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# Socio-economic Characteristics and Their Effect on Smallholder Farmers' Decisions to Participate in a Communal Land Restoration Project in Central Ethiopia

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## ABSTRACT

*Communal land restoration programs in Ethiopia overlooked the socio-economic context and decision behavior of smallholder farmers for better planning and intervention. Thus, studies related to socio-economic aspects and decision behaviors of smallholder farmers prior to the implementation of communal degraded land restoration are scanty. This study assessed the socio-economic characteristics and decisions making of smallholder farmers in degraded communal land restoration. The kebele under study was purposively selected near the communal degraded land for future intervention. Cross-sectional data were collected from 94 smallholder farmers selected using a systematic random sampling method. Binary logit was employed to see determinants of farmers' decision to participate in the rehabilitation of communal degraded land. The study result revealed that attitude towards village leaders and labor availability positively determines farmers' decision, while credit to access and absence of local institutions negatively influence the willingness of farmers to participate in communal land restoration. It seems that the socio-economic base of smallholder farmers did not have a strong linkage for their decision in the land restoration effort. The findings generally suggest that there should be locally based capacity building of the community in a participatory approach for land restoration efforts.*

*Keywords : smallholder farmers, socio-economic, decision making, communal land restoration, Ethiopia*

## INTRODUCTION

Ethiopia was one of sub-Saharan Africa's most well-endowed countries in terms of natural resources. Its abundant natural resource base has served as the foundation for agricultural growth and addressing the basic needs of the country's millions of rural residents (Zeleke *et al*., 2006). But most of Ethiopia's forest and land degradation occurred as a result of the rising population and increased demand for land for food cultivation (Brasser & Ferwerda, 2015). Thus, the process of land degradation has been intensified by high human activities as well as animal population pressures; very unpredictable and inconsistent rainfall; and steep topography (Gashaw, 2015). For example, the country's highlands are suffering from severe land degradation due to improper land use and deforestation, which is mostly caused by the country's expanding population (Deichert *et al*., 2014). As a result: millions of people's livelihoods, well-being, and energy security, as well as resilience are jeopardized (Appanah *et al*., 2015).

Ethiopia has been working hard to mitigate desertification and stop land degradation. Ethiopia's Environmental Policy highlights the importance of re-vegetation, grazing monitoring, and repairing degraded land to compensate for increased biomass-fuel consumption (FDRE, 2004). The country has pledged to rehabilitate 22 million hectares of degraded land by 2025 (Brasser & Ferwerda, 2015). The economic sector has set targets in the Second

Growth and Transformation Plan, primarily regarding establishing a climate-resilient green economy, environmental protection, and forest development. To boost carbon sequestration in forests and woodlands, one of the CRGE's prioritized initiative tactics is to increase afforestation, reforestation, and forest management (FDRE, 2011; 2015).

The Ethiopian government has been mobilizing the population for soil and water conservation, plantation, and area closure practices to alleviate land degradation (Megersa & Hailu, 2021). However, according to Demissie *et al*., (2017) physical management of land could not alone reverse land degradation. They suggested the need to involve the local community in consultation, planning, and implementation throughout the process of a restoration effort. Thus, land restoration intervention should follow a participatory approach, and strive toward socio-economic benefit (Abera *et al*., 2020; Hagazi *et al*., 2020). Similarly, Alemu (2015) suggested the need to understand the socio-economic causes of land degradation for appropriate land management and effective intervention. The quantification of socio-economic benefits is required particularly for food-insecure areas due to land restoration (Woolf *et al*., 2018). Generally, the land restoration program requires a balance between short-term socio-economic and long-term environmental objectives, which local community's usual choice (Chimdesa, 2016; Mekuria *et al*., 2020).

The government's focus on environmental rehabilitation while neglecting socio-economic aspects limits the sustainability of the land restoration program. According to Meseret (2016), the land restoration program failed to bring the expected result due to a lack of active local community participation and considering socio-economic causes. Hence, the failure to understand the influence of socio-economic factors limited the success of the land restoration program through soil and water conservation practices (Haregeweyn *et al*., 2015). Particularly, restoration in communal land has a risk of conflict over the land for ownership and needs to consider alternative customary laws (Amede *et al*., 2020). Further challenges with communal land restoration ahead are a shortage of grazing land, lack of an appropriate plan, conflict over benefit sharing, and lack of ownership for its protection (Megersa & Hailu, 2021). For instance, in the area where smallholder farmers are dependent on the forest for energy and construction materials; it was suggested that the intervention should take into account energy and wood material alternatives for the community residing around the forest (Kidu *et al*., 2017). Decentralizing land restoration programs empowers local communities and paves the way for livelihood diversification (Erbaugh & Oldekop, 2018). Hence, rural land management can be sustained through livelihood diversification in rural areas (Kassie, 2017). It was recommended the need to consider the local context and priorities of the smallholder farmers for viable land restoration options (Crossland *et al*., 2018).

Various works of literature indicate the need to give emphasis to socio-economic aspects through a participatory approach as well while environmental rehabilitation is done. Wainaina *et al*., (2020) put forward the need to have a socio-economic cost-benefit analysis for land restoration intervention programs for better planning and implementation. Mekuria *et al*. (2020) found quick economic returns like beekeeping, fodder for animal fattening, and tree plantation with economic value pave the way for environmental rehabilitation sustainability. Further, alternatives to wood for fuel sources and construction were recommended in land restoration efforts (Alemu, 2015; Hassen & Assen, 2018). The proper integration of local knowledge in modern land management could also serve as a better land management strategy (Zerga *et al*., 2018). Heyi & Mberengwa (2012) and Nigussie *et al*., (2017) pointed out that active farmers' participation positively determines land restoration practices. Otherwise, watershed management, which didn't consider community livelihood had shown encroachment to rehabilitated land for agriculture and construction materials (Gebregergs *et al*., 2021). However, empirical studies are lacking related to prior documentation of the socio-economic and decision-making characteristics of smallholder farmers' information. Baseline information regarding smallholder farmers' socio-economic conditions could support better planning and facilitate intervention in communal land restoration programs. Therefore, this paper assessed the socio-economic attributes and their role in decision-making for smallholder farmers' willingness to participate in communal degraded land rehabilitation programs.

## MATERIALS AND METHODS

### *Study area*

This study was conducted in *Dirre* kebele of *Ada'a* district in the East Shewa Zone of Oromia Regional State of Ethiopia, which is located in the Great Rift Valley. The relative location of the district is about 45 km southeast of Addis Ababa, the capital of the country with an altitudinal range of 1540-3100 (AWAO, 2009). Its geographical coordinates are 8° 48' 0" North, and 38° 58' 0" East (Google satellite map). Important forests include the government-protected were *Dirre-Garbicha* and *Tedecha, and Ude* community forests found in the district. A survey of the land in this woreda shows that 51% was arable or cultivable, 6.4% was pasture, 7.4% was

forested, and the remaining 34.8% was considered degraded or otherwise unusable. The woreda produced mostly teff, wheat and legumes, and sugar cane. The 2007 national census reported the total population of this woreda was 130,321, of whom 67,869 were men and 62,452 were women (Wikipedia).

*Sampling technique and sample size*

The study population comprised all households in purposively selected clusters (groups) of the Kebele near the selected communal degraded land site for future intervention efforts. The sample size of the study was determined depending on the nature of the study and the cooperation of the involved participants of the study. From several approaches to determining sample size, this study applied a simplified formula provided by Yamane (1967) cited in Glenn (1992) to determine the required sample size at a 95% confidence level, degree of variability =.05, and level of precision =7% (.07; $\frac{N}{1+N(e)^2}$ is employed for sample size determination, where "N" is the total population for the study, "n" is the sample size and "e" is the margin of error at 0.07. From purposively selected clusters, 94 households were selected according to the probability proportional to size through systematic random sampling.

*Types and sources of data*

For this study, both qualitative and quantitative data types were collected from primary and secondary sources available. Primary data were collected from sampled respondents on different socio-economic variables which could show socio-economic aspects of villagers near the site using structured and semi-structured interviews with the relevant respondents. In the study, demographic information such as the age of the household head, marital status, educational level of the household head, gender of the household head, and family size(labor) were considered. The socio-economic characteristics of the farmers were assessed in terms of land and livestock ownership, yearly income, access to extension, and credit. Moreover, it was measured through previous farmers' experiences related to land management, the existence of land-related local institutions, and farmers' attitudes toward village leaders. Secondary data were searched from journals, reports, proceedings, and unpublished and published documents.

*Method of data analysis*

Based on the nature of the data available, different data analysis methods were applied using different approaches. Descriptive and inferential statistics such as mean, percentage, frequencies, and standard deviations were used descriptively to summarize and categorize the data. The Chi-square test was applied to see the association between the categorical variables and dependent variables. Continuous variables were tested using the t-test to see the mean difference. Binary logistic regression was employed to determine factors influencing farmers' decisions to participate in the land restoration project. Different authors suggested that the function of the logit model can be presented in the following format (Aldrich & Nelson, 1984; Hosmer & Lemeshow, 1989; Gujarati, 1995):

$$P_i = \frac{1}{1+\beta-(\beta_{0+x_1})} \text{ -- (1) or } P_{i=\frac{1}{1+e^{-z}}} \text{ -- (2)}$$

Thus, $P_1$ shows the probable that farmers' decision to participate in land restoration;

$$Z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + - - - - \beta_n x_n;$$

βo is an intercept; $\beta_1$, $\beta_2$, - - - $\beta_n$ are slopes; $x_1$, $x_2$, - - - $x_n$ are the independent variable. In a similar case, farmers' unwillingness to participate in the restoration of the land was expressed;

$$1- p_i = \frac{1}{1+e^{zi}} \text{ ------ (3). Thus, } \frac{p_i}{(1-p_i)} = \frac{1+e^{z_i}}{1+e^{-zi}} = e^{z}i \text{ ----- (4)}$$

Hence, application of natural logarithm to equation (4) can be resulted in

$$L_{i=ln\frac{p_i}{(1-p_i)}} = z_i \quad - - - (5)$$

where $L_i$ is the odds ratio.

A Likert 5-point scale was employed to measure respondents' attitudes toward village leaders and land-related decisions. Accordingly, ten different attitude statements were developed and presented to the sampled respondents. Reliability analysis was undertaken for all statements to determine potential items which influence respondents' attitudes.

## RESULTS AND DISCUSSION

*Demographic information*

The result shows that in terms of marital status; 89.4%, 5.3%, 3.2%, and 2.1% were married, widows, single, and widowers respectively. In relation to the gender of the household head, 91.5% and 8.5% were male-headed and women-headed respectively. The majority (57.5%) of the sampled households were illiterate. The other households fell into educational

levels of primary (21.3%), adult education (16 %), and secondary (5.3%). The chi-square result shows that the marital status of households has an association with farmers' decisions in communal land restoration ($\chi^2$= 7.5357, p-value= 0.057). In contrast, the gender and education level of household heads do not show a significant association with the farmers' decisions in future interventions (Table 1). The household heads' ages range between 18 and 86 years, and the average age was 46.5 years. The t-test result indicates that there is no significant mean difference between willers and non-willers in the participation in the restoration of communal degraded land (Table 2).

*Family labor*

Households' family members by age category measured in person days, which could contribute to the labor force for any activities in the households. The study result reveals that the minimum and maximum family labors were 1.5 and 13.1 respectively. The average family labor for sample respondents was 5 with a variation of 2.4 from the average. Farmers who were willing to participate had better family labor (5.4) than those who were not (4.5) willing to participate. The survey result indicates that there was a significant mean difference (t-value=1.9308, p-value= 0.0566) between farmers who were willing and not willing to participate at less than a ten percent probability level (Table 2).

Table 1. Summary of demographic categorical variables

| | | Willers | | Non-Willers | | Total | | |
|---|---|---|---|---|---|---|---|---|
| Variables | Categories | F | % | F | % | F | % | $\chi^2$ |
| Gender | Male household head | 49 | 94.23 | 37 | 88.10 | 86 | 91.49 | 1.1233NS |
| | Female household head | 3 | 5.77 | 5 | 11.90 | 8 | 8.51 | |
| Marital status | Single | 3 | 5.77 | 0 | 0 | 3 | 3.19 | |
| | Married | 48 | 92.31 | 36 | 85.71 | 84 | 89.36 | 7.5357* |
| | Widower | 0 | 0 | 2 | 4.76 | 2 | 2.13 | |
| | Widow | 1 | 1.92 | 4 | 9.52 | 5 | 5.32 | |
| Education level | Illiterate | 29 | 55.77 | 25 | 59.52 | 54 | 57.45 | |
| | Adult education | 7 | 13.46 | 8 | 19.05 | 15 | 15.96 | 1.9209NS |
| | Primary | 12 | 23.08 | 8 | 19.05 | 20 | 21.28 | |
| | Secondary | 4 | 7.69 | 1 | 2.38 | 5 | 5.32 | |

Source: own survey (2021); * is significant at<10 probability level and NS are not significant

Table 2. Age and family labor of farmers mean differences

| Variable | Respondent Category | n | Mean | S. D | t-value | p-value |
|---|---|---|---|---|---|---|
| Age | Non-willers | 42 | 44.83 | 16.525 | -0.9455NS | 0.3469 |
| | Willers | 52 | 47.87 | 14.543 | | |
| Family labor | Non-willers | 42 | 4.50 | 2.031 | -1.9308* | 0.0566 |
| | Willers | 52 | 5.44 | 2.570 | | |

Source: own survey (2021); * is significant at<10 probability level and NS is not significant

*Socio-economic Characteristics*

*Land ownership*

Land is an important farm asset in rural settings. In the study area, the majority of the households (83%) owned land; while 17% did not own land. Thus, farmers' land ownership has no association with farmers' decisions in the project (Table 3). The survey result shows that there was variation in land holding size. For those who owned land, the minimum and maximum land holding sizes were .25 and 9 hectares respectively. The total mean land holding size of farmers was 1.1 hectares with a 1.2 standard deviation.

*Livestock Ownership*

The study reveals that respondents reared various livestock. Out of the total respondents, 86.2% of households owned at least one among various livestock such as local cattle, donkeys, poultry, sheep, goat, and horses. There was no significant association between farmers' livestock ownership and their decision in the future project (Table 3). Livestock ownership converted into a tropical livestock unit (TLU) varied from 0 to 26.9 with mean ownership of 4.4.

*Income*

Income refers to annual income obtained from sale and in-kind estimates at the time market of crops, livestock, wage labor, petty trade, forest product, remittance, etc. The survey result reveals that the minimum and maximum income of total sampled respondents from different income sources were 1200 and 116,900 ETB (Ethiopian birr) respectively. The average income from different sources of income for respondents was 25,922 ETB with a standard deviation of 21757 ETB, which showed great variation among households. But it indicates that farmers who were willing to participate (23514 ETB) have a lower average yearly income than those who were not willing to participate (28904 ETB) in the project. The t-test statistic indicates that there was no significant mean difference between the two groups.

*Extension and Credit Access*

It was found that the majority of the households (68.1%) did not have access to agricultural extension. Only 31.9% of the households had access to different extension services. Those who had access to the extension service; were mainly on crop production and protection, tree planting, soil and water management, livestock production, agriculture conservation, and forest wood management. The minimum and maximum extensionist contacts with the households were .25 and 2.5 respectively; with average contact of 1.14 per year. Thus, a significant majority of the households (63.04%) indicate that their access to agricultural extension was poor. Likewise, the majority of the households (80.9%) did not have access to credit access. Those who had access to credit expend mainly on agricultural inputs and food. Farmers' extension access does not have a significant association with their decision, while farmers' access to credit has shown a significant association with farmers' decision in the project ($\chi^2$=4.5431, p-value= 0.033) (Table 3).

*Local Institution*

The study result shows that 66% of the respondents expressed the absence of local institutions dealing with land-related issues. According to the respondents, the kebele administration (84.3%) was the most important decision-maker about land issues. The majority of the respondents (73.91%) were neither satisfied nor dissatisfied with decision-making about land. But the absence of local institutions did not show an association with farmers' decisions in the project (Table 3). The study has further shown that 58.5% of the respondents did not participate in a local leader's selection that deals with land-related

decisions. A few (16.3%) respondents participated usually in matters of land use dispute meetings. Those of the households (39.13%) who never attended land use meetings reasoned they were mainly not informed, busy working, and not interested in the meeting.

*Farmers' experience in land restoration programs*

The study indicates that the majority of respondents (60.6%) were not previously participated in the restoration of degraded land programs. It was found that those who did not attend the program mainly because of house workload and also because the program required intensive labor. But farmers' lack of experience in land restoration programs doesn't show a significant association with farmers' decisions in the project (Table 3). The majority of farmers' opinion (85.9%) shows that the size of degraded land was increasing. According to the respondents: the major reasons for land degradation were investment; inappropriate land management; and fuel wood collection respectively. There was an indication that there was no active effort in the village through training and awareness creation to alleviate land degradation. According to the opinion of households: the direct benefits they missed from the degraded land were construction wood, fuel wood, and livestock fodder respectively.

*Attitude toward village leaders*

Based on the survey results, attitude toward village leaders' responses was recategorized into low, medium, and high categories using a normal distribution (mean ± standard deviation). Thus, the lower and higher score shows a negative and positive attitude towards village leaders and land-related decisions respectively. Out of the total respondents, 17.4% fell under the low score and had a negative attitude; 60.9% fell under the medium score; and 21.7% fell under the high score, which showed a positive attitude toward village leaders and their decisions. Attitude toward village leaders has shown a significant association with farmers' decisions in the project at less than one percent probability level ($\chi^2$=13.1610, p-value= 0.001) (Table 3).

Table 3. Summary of socio-economic categorical variables

| | | Willers | | Non-Willers | | Total | | |
|---|---|---|---|---|---|---|---|---|
| Variables | Categories | F | % | F | % | F | % | $\chi^2$ |
| Land ownership | Yes | 42 | 80.77 | 36 | 85.71 | 78 | 82.98 | 0.4023NS |
| | No | 10 | 19.23 | 6 | 14.29 | 16 | 17.02 | |
| Livestock ownership | Yes | 44 | 84.62 | 37 | 88.10 | 81 | 86.17 | 0.2361NS |
| | No | 8 | 15.38 | 5 | 11.90 | 13 | 13.83 | |
| Credit access | Yes | 14 | 26.92 | 4 | 9.52 | 18 | 19.15 | 4.5431** |
| | No | 38 | 73.08 | 38 | 90.48 | 76 | 80.85 | |
| Extension contacts | Yes | 18 | 34.62 | 12 | 28.57 | 30 | 31.91 | 0.3906NS |
| | No | 34 | 65.38 | 30 | 71.43 | 64 | 68.09 | |
| Experience | Yes | 18 | 34.62 | 19 | 45.24 | 37 | 39.36 | 1.0984NS |
| | No | 34 | 65.38 | 23 | 54.76 | 57 | 60.64 | |
| Local institution | Yes | 14 | 26.92 | 18 | 42.86 | 32 | 34.04 | 2.6272NS |
| | NO | 38 | 73.08 | 24 | 57.14 | 62 | 65.96 | |
| Attitude | Negative | 4 | 7.69 | 12 | 28.57 | 16 | 17.02 | |
| | Neutral | 31 | 59.62 | 27 | 64.29 | 58 | 61.70 | 13.1610*** |
| | Positive | 17 | 32.69 | 3 | 7.14 | 20 | 21.28 | |

Source: own survey (2021); ** & *** are significant at< 5% and <1% probability levels and NS are not significant

*Results of the binary logistic regression model*

The binary logistic model was applied to assess the relative influence of explanatory variables and their intensity in farmers' decisions in the restoration of communal degraded land. The multicollinearity test was checked among selected variables and the measurement of goodness of fit was tested before the model estimation. Thus, there was no potential multicollinearity problem among explanatory variables, and also the data was within the accepted range of fitting to the model.

*Results of farmers' decision in the restoration of communal land*

The model results show that out of 13 explanatory variables, 4 were found to determine the probability of being farmers willing to participate in the restoration of communal land. The variables found to be significant were attitude towards village leaders (ATTITUDE), availability of family labor (LABORAVAL), absence of local institution (LOCALINST), and credit access (CREDITACESS). Other variables that have not been found significant to influence farmers' participation were age (AGE), marital status (MARITAL), gender of household head (GENDERHH), education level (EDULEVEL), land ownership (LANDOWN), livestock ownership (LIVESTOCKOWN), income (INCOME), access to extension (EXTCONT), and experience in land restoration of communal land (EXPERIENCE). Those explanatory variables, which have been significantly found to affect farmers' willingness to participate are discussed below (Table 4).

*Attitude towards village leaders (ATTITUDE)*

The study result shows that attitude towards village leaders positively influences farmers' willingness of participating in the restoration of degraded lands. The probable reason is local leaders support efforts related to natural resource management including land management, which local people will easily follow the path of development efforts. The binary logistic regression result indicates that attitude towards village leaders influences farmers' willingness by one (1) percent probability level. Thus, attitude towards village leaders affects farmers' decision to participate in the restoration of communal degraded land by 31% keeping other factors constant.

*Availability of family labor (LABORAVAL)*

The availability of family labor will relieve household activities and give space for farmers to participate in the restoration of degraded lands. In another way, the lack of labor in the households would force farmers to concentrate on their own livelihood activities. The study result shows that those farmers with enough family labor positively contribute to farmers' willingness to participate in the restoration of degraded land. Hence, farmers with better family labor were willing to participate in the restoration of communal degraded lands at less than a five (5) percent probability level. The marginal effect result shows that the availability of family labor will increase farmers' willingness to participate by 7.4 % while keeping other factors constant.

*Local institution (LOCALINST)*

Local institutions related to development efforts in the village could positively determine farmers' willingness in the land management. Land-related local institutions could enhance the optimum utilization of land based on local needs. The result shows that the absence of local institution, which deals with matters of land management negatively affects communal land restoration effort. This study indicates that the absence of local institutions negatively influences farmers' future decisions at a ten (10) percent probability level. Thus, it decreases farmers' willingness to participate by 26.2% keeping other determinants constant.

*Credit access (CREDITACESS)*

Credit access is the key variable for doing business for household earnings and diversifying household livelihoods. In this study, it is a limiting factor for communal land management activities as households divert their attention to different business activities. The model result shows that household access to credit negatively influences farmers' willingness to participate in the restoration of the land at less than a five (5) percent probability level. Access to credit access in the study village decreases farmers' willingness to participate by 42% in the restoration of communal degraded lands while keeping other factors constant.

Most of the households had enough family labor which could positively contribute to their agricultural activities or any labor-intensive activities. Thus, the study revealed that household family labor positively affects farmers' decisions in communal land restoration. Those households with enough family labor can have an opportunity to participate in the land restoration project. Therefore, any land restoration project should take into account the existence of enough family labor while mobilizing labor for land restoration activities. This is in line with Adimassu *et al*., (2012) and Nigussie *et al*, (2017) findings that labor availability could help smallholder farmers' adaptability to sustainable land management.

Table 4. The binary logit model maximum likelihood estimate

| Variables | Coef. | Std. Err. | Marginal effect | Z-value | P-value | 95% Conf. Interval | |
|---|---|---|---|---|---|---|---|
| Constant | -.681 | 3.019 | - | -0.23 | 0.821 | -6.597.264 | 5.235.061 |
| AGE | .026 | .019 | .0062 | 1.32 | 0.188 | -.0125361 | .0638398 |
| GENDERHH | .737 | 1.456 | .1785 | 0.51 | 0.613 | -2.117.202 | 359.067 |
| MARITAL | -.683 | .549 | -.1655 | -1.24 | 0.214 | -1.759.259 | .3937128 |
| EDULEVEL | .292 | .299 | .0708 | 0.98 | 0.328 | -.2933011 | .8778373 |
| LABORAVAL | .305** | .132 | .0739 | 2.31 | 0.021 | .0461173 | .563601 |
| LANDOWN | .629 | .764 | .1525 | 0.82 | 0.410 | -.8672693 | 2.125.794 |
| LIVESTOCKOWN | .146 | .899 | .0354 | 0.16 | 0.871 | -1.615.412 | 1.907.137 |
| INCOME | -.000 | .000 | -2.89e-06 | -0.99 | 0.323 | -.0000355 | .0000117 |
| EXTCONT | -.622 | .628 | -.1508 | -0.99 | 0.321 | -1.852.343 | .607537 |
| CREDITACESS | -1.734** | .822 | -.4202 | -2.11 | 0.035 | -3.345.043 | -.1226124 |
| LOCALINST | -1.083* | .611 | -.2623 | -1.77 | 0.077 | -2.280.326 | .1152953 |
| EXPERIENCE | .578 | .564 | .1401 | 1.03 | 0.305 | -.5269663 | 1.683.429 |
| ATTITUDE | 1.270*** | .469 | .3078 | 2.71 | 0.007 | .3502331 | 2.190.004 |

Source: Own survey data model output (2022); -2 Log likelihood function= -46.963023; Pearson chi-square($\chi^2$) = 35.32; Pseudo $R^2$ = 0.2733; P-value= 0.0008. ***, ** & * are significant at <1%, <5% and <10% probability levels respectively

The study reveals that attitude towards village leaders positively determines farmers' decisions in the restoration of communal land. It indicates that village leaders' efforts in mobilizing and supporting natural resource management were encouraging. This is probably the case as no alternative rural body dealing with a degraded land restoration project in the village. It seems that local people easily follow their village leaders in the land restoration effort as land degradation went increasing and affected their livelihood. In contrast, (Yami & Mekuria, 2022) found that local village leaders' interference in the decision-making process discouraged the local community willing to participate in land restoration efforts.

Credit access was found to be a barrier to farmers' decisions in the land restoration project. It became a diverging factor as farmers' access to credit probably invest in non-agricultural and non-rural livelihood activities. This might work for those who did not either own land or with low awareness of the appropriate utilization of scarce land. There should be some kind of capacity building for those who have access to credit for investing in rural-based livelihood activities like agriculture and land management. There should be some effort in awareness creation in land management and usage on different rural-related livelihood activities. Several studies show that smallholder farmers' access to credit facilities and information encouraged land restoration and its sustainability (Kirui & Mirzabaev, 2015; Teshome & Baye, 2018; Tarfasa *et al*., 2018; Mengistu & Assefa, 2020).

The absence of local institution dealing with land management negatively influence farmers' decision in the communal restoration of the land. The study reveals that land size degradation was increasing due to investment, inappropriate land management, and fuel wood collection respectively. Local institutions could play a greater role in the protection and restoration of degraded land by supporting local needs in the village. There should be an active effort

in the village through training and awareness creation to alleviate land degradation. There must be a consideration for open villagers' participation in inclusive decisions and for the best interest of the community. Evidence shows that active community participation had proven to sustain land and other natural resource management (Meseret, 2016; Legesse *et al*., 2018; Arfasa & Amenu, 2019; Kuma *et al*., 2022).

## CONCLUSION

Ethiopia's rich natural resources have severely declined as a result of environmental degradation mainly due to deforestation and land degradation. To reverse environmental degradation, the government has set different policies and strategies to arrest deforestation and land degradation. However, the restoration efforts neglected documentation of the socio-economic and decision behaviors of smallholder farmers for better implementation and engagement at the local level. Therefore, this study assessed the socio-economic condition and decision behavior of smallholder farmers around selected communal degraded land for future restoration intervention efforts. The study found attitudes towards village leaders and enough families positively determine farmers' decisions; while access to credit access and the absence of local institutions negatively affect farmers' decisions in the restoration of communal degraded land.

There should be capacity building of the community at the local level including awareness creation related to land management, land restoration, and forest development. There should be also a functional local institution, which mobilizes rural people, and also work for intervention and land management on behalf of rural people's needs. We recommend this information can serve as a baseline for the intervention related to land restoration, and any community-based development projects in rural areas.

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