The Evaluation of Resettlement Populations on the Income of Settler's in Sasiga Woreda, East Wollega Zone, Oromia Regional State, Ethiopia

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Abstract

The study evaluated the burden of resettlement Populations on the settler's income in Sasiga Woreda of East Wollega Zone Oromia, Ethiopia. Some of the resettlement schemes around the world failed, while some others were successful. The objective of the study was to identify facators that cause resettlement and evaluate the burden of resettlement on the settler's's annual income in study area.The study was based on cross-sectional data collected from a sample of 140 settlers (81 were Populations participants and 59 were non-Populations participants) using purposive and stratified random sampling techniques. Descriptive statistics and econometric models were employed to analyze the data. The Logit model indicated education status of the settlers, availability of credit access, availability of agricultural inputs, land farm size holding by settler's, farm income of settler's were negatively and significantly related to Populations participation while shocks, livestock holding by settler's, access of extension service, and total asset of settler's were positively affect and significantly associated with Populations participants. Propensity score matching shows, that the average annual income of resettlement Populations participants more than income of non participant by 29,182.6463 ETB. Based on the findings, the study suggests that strengthening the encouragement of resettlement Populations have crucial role towards improving the income of settlers in the study area. Finally, the policy implication of the study is that income sources diversification, incorporated development Populations , practical based extension service delivery, access to credit service for the purchase of agricultural inputs and its preparations are needs policy attention.

Keywords: Resettlement Populations me, Propensity score matching, Settlers' income, Sasiga Woreda.

1. INTRODUCTION

Resettlement is a population movement planned directly by the government or private developers, where an area is chosen in order to resettle the population (Sherbinin *et al*., 2010). If, resettlement is effectively used, it is a vital to realize these entire notions, and to proactively plan for resettlement as part of equipped protection approach (UNHCR, 2012). The effect of resettlement is more on women than men (Bisht, 2009, Terminski 2013). The resettled settlers have restricted options to rebuild their livelihoods (Wilmsen et al. 2011 and 2015) Ogwang et al. 2018b).

Many African governments to respond to the mismatch of Population numbers and environmental conditions, inter alia, to cope with landscapes that could not sufficiently care for their inhabitants have employed resettlement (Tilt B, 2016).

The other way of resettlement scheme would be implemented through centrally planned coordination of the government policy intervention. This was really practiced in Ethiopia at different administrative regimes where the areas were selected by resettlement administering authorities, without consultation of the host communities and assessment of the area (Adugna M. 2012). On the other hand, a change in any one of these assets may result in a difference in the income assets of the settlers either positively or negatively (Zeleke,T., 2014,P 36).

1.1. STATEMENT OF THE PROPLEMS

As several researchers have tried to assess the resettlement schemes and identified practical evidences on factors affecting success or failure of resettlement Populations s, some of the resettlement schemes around the world failed, while some others were successful. This is due to the proper planning, site selection, size of land allocated to settlers, land tenure and farming systems, management and administration. (Woldeselassie, 2014, Gebregzihabher, 2014). In China, studies found that resettlement is associated with a range of negative burden s on communities, such as reduced land holdings (Tilt, B.; Gerkey, D, 2016), reduced access to natural resources and ecological services (Wilmsen, B.; Webber, M.;2015 and Yuefang, D. 2011), declined settler's incomes (Sikka, G.; Mathur, V, 2015). Besides, McDonald et al. (2018) investigated different villages after resettlement and found that some villages have higher incomes than others. Most existing literature on resettlement in developing regions, including Africa, has focused on the general effects (Quetulio-Navarra et al. 2014; Kyomugasho 2016: Ogwang et al. 2018a). A major cause of resettlement in Africa is the exploitation and transportation of raw materials and the creation or

expansion of conservation areas. During the 1970s and 80s, the most drought stricken areas were limited to northern Ethiopia, especially Wallo and Tigray. Previous studies found that resettlement have negative burden s on the socio-economic conditions of the local regions (FAO, 2016). For instance, Desalegn (2018) identified that resettlement would cause disruption by causing impoverishment of host communities, destruction of productive assets, and disruption of the social fabric. Dwivedi (2017) added that resettlement could result in asset and job losses, the breakdown of the social and food security, credit, labor exchanges, networks, social capital and kinship ties. In addition, Heggelund (2010) found that the resettlement in Three Gorges Project displaced local people to dissimilar places, which caused their social networks to become disconnected and also led to potential variation with the new host community. Studies by Kassahun and Shiferaw (2017) shows that relocation was said to have preserve the life and was a dark spot in the settlement history of the country.

The suffering brought by displacement and resettlement makes it hard for the women to adapt in the new environment (Terminski 2013). A study by Ogwang et al. (2018b) in the Albertine region of Uganda indicated that shortage of land and exploitation of the cash from compensation on treaties and freedom by men led to family collapse. The resettled settlers have limited options to reconstruct their livelihoods (Wilmsen et al. 2011). A study by Yankson et al. (2018) indicated that several challenges such as water scarcity, decreased access to forest products such as charcoal and firewood, and reduced access to fertile soils constrain the coping strategies of resettled communities. Therefore, this research contributes to fill the gap in the literature in this regard. So the research goal is to respond the following research questions:

1.2. RESERCH QUESTIONS
1. Did resettlement affect the income level of the settlers? If yes, by what amount (positively or negatively?)
2. What are the burden of the resettlement Populations me on the settler's's annual income?

2. RELATED LITARACTURE REVIEW
2.1. Resettlement at the international level
Resettlement is a lifeline open to some of the world's most vulnerable refugees (InaStrøm, 2017). According to the WBED report, transportation was the cause of 24.6 percent of resettlement projects between financed by World Bank and active in 1993. Resettlement is recognized today as a vital instrument of international protection, integral to comprehensive protection and durable solutions strategies(UNHCR, 2011, 2017). In 2010, a massive earthquake in Haiti displaced over 1.5 million people. By 2012, more than 100,000 transitional shelters had been built across Haiti and 420,000 individuals had resettled in the United States of America. Extreme weather events in 2015 and 2016 further affected food access and agricultural production (NMUN.NY, 2016).

2.2. Resettlement in Africa
In Africa, resettlement is a serious matter of current as well as future concern. Africa's share of displaced people has been exceptionally high (Ohta and Gebre 2005). In some cases, local congestion was so serious that people were no longer able to produce enough food to feed their families and had to be assisted with food by the government (Mwiza, 2010). Resource redistribution is also another factor for displacement. The contested land reform and resettlement Populations me of Zimbabwe and Namibia is a typical example (Chimhowu and Hulme 2006).

2.3. Resettlement in Ethiopia
Resettlement under the Imperial regime: The major objective of the plan was not food insecurity and famine as they were principal causes in the later government rather to relive population pressures in the highlands (Desalegn, 2003b). Nevertheless, these were habitually small in size, informal in nature, and were mainly designed to achieve specific and limited objectives (Berhane 2003). Resettlement under the Derge: The basic rational to design the policy of the Derg in relation to resettlements was the defective estimate of unutilized and underutilized land resources found particularly in the southwestern parts, and south of Ethiopia. Resettlement under the EPRDF:The basic assumptions behind the current resettlement Populations me remain similar to those made during previous periods (Imperial and Derg regime). Official declaration, voluntary resettlement is view as a main and essential factor of endeavours aimed at addressing the paramount problem of food insecurity in Ethiopia (GFDRE 2001).

2.4. Cause of the resettlement in Ethiopia
The official objective of resettlement plans in Ethiopia, both in the past and current regimes, as stated in various documents, was to prevent famine or attain food security) by moving people from drought-prone and overloaded areas to lightly populated regions and unoccupied virgin lands (Yntiso 2002). The rapid population growth particularly in rural areas has decreased the size of land holding leading to landlessness and deterioration of the environment which were considered as causes of migration and resettlement (Ahmed Mohammed, 2005).

2.5. Functions of Resettlement

States are not obliged to accept refugees for resettlement, but rather voluntarily offer resettlement places as a tangible expression of international solidarity (UNHCR, 2014). Following the resettlement Populations there is considerable damage to the natural vegetation of the study area. Large areas are cleared of their vegetation for crop production, to build homesteads and to acquire fuel wood (Haile, 2007).

3. METHODOLOGY

The researcher was used qualitative and quantitative data and cross-sectional design. The data had been collected using open ended and closed ended questionnaires. For the analysis of the data both descriptive and econometric analyses was employed. The sampling frame for this study was rural resettled and non settled settlers that are living in lowland/kola. The study was employed different sampling techniques to select the representative samples due to obtain both residents. Sasiga woreda has 27 kebeles of which 26 was rural and one (1) were Town kebeles having resettlement dwellers. Firstly, the Sasiga Woreda was purposively selected. In addition to this, three kebeles which had settler's and non-settler's populations namely, Gudina, Bareda, Shonkora had been selected from 27 kebeles of the Woreda purposively and by simple random sampling. The selection of these kebeles are due to the majority of the settlers dwellers are new resettles', which were settled in 1995EC/2003GC coming from Western Harargeh and the origin populations were less than these settlers. The total populations survive in the selected kebeles were 13145. The sample frame of the settlers and non-settlers from the three kebeles were 13,142 from these (5764) settler populations and (7378) original populations of which 2657 male and 4721 female non-settlers and 2567 male and 3197 settlers). From the total population 13142of the three kebeles 5,224 are male and 7,918 female. Thirdly, adequate Respondent settlers had been selected from both settlers and non-settlers by using systematic Random sampling techniques from selected kebeles. Hence, **140 settlers** had selected randomly for the study from these sample kebeles including both male and female-headed settlers (Source: Sasiga Woreda office, 2020).

3.1. Methods of Data Analysis

The study was employed both descriptive statistics and Econometric model. Statistical descriptions like table, graph, frequency descriptive, inferential statistical methods and percentages, Logit model and Propensity Score Matching method (PSM) were employed for analyzing and interpreting the data.

Conventionally, linear regression analysis was widely used in most economic and social investigation because of availability of simple computer packages, as well as ease of interpreting the results. However, according to Amemiya (1981), Maddala (1997) and Gujarati(2004) the linear probability model has an obvious defect in that the estimated probability values can lie outside the normal 0-1range and that it models the probability of Y=1as being linear: $Pr(Y=1|X)=\beta_0 +\beta_1 X$.

3.2. Econometric Model Specification

The study was affected by the independent variables such as demographic factors, social factors, Economic factors, and sources of income factors, settler's education, and factors causes' resettlement. The major pillars of this model are individuals, treatment and potential outcomes. The treated settlers were from the resettlement Populations participants and the control group will from the non-participants for comparison. In order to overcome the problem Propensity score matching method will be applied for burden evaluation in the absence of baseline survey data. Imbens (2000) and Lechner (2001) when leaving the binary treatment case the choice of multinomial logit is quite easier to analyze dichotomous variables and approaches relatively preferable mathematical performance to estimate. In the cause of binary treatment the treatment indication Di equals 1 if individual i received treatment and 0 otherwise.

The potential outcomes were then defined as Yi (Di) for each individual i, where i =1…, N and N denoted the total population. The treatment effect for an individual i was written as:

T = Y (1) – Y (0)

A logit model would be used to estimate propensity scores using a composite of pre-intervention characteristics of the sample settlers (Rosenbaum and Rubin, 1983) and matching was then performed using propensity scores of each observation. In estimating the logit model, the dependent variable was resettlement Populations me participation, which took the value of 1 if a settler's participate in resettlement and0 otherwise. The specification of the logit model was as follows**:**

We begin from the linear probability model of the form:

$$P(y = 1 / xi) = Zi = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + - - - + \beta_k x_k - - - - - - - - - - (1)$$

$Pi = \dfrac{1}{1+e^{-zi}}$ is simplified to:

$$Pi = \frac{e^{zi}}{1+e^{zi}} \text{---(2)}$$

Where, Pi is the probability that the ith settlers will participate in resettlement, z_i -is a linear function of 'n' explanatory variables (x) and will be expressed as:

$$Zi = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + - - - + \beta_k x_k + Ui - - - - - - - - - - - - - - -(3)$$

Where, β_0 -intercept, β_i - regression coefficients to estimate, U_i– is an error term.

$$1 - Pi = \frac{1}{1+e^{-zi}} \text{is simplified to:}$$

$$1 - Pi = \frac{1}{1+e^{zi}} \text{--(4)}$$

Where $1 - Pi$ is the probability that a settler's belongs to the non-Populations me participant.

$$\frac{Pi}{1-Pi} = \left(\frac{1+e^{zi}}{1+e^{-zi}}\right) = e^{zi} \text{or}$$

$$\text{Or} \left(\frac{Pi}{1-Pi}\right) = \left(\frac{e^{zi}}{1+e^{-zi}}\right) = e^{\left(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + - - - + \beta_k x_k\right)} - - - - - -(5)$$

This is known as Odds ratio. Taking the natural logarithm of the Odds ratio, thelogit model is:

$$Li = \ln\left[\frac{Pi}{1-Pi}\right] = \ln e^{\left(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + - - - + \beta_k x_k\right)} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + - - - + \beta_k x_k \ldots (6)$$

Where x_1, x_2, ………….., x_k are demographic, social and Economic factors that cause resettlement which will be included in the above econometric model.

3.3. Evaluation the burden of resettlement on income of settler population
Propensity scores and PSM

Prior to analyzing the burden of resettlement Populations by employ PSM matching algorithms, logit regression model is used as a necessity to identify the Populations participant's annual income in order to understand the importance of resettlement Populations. The model is estimated with STATA software using the propensity score-matching algorithm developed by Leuven and Sianesi (2003). Propensity score matching (PSM) build a statistical evaluation group that is based on a model of the probability of participating in the treatment, using observed characteristics. Population's participants are then matched on the basis of this probability, or propensity score, to nonparticipants of the Populations. The average treatment effect of the Populations is then deliberate as the mean distinction in outcomes across these two groups. The validity of PSM depends on two circumstances: (a) conditional independence (namely, that unseen factors do not affect participation) and (b) sizable common support or overlap in propensity scores across the participant and nonparticipant samples (Shahidur R. Khandker,Gayatri B. Koolwal & Hussain A. Samad, 2010).

Relocated people suffer from the loss of farmland, forestland, houses and other properties, which may then reduce their income (Wang, P, 2013, Tilt and Gerkey 2016). McDonald et al. (2018) found resettlement could have positive burden s on maintaining and raising the income level of the resettled community. Galipeau et al. (2013) compared the distinction between a resettled community and a non-resettled community in term of income and landholding, showing that resettled communities have a higher income level.

The establishment of this counterfactual often creates problems where before intervention situation remains missing. Burden through this outcome variable was obtained by matching an ideal comparative group (non-settler farmers) to the treatment group (settler farmers) based on propensity scores (P-scores) of X. X was the set of observable characteristics that determine settlement participation. By so doing, the selectivity bias was largely eliminated.

Equation 1 below presented the basic evaluation problem comparing outcomes *Y* across treated and non-treated individuals *i*:

$$Y_i = \alpha X_i + \beta T_i + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(1)$$

Here, T is a dummy equal to 1 for those who participate in resettlement Populations and 0 for those who do not participate in the Populations. X was set of other observed characteristics that determine participation in resettlement and 'ε' is an error term reflecting unobserved characteristics that also affect Y.To develop the PSM model, let Y_i be the outcome variable of settler's i, such that Y_{1i} and Y_{0i} denote settler's outcomes with and without participating in resettlment, respectively. A dummy variable T_i denotes rettlement participation by settler's i, where $T_i = 1$ if the settler's had participated in resettlement and, $T_0 = 0$, otherwise. The outcome observed for settler's i, Y_i was defined by the switching regression (Quandt, 1972).

$$Y_i = T_i Y_{1i} + (1-T_i)\ Y0i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The burden of resettlement on income of settler i's is given by;

$$\Delta_i Y_i = Y_{1i} - Y_{0i} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.\ldots(3)$$

Where, $\Delta_i Y_i$ denotes the change in the outcome variable of farmer i, resulting from participation in resettlement. A farmer cannot be both ways, therefore, at any time, either Y_{1i} (resettling farmer) or Y_{0i} (non-resettling famer) is observed for that farmer. This gives rise to the selectivity bias problem (Heckman et al., 1997). For this study, ATT was used to estimate the burden of rettlement on income of settler population and it was represented as follows:

$$ATT = \{E(\Delta_i|I_i =1)\} = E\{Y_{1i} - Y_{0i}|I_i=1\} = E\{Y_{1i}|I_i=1\} - E\{Y_{0i}|I_i=1\} \ldots\ldots\ldots\ldots.. (4)$$

From equation (4), $E\{Y_{0i}|I_i=1\}$ was the missed data representing the outcomes of non-resettling group. The outcomes of non-resettling farmers could rewritten as:

$$E\{\Delta_i|I_i=1\} = E\{Y_{1i}|I_i=1\} - E\{Y_{0i}|I_i=1\} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

However, a bias of the magnitude indicated in equation (6) below results when non-resettling farmers were selected for comparison with settling farmers, without controlled for the non-random resettlement assignment (Namara, 2014).

$$Bias = E\{\Delta_i|I_i=1\} + \{E[Y_{0i}|I_i=1] - E[Y_{0i}|I_i=0]\} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Finally, up on establishing common support for the resettler farmers, the ATT of resettlement on settlers' income can then be estimated using the following equation:

$$ATT = \left[E(\Delta_i|I_i = 1] = \frac{1}{I_i} \sum (Y_{0i})I_i = \frac{1}{I_i} \sum \Delta_i I_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots(7) \right.$$

Table 3.1: Summary of Variables included in the models

S/n	Variable		Units of measurement	Expected Sign
1	Progptn	participation in resettlement Populations me	Dummy (Populations participant=1, not participant=0)	
2	Totinc	Total annual income(outcome variable)	Continuous: Measured in Birr or total annual income in birr.	
3	Gen	Gender of settler's	Dummy: 1 if male, 0 otherwise	-ve
4	Age	Age of house hold head	Continuous Measured in year	+ve/-ve
5	Educ	Educated settler's	Dummy: 1 if Literate , 0 Otherwise (Illiterate)	+ve
6	Famsize	Family size of settler's	Continuous	+ve/-ve
7	Farmsize	Farm size	Continuous in hectare	+ve/-ve
8	Shoc	Shocks	Dummy, 1(if there is drought & famine), 0 otherwise (shortage of land)	-ve
9	Nfarminc	Total Non-farm income	Continuous: measured in br.	+ve
10	Farminc	Total farm income	Continuous in Ku or Kg	+ve
11	Craa	Credit access	Dummy (No=0 , Yes =1)	+ve
12	Extns	Extension service	Dummy (access=1, no access=0)	+ve
13	Acoirrin	Access of irrigation	Dummy 1 If irrigation access, 0 if no access	+ve
14	Dismark	Distance to market	Continuous: Walk hours	-ve/+ve
15	Livestock	Livestock holding	Continuous measured in TLU	+ve
16	Totasset	Total settler's asset	Continuous Measured in br/number/hectare	+ve
17	Agrinp	Access of agricultural input	Dummy: 1 if access to agri. input, 0 otherwise.	+ve/-ve

Source: Own Estimation, 2020.

4. RESULT AND DISCUSSION

4.1. Descriptive Analysis of Sample Settlers Characteristics

The results of descriptive analyses were presented in the form of mean, mean difference, standard deviation, frequency distributions and percentage. The descriptive statistics was runned to observe the distribution of the independent variables. The socio-demographic, socio-economic and institutional characteristics of the respondents' settler's heads were analyzed. The sample under consideration consists of 140 settlers. Of the total, sample respondents 81 (57.86%) were participants of the Populations and 59 (42.14%) were non-participants of the Populations.

Chi-square ($\chi 2$) and t – statistics tests were used to identify whether the explanatory variables are statistically significant or not significant. The t-test was used to test the significance of the mean value of continuous variables of the two groups of participants and non-participants and chi-square ($\chi 2$) was used to test the significance of the mean value of the potential discrete (dummy) explanatory variables. Generally, in this section socio-demographic characteristic of sample settlers such as gender of settler's heads, age of settler's heads and total family size; economic characteristics of sample settlers such as livestock holding, farm land size and inputs of production used; settlers characteristics or attributes such as education status of settler's heads and accessibility to information; institutional characteristics such as availability of extension services and credit services characteristics of sample settlers and distance of settler's residence from nearest to water source, nearest to health, nearest to school and nearest market center for discrete as well as continuous variables were analyzed.

4.2. Settlers Socio-Economic Characteristics

Settler's farmland size holding: The average mean of land holding of the surveyed settlers equal to 3.69 ha with a minimum of 2and a maximum of 12 ha. This figure is larger than the average national figure, which is 1.2ha (CSA, 2008) indicating the existence of relatively higher land holdings in the study area. Even though this figure is over than the national average, there exists a high gap among farmers based on their farmland holdings. The average mean of land size for Populations participants and non-participants were 5.54 and 2.35 respectively with the mean difference of 3.197. The average family size of the surveyed farm settlers equals to 8.06. This is slightly higher than the national average of 6 members (CSA, 2008).

Settlers Livestock Holding: This reveals the total livestock the farmers own in tropical livestock unit. It is a proxy variable for the wealth position of the farmers. The study area was known by mixed crop- livestock farming.

Average livestock owned in TLU by each farm settler's equals to 7.79. The minimum and maximum livestock owned is 1 and 20, respectively. The draught power used for different farming activities was taken as major source of production in the study area. The settler's farmers with higher number of oxen would be more confident to produce more crop grains rather than counterparts because they had one of the most important factors of production, which creates confidence in hearts of the settler's's farmer for crops production. Majority of farmer settlers attained their income from mixed farming (like beef cattle rearing for commercialization and production, rarely dairy farming, grain crop production and others). The average number of livestock owned by each farmer was equal to 7.79 in TLU with standard error of 0.245and a 95% confidence interval of [7.308   8.278].

Settler's heads access to Agricultural input (agrinp): Regarding to agricultural inputs from the total sampled settlers 85(60.71%) access to agricultural inputs while 55 (39.29) farmers were not access to agricultural inputs. The mean difference between those gained agricultural inputs in the Populations participation and non-participation were 0.27. Generally, the null hypothesis' was rejected, due to our variable, access to agricultural input was more important in our study.

Institutional Factors: From the total 140 farm settlers 83 (59.29%) settlers had been credit access while the remaining 57 (40.71 %) settlers did not have access to credit. The mean difference between Populations participants and non-participants on credit access was 0.56. It is statistically significant at a significance level 1%, 5% and 10% [2.624, 1.761, and 1.345] respectively. Therefore Ho: is rejected. It means that our variable was important in our study. Of the total respondents, 105 (75%) settlers had access to extension while the rest 35 (25%) did not have access to extension. The average mean of credit access of those participating in resettlement Populations were 0.73 while non-Populations participants mean average of access to credit were 0.78. Usually, the null hypothesis' was rejected, due to our variables (access to credit, and access to extension services) were more vital in our study.

4.3. Hypothesis testing and econometric model results
1. Hypothesis Testing
Table 4.1: Summary results of LR test of hypotheses for the aforementioned results

Null hypothesis	Calculated LR ratio	Critical LR at 5% level	Decision rule
$\beta_1 = \beta_2 = \ldots \beta_{14} = 0$	139.66	6.57	Reject Ho
$\delta_1 = \delta_2 = 0$	8.36	0.013	Reject Ho
$\beta_1 = \beta_2 = \ldots = \beta_6 = 0$	34.56	1.635	Reject Ho

Source: Own computation from survey data (2020)

4.4. Results of Logit model for resettlement Populations participation decision of the sample settlers
As already mentioned, this study employed the logit model to estimate and conclude the parameters of the determinants of farmers' resettlement Populations participation decision in the study area. The frequency distribution of resettlement Populations participation reveals that out of the 140 total sampled settlers, 81 settlers (57.86%) were participants in the Populations while the remaining 59 (42.14 %) were non-participants of resettlement Populations . Thus, the result expose that more than half of the sampled respondents were Populations participants.

Table 4.2: Estimates of Maximum-likelihood logit model on the determinants of resettlement Populations participation.

Progptn	Coef.	Std. Err.	Z	P>z	[95% Conf.Interval]	
Gen	-.1659368	1.805019	-0.09	0.927	-3.703709	3.371835
Educ	-2.098819	.9166884	-2.29	0.022**	-3.895496	-.3021432
Craa	-1.884239	1.010618	-1.86	0.062*	-3.865014	.0965356
Extns	2.453423	1.123667	2.18	0.029**	.2510768	4.65577
Agrinp	-1.697162	.86886	-1.95	0.051*	-3.400097	.0057718
Shoc	3.157063	1.2286	2.57	0.010**	.7490517	5.565074
Famsize	.3221672	.2140418	1.51	0.132	-.097347	.7416813
Age	-.0125211	.0564392	-0.22	0.824	-.1231399	.0980976
Dismark	-.0623245	.0576121	-1.08	0.279	-.1752422	.0505932
Livestock	.3418422	.1365745	2.50	0.012**	.0741612	.6095233
Farmsize	-1.26825	.3594521	-3.53	0.000***	-1.972763	-.5637372
Nfarminc	3.50e-06	9.65e-06	0.36	0.717	-.0000154	.0000224
Farminc	-.0000226	7.93e-06	-2.85	0.004***	-.0000382	-7.08e-06
Totasset	.0000279	.0000117	2.38	0.017**	4.95e-06	.0000508
Constant	.1390963	3.129724	0.04	0.965	-5.99505	6.273242
Logit Regression						
				Number of observation		140.000
Mean of dependent Var.		0.579		LR chi2(14)		139.67
SD of dependent Var.		0.496		Prob > chi2		0.0000
Log likelihood		-95.304848		Pseudo R2		0.7328
***p<0.01, ** p<0.05, * p<0.1						

Source: Own computation from survey data using stata14.2 (2020)

***, ** and * shows significance at 1%, 5% and 10% significance levels, respectively.

Out of the total 14 explanatory variables, 9 variables of which 5 were dummies and 4 continues variables were found to be significantly creating variation on the probability of farmers' resettlement Populations participation.

The coefficients of gender of settler's head, age of settler's heads in years, family size of settler's heads in number, distance from market in kilometers and non-farm income were not statistically significant at all 1%, 5% and 10% significance levels implying that they were less important in affecting the probability of participation in resettlement Populations .

Nevertheless, under logit model coefficient of the variable have no direct interpretation; as a result, we can use Marginal effect. Logit is all about prediction for interpretation and hence, we must find predicted probabilities to interpret the significant variables. Therefore, interpretation can be derived from the marginal effects after logit.

Table 4.3: Estimation of Marginal effects after logit regression

Marginal effects after logit

y = Pr (progptn) (predict)

= 0.76763364

Variable	dy/dx	Std. Err.	Z	P>z	[95% C.I.]		X-bar/mean
gen*	-.0283911	.29758	-0.10	0.924	-.611638	.554856	.957143
educ*	-.3821786	.14572	-2.62	0.009	-.667778	-.096579	.457143
craa*	-.3045143	.15859	-1.92	0.055	-.615346	.006317	.592857
extns*	.5150614	.20673	2.49	0.013	.109879	.920244	.75
agrinp*	-.2734329	.13802	-1.98	0.048	-.543953	-.002913	.607143
shoc*	.4686937	.12067	3.88	0.000	.232194	.705193	.392857
Famsize	.0574657	.04044	1.42	0.155	-.021805	.136736	8.06429
Age	-.0022334	.01015	-0.22	0.826	-.02213	.017663	45.3857
Dismark	-.011117	.00989	-1.12	0.261	-.030497	.008263	17.6214
livest~k	.0609752	.02561	2.38	0.017	.010785	.111165	7.79286
Farmsize	-.2262206	.07985	-2.83	0.005	-.382727	-.069714	3.69286
Nfarminc	6.24e-07	.00000	0.37	0.711	-2.7e-06	3.9e-06	22201.4
Farminc	-4.03e-06	.00000	-3.25	0.001	-6.5e-06	-1.6e-06	124758
Totasset	4.98e-06	.00000	2.29	0.022	7.1e-07	9.2e-06	181864

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source: Own computation from survey data using stata (2020)

4.5. Interpretation of Significant Variables

Education status of settler's head (educ): The coefficient of this variable was significant at 5% level of significance and it is influencing resettlement Populations participation negatively. Our result was showed that educated settler's heads did not more involve in resettlement Populations. Educational attainment by the settler's head could lead to awareness of the possible advantages of resettlement Populations in order to innovation of new site due to enhance settler's incomes.

The marginal effect of the variable shows that keeping all other variables constant at their mean value, educated settler's heads have 38.2% times less probability of participation in resettlement Populations than those illiterate settler's heads. It is agreed by the finding of Vande Walle (2000) and Melaku (2014).

Credit access (craa): Farmers who have credit access are fewer participants in resettlement Populations. Therefore, access to credit influences the farm settler's participation in resettlement negatively. The study result also reveals that credit access is statistically significant at 10% level of significance and a change from no credit access to access decreases the probability of the decision to join resettlement Populations other things remain constant, settlers those had access to credit has30.45%less probability to participate in the Populations me than their counterpart. It is supported by Muez (2014) and Adugna, (2012).

Access to extension services (extns): access to extension service influences the farm settlers participation in resettlement Populations is positively associated with settler's total income and statistically significant at 5% of probability level. This result was decided with Adugna, (2012) and Muez (2014). The marginal effect of the variable indicates that settler's access to extension service of the discrete effect change from 0 to 1 in access to extension service decrease the probability of participation in resettlement Populations by 51.51 percentage points than their counterparts others remain constant at their mean value.

Access to agricultural input (agrinp): Farmers who have access to agricultural input can increase their income rather than those who have no access agricultural inputs. So this implies that decrease the participation in resettlement Populations as compared to those who do not have access. The study result also reveals that access to agricultural input is statistically significant at 10% level of significance and a change from no access to access agricultural input decreases the probability of the decision to join the Populations by -27.34% higher than their counterparts, holding other variables constant. It is decided in by the finding of W.Zeweld et, al. (2015).

Shocks (shoc): The coefficient on the shocks (drought & famine) is significant at 5% level of significance with positive sign. The result indicates that being exposed to shocks (droughts and famine) increase the likelihood of settler's participation in the resettlement Populations by 46.87% than settlers not exposed to shocks. It is agreed by A. Arnall (2014).

Livestock: livestock holding, measured in tropical livestock unit, was found to have positive and significant effect at 5% level of significance on the probability to participate in resettlement Populations. The positive relationship indicates that settlers with larger livestock holding may migrate to new site to feeding his/her livestock's. In the study area marginal effect of this variable shows that as the number of livestock in tropical livestock unit increases from its mean value by one unit, the chance to participate in resettlement Populations increase by 6.098% points, while keeping all covariates constant at their mean value. The evidence of this finding reflected in contrast to the idea that farmers who have enormous number of livestock are wealthier and have sufficient number of oxen to plough their field timely as a result of which they quickly decide to participate in the resettlement Populations. This is in line with the result of Asayehegn et, al. (2011) and Hadush (2014).

Farmland size in Hectare (farmsize): This is the total land size owned by each sampled settler's heads given in hectare. The result of this study showed that size of farmland has a negative significant effect at 1% level of significance on the probability of farmers' decision to participate in resettlement Populations. Farmer settlers that had large farm size did not participate in resettlement Populations since he/she has sufficient land used for mixed farming system both crop production and livestock rearing. The marginal effect of this variable reveals that, a marginal change in farm size from the average of 3.693hectare is associated with a 22.62% points decrease in Populations participation, keeping other variables constant at their mean average. This result against the expectation supported by Asayehegn et al., (2011), as Asayehegn finding settlers having large cultivated land has more income but my finding were against this finding.

Farm income of Settler's (farminc): The coefficient on farm income of the settler's's head is significant at 1% of significance level with negative sign. The marginal effect of this variable shows that as farm income from mixed farming source increases from mean value (124758.2) by one Birr, the probability of participation in resettlement Populations less by 4.03×10^{-6} percentage (-0.000403%) than their counter parts, while other variables were kept constant at their mean value. The result of this finding is in line with the findings of Jamal Haji & Mohammed Aman (2013).

Total asset owned by settler's (totasset): Settler's total asset was found to have a positive effect on the Populations and significant influence on the probability of participation in resettlement Populations of the settler's heads. Financial and social resources were to some extent available, while natural capital like land resource was the abundant assets for each sampled settlers in the study site as the researcher discussed with respondents. This

variable is statistically important at 5% level of significance. The marginal effect results showed that a one Birr increase in total asset of settler's heads from the average/mean 181,864increases the likelihood of participates in resettlement Populations by 4.98x10^{-6}percentage whereas other factors remaining constant.

4.6. Burden Evaluation and Propensity scores

Without information on the counterfactual, the next best alternative is to compare outcomes of treated individuals or settlers with those of a comparison group that has not been treated. In doing so, one attempts to pick a comparison group that is very similar to the treated group, such that those who received treatment would have had outcomes similar to those in the comparison group in absence of treatment. Successful burden evaluations hinge on finding a good comparison group (Shahidur R. Khandker,Gayatri B. Koolwal & Hussain A. Samad, 2010).

Prior to analyzing the burden of resettlement Populations by employ PSM matching algorithms, logit regression model was used as a necessity to identify the Populations participant's annual income in order to understand the importance of resettlement Populations. As indicted in the former sections the dependent variable in this model is a twofold variable indicating whether the settler's head was resettlement Populations participant or non-participant. The model was estimated with STATA 14.2 4.7.

4.7. Evaluation of Burden of Resettlement on Income of Settler settler's by Propensity Score Matching

Under this, Propensity score use logit model to estimate the probability of each group i.e., resettlement participants and non-participants as a function of observable covariates. The result of propensity score matching of Populations participant and their counterpart was used to define the common support region. Supplementary, the quality of matching algorithms also identified in orientation to the propensity scores pseudo R^2 and significance level of each covariates. Table {4.6} shows the logit estimation results or marginal effect after logit of sample settler's head in the Populations were used to create propensity score.

The Pseudo R^2 which makes clear to how well the regressors explain the participation probability is 0.7328 for logit model is larger. A large pseudo-R^2 value shows that resettlement Populations participants' settlers do have some divergent individuality overall and automatically finding a good match between participants and non-participants settlers becomes less challenging. Depending on the propensity score-matching distribution of both resettlement Populations participants and non-Populations participants, the common support region was identified. As shown on table {5} below the estimated propensity scores vary between 0.0442142 to 1 for the Populations participant and 1.36x10^{-15}to 0.908626 for non-participant.

The common support region is area, which lies between 0.0442142 up to 1, is larger than that of none Populations participant common support region [1.36x10^{-15} to 0.908626]. Therefore, settler's who estimated propensity score is less than 1.36x10^{-15}and larger than 0.908626 were surplus from common support region. So observations which lie outside this region are discarded from analysis. It is support by (Marco & Sabine Kopeinig, May, 2008). Thus, 56 settlers from Populations participant were out of the common support region while 25 settlers' heads' were involved in common support region.

Table 4.4: Distribution of estimated Propensity Score matching.

Resettlement Populations	Sample size	Mean	Std. Dev.	Min	Max
Total observation	140	0.5791825	0.4341378	1.36x10^{-15}	1
Participants	81	0.9030572	0.1930847	0.0442142	1
Non-participants	59	0.1345411	0.229484	1.36x10^{-15}	0.908626

(Source: Own computation survey data, 2020)

4.8. Matching algorithms

According to Khandker et al (2010), comparing different matching methods results is one approach to check robustness of average treatment effect. Four matching algorithms (i.e., Nearest Neighbor matching, Radius matching, Caliper matching, and Kernel matching) were checked to choose the best matching methods. The choice of matching estimators was based on pseudo R^2, matching sample size; mean test referred to as to balance test and insignificancy of variables in analysis after PS matching. Low pseudo R^2 value and large matched sample size is preferable. In order to accept the findings of PSM, it is suggested that the standardized mean difference needs to be at most 20% and the pseudo R^2needs to be low after the matching process (Rosenbaum, 2005; Caliendo and Kopenig, 2008). In line with those authors, the researcher would be obtained the least amount of pseudo R^2 that was 5.5% and 80 number of matched observation.

Thus depending on the kernel matching criteria, kernel(0.5) was selected in which the mean difference of the two groups explanatory variables were significant, Pseudo R^2 is the lowest compared to other matching categories and finally balance 80 sample size.

Table 4.5: Performance of Propensity Score Matching Estimators

Matching estimator Sample size	Balancing test	Pseudo R2	Matched
Kernel matching			
0.01	7.6e+14*	1.000	65
0.1	126.5*	0.255	76
0.25	66.7*	0.078	80
0.5	**54.9***	**0.055**	**80**

(Source: Own computation survey data, 2020)

Table 4.6: Propensity Score Matching and Covariate balancing.

										T= Treated group C=Control group	
The whole balance indicators of covariates											
Sample	No. of Observation			Ps R2	LR	p>chi2	Mean	Med	B	R	%Var
	140	**T**	**C**		chi2		Bias	Bias			
Unmatched	64	64	0	0.717	158.1	0.000	75.4	68.7	206.9*	20.71*	44
Matched	76	17	59	0.255	12.02	0.678	25.4	29.0	126.5*	0.99	11

Source: Own computation from survey data, 2020

As shown in the table 7 above, matching reduce total bias, reduce pseudo R^2 from 0.717 before match to 0.255after match and any difference between the two groups covariates mean in the matched sampled has been reduced and after matching nine variables are significant as before matching and were balanced treated and control group.

Table 4.7: Burden of resettlement Populations participation decision on settler's income (ATT-Average treatment effect on treated)

Variable	Sample	Treated	Controls	Difference	S.E.	T stat
Totinc	Unmatched	133555.914	115582.22	17973.6932	6351.13923	2.83
	ATT	144465.476	115282.83	29182.6463	15933.3126	1.83

Source: Own computation from survey data, 2020

Average Treatment effect on the Treated (ATT) was estimated depending on Kernel (0.5). The Kernel (0.5) algorithm estimated the average annual income of the matched treated settler's farmers to be 1, 44,465.476ETB and of the matched control of settler's head farmers to be1, 33,555.914ETB. Hence, the ATT for that reason resettlement Populations participant was received 29, 182.6463ETB annual income. In summary, the empirical findings suggest that involvement of resettlement Populations participation is enhanced settler's annual income for treated settlers in a significant way. This is supported with the finding results of Adugna (2012), Jamal Haji and Mohamed Aman (2013).

5.   CONCLUSION S AND RECOMMENDATIONS
5.1. Conclusions
Resettlement is a recovery liberate to some of the world's most vulnerable displacement. From the research findings, it could be concluded that resettlement Populations is play a fundamental role in increase of settler's income in the study area due to resettled in favorable site. Farmers settlers have confirmed that they were benefit greatly from these resettlement Populations and they had been improved their income living standards. To sustain the positive burden s of the Populations and to enable treated settlers make optimum resettlement participation. Purposely, expansion of new habitat and creating additional access of infrastructures and to obtain fertile/virgin land for agricultural productivity on a sustainable basis and thereby increase smallholder farmers' settler's annual income.

The logit regression shows that from the fourteen variables included in the analysis, nine of them were significantly affecting the settlers those participating in the Populations me. Shocks (drought and famine) and farm land size of settler's heads were the more susceptible for the Populations me participation. Settler's heads in the study site were not more educated rather than they were performing agricultural and non agricultural tasks to achieving enough income for stay alive.

Generally resettlement Populations me in the study site attained a positive burden on the resettlement Populations participant settlers annual income in improving livelihood like physical asset, natural asset and stipulation of social services like human health service by constructed health center in the study site, health extension service at each Kebeles, agricultural extension service, veterinary health post service at each Kebeles, and as well as availability of all weather road connecting each rural Kebeles of the study site and other resettlement sites in the study area. This study concluded that, participation in resettlement Populations had been a deep burden on improving the annual income of settler's farmers in the study site.

5.2. Recommendations

This study had been indicated that involvement in resettlement Populations enabled farmer settler's to increase their annual income. Even though, the detailed studies selection of non-Populations participants from original places is the best way for comparison as a control group. Regarding the burden of resettlement Populations on settler's income, the following main points needed to be considered as a possible policy implications forwarded in order to improve the goal of resettlement Populations for the rural settler's.

➢ The study showed that most of the farmers settlers head in this study were depending on agricultural production or obtaining their income from faming activities rather than non-farm income due to low diversification of non -farm activity during comparison with farm income in study area. So it is better if local or regional government giving more attention to improve source of income for rural settler's.

➢ Farmers need modern agricultural inputs. However not adapting more utilization of all modern agricultural inputs such as improved seed varieties, improved animal breeds for milk, and meat and poultry production for egg, commercial fertilizer and different chemicals. The fact is that the farmers could not have enough money to buy all the required agricultural inputs on cash and lack of habit to use short-term credit from financial institutions in the last cropping seasons. So, it is necessary for the national and regional policy makers to assess and find out ways in which farmers to get the tradition of use credit service for purchase of agricultural inputs in order to produce excess product for food achievement.

➢ Settler's head's education level was found to be negatively significant determinant of the resettlement Populations participation. This shows that educated settlers had enough potential to changing their environment as it is favorable to survive. Therefore, government will gives a great attention as the farmers should be educated by a means that fits with their living condition, such as adult education.

➢ Shocks is one of the main determinant cause of resettlements Populations participation as the researcher undertook analysis from sampled respondents in the study area; therefore, favorable environment should be improved by concerning body to enable farmers easily stabilize their surroundings to living.

➢ In each three study kebeles development agents were assigned for peasant association to give extension service. Those assigned DA's were only giving theoretical advice for the farmers which was not practically supported and show. It is obvious that extension service provision in training and practical demonstration of farmers has a great contribution to increase production and productivity of the farmers in order to improve their annual income. As a result, it is more important to redesign policy measures for farmers training centers (FTCs) as a practical training and demonstration center of research outputs support level as per the national level farmers training Populations to build up the producing capacity of the farmers to increase their income.

➢ Large cultivated land size in the study area were held by economically inactive settlers heads rather than economically active farmer settlers, so it is better if local government or other concerned body readjusting the farm land allocation.

➢ Livestock were the major source of income in the study area but the farmer settlers were little knowledge about livestock rearing and using modern technology like animal breeding system, it is better if concerning body make awareness regarding to how the farmers increase livestock rearing by the way of modern technology for enhance their annual income.

➢ During data collecting survey supervision, key informants interview and FGD final result, it was observed that the study area has a potential of commercialization farm land. To increase rural settler's farmer's annual income, it requires the local government, agriculture development office, development center offices, the policy makers and other concerned parties has crucial role interest to aware and building the capacity of the farmers to use these potential resources effectively and efficiently.

➢ Generally, as the study showed that resettlement Populations is the vital alternative to overwhelm the shortage of income and the rural access of land for agricultural production by providing virgin or unutilized cultivable land and accessing necessary basic infrastructural facilities within the intra-regions. Again to enhancing the settlers total fixed asset in the study area the concerned body would be take appropriate action to design incorporated development strategy by creating common feeling in wise utilization of the existing resources under sustainable way.

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