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Research Article

# Effects of Large-Scale Agricultural Land Investment on Local Communities Livelihoods: Evidence from Bambasi Woreda, Western Ethiopia

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## Abstract

Most of the African countries including Ethiopia are often known by problem of large scale agricultural land investment effects on the local community where land is being transferred to investment. Even though several efforts made so far to solve the overall effects of large scale agricultural land investment situation, the challenge is still widespread problem in Ethiopia. Hence the study project's purpose was to find out how large agricultural investments in Bambasi Woreda, Western Ethiopia impact the livelihoods of the surrounding populations and examine the local communities' participation in the large scale agricultural investment. In order to attain these objectives, data were collected from 330 randomly selected households in four purposively selected kebeles of the district for both control groups and treatment groups. The sample size was chosen using a multistage stratified random sampling technique. Both qualitative and quantitative data gathering techniques and instruments were employed in the study. Besides, the instruments utilized to collect the data were observations, focus groups, interviews, household surveys, and document reviews. Data was analyzed using both descriptive statistics and econometric methods. The study shows that out of the total sampled respondents 30 of the treatment group and 13 percent of control group reveal that the project provided opportunity in terms of employment opportunity, technology transfer, utilization of agricultural inputs, changing the working culture of the community and productivity. The chie square value shows there is statistical significance among treated and control group on opportunity investment provided for the household and community. A binary logit regression model was used to describe how large-scale agriculture land investment affected the local community's standard of living. The findings indicated that only six variables were found to be significant out of the characteristics that were expected to influence local community employment in large-scale agricultural land investment projects. These includes household's educational accomplishment, size of HH, occupation of HH, Loss of useful land due to investment Project and technology transfer significantly and positively affected the employment opportunity in large scale agricultural investment projects, whereas the distance of a household's home from an investment project has a negative impact. Large-scale agricultural investments have a detrimental influence on household wealth accumulation and income, according to the estimation results of the average treatment effects on the treated. The management and implementation of land transfer for large-scale agricultural investment projects is inadequate, lack of openness, absence of community consultation, natural forest degradation, socio-economic and ecological effects must be carefully considered before transferring the land for large-scale agricultural investment.

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## Keywords

Effects, Large Scale Agricultural Land Investment, Control Group, Treatment Group and Livelihoods

## 1. Introduction

Globally, large-scale land attainments, sometimes known as "land grabbing," have attracted attention from the public ever since nongovernmental organizations published media reports, articles, and research studies about the subject in 2007 and 2008. The drive for global commercial property agreements by foreign managements, private businesses, and asset moneys is brought to light by land grabs. By the end of 2020, these land investment attainments had enclosed more than 56 million hectares of agricultural land. Out of this around 4.5 million ha of land available for commercial land investment in Ethiopia [1]. Advocates highlight the economic benefits for surrounding communities, which will profit from the earnings produced from the land's sale or lease as well as the employment that will result from it. Promoting the essential expenditures on modern technology and infrastructure may offer additional benefits. New agricultural investments generally have the ability to contribute to the provision of the necessary conditions for sustainable development, according to [2].

A large amount of land is being invested in as part of the Ethiopian government's development agenda. Over 75% of the work force, 40% of GDP, and 80% of exports are derived from agriculture, which is the foundation of the country's economy. Contrarily, Ethiopia experiences a significant yearly food deficit and is known for its ongoing food insecurity. Highland plots are small, fruitful, and dependent on erratic rainfall. Pastoralism, agro-pastoralism, or shifting agriculture makes up the majority of rural lowland livelihoods. Rapid agricultural change is planned, involving both smallholder sector innovation and the expansion of large-scale commercial agriculture sectors. The lowlands of Oromia, Gambela, SNNPR, Afar and Somali regions, and Benishangul Gumuz are home to the government's land bank and largest land holdings. Minority ethnic groups regard the land in these areas as vacant, notwithstanding claims that it is a part of pastoralist or shifting agricultural land use systems. The government of some places, such Benishangul Gumuz, Gambela, and Somalia, is implementing villagization plans, which entail relocating populations to create room for better service delivery.

Significant agricultural investments should not jeopardize the community, but rather strengthen it. This covers local and indigenous populations, food security, sociocultural norms, political and human rights, and the ability to access resources such as land. The African governments are provided with clear recommendations by the CAADP [3] on how to attain food security, evidence, technology, physical resources, and financial funds in order to facilitate community' access to the global market. The administration hasn't given any of these suggestions much thought thus far, although the reality seems to be different [4-6]. Developing agricultural land is meant to be the aim of this endeavor. Only 14.6 million of Ethiopia's 111.5 million hectares are currently utilized for agriculture, out of the country's total area of 74.3 million. Just 1 million hectares are being irrigated, despite the potential for 4.3 million hectares [7].

Land that the Ministry of Agriculture and Rural Development (MOARD) was unable to coordinate and attract capital-intensive foreign direct investment to the various regions of the country made up the majority of the land that was handed to the federal land banks. The entire amount of investment land supplied to the Federal Land Bank was 3,169,352ha, divided among Amhara (420,000ha), Afar (409,678ha), Benishangul Gumuz (691,984ha), Gambella (829,199ha), Oromia (1,057,866 ha), and SNNP 180,625ha [8]. Under Ethiopia's federal political system, which is based on ethnic regional governance, the Benishangul Gumuz area transferred 691,984 hectares of investment land to the federal land banks. Both domestic and foreign investment increased significantly in the region between 2007 and 2019, with an estimated 316,415.9 hectares of land transferred to 531 agricultural investors.

The primary goal of the study is to determine how the locals of Bambasi Woreda, in the Ethiopian regional state of Benishangul Gumuz, are affected by a significant agricultural investment project. With a total wealth of 283,837,725.00 million Ethiopian birr invested, there are 72 large scale agricultural land investment projects in the woreda. Of those investors, 34 large-scale agricultural investments totaling more than 250ha of land have been taken as large-scale land transfers in the area (BGRSIO, 2023). However, the Report Office (2023) notes that there is extreme land grabbing in the study area, with land being transferred to investors without any consideration for how this would affect the local community's means of subsistence. Nevertheless, the specifics of the indigenous community livelihoods in the woreda or region remain unknown. Therefore, this study was made to examine how large-scale agricultural land investment initiatives affected the livelihoods of the local communities in Bambasi woreda of BGRS, Western Ethiopia.

### 1.1. Statement of the Problem

Land is the resource that is necessary for all of the socio-economic and ecological aspects of local communities' life. Sufficient access to land and related resources, therefore, constitute the foundation of rural communities' livelihoods and offer significant social and economic advantages. Many smallholder communities have historically relied heavily on the question of access to land and related natural resources for their subsistence. The topic is receiving more attention these days because of the continuous intense competition for this vital resource, which involves many different actors in the agricultural investment sectors. Since there are differing opinions about how "Large Scale Agricultural Investment" would affect the native population in the nations where land is being transferred, this is one of the most argued and hot topics of our today. Thus, the question was the focus of continuing discussions among researchers, lawmakers, and policy leaders, among others.

Due to the increased attention being paid to the agricultural sector globally and in particular to the acquisition of large tracts of farmland, a number of private and foreign investors from a variety of countries have been involved in the acquisition of large amounts of land in sub-Saharan Africa. Large areas of land in less developed nations, particularly in sub-Saharan Africa, have been acquired by governments and businesses in recent years with the goal of producing food crops and biofuels for export [9]. Similar to other countries, Ethiopia has attracted both foreign and domestic investors, who have some of the blame for improper land investments that fail to protect the social, economic, and environmental demands of the local communities. Governments create favorable conditions for investors to invest in various parts of the region, particularly specific sections of BGRS, in order to draw in both domestic and foreign capital. The primary goals of large-scale agricultural land investment in the study areas are to address the issue of food security, generate employment opportunities, reduce poverty, provide infrastructure, and transfer technologies to small-scale farmers.

Reviewing the results of other studies carried out in various locations has shown that numerous agricultural investments have caused rural household communities to be evicted and displaced, affecting their local means of subsistence, social and economic issues, and access to resources and infrastructure.

However, 1.19 million hectares of Ethiopian agricultural land were leased to both domestic and foreign investors [10-12]. While many people are impacted, few are aware of the conditions and benefits on those investments. Researchers looked at how different projects in various regions of Ethiopia affected the local communities as a result of LSAI. For example, [2, 13, 14], concentrate on the interaction between investors and the local population, the consequences of land transactions on the socioeconomic landscape, and the environmental effects on the livelihoods of the local inhabitants.

In the specific research region, there is a dearth of attention paid to employee involvement and contributions that alter workplace cultures, job opportunities created for the community, and technology transfer to the local community that improves productivity and addresses issues with food security. As a result, the problem that spurred research on the "impact of LSAI on the livelihoods of the local community" in the study areas was the possibility of numerous investment projects, especially in the field of agriculture, being made in the woreda, and the rise in land grabbing concerns being more of a problem than a chance for the local community to improve its assets and income. Therefore, research study need to close the gaps on the contributions generated by LSAI to the socioeconomic well-being of the local communities, the availability of infrastructure, and the enhancement of asset growth and income in the studied area.

### 1.2. Objectives of the Study

The general objective of the study was to examine the effect of large-scale agricultural land investment on the livelihoods of the local communities. The specific objectives are as follows:

1) To examine the local communities' participation and opportunities generated by large-scale agricultural land investments
2) To examine the effects of large-scale agricultural land investments on Asset growth of local communities

## 2. Methodology of the Study

### 2.1. Description of the Study Area

The study was carried out in Western Ethiopia's Bambasi woreda. Benishangul Gumuz regional states comprise Bambasi woreda, which is bordered to the east in part by Oromiya region, to the west by Assosa woreda, to the south by a portion of Maokomo special woreda, and to the north by Odablglidu woreda. There were 62,693 people living in the woredas overall, with 13,389 men and 10,65 women making up the household population. The capital of the woreda, Bambasi Town, is the head office. It is situated at 09017'- 12006' North Latitude and 34010'-37004' East Longitude, with an elevation of 580–2730m above sea level. Assosa, a regional town, is 42 km away, while Addis Ababa is 662 km away.

There are 38 Kebeles in the woreda, and nine of those Kebeles are home to the investment projects. The four purposefully chosen Kebeles—Wombselam, Shobergushi, and Amebaa 16 and 27—where large-scale agricultural investments (LSAI) were owned and no large-scale agricultural investments projects were carried out, respectively, were the subject of the investigations. Seventy-two investment projects, all related to agriculture, are presently under implementation (Table 1). The study's main goal is to find out how those agricultural investment initiatives affect (negative or positive)

local populations' livelihoods, particularly those of the indigenous population.

*Table 1. The distribution of investment projects in the Bambasi Woreda.*

| Kebele | No. of investment projects | Land transfer to investment projects in ha. | LSAI projects |
|---|---|---|---|
| Wombselam | 13 | 3872ha | 8 |
| Garabichwollega | 12 | 2761ha | 6 |
| Budaselga | 9 | 2147.4ha | 3 |
| Mustia | 5 | 1424ha | 3 |
| Idadabus | 3 | 625ha | 0 |
| Shobergushi | 19 | 6176.5ha | 8 |
| Bushmakargagi | 7 | 1654.6ha | 4 |
| Jmasta | 1 | 250ha | 1 |
| Shbora | 3 | 572ha | 1 |
| Total | 72 | 19,482.5ha | 34 |

Sources; - (BGRSIO data, BWEFLA office data, and BWARD Office post harvesting report, 2017)

## 2.2. Research Method

Econometrics Model Analysis Propensity score matching (PSM) analysis tools are suitable for the study based on the type, analysis, and interpretation of the surveyed data. The PSM eliminates bias resulting from observable variables by balancing covariates across the "treatment" and "control" groups, improving regression's capacity to produce precise causal estimations. Matching the treatment variable employment (E) as treatment and control group, the PSM model matches on the probability of getting the conditional probability of the treatment and being treated. The purpose of this group comparison is to assess how large-scale agricultural investment affects the creation of employment opportunities for the livelihoods of the treated groups.

## 2.3. Data Type and Sources

Both quantifiable and qualitative data types were used. The quantitative data's are data that collected through organized and semi organized interview of household. The qualitative data are data collected through key informant interview, focus group discussions, and observations and filed notes.

Informants such as community household surveys, traditional community elders, government officials (bureau head, directorates and experts), owners of investment projects, project managers, extension workers (development agents) and household heads impacted by large-scale agricultural investment projects are the main sources of information for this study. In order to improve the data, secondary data was also gathered and acquired through the examination of records, published works, and reports from relevant industries.

## 2.4. Target Population

The local community, community households, and the community with residences close to investment projects, community those get any opportunity from investment projects and large-scale agricultural investments (investors) are the target audiences for this study.

## 2.5. Sampling Technique

The research was carried out in Benishangul Gumuz Regional State (BGRS) in the Bambasi woredas. The size of the household sample from purposefully chosen Kebeles was determined using the basic random sampling technique. Based on the random sampling percentage to their population members, the sample size from the treated groups that receive employment opportunities and do not have jobs in the large-scale agricultural investment was selected. In the study, development agents from the purposefully selected Kebeles and local administrations were consulted before ahousehold survey of 330 randomly selected families was conducted. Using Yamane's formula [15], the samples from the treatment group were 102 households from 460 families in Wombselam Kebeles and 58 households from 261 households in Shobergushi Kebeles.

$$n = \frac{N1}{1+N1(e)^2}$$

n = the number of sample size of the HHs selected

N1= number of the HHs from purposively selected Kebeles

e = 0.07 is the proportion of the imitations of sampling error that can be tolerated

n = $\frac{721}{1+721(0.07)^2}$ = 160 from the total 721 HH of the purposively selected Kebeles, HH sampled for the survey are 160.

The investment projects having large-scale agricultural investment projects (LSAIP) are also sample for the study to investigate the impacts of large sale agricultural investment on the local community's livelihoods.

*Table 2. HH Survey samples in each of the study areas in treatment groups.*

| Woredas | No_ of Kebeles selected | Total no_ of households | Sampled of HH | Remark |
|---|---|---|---|---|
| Bambasi | Wombselam | 460 | 102 | |
| | Shobergushi | 261 | 58 | |
| Total sample | No_ of household | 721 | 160 | |

In the case of control group**,** 170 households randomly selected from purposively selected two Kebeles where no large-scale agricultural investments projects practiced after consultations with the local administrations and development agents using Yamane's formula.

$$n = \frac{N1}{1+N1(e)^2}$$

n = the number of sample size of the HHs selected

N1= number of the HHs from purposively selected Kebeles

e = 0.07 is the proportion of the imitations of sampling error that can be tolerated

n = $\frac{764}{1+764(0.07)^2}$ = 170 from the total 764 HH of the purposively selected Kebeles, HH sampled for the survey are 170

*Table 3. HH samples for control group in each of the study areas.*

| Woredas | No_ of Kebeles selected | Total no_ of households | Sampled of HH | Remark |
|---|---|---|---|---|
| Bambasi | Amebaa 16 | 451 | 106 | |
| | Amebaa 27 | 313 | 74 | |
| Total sample | No_ of household | 764 | 170 | |

## 2.6. Methods and Instruments of Data Collection

Structured and semi-structured interviews, a household survey, interviews with key informants, focus group discussions (FGD), observations, and document reviews were all employed in the study.

Structured and semi structure interview; - Researcher used the structured and semi structure interview to extract detailed information from interviewee. In general, the main drive of conversation is to get related information from sample HH head and investment project owner/project manager.

Household Survey; the primary economic data collection instrument for the project; household characteristics, assets, income, and additional contextual factors are among the data gathered. The size, sex, age, education level, and economic activity of the household are among its qualities. The possession of land, ownership of animals, a place to live, furniture, appliances, money, and savings are all considered household assets. Crop production, livestock, off-farm self-employment (non-farm activities), off-farm wage employment, irrigation, and other activities are the sources of income collected for the household.

Focus group discussions (FGD);- is use to gather qualitative facts on fluctuations in local livings connected to LSAI-investing near to the area of the local communities. The representatives of the selected households in each Kebeles were composed and questions highlighting on changes in right to use of land, forest and water resources, completion and conflicts over the use of local properties, fluctuations in local

markets, business, infrastructures and facilities, and fluctuations in production methods and skills.

The key informants; in the context of the studies the key informant interviews are 12 large-scale agricultural investment projects, traditional community elders, Kebeles agricultural extension lead workers, woredas and regional environment, forest and land administration bureau and regional investment office experts/directorate and bureau head.

Document: - the review of official papers and policy, rules and regulation documents, regional and woredas investment facts and reports from comparative sectors. The relevant data mainly collected from Woreda administration, Bureau of environment, forest and land administration, Bureau of agriculture and regional investment office. The internet/website is also potential sources of information for the study.

Observations; - is conduct as part of the felid work to observe in and around the investment projects through taking filed notes. It comprise on the observations of land allotted for the investments and its bounders with local landholding, communal grazing land, walkways for local people and livestock, infrastructures and other services. The other observation made within the study's areas of field works are infrastructure made by privet investors and the addressed infrastructure to the community.

## 2.7. Data Analysis

Econometric models and descriptive statistics are used in the analysis of the gathered data. Descriptive analysis is used to study the raw data, which facilitates understanding, interpretation, ordering, and rearranging of the data. Given that PSM is the treatment, an economic model was utilized to create the comparison groups according to the likelihood of participation. PSM model used to look into how a binary treatment affects an observation's result. Matching the treatment variable employment (E) as treatment and control group, the PSM model matches on the probability of getting the conditional probability of the treatment and being treated.

$$p(x) = Pr(E = 1/x) = Pr(E = 0/x)$$

where P(x) ix the outcome, E=1 one or more HH members employee participate in LSAI, E=0 HH do not participate as employee member in LSAI, x is asset of observed characteristics. The researcher used binary logit model to analysis the data.

$$Y = X\beta + \varepsilon$$

Y- is the outcomes variable, x- is asset of observed characteristics, $\beta$- is parameter of interest and $\varepsilon$- is an error term that reflect the unobserved characteristics that affect the outcomes.

### 2.7.1. Descriptive Analysis

To assess the data, descriptive statistical techniques like variance and mean were used. The unprocessed data obtained from the completed forms was analyzed, categorized, reorganized, encoded, and entered into Mex before being imported into Stata. The relationship between land taken due to investments and food self-support, employment opportunities created, infrastructure developed, and social service delivery as a result of LSAI expansion on the study areas were also tested using statistical correlations and regressions.

### 2.7.2. Econometric Analysis

Propensity score matching (PSM), is an econometric model that was chosen to analyze the non-parametric techniques to balance covariates between the "treatment" and "control" groups, it eliminates bias resulting from observable variables and enhances regression's capacity to produce precise causal estimates. By matching users who are equivalent in terms of their observable qualities, both participants and non-participants are to be created using the propensity score matching approach. The models were also employed to look at how a binary treatment affected an observation's outcome. Matching the treatment variable employment (E) as treatment and control group, the PSM model matches on the probability of getting the conditional probability of the treatment and being treated. The purpose of this group comparison is to assess how large-scale agricultural investment affects the creation of employment opportunities for the livelihoods of the treated groups. Let the income for participants and non-participants, respectively, be represented by YiT and YiC.

$$\partial i = Yi^{T} - Yi^{C} \quad (1)$$

$\partial$i = change in outcome as result of treatment or change of income for participant in the program

$Yi^{T}$= outcome of treatment (income of $i^{th}$ household when one or more household members are get employment opportunity from LSAI); $Yi^{C}$= outcome of treatment (income of $i^{th}$ household when one or more household members are does not participates as employment opportunity from LSAI).

The above will be questions expressed i causal effect notational form, by assigning Di= 1 as treatment variable takes the value of 1, if the household participated as treatment (get employment opportunity) and 0 otherwise. Thus the average treatment effect of household i can be written as:

$$ATT = E(Yi^{T}|D=1) - E(Yi^{C}|D=0) \quad (2)$$

Where ATE, average treatment effect, which is the effect of treatment on income, $E(yi^{T}/D=1)$;

average outcomes for household, with treatment, if one or more of the household get employment opportunity from large scale agricultural investment (D= 1). $E(Yi^{C}/D=0)$; average outcome of untreated, when the households are not

participate as employee in LSAI, (D=0).

To measure the Average Effects of Treatment on the treated (ATT) for the sample can be formulated as:

$$ATT = E(Yi^T - Yi^C)| D=1) = E(Yi^T| D=1) - E(Yi^C| D=1) \quad (3)$$

The evaluation problem in estimation of impact is that it is impossible to observe persons for with and without treatment at the same time. While the post intervention, the outcome $E(Yi^T|D=1)$ is possible to observe.

## 2.8. Variables

*Independent Variables*

1. *Household head sex*- It is a dummy variable with value of 1 for male, other wise 0. It is expected that relatively male head of household will participating in LSAI as employee and get new technology from investors than female head of household.
2. *Household head age*- It is continuous variable measured in year. It is expected that younger families will participating in large-scale agricultural investment as employment, getting new technology and transferring to investors than older generation.
3. *Household size*- It is a continuous variable; the number of family size live in the same household affects household engagement as employee in the LSAI. It is expected that the more household size have more employee member in LSAI than the less household size.
4. *Household education level*- it is a dummy variable with value of 1 for those who are literate (who are attending formal school), 0 otherwise. It is expected that the more educated household get new technologies from agricultural investment and transfer to investors than the illiterate one.

a) *Occupation of household*- It is a dummy variable with value of 1 if the household headed employed in the farming activities, other wise 0. It is expected that household which participate in farm activities have more approach to LSAI and can get new technologies and employment opportunity than others.

b) *Large scale agricultural investment:*- The total number of agricultural investment projects having land owned.

c) *Technology transfer:*- it is a dummy variable with the value of 1 for those household who get technology from LSAI and 0 other wise.

d) *Infrastructure developed:*- The infrastructure developed due to the expansion of LSAI.

e) *Loss of land:*- it's the dummy variable with the value 1 for the household loss the land due to expansion of LSAI and 0 other wise.

f) *Distance of HH residence from the investment project:* - it is a dummy variable with the value of 1 for the HH residence nearest to the agricultural investment and 0 if the HH residence far from the agricultural investment. It is expected that the HH nearest to the agricultural investment be affected by any factors than the HH with far from the agricultural investment.

g) *Dependent Variables.*

h) *Employment (as treatment and control):*- It is a dummy variable with 1 for household having one or more employee members in LSAI and 0 other wise. Treatment group for household having one or more employee members in the large-scale agricultural investment and Control group for the household do not have employee members in large-scale agricultural investment.

i) *Outcome Variables*

j) *Household income:* - The household incomes generated are from crop production, livestock farming, forest products, irrigation and other off-farm incomes. It's expected that the expansion of LSAI will increase the income at the household level through poverty reduction, employment opportunity creation, productivity improved, production technology and other related activities.

k) *Household asset growth:* - The asset growth due to expansion of LSAI at the household level will be the land holding, residence (dwelling), machinery (farm machinery), livestock production, financial assets and other resources accumulated by the household. It is expected that the expansion of LSAI project will increase the household asset accumulation through the transfer of new technology, improve working culture, productivity improvement, availability of infrastructure and others related activities.

# 3. Result and Discussions

## 3.1. Descriptive Analysis

It was hypothesized that the social, economic and institutional features of the households—such as age of HH, sex of HH, educational attainment, size of the household, technology transfer, type of occupation, developed infrastructure, loss of land, and distance from investment projects—would have an effect on the communities involved in the large-scale agricultural program, which would then have an impact on the outcomes variables, like household assets and income. Crop production, livestock products and supplies, off-farm revenue, revenue from forest goods, and revenue from irrigations are the sources of income for the households. A household's assets include its land, house, vehicle, animals, produce, and money. Out of the 330 sample respondents in total, 160 were treated household members who received employment opportunities from investment projects, and the remaining 170 were control households, located far away from investment projects, where their HH members did not receive employment opportunities from investment project. The (table 4) below shown has the following Summery statistics tables for categorical and dummy variables.

*Table 4. Summery Statistics categorical variables.*

| Variable | Obs | Categorical variable | frequency | Percent |
|---|---|---|---|---|
| marital status of Households | 330 | Married | 252 | 76.36 |
| | | Never married | 49 | 14.8 |
| | | Widow | 29 | 8.79 |
| Information about investment owning land | 330 | kebele leaders" | 132 | 40.0 |
| | | Kebele land management committee | 40 | 26.7 |
| | | government officials | 107 | 32.4 |
| | | Investors | 3 | 0.9 |
| Investment affected household income | 330 | loss of farm land | 33 | 10 |
| | | absences of job opportunity | 7 | 2.1 |
| | | production decrease | 2 | 0.6 |
| | | income generating forest and deforest | 178 | 53.9 |
| | | All | 110 | 33.3 |
| Type of land losses | 330 | crop land | 34 | 10.3 |
| | | grazing land | 48 | 14.5 |
| | | grass land | 1 | .3 |
| | | source of forest products | 50 | 15.2 |
| | | All | 1 | .3 |
| | | no loss of land | 196 | 59.4 |
| Agreement with the transparency of land deals | 330 | strongly agree | 8 | 2.4 |
| | | Agree | 100 | 30.3 |
| | | Neutral | 66 | 20.0 |
| | | Disagree | 119 | 36.1 |
| | | strongly disagree | 37 | 11.2 |
| Extent of the direct effects of investment projects on means of living | 330 | High | 78 | 23.6 |
| | | Medium | 222 | 67.3 |
| | | low" | 30 | 9.1 |
| Investment project investing in your area affected you | 330 | security of land holding | 14 | 4.2 |
| | | access to crop land | 8 | 2.4 |
| | | access to grazing land | 45 | 13.6 |
| | | access to forest land and forest products | 223 | 67.6 |
| | | access of water for drinking | 34 | 10.3 |
| | | access of water for your animals | 3 | .9 |
| | | access of water for irrigation | 1 | .3 |
| HH livelihoods option & opportunity affected by investment projects | 330 | None | 2 | .6 |
| | | loss of forest products do to deforestation | 8 | 2.4 |
| | | crop production and productivity decrease | 3 | .9 |
| | | computation on grazing land | 21 | 6.4 |

| Variable | Obs | Categorical variable | frequency | Percent |
|---|---|---|---|---|
| Opportunity that investment project provide | 330 | farm land grabbing | 39 | 11.8 |
| | | All | 259 | 78.5 |
| | | employment opportunity creation | 25 | 7.6 |
| | | technology transfer | 23 | 7.0 |
| | | utilization of agricultural inputs increase | 12 | 3.6 |
| | | productivity of crop increase | 66 | 20.0 |
| | | working culture of the community change | 6 | 1.8 |
| | | None | 198 | 60.0 |
| Livelihoods of household change | 330 | asset accumulation of household improved | 81 | 24.5 |
| | | food security problems of the household improved | 1 | .3 |
| | | employment opportunity generated | 99 | 30.0 |
| | | None | 149 | 45.2 |
| Variable | | Dummy | | |
| Sex of household | 330 | Female | 37 | 11.2 |
| | | Male | 293 | 88.8 |
| Educational levels of household | 330 | "literate" | 218 | 66.1 |
| | | illiterate | 112 | 33.9 |
| Distances of household residence from investment projects | 330 | "far from investment projects" | 119 | 36.1 |
| | | "nearest to investment projects" | 211 | 63.9 |
| Rate of poverty | 330 | "increase" | 36 | 10.9 |
| | | "decrease" | 294 | 89.1 |
| Technology get from investment project | 330 | "no" | 129 | 39.1 |
| | | "yes" | 201 | 60.9 |
| Employment opportunity from investment Projects | 330 | treated | 160 | 48.5 |
| | | control | 170 | 51.5 |
| Occupations of the household | 330 | "farming " | 232 | 70.3 |
| | | "both farming and trade" | 98 | 29.7 |
| Loss of useful land due to investment project | 330 | "no" | 114 | 34.5 |
| | | "yes" | 216 | 65.5 |
| Infrastructure develop by investment projects | 330 | yes | 70 | 21.2 |
| | | No | 260 | 78.8 |
| Large-scale agricultural investments has contribution on household poverty reduction | 330 | yes | 177 | 53.6 |
| | | No | 153 | 46.4 |
| Consultation when land transferred to Investors | 330 | yes | 106 | 32.1 |
| | | No | 224 | 67.9 |
| Evicted from home because of investment Projects | 330 | high | 20 | 6.1 |
| | | medium | 231 | 70.0 |
| | | low | 79 | 23.9 |

| Variable | Obs | Categorical variable | frequency | Percent |
|---|---|---|---|---|
| HH face food shortage last 12 months | 330 | yes | 276 | 83.6 |
| | | No | 54 | 16.4 |

Source: - own Survey of 2023

*Table 5. Summery Statistics continues variables.*

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Age of household | 330 | 40.48 | 9.81054 | 22 | 66 |
| Size of the household | 330 | 6.05 | 3.512 | 1 | 27 |
| Numbers of employment opportunity created Permanent | 330 | .0697674 | .2977773 | 0 | 2 |
| Numbers of employment opportunity created Temporary | 330 | .6104651 | 1.258657 | 0 | 8 |
| Size of the land lost because of land investment | 330 | 1.431 | 2.65435 | 0 | 10 |
| Months of households food production for their own use | 330 | 2.610465 | .9012699 | 1 | 4 |

## 3.2. Characteristics of Continuous Variables

The descriptive results of continues variables for the whole sample of the households those nearest to investment projects affected by the LSAI (treatment group) and those far from investment projects not more affected by LSAI (control group). The mean difference test between the treatment group and the control groups are presented in the table 5 above.

## 3.3. Mean of Continuous Variables Characteristics of Respondent

Table 6's descriptive data demonstrate that there is no discernible difference in the employment status of households based on age. However, the mean responder size differs statistically significantly between respondents who are employed and those who are not. The total sample's average land loss as a result of investment projects is 2.43, while the treatment groups' average land loss (households closest to the investment and farmlands) is 1.434 and the control groups' average land loss (far from investment projects no any loss of lands) is 1.427. The size of land lost as a result of investment projects did not significantly differ, according to the results. In terms of size of land lost due to investment projects, result indicated there is no significant difference on loss land.

The results of the Pearson's chi square proportions test for dummy variables across the treatment and control groups show that the LSAI affects local populations' livelihoods either directly or indirectly (Table 7). Consequently, 216 respondents (or 65%) of the selected population affirm that there has been a loss of use of land as a result of investment projects, whereas 114 respondents (or 0.34%) stated that there has been no loss of use of all land. It can be inferred from this that households closest to investment projects lose more land than ones farther away. There was inadequate community consultation done throughout the land transfer to investment.

Based on the findings presented in Table 6, 224 (68%) of the sample respondents stated that no community consultation was carried out prior to the land transfer for investment. 106 respondents, or 32%, confirmed that community consultations were held prior to the transfer of land for investment. This indicates that no consultation will take place before to the land being handed to the investment. Because of the investment projects' expansion, the households closest to them are forcibly removed from their homes. According to the study, 37 treatment groups (or 23.26%) out of all the groups have had some level of home displacement, whereas the control groups have experienced none.

When a household is forced to leave their home owing to settlement in the region, their land is fully turned over to investors. According to the poll results, 6% of the control group and 20% of the treatment group said that farmers are being forced to leave their homes because the project is growing. Furthermore, 94% of the control group and 8% of the treatment group concur that there has never been a farmer evicted as a result of an investment project. The chi square value indicated that there is no statistically significant difference between the treated and control groups when it comes to house evictions brought on by investment projects.

*Table 6. Descriptive statistics and mean different test between the continuous variables.*

| Variables | Employed | | Unemployed | | Total | | t- value |
|---|---|---|---|---|---|---|---|
| | Mean | Std | Mean | Std | Mean | Std | |
| Age of HH | 41.225 | 10.33 | 39.788 | 9.60 | 40.54 | 9.83 | 1.3084 |
| Size of HH | 3.6 | 1.939 | 8.34 | 3.09 | 6.04 | 3.51 | -16.5233 *** |
| Size of land lost because of land Investment | 2.434 | 2.75414 | 1.427 | 2.565047 | 1.431 | .146117 | 0.0220 |
| Numbers of employee opportunity created permanently | 0.13 | 0.04 | 0.01 | 0.01 | 0.07 | 0.03 | -5.56*** |

Source: - Own survey2023
Note: - *, **, *** significant at 10%, 5% and 1% probability level

According to the study, 30 members of the treatment group and 13% of the control group out of the total sampled respondents said that the project offers opportunities for employment, technology transfer, the use of agricultural inputs, altering the community's working culture, and productivity. On the other hand, roughly 3% of the treatment group and 9% of the control group thought the investment project offered no opportunities for the community. The statistical significance between the treated and control groups for opportunity investment proved for the household and communities are indicated by the chi square value.

In terms of technology transfer from the investment projects, Out of all responders, 38 (44.19%) of the treatment groups receive different technologies from the investment projects than do the 12 (13.95%) control groups. The chi square result indicates that the HH receives technology from an investment project with statistical relevance. As the study showed, LSAI makes a very small contribution to reducing poverty; among the sampled respondents, 81% of the treatment group and 95% of the control group stated that the project did not lower the level of poverty, with the remaining 18% of treatment groups and 4% of the control group saying the same. The rate of poverty is rising sharply, meaning that 21% of those receiving treatment and control report that the increase in poverty is a result of increased agricultural investment in the region.

According to the chi square result, there is no statistically significant difference in the rate of poverty between the treatment and control groups. Within a year of crop production or within a year of facing a food crisis, 73% of the total respondents indicated that they had experienced a food shortfall in the previous year. The findings indicate that households closest to investment projects have a greater food shortage than households farther away from investment projects. Expansions of investment ventures into new areas can help the community by constructing new infrastructure. As a result, 21% of respondents from the treatment and control groups state that the research area lacks any infrastructure created by investment projects.

*Table 7. Descriptive statistics and percentage difference test for the dummy variables.*

| Dummy variables | Category | Treatment | | Control group | | Total group | | |
|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | $x^2$ |
| HH Loss of valuable land due to investment projects | Yes | 49 | .93 | 167 | 0.98 | 216 | .65 | 0.6410*** |
| | No | 111 | 0.3 | 3 | 0.017 | 114 | 0.345 | |
| Consultation in the course of land transferred to investment | Yes | 48 | 0.3 | 58 | 0.34 | 106 | 0.32 | 0.6410 |
| | No | 112 | 0.7 | 112 | 0.7 | 224 | 0.68 | |
| Evicted from home due to investment projects | Yes | 37 | 0.2 | 11 | 0.06 | 48 | 0.15 | 30.661 |
| | No | 122 | 0.8 | 160 | 0.94 | 282 | 0.85 | |
| Opportunity investment provided for the household and community | Yes | 46 | 0.3 | 22 | 0.13 | 68 | 0.2 | 4.65 |
| | No | 114 | 0.3 | 148 | 0.9 | 262 | 0.8 | |

| Dummy variables | Category | Treatment | | Control group | | Total group | | |
|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | x ² |
| Technology that the household acquire from land investment project | Yes | 44 | 0.28 | 157 | 0.92 | 201 | 0.6 | 145.59 |
| | No | 116 | 0.725 | 13 | 0.08 | 129 | 0.39 | |
| Rate of poverty | Yes | 29 | 0.18 | 7 | 0.04 | 36 | 0.11 | 16.639 |
| | No | 131 | 0.818 | 163 | 0,95 | 294 | 0.8 | |
| LSAI support to HH poverty reduction | yes | 81 | 0.5 | 96 | 0.56 | 177 | 0.54 | 0.287 |
| | no | 79 | 0.49 | 74 | 0.43 | 153 | 0.46 | |
| Infrastructure develop by investment projects | yes | 34 | 0.21 | 36 | 0.21 | 70 | 0.22 | 0.0003 |
| | no | 126 | 0.78 | 134 | 0.78 | 260 | 0.78 | |
| HH face food deficiency last 12 months | yes | 134 | 0.83 | 142 | 0.83 | 276 | 0.73 | 0.0029 |
| | no | 26 | 0.16 | 28 | 0.17 | 54 | 0.16 | |

Source;-Own survey data of 2023

## 3.4. Mean Diverse Test of the Outcome Variable

The household's income and asset accumulation represent the mean different test of the study's outcome variables. The land holding capacity of the household, dwelling (home), machinery (equipment), livestock, fruits, and other financial assets account for the entirety of the asset accumulations. Crop output, livestock products, off-farm income, forest goods, and irrigation revenue account for the households' overall income.

***Table 8.*** *Mean diverse test for the outcome variable.*

| Variables | Unit | Treatment group | | Control group | | t-value |
|---|---|---|---|---|---|---|
| | | Mean | Std | Mean | Std | |
| Total asset growth of the HH | Birr | 1.63125 | .3387338 | 1.411765 | .4936069 | -5.9835*** |
| Total revenue of the HH | Birr | 1.506 | .4596964 | 1.3 | 1.429961 | -3.8807*** |

The average total asset buildup of the household is 1.63125 for the treatment groups closest to the investment projects in terms of residence and farmland, and 1.411 for the control groups farther away from the projects in terms of residence and farmland, representing asset values greater than 0-100,000 birr. The treatment groups' total household income is 1.506, signifying an increase in income over 30,000 birr, whereas the control groups' total income is 1.3, signifying an increase in income below 30,000 birr. The findings indicate that there is a statistically significant difference at 1% for income and total asset accumulation, respectively.

## 3.5. Econometric Analysis

In order to increase the quality estimate, balancing tests and certain indicators were used to determine the suitability of Propensity Score Matching as the estimator. The econometric analysis is carried out to determine the factors that influence employment opportunities, technology transfer, infrastructure development, changes in household livelihoods, land loss and the amount of land taken up by investment projects, opportunities that investment projects offer for the local community, the contribution of LSAI to the reduction of poverty, the rate of poverty, the opportunities and livelihood options available to households, the impact of investment projects on household income and asset accumulation, and more.

### 3.5.1. Logit Model Determinants of LSAI on Livelihoods of Local Community

A binary logit regression model was used to describe how large-scale agriculture affected the local community's standard of living. The findings indicate that only six variables were found to be statistically significant out of the characteristics that were expected to influence local community employment in large-scale agricultural land investment projects (LSAI). These include of the household's educational attainment, size, occupation, and proximity to investment projects, among other things. The employment opportunity projects are greatly and favorably impacted by the loss of land resulting from investment and technology transfer, whereas the distance of a household's home from an investment project has a negative impact (Table 9). A household's proximity to a large-scale agricultural investment has an impact on employment and community involvement in the area.

***Table 9.*** *Binary logit regression of households' employment opportunity from LSAI.*

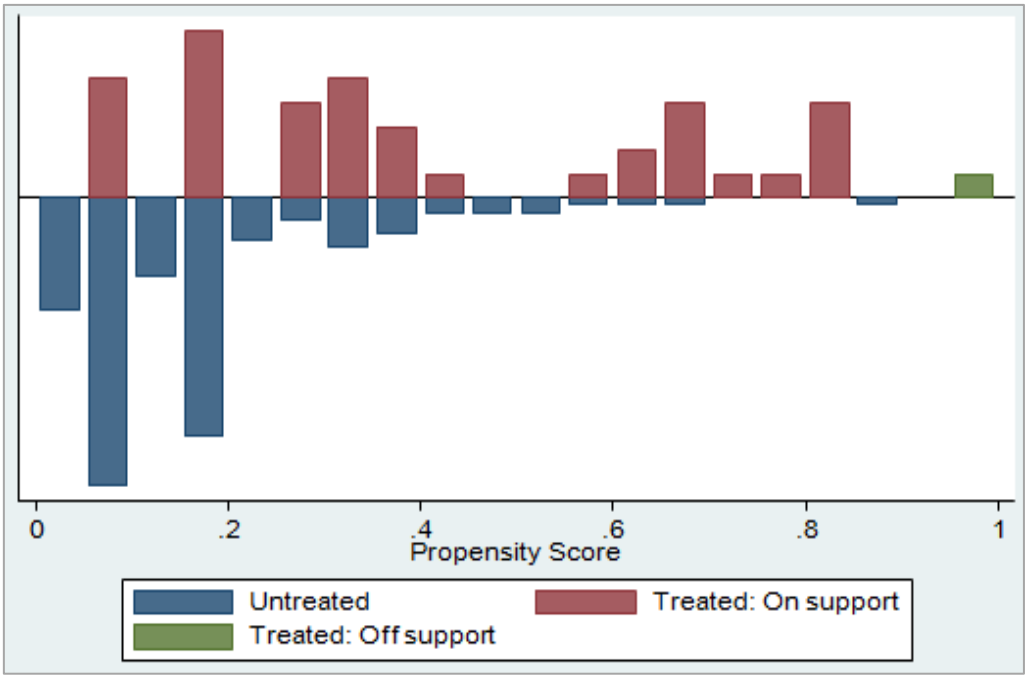
| **Employment opportunity investment project** | **Coef.** | **Std. Err.** | **Z** | **P>\|z\|** |
|---|---|---|---|---|
| Sex of the household head | 7.106623 | 17.9521 | 0.78 | 0.438 |
| Age of the household head | .9779019 | .0445749 | -1.01 | 0.701 |
| Educational levels of household | 98.88295 | 130.5764 | 3.48 | 0.001 |
| Occupation of the household | 4.51284 | 3.837754 | 1.77 | 0.076 |
| Size of household | 2.119105 | .3389252 | 4.70 | 0.000 |
| Remoteness of HH residence from land investment project | 23.21895 | 25.55457 | 2.86 | 0.004 |
| Loss of valuable land due to land investment Project | 895.96 | 1454.46 | 4.19 | 0.000 |
| Size of land lost for the reason that of land investment | 0.329943 | .4384427 | 0.86 | 0.387 |
| Rate of poverty | .2570666 | .4101169 | -0.85 | 0.395 |
| Technology get from investment Project | 185.8994 | 244.0064 | 3.98 | 0.000 |
| Infrastructure developed by investment projects | 4.65673 | 4.952327 | 0.148 | 0.148 |
| Cons | 9.99e-12 | 5.82e-11 | -4.35 | 0.000 |
| Marginal effect after logit model | | | | |
| Variable name | | | | |
| Sex of the household head | .3721002 | .28417 | 0.31 | 0.438 |
| Age of the household head | -.005499 | .01117 | -0.51 | 0.599 |
| Learning levels of household head | 1.130496 | .34109 | 3.31 | 0.001*** |
| Occupation of the household | .3708311 | .20943 | 1.77 | 0.077** |
| Size of household | .1848078 | .04033 | 4.58 | 0.000*** |
| Remoteness of HH head residence from investment project | .6130576 | .1461 | 4.20 | 0.000*** |
| Loss of valuable land due to investment Project | .8815833 | .07672 | 11.49 | 0.000*** |
| Size of land lost for the reason that of land investment | .0701674 | .08299 | 0.85 | 0.387 |
| Degree of poverty | -.3214855 | .3279 | -0.98 | 0.327 |
| Technology acquired from investment Project | .8258028 | .09192 | 8.98 | 0.000*** |
| Infrastructure developed by investment projects | .3785554 | .2657 | 1.42 | 0.154 |

Source: - Own survey data of 2023
Note: - *, **, *** significant at 10% and 5%, and 1% probability level

### 3.5.2. Matching Estimates of the Propensity Score

In collective action schemes, the histograms of estimated PS density for treatment groups and control groups overlap the common provision section graphs, as seen in Figure 1. Participants who receive appropriate support are indicated by the term "treated on supports," whereas those who receive inappropriate support are indicated by the term "treated off supports."

The graphs showed that, with the exception of some treated off support individuals; all treated and untreated persons were located inside the zones of common provision, suggesting that every treated individual had a matching untreated individual. Although some treated off-support individuals will not be comparable to the untreated persons, this ensures that statistically treated and untreated individuals are equivalent. This guarantees statistical parity between persons who have received treatment and those who have not; nonetheless, certain treated off-support patients will not be comparable to the untreated individuals.




Source; own computation 2023

***Figure 1.*** *Propensity score spreading and common provision for propensity score estimation.*

### 3.5.3. Matching Estimation Procedures

Propensity score results for the effects of LSAI on local community livelihoods were estimated with the aim of determining whether our cross-sectional matching estimators are sensitive to sample size choices, common support conditions that are enforced, and whether balancing propensity is set and satisfied in all regressions at the 1% significant level. The probability of the effects that the LSAI addresses on the daily activities of the local community is predicted using the logit model, which also takes into account a variety of household aspects. Table 10 presents radius matching, kernel matching, and nearest neighbor matching which are helpful tools for ensuring that the estimated causal effects are consistent.

***Table 10.*** *Performances of matching estimators.*

| Matching algorithm | Psedo-R2 | Insignificant Variables | Sample size matched |
|---|---|---|---|
| Nearest Neighbor matching (NNM) | | | |
| NNM (1) | 0.528 | 10/11 | 206 |
| NNM (2) | 0.540 | 8/11 | 207 |

| Matching algorithm | Psedo-R2 | Insignificant Variables | Sample size matched |
|---|---|---|---|
| NNM (3) | 0.337 | 5/11 | 207 |
| NNM (4) | 0.298 | 8/11 | 207 |
| NNM (5) | 0.265 | 9/11 | 207 |
| Caliper match (CM) | | | |
| Caliper (0.01) | 1.000 | 7/11 | 182 |
| Caliper (0.1) | 0.528 | 10/11 | 206 |
| Caliper (0.25) | 0.528 | 10/11 | 55 |
| Caliper (0.5) | 0.540 | 8/11 | 207 |
| Radius match (RM) | | | |
| Radius (0.01) | 0.851 | 3/11 | 207 |
| Radius (0.1) | 0.851 | 3/11 | 207 |
| Radius (0.25) | 0.851 | 3/11 | 207 |
| Radius (0.5) | 0.851 | 3/11 | 207 |
| Kernel matching (KM) | | | |
| Kernel (0.01) | 1.00 | 9/11 | 182 |
| Kernel (0.1) | *1.00* | 11/11 | 207 |
| Kernel (0.25) | 1.00 | 9/11 | 207 |
| Kernel (0.5) | 1.00 | 11/11 | 207 |

The number of matched observations, the pseudo R-square value, and the insignificant variables are the three criteria used to choose the best matching algorithms through matching the various algorithms for the estimations of the treatment effects. The optimal matching algorithm, as determined by the selection criteria, is kernel matching (KM) with a band width of 0.1.

### 3.5.4. Balancing Tests

According to the t-test balancing tests, there are some household characteristic differences between the treatment and control groups that are significant in other ways and jointly insignificant before and after matching. The variables that do not have statistically significant mean differences among the numbers in the individual covariates balances tests are the following: sample size matchless (sex of HH, age of HH, educational levels of HH, occupation of the HH, and size of the HH); sample KM at bandwidth with 0.25 (all variables haven't significant differences); sample after KM (0.1) bandwidth (all variables haven't significant differences); and sample after caliper radius with bandwidth at 0.25 (sex of HH, age of HH, HH educational levels, occupation of the HH and size of the HH have no significant differences). At 10%, 5%, and 1%, the remaining differences were statistically significant. After matching processes, the balancing test demonstrates that the numbers of covariates stay balanced.

Stated differently, following the matching methods, there is no discernible difference between the treatment and control groups' covariate means and frequency distributions. As a result, the treatment effects estimation results are expressed and implemented using kernel matching. We perform the ATT estimate using the best choice estimator, which is the kernel matching band width (0.1) matching approaches, as determined by the study. Based on all of the experiments, it appears that the selected matching algorithm performs relatively better with the available data. As a result, we are able to estimate the households' average treatment effects (ATT).

***Table 11.*** *Propensity scores and Covariate balances.*

| Variable | Sample | Treated | Controls | Difference | Bias (%) | T test |
|---|---|---|---|---|---|---|
| Propensity score | Un matched | 0.41021 | 0.37765 | 0.03256 | 15.0 | 0.32 |

| Variable | Sample | Treated | Controls | Difference | Bias (%) | T test |
|---|---|---|---|---|---|---|
| Sex | Matched | 0.42033 | 0.41932 | 0.00101 | 9.4 | 0.02 |
| | Un matched | 0.87 | 0.79 | 0.08 | | 1.15* |
| | Matched | 0.84 | 0.88 | -0.04 | | -0.45 |
| Age | Un matched | 40.26 | 40.62 | -0.37 | -7.2 | -0.21 |
| | Matched | 40.91 | 41.84 | -0.93 | | -0.44 |
| Education levels | Un matched | 0.54 | 0.61 | -0.07 | -11.4 | -0.79 |
| | Matched | 0.53 | 0.54 | -0.01 | | -0.11 |
| Occupation | Un matched | 0.87 | 0.87 | 0 | 1.3 | -0.01 |
| | Matched | 0.84 | 0.88 | -0.04 | | -0.5 |
| Household Size | Un matched | 9.08 | 8.48 | 0.6 | 1.4 | 0.8 |
| | Matched | 9.31 | 10.11 | -0.8 | | -0.76 |
| Distances from investment project | Un matched | 0.67 | 0.45 | 0.22 | 19.7 | 2.39** |
| | Matched | 0.63 | 0.61 | 0.02 | | 0.13 |
| Loss of land to investment projects | Un matched | 0.28 | 0.17 | 0.12 | 9.7 | 1.63* |
| | Matched | 0.22 | 0.28 | -0.06 | | -0.65 |
| Size of land taken for investment | Un matched | 1.87 | 0.64 | 1.23 | 15.7 | 2.57** |
| | Matched | 1.34 | 1.68 | -0.33 | | -0.48 |
| Rate of poverty | Un matched | -0.48 | 0.03 | 0.2 | 42.2 | 4.37** |
| | Matched | 0.16 | 0.13 | 0.03 | | 0.44 |
| Technology transfer | Un matched | 0.62 | 0.2 | 0.42 | 45.7 | 5.48*** |
| | Matched | 0.53 | 0.52 | 0.02 | | 0.14 |
| Infrastructure developed | Un matched | 0.08 | 0.01 | 0.07 | 15.3 | 2.56** |
| | Matched | 0.03 | 0.02 | 0.01 | | 0.39 |

Note: *, **, *** significant at 10%, 5% and 1% probability levels
Source: own data estimation results

### 3.5.5. Treatment Effects on the Treated (ATT)

The study finding provides the evidences as to whether or not an effects of LSAI on the livelihoods of the local communities have bring important change on the total household asset growth and total income of the household.

*Table 12. Average treatment effects on treated (ATT).*

| Variable | Treated | Controls | Difference | S.E. | T-stat |
|---|---|---|---|---|---|
| Total asset growth of household head | 1.15625 | 1.28458361 | -.128333607 | .086586478 | -1.48* |
| Total income of household head | 1.34375 | 1.45814267 | -.114392666 | .11026736 | -1.04* |

Sources: Own survey results; * significant at 10% probability levels

When the estimation results were compared to the total household income in birr, which is gained from various livelihood options such as crop production, livestock products, forest products, irrigation, and off-farm incomes, they pro-

vided supportive evidence of statistically significant differences in the household's total asset accumulations.

The total asset buildups of households and the total household revenue by 10% probability levels differ statistically significant, according to the propensity score data. The findings indicate a negative correlation between household income and asset accumulation resulting from large-scale agricultural investments.

### 3.6. The Effect of Land Transfer to Large Scale Agricultural Land Investment Projects on Local Communities

Large-scale agricultural land transfers for investments have both beneficial and negative consequences on the standard of living in the surrounding populations. According to the main interviews, the Woreda administration provided more information and made more choices regarding the transfer of land for investment than did the local communities. 40 percent (132) of the information regarding the land transfer to the communities came from government members, 32.4% (107), Keble leaders, 26.6% (88), the land management committee, and 1% (3) from investors. This suggests that land has been transferred to large-scale agricultural land investment without communities' consultation or agreement.

Accordingly, there is roughly 36.1% disagreement (119 people), 20% neutrality (66 people), 15.1% agreement (50 people), 26.4% strong disagreement (87 people), and 2.4% strong agreement (8 people). The majority of households do not find large-scale agricultural land investments appealing due to the greater number of negative effects than favorable ones, according to the statistics.

According to the survey, 10.3% (44) of the land lost as a result of large-scale agricultural land investment projects was lost as crop land, 15.5% (50) as a source of forest products, 14.5 (48) as grazing land, and the remaining 59.4% (196) did not lose any valuable land.

Thus, the local inhabitants' means of subsistence are directly impacted when land is transferred for extensive agricultural investment. According to the results, over 76.74 percent of respondents depend on forests and forest products for their livelihoods.

### 3.7. Opportunity of Large Scale Agricultural Land Investment for the Local community

For the local communities, the growth of large-scale agricultural investment presents new opportunities. The possibility that investment projects offer to the nearby communities was another major focus of the study. Of the 330 respondents, 7.6%(25) said that no opportunities would be created for the local community; 7.0%(23) said that technology would be transferred; 1.8% said that the community's working culture would change; 3.6%(12) said that the use of agricultural inputs would increase; 20.0%(66) said that crop productivity would increase; and 60% (198) said that no opportunities would be created for the local community. The aforementioned finding suggests that large-scale agricultural investment initiatives did not offer any opportunities for the local people.

In response to the proposal to modify LSAI to improve household income and the lives of the local community, 10.47 percent (36 respondents) rated the creation of job opportunities as positively impactful, 1.16 percent (4) said that the household's asset growth improved, 0.58% said that the household's problems with food security were resolved, and 86.79% said that their livelihoods would remain the same. The findings show that there is no discernible impact of large-scale agricultural land expansion on the local communities' standard of living within the study region.

## 4. Conclusion

The aim of the study was to investigate effects of large scale agricultural land investments on the livelihoods of communities. The whole of the land rented to investment projects and the cultured areas are not being used in accordance with community agreements and intentions. Few of the overall number of investors in the area make excellent returns; the majority of investment projects lack sufficient equipment, the sites are not automated, opportunities for the communities were not produced, and the land is unlawfully rented to other farmers. The land transfer procedures are opaque; communities are not consulted; instead, the land transfer is approved by the woreda investment committee and is only discussed with the Kebele administration and land use committees. This keeps the land transfer hidden from the community. A community's opportunity to support itself was lost as a result of the unseen land transfer to investors.

The local communities and investors have very little interaction; investors deal with Kebele administration when issues arise and they need labor on a daily basis for cropping, weeding, and harvesting, unless the local community is not involved as a permanent employee. In comparison to the quantity of investment projects, the opportunities generated for the local populations by large-scale agricultural investments are quite modest. Descriptive statistics and econometric analysis were used to assess the data, with comparisons made between treatment groups (those closest to investment projects) and control groups (those farthest from investment projects). The household asset accumulations are the outcome variables impacted by large-scale agriculture.

Descriptive analysis findings indicate that there is a statistically significant difference between the treatment and control groups.

Regression analysis results demonstrate that the explanatory variables—household sex, proximity to investment projects, land loss as a result of investment project, degrees of poverty, and technology transfer—have a positive impact on households' employment opportunities in large-scale agri-

cultural investments. The average treatment effects estimation results on the treated show that large-scale agriculture land investments has detrimental effects on household incomes and asset buildups.

The study's conclusions led to the following recommendations regarding drowning:

1) The lack of openness in the land transfer to agricultural investment can be attributed to the lack of decision-making and community consultation. Therefore, while transferring land for agricultural projects, the government pays attention and the community must be consulted.
2) The management and implementation of land transfer for large-scale agricultural land investment projects is inadequate. Consequently, the governments oversee and manage the land that is transferred for agricultural land investment and regularly assess the level of performance.
3) The socio-economic and ecological effects of a large-scale agricultural investment must be carefully considered before transferring the land for investment.
4) Alternatives to agriculture are necessary for the local community's livelihoods in order to survive. There were no longer any medicinal plants or trees that produced honey in the areas' natural forest, which had been cleared of snow and destroyed. Consequently, when land is transferred to large-scale agricultural investments, the government must compromise natural forest degradation.
5) Investment initiatives in the research regions deplete natural resources, even though they create opportunity for the local people. The loss of resources as outcome of the growth of large-scale agricultural land investment is something that the governments are aware of.

## Abbreviations

BGRS: Benishangul Gumuz Regional State
BGRSIO: Benishangul Gumuz Regional Sate Investment Office
BWARD: Bambasi Woreda Agriculture and Rural Development Office
HH: Households
CAADP: Comprehensive Africa Agriculture Development Program
FAO: Food and Agriculture Organization
FDRE: Federal Democratic Republic Of Ethiopia
FGD: Focus Group Discussion
GDP: Growth Domestic Product
LSAI/P: Large-Scale Agricultural Investment Project
MOARD: Minister of Agriculture and Rural Development

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## Conflicts of Interest

The authors declare no conflicts of interest.

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