The impacts of land tenure security on investment have long been recognized. The paper explored households' perception on land certification and how land certification and other variables influenced plot level farm investment decisions on tree, fruit tree and coffee plantation. The study revealed that most of the respondents have secured land certification between 2005 and 2011. Farmers have positive and strong perceptions towards land certification its major attributes such as benefits of land certification, encourage investments activities, encourage soil conservation, prominent role of land certification increased land tenure, and role of land certification to reduce land related disputes. It is also clear from the study that long term land related investments are affected by socio-economics and institutional factors. Long term land related investment such as tree plantation influenced by land certification, and access to extension service. Whereas land certification, size of landholding, and oxen ownership are found be significant to influence fruit tree plantation. Moreover coffee investment influenced by size of landholding, oxen ownership and annual income. However coffee planting is not affected by land

certification unlike the other land related investments activities.

Based on the findings the following points are recommended

- Farmers found to have positive perception towards land certification and its attributes; therefore, further capacity building schemes need to be designed to ensure sustainability of the program.
- Land certification was one of the significant variables that affects land related investment activities such as tree and fruit tree planting. Thus, it is recommended that the concerned body need to continue granting land certification for the farmers who did not have it so far.
- Land certification is not sufficient condition and guarantees to enhance long-term land related investments. Besides to it, landholding, extension service, oxen ownership and annual income had prominent role to commence long term land related investments. Thus, appropriate policy and training schemes in the above mentioned areas need to be designed to improve long term land related investment.

- The study addressed mainly the relation between land certification and long term land related investments such as tree, fruit tree and coffee plantation. Further research is recommended in other long term land related investment areas such as soil and water conservation, land management and so forth.

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