

IMPACT OF LAND RENTING-OUT ON WELFARE OF RURAL HOUSEHOLDS: EVIDENCE FROM ETHIOPIA

Eden Tilahun*¹ Mengistu Ketema¹ Fekadu Gelaw²

¹ Haramaya University, Ethiopia

² Private consultant at Meles Zenawi Foundation, Ethiopia

*Corresponding author: E-mail: edifenet@gmail.com

Abstract

This paper measured the poverty status of the land renting-out and own operating households and evaluated the impact of land renting-out on the welfare of rural households taking evidence from central Ethiopia. The results indicated that 26.4 percent of the non-participant and 29.8 percent of the participant households were found to be poor. The study further checked whether this poverty difference necessarily come from participation in land renting-out or not and PSM ascertained that the difference is due to participation. Hence, the estimated average treatment effects revealed that the own operating households are in a better position than that of the land renting-out households regarding their consumption expenditure, expenditure for education and diet diversity. Moreover, the results indicated that most of the participant households perceive themselves as the poorest and poor households compared to the non-participants. Therefore, the study suggests encouraging the farmers to operate by their own and to carry out comprehensive efforts to tackle factors that drove farmers to rent out their lands.

1. Introduction

Though efforts to transform the economy towards a more manufacturing and industry-oriented economy are underway in the Ethiopia, the agriculture sector still accounts for 42 percent of the GDP, 85 percent of employment, and nearly 90 percent of foreign export earnings. Land is a critical asset for the nation since; the vast majority of rural households depend on subsistent agriculture (Larsen and Lilleør, 2014 and NBE, 2018). In addition to its role as a key factor in the agricultural production, land is a symbol of social, economic, and political prestige in the

country, which could also be transferred to offspring (Berhanu *et al.*, 2003). Thus, Land for rural households is everything; in fact, land-related issues usually generate intense emotional reactions.

Of Ethiopia's total area of land, 36.26 percent of it is arable land while the remaining area is classified as marginal and non-arable land (World Bank, 2014). Out of the total arable land, about 35.81 percent of it was cultivated in 2016/17 production season and the households' average holding sizes was 1.04 hectare (CSA, 2015). However, irrespective of the average land holding size, 55.8 percent of Ethiopian households own less than one hectare of land. In areas where population densities have become very high and farm sizes have become very small, land scarcity is becoming severe challenge to improve one's livelihood in Ethiopia (Sosina and Holden, 2014). Exacerbating the problem, the population of the country has been growing at the rate of about three percent per annum and it is expected to reach 160 million by 2050 (Josephson *et al.*, 2014). Therefore, to escape the threat of starvation and dependence on food-aid, making the most productive use of available land is important for the country.

As it is mentioned under Article 40(3) of Ethiopian constitution, land ownership is vaguely defined as owned by the state and the public (FDRE, 1995). The constitution provides peasants and pastoralists only the right to use land with some rights to temporarily transfer their use right. The land ownership right given for the farmers is called "holding right" that provides rights of leasing/renting, inheriting and enjoying the fruits of the land (Daniel, 2015). Recently, Ethiopian youth households are becoming landless because of the rapid population growth in the country. Even if the constitution grants free access to land to every rural resident who wants to farm and earn income from farming, neither all rural households have the land they can farm nor all rural households who own land have the necessary resources to operate the land. Some farmers may own larger land size than the resources required to farm and others may own more other resources than required to farm the land they own. In such situation, where the distribution of land ownership differs from optimal operational structure and agricultural labor market is nearly non-existent, the efficient use of the land crucially depends on the ability of owners to transfer their use rights temporarily in exchange for some economic gains (Deininger *et al.*, 2006).

Under such conditions, land rental market is less costly and flexible land transaction system, which can substitute sales market (Denienger *et al.*, 2013). Mainly in Ethiopia, land rental

market is an important means of accessing agricultural land since sales of land are prohibited by proclamations (Hosena and Holden, 2016). Thus, rental markets can provide a good opportunity of investment for those who have abundant capital and are efficient in production but constrained by agricultural land. Land rental markets could improve productivity because it is one way of transferring land from less efficient producers to ones that are more efficient (Deininger *et al.*, 2008). The improvement in productivity is expected to happen even in the presence of transaction costs, which may arise from restrictive regulations on the leasing of land, information asymmetry and problems related to contract negotiation enforcement (Deininger *et al.*, 2008 and Jin and Deininger, 2009). Therefore, land rental markets play a great role in improving efficient use of the available land by moving the distribution of land ownership towards operationally optimal allocation structure. However, land rental market also has adverse impact on farmers' investment on soil and water conservation activities. For instance, Musa (2015) argued that soil conservation is usually a long-term investment, the farmer, who rented-in land for short-term use, might not have the incentive to invest on activities such as manure use and conservation tillage whose expected future benefits are captured by the owner, not the renter. Hence, the farmer who rented-in the land does not care much about the land use and concentrate on short-term profit maximizing activities at the potential cost of increased land degradation (Shimelles *et al.*, 2009). These empirical studies indicate the general contribution of land rental market on productivity and adverse impacts of the market on land conservation but the welfare changes on both the land renting-in and renting-out households remain hidden. To the best of the authors' knowledge, Hou *et al.* (2017), which considered only the impact of land rental market on the households who rent-in land in China, Jin and Jayne, (2011) which evaluated the impact in Kenya whose land and agricultural policies are different from Ethiopia and Kousar *et al.*, (2015) in Pakistan are the articles that rigorously evaluated the impact of land rental market on welfare of households. Furthermore, while the study conducted in Kenya used Households' income, which fails to consider illegal activities and is hard to measure in most developing countries as an outcome variable, both the studies by Hou *et al.* (2017) and Kousar *et al.*, (2015) added productive expenditure on income. Therefore, interest has arisen to know the welfare changes due to land rental transactions using different outcome indicators; expenditure and nutritional status. Specifically, the study focused on measuring the dimensions of poverty of land renting-

out households and owner operators and evaluating the impacts of the two groups using consumption expenditure, expenditures for school, diet diversity, and minimum level of diet. In addition to these listed objective indicators of poverty, the study also used subjective poverty as an outcome variable to have robust estimates.

2. Literature Review

2.1. Historical Perspectives of Land Tenure in Ethiopia

According to Teshome (2016), in pre 1975, land ownership in Ethiopia was under the state (the king) and the feudal lords and citizens had different land use rights namely communal (*rist*), grant land (*gult*), freehold, or sometimes referred to as private (*gebbar* tenures), church (*samon*), and state (*maderia, mengist*). These land holding and land use systems highly contributed for the concentration of land in the ownership of some people (feudal lords) which resulted in unequal distribution of land. The land tenure systems classified as northern and southern following the geography of the country and the northern part of the country regarded as the cradle of the Ethiopian civilization. As a result, compared to the southern part of the country the northern part did not face land tenure insecurities and the system in the region was relatively less exploitive.

The 1975 overthrow of the Haile Selassie regime by the Derg provided usufruct rights to large numbers of rural families while declaring all land to be the property of the state (EPRRG, 2011). The ten point program of Ethiopian Socialism introduced by Derg on December 20/1974 allowed farmers to own the land they were operating, and it is stated as “the right to own land shall be restricted to those who work on the land” (Daniel, 2015). According to Article 3.2 of the 1975 proclamation, Derg also restricted rural private land holding which allowed rural households and tenants to access and cultivate their own lands and also any kind of land transfer was forbidden.

The overthrow of the Marxist government of Ethiopia (Derg) in the early 1990’s led to some changes in the land policy, though the fundamental elements remain the same. The 1995 constitution established a federal system comprised of nine ethnically based states, in which land ownership is vested in the federal government, but long term land holding right are granted to peasant farmers and pastoralists (FDRE, 1995). Broad land policy is created at the federal level while administration and allocation are delegated to the regional governments.

With the objective of social equity and tenure security the current ruling party continued by considering land as a public and state property (Daniel, 2015). The FDRE Constitution prohibits any sale and exchange of land. To protect the peasants against market forces state ownership of land is considered as the best mechanism. In particular, the current government believes that poor farmers would be forced to sell their plots to urban speculators who come to invest in the rural area especially in their hardest times (MoIPAD, 2001). Some researches against the government of FDRE assumptions argued that farmers owning land tend to rent-out their land in their harder times rather than selling it out. For instance, Daniel (2015), argued that farmers lose their motivation to improve the land productivity when they feel tenure insecurity, they incur high transaction costs because of land disputes and state and public ownership also hinders them from accessing credits by using their land as a mortgage or collateral.

According to federal Rural Land Administration and Use Proclamation (RLAUP) (2005) farmers provided holding rights on Article 2.4, which enable peasants and pastoralists to use rural land for purposes of agriculture and natural resource development, lease and bequeath to members of his/her family or other lawful heirs. According to the federal RLAUP land can be acquired in three different ways by land grant, bequeath (donation for family member) and lease (large-scale agricultural land transfer practices). According to RLAUP, Article 5(2); 3; 9(1) land granted for those in need of land by the government of the country and sources of land will be unoccupied government lands, communal lands and land reserve (land neglected by the holders for years) (RLAUP, 2005).

3. Data Source and Estimation Strategies

3.1. Study Site and Data Description

Dugda woreda is located in Central Rift Valley of Ethiopia specifically in East *Shoa* zone of Oromia National Regional State. Geographically, it is found in 8°01' to 8°25'N Latitude and 38°32' to 39°04'E Longitude with an elevation of 1636 meters above sea level. *Dugda woreda* has a total area of 95,945 ha.

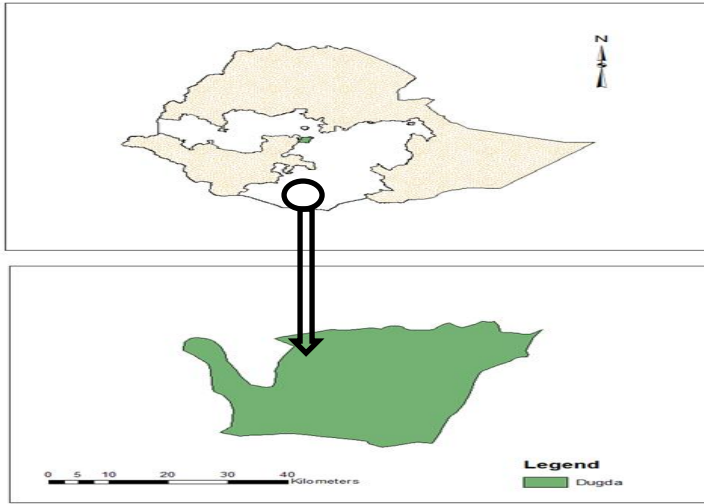


Figure 1. Location of the study area

Dugda woreda is well known for the prevalence of land rental transactions. Hence, *Dugda woreda* is purposively selected as a study area. From the *woreda*, four *kebeles* were randomly selected, among 18 *kebeles* in which land renting-out is identified. A total of 200 respondents were selected out of which 100 were participants and the remaining 100 were non-participants of land renting-out market using simple random sampling technique with replacement. That means, when the randomly selected farmer doesn't rent-out his/her land he/she was replaced by the next random sample after the 100 sample for own operators drawn and vice versa.

3.2. Estimation strategy

According to Deininger *et al.* (2008), households participate in land rental markets to maximize their income, by reallocating resource endowments. Households rent-in land when they hold lesser land than that of their capacity to cultivate and farmer households rent-out their land when the available land exceeds their capacity to cultivate. Therefore, the participation in land renting-out or in renting-in depends on the optimal amount of land for each household. Optimal level of land determined by different factors such as available labor, credit availability and utilization and heterogeneity in households characteristics (Hou *et al.*, 2017). Land renting-out households are the interest of this study and below is the mathematical formulation of participation in land renting-out market:

$$Y^* (A^* < \bar{A}): MP(\bar{A}) + \varepsilon_i \leq r - T^{out} , \quad (2)$$

where; Y^* is participation in rental market as a renting-out household, A^* is optimal level of land to be cultivated, \bar{A} is land endowment, T^{out} is transaction cost related to rent-out, r is rental rate and $MP(\bar{A}) + \varepsilon_i$ = marginal value of product by cultivating an extra unit of land without the existence of land rental market. Therefore, from the mathematical explanation whenever the marginal value of product is less than or equal to the market price received minus the transaction costs households incur to rent out their lands, they will go for land renting-out since the benefit is higher than cultivating by oneself.

The farmer chooses to participate in land renting-out if the optimal land is less than the endowed land; $\bar{A} - A^* > 0$. However, the optimal level of land is non-observable since it is a function of different resources other than land and the participation, Y_i^* , that the farmer decides is a latent variable determined by observed and unobserved characteristics given in equation 2:

$$Y_i^* = X_i\beta + \varepsilon_i \text{ With } Y_i^* = \begin{cases} 1 & \text{if } Y_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (3)$$

where Y_i^* is a binary variable representing participation in land renting-out market; β is a vector of parameters to be estimated; X stands for a vector of household, socioeconomic, geographic and institutional characteristics that influence farmers participation decision and ε_i represents the random error term. Moreover, the relationship between participation and its impact (welfare measured as consumption per adult equivalent, for our case) can be expressed, along with a vector of other explanatory variables (Z) as follows:

$$W_i^* = Z_i\phi + \theta Y_i + \mu_i \quad (4)$$

Where W_i^* represents the outcome variables (consumption per adult equivalent), Y_i is a dummy variable for participation in land renting-out market, ϕ and θ_i are vectors of parameters to be estimated, and μ_i is an error term. The impact of participation on the welfare of farmers is therefore measured by the estimations of the parameter θ if farmers are randomly assigned to participants and non-participants. However, since farmers themselves decide to participate in land renting-out market based on their characteristics and the information they have, participants and non-participants may not be randomly distributed to the two groups, as they may be systematically different. In this case, the mean outcome of the two groups differs

even in the absence of the participation. Hence, this initial bias has to be solved. To do so, propensity score matching (PSM) is used.

3.2.1. Propensity Score Matching

Propensity Score Matching (PSM) and Placebo Regression estimation methods were implemented to evaluate the impact of land renting-out on the welfare of the rural households using consumption expenditure, diet diversity, minimum diet and expenditure for school as indicators. The observable characteristics of the households are age, sex and education level of the household, family size, cooperative membership, size of land, distance from infrastructure, livestock holding and credit utilization. The binary choice model used to estimate the probability to participate in land renting-out generate a parameter that can be used to match the land renting-out and own-operating households.

3.2.2. Measuring welfare

Welfare can be measured either from income or consumption expenditure perspectives. However, it is advised to measure welfare based on expenditure in less developed countries like Ethiopia. This is because, household's income is hard to measure in less-developed countries as much of it comes from self-employment. According to Meyer and Sullivan (2003), income is indirect measure of welfare rather consumption expenditure measures the welfare of a family directly. Income measures fail to handle appropriately illegal activity and also fail to reflect in-kind transfers. In this case, an individual participating in illegal activities may not report revenue from this illicit activity as income, but involvement in illicit activity does not imply that food and housing expenditures will be misreported. Besides, income fluctuates in the course of one's lifetime, whereas consumption is relatively less erratic, hence easier to estimate (Haughton and Khandker, 2009). Consumption data also have additional information since consumption decisions are related with other household decisions such as nutrition and health (Atkinson, 1992). Therefore, in this study welfare was measured by consumption expenditure per adult equivalent. To estimate the households' consumption expenditure, respondents were asked a range of questions on aggregate expenditure on both food and non-food items including those on food, clothing, housing, education and medical care. The aggregated figure then re-estimated in

per-adult-per annum base. Previous works that used consumption per adult equivalent to measure welfare in Ethiopia includes Fitsum and Kassahun (2014), Sosina *et al.*, (2012) and Yonas and Söderbom (2012).

The poverty measurement objective of the study was achieved using the three commonly pursued procedures of Foster, Greer and Thorbecke (FGT) (Foster *et al.*, 1984) model.

Poverty measurement: FGT was used after the determination of poverty line; if the household spend below it, a household was considered as poor because that expenditure is insufficient to meet the food and other basic requirements that is considered as a minimum subsistence level. The mathematical notation of FGT can be expressed as:

$$P_{\alpha} = \frac{1}{N} \sum_1^N \left[\frac{G_i}{z_i} \right]^{\alpha}, (\alpha \geq 0), \quad (1)$$

Where P_{α} = Poverty measure; z_i = Poverty line; G_i = The difference between expenditure per capita and poverty line; N = Total population; α = Weight attached to the severity of poverty.

The commonly used values of α are 0, 1, and 2. When it is equal to 0, P_0 indicates the headcount ratio, which measures percentage of population that falls below the stated poverty line for their living. On the other hand, when it equal to 1 and 2, we obtain the poverty gap and severity of poverty index, respectively. They are also denoted by P_1 and P_2 and unlike the head count measure they have the advantage of giving more weight for the poorest segment of the group.

This study adopted the poverty line estimated by MoFED for the poverty analysis. This poverty line was estimated in 2013 and was employed in this analysis for the reason that it was determined for the whole country and no better choice was available to use particularly for the study area. The poverty line used in this study was the one estimated for rural areas of the country, which was 3781 ETB per year per adult equivalent.

4. Results and Discussions

4.1. Descriptive statistics

Before boarding to the econometric results, it is vital to provide clear information on the variables and sample respondents used in the econometric model and analysis. Consequently,

Table 1 presents the descriptive statistics of variables used for this study. The mean schooling years of the sample household heads is about 3 years, while the mean age of the sample household heads is 42 years. On average the participant households have family size of 4.4 AE. Regarding the sex of the sample households, participant and non-participant households, 77.5% of them are male.

As far as their cooperative membership, 70.5% of the sample households were member. The sample households' credit utilization and off/non-farm income show that only 29% and 35% of the sample households utilize credit and generate off/non-farm income, respectively. The size of land households own on average is 4.3 *timad*. On average the sample households have 4.1 TLU and take 44 and 27 minutes on average to access the nearest market and all weather roads, respectively.

The non-participant households spend more for health care than that of participants similar to their consumption and educational expenditures. Regarding adequacy of food produced, 39 percent of the non-participants produce sufficient for their household whereas only 20 percent of the participants do the same.

Table1. Summary statistics of the variables used in the analysis

Variables	<u>Non- Participants</u>		<u>Participants</u>		<u>Combined</u>	
	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
Educational level	3.9	0.42	3	0.29	3.4	0.26
Age	39.5	1.10	45.1	1.29	42.3	0.87
Family size (adult equivalent)	4.3	0.23	4.5	0.22	4.4	0.16
Proportion of male headed households	88	0.03	67	0.05	77.5	0.03
Cooperative membership (percentage)	73	0.04	68	0.05	70.5	0.06
Credit utilization (percentage)	37	0.05	21	0.04	29	0.03
Participation Off/non-farm activities (percentage)	25	0.04	45	0.05	35	0.03
Size of land	4.5	0.35	4	0.30	4.3	0.23

Livestock owned in TLU	4.9	0.44	3.7	0.38	4.3	0.29
TLU less oxen owned	3.6	0.35	2.8	0.30	3.2	0.23
Distance from nearest market	60.9	4.68	54.6	4.03	57.8	3.09
Distance from road	18.25	2.42	24.6	2.9	21.4	1.9
Health care expense	610.5	72.46	445.84	48.97	528.16	44.01
Diet Diversity	8.15	0.16	5.96	0.14	7.06	0.13
Adequacy of food produced	39	0.05	20	0.04	29.5	0.03
Consumption expenditure	11268.3	1339.0	7123.8	547.85	9196.1	736.33
Educational expenditure	728.56	99.09	446.68	81.99	587.62	64.92

4.2. Dimensions of Poverty

The estimation result using consumption expenditure per year per adult equivalent for the overall sample yields head count ratio of 0.285 which is explaining that 28.5 percent of the households from the overall sample households spent less than the amount of money required to meet their needs at minimum. By decomposing the result to the two interest groups (participant and non-participant households), 29.8 percent of the participant households spent less than the minimum requirement estimated by MoFED whereas, among the non-participant households 26.4 percent of them spent below the threshold level (Table 2). The head count ratio was showing that much of the participating households were under poverty than that of the non-participating households.

Table 2. Poverty index comparison on consumption expenditure

Household group	Head count ratio (P_0)	Poverty gap index (P_1)	Severity of poverty index (P_2)
Participant	0.298	0.148	0.074
Non-participant	0.264	0.103	0.041
Over all sample	0.285	0.131	0.062

Moreover, the participant households need to spend 559.6 ETB more to meet the basic requirements of the households while the non-participant households only need 389.4 ETB to move out of poverty.

Table 3. Subjective poverty of households

Characteristic		Participants (100)		Non- participants (100)		Total sample (200)		X ² -value
		N	%	N	%	N	%	
Subjective poverty	The poorest	28	28	12	12	40	20	11.03*
	Poor	38	38	36	36	74	37	
	Middle class	30	30	42	42	72	36	
	Rich	4	4	10	10	14	7	

Note: *10% Significant

To support the poverty results from the FGT model, a ladder with four steps was used to categorize farmers as the poorest, poor, middle-class and rich. Farmers in both groups (participant and non-participant) were requested to group themselves in one of the four steps of the ladder and the result indicated that farmers who participate in land renting-out market perceive themselves as poor and the poorest more than that of the non-participants.

Generally, farmers who operate their own land were in better living conditions in all measures of FGT model. In other words, individuals who participate in land renting-out were vulnerable to fulfill their basic needs. In addition, the figure from pearson χ^2 test of the subjective poverty shows that there was statistically significant difference between the participant and non-participant households. To ascertain that this difference comes mainly from participating in land renting-out PSM was employed.

4.3. Impact of Land Renting-out on Welfare

Based on the matching criteria of taking the minima of the maximum and maxima of the minimum, the common support region would lie between 0.142 and 0.818. This means that households whose estimated propensity scores of below 0.142 and larger than 0.818 were not included in the matching process. As a result, 21 households (4 from the non-participating households and 17 from participating households) were discarded from the impact analysis.

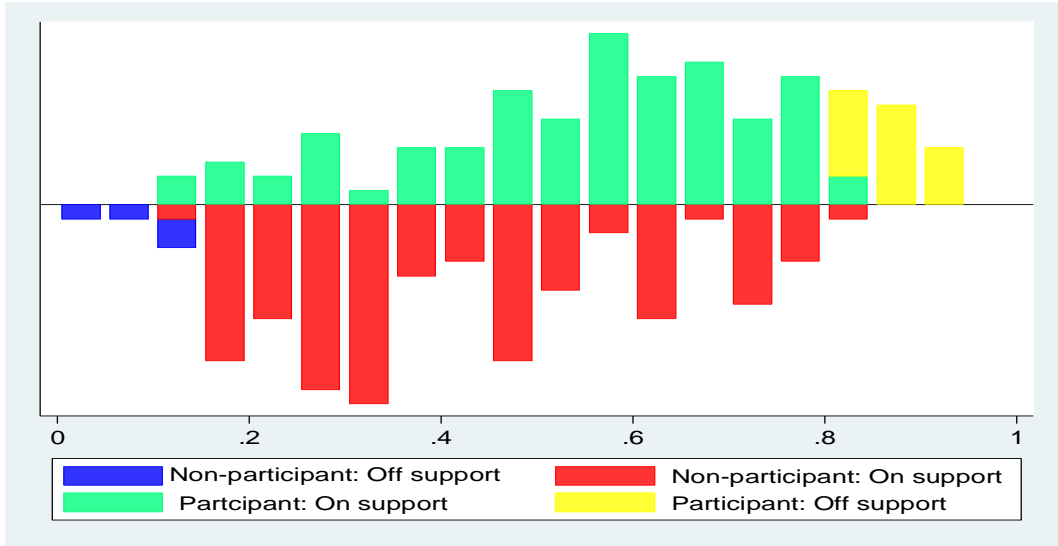


Figure 2. Summary of the common support region

The result of the average treatment effect on the treated from the PSM showed significant differences between the participant and non-participant households for all the outcome variables except minimum diets. Comparison between the two groups was made by taking the land renting-out households as a baseline, therefore, the negative mean differences in the impact results showed that the participant households are spending below the non-participant households. The participant households' annual consumption expenditure was found to be 31.4 percent lower than that of the non-participants. In regards of the diet diversity and expenditure for education, the non-participant households are in a better position compared to the participants. Moreover, to support the welfare measurement, subjective poverty was used. Thus, as the impact estimation in Table 4 showed the difference between the participating and non-participating households regarding their subjective poverty found to be significant at standard level of five percent.

Table 4. Estimates of average treatment effect (ATT)

Outcome Variables	Treated	Controls	Difference	S.E.	T-stat
Annual Consumption Expenditure (ln)	9.50	9.81	-0.314	0.114	-2.76***
Subjective Poverty	2.15	2.50	-0.349	0.140	-2.49**
Diet Diversity	6.08	8.17	-2.08	0.255	-8.18***
Minimum Diet	1.096	.996	0.100	0.077	1.30
Expenditure for education	6.098	6.559	-0.461	0.212	2.17*

*Significant at 10%

** Significant at 5%

*** Significant at 1%

5. Conclusions

The paper compared the poverty status of the two groups and evaluated whether the difference necessarily comes from land renting-out or not. To achieve the objectives the data was analyzed using both descriptive statistics and econometric models. Accordingly, FGT was used to measure poverty status of the households and PSM was utilized to evaluate the impact of participation on the welfare of the participant households using expenditure, diet and subjective poverty as an outcome variable.

The three measures of FGT (the head count ratio, poverty gap index and poverty severity index) indicated that the non-participants are better off as compared to the participants. This study also investigated that whether the reason behind this poverty difference between the land renting-out and own-operating households is participation in land renting-out or not and PSM ascertained that the difference came mainly from participation (the treatment).

Therefore, land renting-out in this study was found to have adverse impact on the welfare of the participant households. The welfare estimates showed that the non-participant households were in a better welfare than that of the participant households in their annual consumption expenditures, educational expenditure, diet diversification and subjective poverty. Finally, the result of Rosenbaum bounding procedure and Placebo regression to check the hidden bias due to unobservable selection bias showed that these estimated ATTs (consumption expenditure and subjective poverty) were insensitive, which clearly indicate its robustness.

This investigation found that land renting-out is leading farm households to severe poverty compared to owner-operators. Hence, the researcher recommends policy makers to provide policies that enable the responsible bodies to organize packages of activities that can help the farmers to operate by their own in light of these findings and that can give a way to the Agricultural office to take actions to help the farmers to operate by themselves.

6. References

- Atkinson, A. B., 1992. Measuring poverty and differences in family composition. *Economica*, 59: 1-16.
- Berhanu Nega, Berhanu Adenew, and Samuel Gebresellase, 2003. Current land policy issues in Ethiopia. *Land Reform, Land Settlement, and Cooperatives*, 11 (3): 103-24.
- CSA (Central Statistical Agency), 2015. Agricultural sample survey 2013 / 2014: Volume I report on area and production of major crops (Private Peasant Holdings, Meher Season), Addis Ababa.
- Daniel Ambaye, 2015. Land Rights in Ethiopia. In *Land Rights and Expropriation in Ethiopia* (pp. 27-92). Springer International Publishing.
- Deininger, K., Daniel Ayalew Ali, and Tekie Alemu, 2013. Productivity effects of land rental market operation in Ethiopia: evidence from a matched tenant–landlord sample. *Applied Economics*, 45: 3531-3551.
- Deininger, K., Daniel Ayalew Ali, and Tekie Alemu, 2006. Land rental in Ethiopia: Marshallian inefficiency or factor market imperfections and tenure insecurity as binding constraints. World Bank, Washington D.C.
- Deininger, K., Jin, S., and Nagarajan, H. K., 2008. Efficiency and equity impacts of rural land rental restrictions: Evidence from India. *European Economic Review*, 52 (5): 892-918.
- EPRRG (Ethiopia-Property Rights and Resource Governance Profile), 2011. Country profile Ethiopia: property rights and resource governance. [http://land wise. Resource equity. org/record/1302](http://landwise.org/record/1302).
- FDRE (Federal Democratic Republic of Ethiopia), 1995. Constitution of Federal Democratic Republic of Ethiopia, Federal Negarit Gazeta, 1st Year, No. 1, Addis Ababa Ethiopia.
- Fitsum Hagos and Kassahun Mamo, 2014. Financial viability of groundwater irrigation and its impact on livelihoods of smallholder farmers: The case of eastern Ethiopia. *Water Resources and Economics*, 7: 55-65.
- Foster, J., Greer, J. and Thorbecke, E. 1984. A class of decomposable poverty measures. *Journal of Econometrics*, 52 (3): 761-766.
- Houghton, J. and Khandker, S. R., 2009. Handbook on poverty and inequality. *World Bank Publications*.
- Hosaena Ghebru and Holden S., 2016. Land access, land rental markets and rural poverty dynamics in Ethiopia: panel data evidence using survival models. Paper prepared for presentation at the 2016 world bank conference on land and poverty. World Bank, Washington D.C, March 14-18, 2016.

- Hou, J., Huo, X., and Yin, R., 2017. Land Rental Market Participation and Its Impact on Fixed Investment and Household Welfare: Evidence from Chinese Apple Production Sites. *Sustainability*, 9 (11): p1961.
- Jin, S., and Deininger, K., 2009. Land rental markets in the process of rural structural transformation: Productivity and equity impacts from China. *Journal of Comparative Economics*, 37(4): 629-646.
- Jin, S., and Jayne, T., 2011. Impacts of land rental markets on rural poverty in Kenya. In presentation at the agricultural be applied economics association's 2011 AAEA and NAREA joint annual meeting Pittsburgh, Pennsylvania (pp. 24-26).
- Josephson, A.L., Ricker-Gilbert, J., and Florax, R.J.G.M., 2014. How does population density influence agricultural intensification and productivity? Evidence from Ethiopia. *Food Policy*, 48: 142–152.
- Kousar R., Muhammad S.A.M, and Muhammad A., 2015. Impact of land ownership on the household welfare in rural Pakistan Paper prepared for presentation at the 2015 World Bank conference on land and poverty. World Bank, Washington D.C. March 23-27, 2015.
- Larsen, A. F., and Lilleør, H. B., 2014. Beyond the field: The impact of farmer field schools on food security and poverty alleviation. *World Development*, 64: 843-859.
- Meyer, B. D., and Sullivan, J. X., 2003. Measuring the well-being of the poor using income and consumption. National Bureau of Economic Research. NBER Working Paper No. 9760.
- MoIPAD (Ministry of Information, Press and Audiovisual Department), 2001. Federal Democratic Republic of Ethiopia Rural Development Policies, Strategies and Instruments (Amharic version). Addis Ababa.
- Musa Hasen Ahmed, 2015. Adoption of multiple agricultural technologies in maize production of the Central Rift Valley of Ethiopia. *Studies in Agricultural Economics*, 117(3): 162-168.
- NBE (National Bank of Ethiopia), 2015. Annual report of National Bank of Ethiopia. Addis Ababa, Ethiopia.
- Sosina Bezu, and Holden, S., 2014. Are rural youth in Ethiopia abandoning agriculture? *World Development*, 64: 259-272.
- Teshome Chala, 2016. Analysis of politics in the land tenure system: Experience of successive Ethiopian regimes since 1930. *African Journal of Political Science and International Relations*, 10(9): 111-118.
- Sosina Bezu, Barrett, C. B., and Holden, S. T., 2012. Does the nonfarm economy offer pathways for upward mobility? Evidence from a panel data study in Ethiopia. *World Development*, 40(8): 1634-1646.
- Yonas Alem and Söderbom, M., 2012. Household-level consumption in urban Ethiopia: The effects of a large food price shock. *World Development*, 40(1): 146-162
- World Bank, 2014. Introduction to poverty analysis. World Bank, Washington D.C.