

The Livelihood Impacts of Resettlement Program, In Amhara Regional State, Ethiopia: A Propensity Score Matching Approach

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Abstract

This study examined the impact of resettlement program on the livelihood of the settlers in Jawie Woreda resettlement site among many resettlement programs conducted in Ethiopia. The study has an objective to evaluate livelihood impact of the resettlement program to the program participants using main livelihood indicator. The data obtained through structured questioner from rural households both from control group (who are remained back home) and treated group (who participate in the resettlement program). The stratified followed by simple random sampling technique used to select respondents. Using the propensity score matching particularly the stratified matching method, the counterfactual group has been constructed. The data was analysis by descriptive and inferential statistics among control and treated groups. Within major livelihood security indicator the result shows that participants have less mean livelihood security score on access to institution, shelter/water sanitation, health and gender status security index before matching but on average they are better than nonparticipants but the overall livelihood impact of the program has been estimated among matched sample which is the average treatment effect of the program on treated is 0.037 livelihood index. Specifically, on access to institution, shelter/water sanitation, and gender status security index the treatment effect of the program has negative effect so that treated groups are less advantageous in those major indicators compared to the non-treated group.

Keywords: - Livelihood, Impact, and Resettlement

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1. Introduction

Historically the central and northern highlands of Ethiopia were heavily populated because this region has suitable climate/temperature and good soil fertility as a result the area was the oldest settled region of the country. Today the region covers much of the Amhara and Tigray regional states of Ethiopia. It was here that the oxen-plow agricultural system began over 2000 years ago. These parts of the country are the most exploited and degraded areas compared to other parts of the nation. Within shortage of arable lands and continuously utilized it each year, production yields were diminishing per unit area (Girma, 2017). Poverty, rampant unemployment, high population growth rate, high environmental degradation, the marginality of land, decline in land productivity, and recurrent drought are a sign of manifestation for the country for many years and those factors generally cause the poor performance of the agricultural sector. This implies that the commonness of food insecurity, both constant and temporarily affecting the life of a substantial part of the population of the nation (Markos, 1997).

The concept of Livelihood was first introduced by the Brundtland Commission on Environment and Development in the mid-1980s as an approach to enhance resource productivity, secure ownership and access to resources and income-generating activities as well as ensure adequate stocks and flows of food and cash to meet basic needs (Brundtland, 1987). Holding this to have sustainable livelihood improvement, countries take different measures like reallocation of peoples to new areas. According to (Chimhowu & Hulme, 2006) the rationality for the need of resettlement and its livelihood linkage are resettlement views as resettled households as making a living in a variety of ways of which farming maybe just one, the need of land which is one of assets/capitals required to make a living, the interaction of the various capitals within a broader policy environment which further improve livelihood, livelihood are different in a given geographical and historical context and it is keen to change in response to various internal and external stimuli, for risk and vulnerability it is appropriate for resettled households in less risky and fewer vulnerability regions.

The Worldwide experience regarding resettlement shows, resettling peoples to a new area leads to impoverishment and hardly ever to attain sustainable development if the resettlement is caused by due to development projects, conflicts, or other socio-economic, political, and environmental factors (Magee & Xu, 2008); (Cernea & McDowell, 2000); (Gebre & Ohta, 2005). But this is not always since some other studies also show that living conditions and livelihoods of resettled people improved after resettlement (Agnes, Solle, Said, & Fujikura, 2009); (Manatunge, Takesada, Miyata, & Herath, 2009), (Nakayama, Gunawan, Yoshida, & Asaeda, 1999). The purpose of resettlement in Ethiopia was to address the problem of high population pressure, famine, landlessness, low agricultural production, less regional development (Pankhurst & Piguet, 2009).

This reallocation/resettlement program was conducted many times in Ethiopia, in meeting the Livelihood of the people. The last three governments of Ethiopia have carried out resettlement projects with different objectives and varying intensity but, broadly speaking at least theoretically the need for resettlement was almost similar.

Ethiopian experience shows that resettlement is conducted due to food shortages, land fragmentation, and congestion faced by producers, rampant unemployment, the marginality of land, and decline in productivity to in areas under cultivation and to out from this problem (Kassahun, 2000).

According to (Kassahun, 2000), to assess the impact of resettlement on the living conditions of the settlers in Ethiopia, he argued that it is impossible to say that all resettlement program conducted in the nation is failing to achieve their objective since the impact of resettlement varying from place to place and it is diverse as well as depend on some host factors. (Belay, 2004) add to this that mostly the resettlement programs were undertaken by governments for political uses rather than for the objective of humanitarian, environmental, social, and economic aspects. Both of them stated that regarding the validity/feasibility, solving the related problem and the limited objective of resettlement program by the government's results the issue to become the source of on-going debate and failures.

According to (Terefe & Melesse, 2014) and (Bisrat, 2011) study on the contribution of rural resettlement to the livelihoods of settlers in Ethiopia particularly on south nation nationalities and peoples of Ethiopia (SNNPR) and at Abobo Woreda, Gambela region respectively using before and after comparison, most of the program participant's livelihood has been improved in terms of their social, financial and physical capitals of settlers' livelihood assets and Bisrat also showed that different demographic factors statistically significant related to the betterment of the livelihood of settler. The livelihoods of settlers have been improved compared to their initial livelihood but it did not contribute equally. This livelihood betterment is obtained at a higher expanse of natural resources. Those studies were conducted based on the information that settlers provide by comparing the before and after resettlement conditions as a result, some of the respondents had difficulties recalling events so the data will be inefficient. Again (Mandefror, 2016) conduct a study on Gambela voluntary Villagization program and shows the deep role of the voluntary Villagization program in reducing poverty and increasing household consumption expenditure and he concludes that the program has profound and far-reaching socio-economic impacts on the standard of living among rural people in the study areas. But Mandefro didn't show the livelihood impact of the program rather he intended to show its impact on one livelihood indicator which is the consumption situation of the household only.

Whereas study conducted in the Amhara Regional State of Ethiopia on the livelihood of rural households in Quara Woreda resettlement area by (Genanew, 2011) and Metema Yohannes resettlement Scheme by (Gerum, 2010) revealed that some proportion of the household obtained sufficient food security since there is higher fertile land but others are still food insecure due to natural resources are gating less and less throughout the year and due to higher exploitation and limited physical assets of the household. The study compares the settler's and host communities' livelihood due to the program but it doesn't examine the livelihood impact of the program by comparing the settlers from the original location.

To give a response to the recent drought and the consequent food shortage problem the current Ethiopian government in 2003 prepared a new plan which is named as voluntary resettlement program or called access to improved land. The aim was to achieve food security through improved access to land for chronically food insecure households the resettlement was voluntary or self-initiated (Feleke, 2003). Among those resettlement areas, the Jawie woreda resettlement sits in the Awi zone of Amhara regional state of Ethiopia was one of this. In all studies mentioned above shows that most of the studies are done on the impact of resettlement program among settlers and host communities and within participants and non-participants of the program using before and after comparison in line with the available baseline data. Therefore, studies are not yet done within the reference of the remaining communities' in some resettlement areas. The study aims to

- ✓ Identify the livelihood indicators and evaluate the livelihood security status of the household across those indicators;
- ✓ Evaluate the livelihood impact of resettlement program on the settlers,

2. Review of Related Literature

Usually, the implementations of different programs through state intervention are to make people's livelihood improved. The program includes the establishment of governmental or non-governmental development projects and other private organizations. There are different types of approaches and analytical frameworks to study livelihoods, for instance, livelihood sustainability, household livelihood security, and livelihood diversification approach. But in this study household livelihood approach was used. So that, the basic framework for program analyses, design, monitoring, and evaluation is household livelihood security (HLS). Household Livelihood Security implies adequate and sustainable access to income and resources to meet a basic need which includes adequate food, educational opportunities, housing, potable water, health facilities, and time for community participation and social integration. Livelihood security has multidimensional aspects. It includes economic security, nutritional security, health security, food security, educational security, habitat security, community participation, environmental security, etc. Therefore, it is important to select parameters, which are representative indicators of all these sectors of human-life (Rai, Sahoo, Malhotra, & Sharma, 2008). According to (Ellis, 2000)

the analysis of livelihood is complex. CARE is one of the frontline NGOs that has been using the livelihoods approach as its primary programming framework while working for the poor and vulnerable in developing countries.

According to Lindenberg (2002) to analyzed livelihood security it is important to categorize under five broad dimensions which are economic security, food security, health security, educational security, and empowerment. According to CARE (2004), Households' livelihood security can be measured by 9 major indicators which are economic security, food security, nutritional security, health security, educational security, shelter/water sanitation security, gender security, community participation, and access to infrastructure.

In Africa most importantly forced displacements are caused by social and political causes like civil wars, ethnic, racial, or religious oppression, or by natural causes such as droughts and famines but not due to development programs. Whereas planned resettlement has been started within some African countries Kenya, Tanzania, Sudan, Burkina Faso, Egypt, Ghana, Senegal, and Ethiopia even if some schemes didn't improve the well-being of participants (Scudder, 2005). But many of the resettlement programs were successful in solving the short-term problems of people and it is very important to see some of the achievements by settlers in the new areas of residence (McDowell and Haan, 1997). The Ethiopian resettlement scheme has a long history as it began before and during the imperial regime ((Mengistu, 2005); (Desalegn, 2003). The immediate cause to launch the resettlement program comes from drought, food insecurity, and population growth, and land degradation. To tackle these problems the three consecutive regimes of the country was implemented resettlement schemes in the 1960s, 1980s, and 2000s (Pankhurst, 1992). In Ethiopia, high settlement costs plus low levels of agricultural productivity represent the most serious problems for the resettlement schemes (Pankhurst, 1992); (Eshetu & Teshome, 1988). For many settlers their off-farm earnings cannot fill the gap between their net farm income and consumption expenses as a result they need to obtain credit from local merchants to keep together their families until the next harvest season. Finally, if they cannot pay their debt, they will be forced to sell their land and Settlers are prone to dependency. Those fewer emphases on work motive, family income, and not providing settlers with all their basic needs result in dependency syndrome which adversely affects the settlements economic performance also the provision of free food, transportation, training, inputs and equipment, and technical services in Ethiopia was found to raise the cost of resettlement (Oberai, 1992).

The contemporary resettlement schemes in Ethiopia in principle were given much attention to sustainable development. The pillars and principles of the implementation of the resettlement program were undertaken through a state-sponsored voluntary resettlement scheme and it should be environmentally friendly since it conducted thorough discussions with the host and the newcomers. The resettlers should not only produce subsistent production but also are expected to engage in off-farm and non-farm activities to increase their incomes. Resettlement planning should be comprehensive so that it results in sustainable food security attainment and overall socio-economic development issue (MoFED, 2006). According to Desalegn (2003) resettlement is a movement of the population from one place to another area that is not their own; this is similar to Ethiopian context resettlement. Due to high population pressure, drought and the degradation of natural resources resettling of people to new locations has become a dominant development discourse in many parts of the world and this is true specifically in Ethiopia. However, resettlement has an influence both on demographic features, livelihood assets, and strategies of settlers. The demographic features include the sex, age, and family size of the households. Certain livelihood assets have strong relationships with livelihood outcomes. Hence, a livelihood outcome has been examined with resettlement in general and demographic features, livelihood assets, and strategies in particular. Demographic features may affect the livelihood assets and strategies of settlers and vice versa. Institutions and organizations are structures that are enhancing or constraining resettlement programs and rural livelihoods. In addition to this, they may also influence the livelihood assets and livelihood outcomes of settlers.

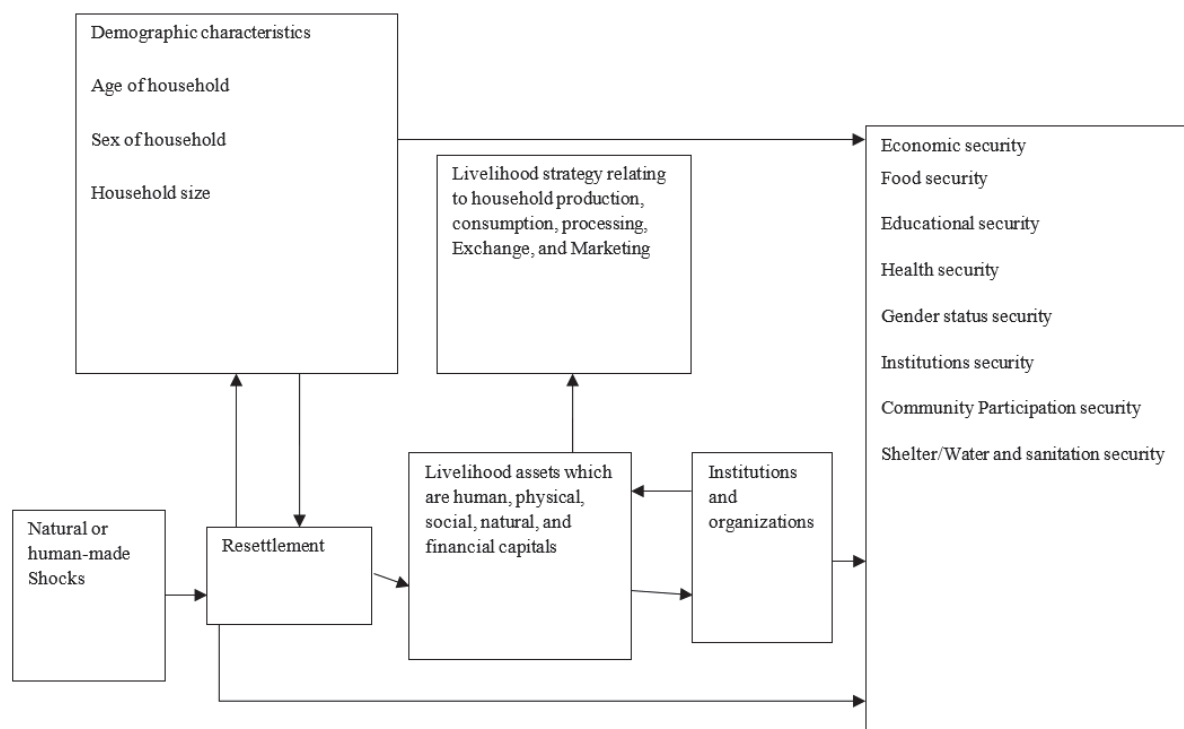


Figure 2.2: Resettlement Framework (Adopted from International Development (2001))

Generally, the resettlement program which was conducted in Jawie woreda is voluntary and has program executing documents but the problem is it is quickly executed but less pre-visibility study. Most of the studies reviewed above show that it was focused on the same issue which is resettlement and livelihood change and problems that the re-settlers faced in a different area of resettlement program and related problems in and before program implementation but still there is no empirical work done on the livelihood impact of resettlement program investigated using the remaining community as a comparison by propensity score matching method especially on the resettlement site which has no baseline data.

3. METHODOLOGY

This study used a quantitative research design because the study examined the livelihood impact of resettlement and estimate this intervention difference using major livelihood indicators. For this study, the target total populations are 2300 households who are program participants and who are resettled in 2004/05 at Jawi woreda settlement site and non-participants of resettlement program around 252 households from Ankesha woreda and 409 from Sekela woreda. The sampling technique used for this is stratified followed by simple random sampling. To evaluate the livelihood impact of the resettlement program on the settlers compared to the non-settlers, it is important to find the closest counterfactual group. In doing so the study used a quasi-experimental design because the treated and untreated dose was not assigned in the experiment so that under this quasi-experimental design and in absence of baseline data the study must use propensity score matching to find the best counterfactual. As a result, the predicted probability of the households being treated subject to some selected background observable factors have been computed by logistic regression. In propensity score matching algorithms the better which were reduced biased and variance, but their effectiveness depends on some specified circumstance. So in line with this stratified matching is helpful to reduce the unobservable factors in matching. Based on their propensity score value they had been arranged in intervals so groups in the interval both include participants and non-participants.

To do so the researcher selects a control group from Ankesha woreda and Sekela woreda and by considering at least their amounts must equal to those migrated. To obtain the relevant and unbiased data for analysis giving equal chance for the respondents to be included in the sample is essential. In the case of a more heterogeneous population, the larger the sample size required to obtain a given level of precision from both participants and non-participants.

The sample size determined using proportion (Cochran, 1963) formula;

$$n_0 = \frac{z^2 pq}{e^2}, \text{ where, } n = \text{sample size}$$

Z2= the abscissa of the normal curve that cuts off an area α at the tails

p = the estimated proportion of an attribute that is present in the population using the maximum variability which is p = 0.5

$$q = 1-p$$

e = level of precision which is a 5% level of precision used in this case.

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 385$$

Then using sample size formula for the finite population;

In 2004/05 there are around 2300 households resettle in the Jawi zone

$$n = \frac{n_0}{1 + \frac{(n_0-1)}{N}}; n = \frac{385}{1 + \frac{(385-1)}{2300}} = 329 \text{ household from treatment group}$$

$$n = \frac{n_0}{1 + \frac{(n_0-1)}{N}}; n = \frac{385}{1 + \frac{(385-1)}{409}} = 198 \text{ household from Sekela woreda /control group}$$

$$n = \frac{n_0}{1 + \frac{(n_0-1)}{N}}; n = \frac{385}{1 + \frac{(385-1)}{252}} = 152 \text{ household from Ankesha woreda /control group.}$$

The data were analyzed through quantitative methods of data analysis in the form of descriptive and inferential statistics. The outcome variable in this study is livelihood and it is difficult to quantify this qualitative variable so that the construction of the livelihood security index or a composite index approach is a major approach to measure the livelihood of the household.

To develop a composite set of household livelihood security (HLS) index at the household level utilizing a set of indicators representing each of these dimensions using an approach similar to (Hahn, Riederer, & Foster, 2009).

$$zind_j = \frac{\text{indicator}_j - \min_j}{\max_j - \min_j} \quad (1)$$

Minimum and maximum values of the indicators (value of the variable) j are belonging to the household. Where Zindj implies standardized livelihood security in indicator j; then the relevant household livelihood security index for the particular domain is constructed by averaging the standardized indicators:

$$HLS_i = \frac{\sum_{j=1}^J zind_j}{J} \quad (2)$$

J is the number of indicators used to construct the index. And then the composite overall Livelihood Security (LS) index for the household obtained through the formula:

$$LS_i = \frac{\sum_{j=1}^n w_j HLS_i}{\sum_{j=1}^n w_j} \quad (3)$$

So that the all-over livelihood security index of the household will be affected by the household livelihood security index (HLS_j) which is the average value of standardized indicators aggregated from eight selected livelihood security indicators. Where w_j is the weight (simple arithmetic mean) attached for indicator j. It may vary among the household due to variation in the indicators j in the household. But livelihood security of the household is determined by the program intervention difference.

LS_i = α + βT + e; Where T = treatment in program; β = the impact of the resettlement program on program participants & e = the error term

LS₁ = Livelihood security outcome of the treated & LS₀ = Livelihood security outcome of the non-treated, then the average treatment effect can be computed from matched sample observations given socio-economic factors of the household. This means $ATT = \frac{1}{k} \sum_{j=1}^k (LS_{j1} - LS_{j0})$: where k is the number of matched pairs and LS_{j1} -

LS_{j0} is the difference between outcome variable of interest for treated and non-treated. Program intervention or treatment will be affected by some socio-economic factors which mean $T = \beta_0 + \sum_{i=1}^n X_i$; T = being treated & X = socio-economic factors of the household/ pre-intervention characteristics of the household.

There are two key assumptions in propensity score matching (PSM) which is the conditional independence assumption that states that there exists a set X of observable covariates such that after controlling for these covariates, the potential outcomes are independent of treatment status: $(Y_i0) \perp T_i | X_i$ and the common support assumption which shows for each value of X_i, there is a positive probability of being both treated and untreated: $0 < P(T = 1 | X_i) < 1$.

4. Result and discussion

4.1. Demographic Characteristics of the Sample Respondents

From the total sample representative, 51.55% are non-participants from the resettlement program and the remaining 48.45% are program participants. This shows the control group has been greater than the treatment group to have enough counterfactual for the treatment group.

Table 4.1: Program participation

| participation | Frequency | Percent | Cumulative percent |
|-----------------|-----------|---------|--------------------|
| non participant | 350 | 51.55% | 51.55% |
| participant | 329 | 48.45% | 100% |
| Total | 679 | 100% | |

All those pre-intervention variables are important to compare participants and non-participants before the program. The demographic characteristics of non-participant and participants of the program show that the mean, standard deviation, minimum and maximum values for each pre-intervention variable. For instance, the marital status, gender, and the existence of shocks before the resettlement among 350 sample respondents of non-participants and 329 participants of the program on average 91% (0.91) and 84% (0.84) are married and with a spouse, 22.8% (0.228) and 21% (0.21) are female and the proportion 10.5% (0.105) and 33% (0.33) are facing shocks. Likewise, the variable age is time invariable so that it is simply taken the current years of age and it shows that non-participants (they are 48.6 years old on average) are older than participants (they are 41.4 years old on average) on average. This means young ages are more probably participate in the program. Nonparticipants and participants have approximately 5 and 4 family sizes on average respectively.

Table 4.2: Describing pre-intervention variables for participant and nonparticipant of the program

| Variable | Program | Mean | Standard deviation |
|-----------------------|------------------|---------|--------------------|
| Marital status | non participants | 0.91 | 0.28 |
| | Participants | 0.84 | 0.36 |
| Shock | non participants | 0.228 | 0.42 |
| | Participants | 0.33 | 0.47 |
| Gender | non participants | 0.105 | 0.307 |
| | Participants | 0.21 | 0.401 |
| Age | non participants | 48.6 | 9.3 |
| | Participants | 41.42 | 7.93 |
| Family size | non participants | 4.79 | 2.08 |
| | Participants | 4.46 | 1.88 |
| Dependency ratio | non participants | 0.34 | 0.25 |
| | Participants | 0.38 | 0.29 |
| Education level | non participants | 1.52 | 3.06 |
| | Participants | 1.55 | 2.23 |
| Farm size | non participants | 1.3 | 1.59 |
| | Participants | 2.3 | 2.6 |
| Livestock value | non participants | 4540.24 | 7329.3 |
| | Participants | 16786.5 | 27086.2 |
| Output level | non participants | 1.81 | 3.26 |
| | Participants | 13.21 | 20.81 |
| Consumption per a day | non participants | 2.21 | 0.67 |
| | Participants | 2.77 | 0.68 |

Generally, it is possible to conclude that participants have a greater mean value in all pre-intervention variables except in variable age, family size, and marital status.

4.2. Household Livelihood Indicators

There are 47 sub livelihood indicators used to construct the 8 major livelihood indicators which are household food security, household economic security, shelter/water, and sanitation security, health security, Educational security, Gender status, Community Participation, and access to institutions mainly used.

4.2.1. Household Food Security Indicator

The household food security index is constructed from six sub livelihood indicators, which are of consumption per day, level of food consumed per month, quality of diet like oil consumption expenditure, diet diversification, the number of months by which the household did not suffer food shortage and consumption per a day during the lean period if the household faces food consumption shortage. The measurements of those indicators are standardized and aggregating this gives household food security index. The result shows that on food security indicators the highest standardized score value in resettlement participants than non-participants. So in all indicators, the participants are better than non-participants in those food security indicators even if the difference is minimal. The interpretation for household food security index implies the participants of the program have 0.44 food security index or 44% food secured. Nonparticipants have a 37% (0.37) food security index on average, so this shows participants are better than non-participants on average in food security status.

4.2.2. Household Economic Security Indicators

The household economic security livelihood indicator is measured by eight sub-indicators which are level of output produced, level of an asset, cash income, having debt or not, types of the credit institution, debt level by the household, saving level, and the soil fertility.

The result below shows that most non-participants of resettlement programs are less economically secure this means, low in soil fertility index, less output level produced, low household assets and cash holding as well savings but they are better at not having debt. In all sub-economic security indicators, participants are more economically secured than non-participants except for the households not having debt.

The household economic security index shows nonparticipants and participants are 18% (0.18) and 21% (0.21) economically secured on average respectively.

4.2.3. Household Shelter/Water Sanitation Security Indicators

Shelter/ and water sanitation by the household is another livelihood security indicator that is constructed from four sub livelihood indicators. This household shelter/ and water sanitation situation can be measured by dose the household have zinc sheet or grass roof house, access to electricity, the drinking water system which is either open or Community/ individual deep tube, and also the distance home to open drinking water system) if the household uses an open system.

Participants of the program are almost not having access to electricity compared to non-participants. But by other indicators, participants are much better than non-participants.

Generally, households in shelter/water and sanitation security nonparticipants and participants account for 60% and 59% secured on average respectively. This shows nonparticipants are good in a little bit in this indicator.

4.2.4. Household Health Security Indicators

Households health situation has been analyzed by considering some health security indicators like last year family number face health illness, several family ill last month, workday lost due to illness, does the household member who is ill goes to the health center or not, treatment cost incurred, transportation service to the health center, and distance from home to health center. So it's possible to compare those seven health status indicators among participants and non-participants of the resettlement program and all indicators are negative.

Nonparticipants have a minimum livelihood security index across each sub-indicator. Treatment groups are more have a health problem or have high negative health score among each health security index but except going to health center during illness (i.e. they are going to health center during illness compared to non-treated). So that the mean index of 0.22 shows the non-participants are 22% health's insecure on average whereas participants are 35% (0.35) not health secured. Participants are less health secured than non-participants.

4.2.5. Household Education Security Indicators

This livelihood indicator is identified by sub household's education indicators which are analyzed by the number of family member's graduate primary, secondary school, also adult child literacy levels, and transport to school and distance to school. All indicators are positive to education security indicators. The treatment groups have better education status than non-treated, but less transportation access to school especially to secondary school quality of school infrastructure is poor. The livelihood indicator household education security shows how much the non-participants and participants are educated after the program. This is index shows households are 29% educational secured/educated among the non-participants and 42% educational secured among participants. This implies participants are good in education status than non-participants.

4.2.6. Household Gender Status Security

Gender security as livelihood security captures the gender biases by males on women or boys versus girls within the household. In other words, gender security shows the empowerment status of the households which is the main category of livelihood security. These biases are indicated by sex/ gender of the household head, women's decision-making in the household, freedoms of movement by wife's and early child marriage. This difference across the control and treatment group looks as follows.

Household gender security livelihood indicators of non-participants of the resettlement program are 49% gender security level and 43% gender security within participants. This means nonparticipants of the resettlement program an average of 49% they are gender secured, regarding the aspects of the wife's freedoms to movement and decision making, being household head and female early marriage than program participants.

4.2.7. Household Community Participation Security

This livelihood indicator is important to understand the program participants and non-participants on having good societal relations in different social groups within the community. Especially Edir Equb and Maheber are common traditional activities that tie social interaction among the community, so their livelihood betterment is related with those activities in good and as well in bad times. Those are several social relations or groups in the community, household participation in a social group, participation benefit, social group's inclusiveness, and household's position in the social group.

Treatment groups are better in social group participation and in having a position within the social groups whereas in other aspects untreated groups are better than treated (i.e. in the benefit obtained from participation and

in the inclusiveness of social groups all community members). Households in non-participants and participants are 61% (0.61) and 64% (0.64) secure with community participation. This shows the livelihood betterment in participating with the community is higher among participants than non-participants.

4.2.8. Household's Access to Institution

The existence of government, non-government and private institutions are the major betterment indicators of the households to understand the livelihood difference between re-settlers and non-re-settlers. The indicator transportation access to a government institution, distance to a government institution, the level of household's satisfaction from that institution, number of private institutions in the community, transportation access, the distance and satisfaction from this institution are aggregated to some manner to measure the households access to institution livelihood indicator. In all control and treatment groups, there is no difference in the number of government institutions but the difference is the distance to and transportation service and also the level of satisfaction from service delivery. There are no non-government organizations at all.

On households, access to institution nonparticipants are 52%(0.52) and participants are 41% (0.41) secured in this indicator, which is included and shows the access of private, government and non-government institution including their degree of satisfaction obtained from. All those accesses to institutions are one of the physical capital status indicators of the household so that nonparticipants are good in this aspect.

As a result, the overall (composite) livelihood index was constructed from those 8 main livelihood indicators. The overall livelihood security index among participants and non-participant's shows that 0.42 and 0.35 respectively or the difference is 0.06 mean livelihood differences which show that nonparticipants are better than participants in their livelihood security status.

Table 4.3: Household Livelihood Indicators

| Variable | Program | Mean | Std. Dev. |
|--|-----------------|------|-----------|
| Livelihood security index(Lsi) | Non participant | 0.35 | 0.09 |
| | participant | 0.42 | 0.14 |
| Household food security index(hhfsi) | Non participant | 0.37 | 0.09 |
| | participant | 0.44 | 0.09 |
| Household economic security index (hhecosi0) | Non participant | 0.18 | 0.08 |
| | participant | 0.21 | 0.08 |
| Household social security index (hhssi) | Non participant | 0.60 | 0.29 |
| | participant | 0.59 | 0.16 |
| Household health security index (hhhsi) | Non participant | 0.22 | 0.21 |
| | participant | 0.35 | 0.16 |
| Household education security index (hhesi) | Non participant | 0.29 | 0.15 |
| | participant | 0.42 | 0.16 |
| Household gender security index (hhgsi) | Non participant | 0.49 | 0.25 |
| | participant | 0.43 | 0.23 |
| Household community participation security index (hhcpi) | Non participant | 0.61 | 0.22 |
| | participant | 0.64 | 0.23 |
| Household access to institution security index (hhaii) | Non participant | 0.52 | 0.27 |
| | participant | 0.41 | 0.18 |

To conclude the descriptive result of the eight livelihood security indicators as participants of the resettlement program are better in food and economic security(in financial-economic capital), education and community participation security(in social capital) whereas nonparticipants are relatively better in health(human capital), shelter/water sanitation, gender and access to institution security (physical capital) status.

4.3. Program Impact Evaluation Using Propensity Score Matching

4.3.1. The average treatment effect of the program on treated

The matching procedure used here is stratified matching since this method is helpful to have enough counterfactuals by classifying both the treated and untreated lies in the same specified interval based on their propensity score value. On average each treated and untreated who are found in the same block has an equal propensity score so that the divergence in the outcome of the treated and control group is calculated to obtain the average treatment effect on the treated. Know the average treatment effect of the resettlement program has been improved because of obtaining the best counterfactuals/matches. It shows that the average treatment effect of this resettlement program on the treated livelihood index is 0.037. So to conclude that the resettlement program cases a positive livelihood difference between treated and untreated but the difference is very low since it is not close to 1. This low difference in livelihood between resettlement program participant and non-participant is almost similar to the study result done by (might, 2010) in Metema resettlement, that is resettlement program at least it eliminates the main problem of landlessness and diminishing landholdings related problems of the re-settlers that significantly

constrained food and economic security. But even if the average treatment effect of the resettlement program on the overall livelihood security index of the treated household is positive, the average treatment effect of the resettlement program on major livelihood indicators of the household specifically on household shelter/water security status, household gender security status and household access to institution security treatment have a less and negative effect on treated compared to non-treated.

Table 4.9: The average treatment effect of the program

| Outcome | Number of treated | Number of control | ATT | Std. Err. | t |
|---------|-------------------|-------------------|--------|-----------|--------|
| Isi | 320 | 278 | 0.037 | 0.014 | 2.67 |
| hhfsi | 320 | 278 | 0.072 | 0.039 | 1.825 |
| hhecosi | 320 | 278 | 0.031 | 0.008 | 3.706 |
| hhssi | 320 | 278 | -0.066 | 0.082 | -0.804 |
| hhhsi | 320 | 278 | 0.249 | 0.011 | 23 |
| hhesi | 320 | 278 | 0.11 | 0.063 | 1.744 |
| hhgsi | 320 | 278 | -0.022 | 0.093 | -0.24 |
| hhcpi | 320 | 278 | 0.03 | 0.04 | 0.738 |
| hhaii | 320 | 278 | -0.175 | 0.136 | -1.288 |

5. Conclusion

Based on the primary data obtained from households through structured questioner the livelihood impact of the resettlement program has been analyzed. Before matching untreated are better than treated on access to institutions, health security, and gender security, and shelter/water sanitation livelihood security indicators. After matching on access to institutions and gender security and shelter/water sanitation livelihood security indicators participants are participants were worse. Now we can determine the exact overall effect of the resettlement program on program participants compared to non-participants which are 0.037 livelihood security index difference. This 0.037 livelihood security index is not a satisfactory difference since it is very less than 1 because the programs try to implement by expecting that it has a great positive impact on the participants which is close to 100 % (1) difference in the outcome of interest. Generally, even if the average treatment effect of the resettlement program on treated is minimal it has a positive livelihood impact. The reason for this small livelihood difference arises from due to less access to institutions and infrastructures (high distance home to institutions, less quality of service delivered, and less transportation access to institutions), shelter/water sanitation security problem (more they use open drinking water system and poor housing) and gender security status like early marriage mostly characterizes the program participants other than non-participants.

6. Recommendation

The study points that there are courage results which intensified that resettlement program contributes positive outcome even if it is not as it expected. Participants are living in a relatively better situation than before but they are not more live in the great difference of livelihood. So to improve their livelihood, the resettlement program must consider the long-run livelihood outcome of the resettlement rather than solving the current periodic problems. Based on the result of this study, program planners must initially adjust the problems that re-settlers will face like problems of access to institutions, shelter/water sanitation, and gender-related problems. This can be through establishing health centers which they able to get treatment when they face sick, trying to improve ways for preventing common endemic disease, increasing the access to institutions (government and non-government) and infrastructures(which able to connect them to education, private and non-government institutions, and other credit institutions), constricting shelter and other water sanitation accesses and also increasing gender-related understanding of the households through awareness creation before program implementation and even after implementation need to be corrected. Furthermore, the finding shows this minimal livelihood difference comes due to the program since the program was having feasibility and implementation problems.

7. References

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