The Contribution of Rehabilitation Program on the Livelihood of Displaced Households in Norther Ethiopia: The Case of Belese Sugar Development Project Jawi District Amhara Region

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Abstract

The study examines the contribution of rehabilitation program to the livelihoods of settlers due to expropriation of landholdings for sugar development project in resettlement areas Alikurand and Kumber kebeles of Jawi woreda in Amhara region.Random sampling technique was employed to select 127sample survey household heads. Data was collected using key informant interview, interview schedule and focus group discussion. Analytical tools used include Descriptive and Logistic Regression. The finding of the study identify challenges experienced by resettlers such as reduction of farm land size, the increase distance from farm land to homesteads, and the reduction and no grazing land for cattle were perceived to be a major threat that were preventing them from achieving their livelihoods objective. The logit model result for factors determine livelihood strategies settlers revealed that out of the 15 explanatory variables, 10 variables were found to affect the livelihood strategies of settlers. age, family size, distance from farm land to homesteads, frequency of extension contact and social network affect significantly and negatively at less than 5% significance level and ethnic group, education level, size of landholdings, fertility level of farm land, membership in cooperative affect significantly and positively at less than 5 % level of significance. And it also shows 4 variables affect the estimated annual income of the displaced households. .compensation affect positively and significantly at less than one % level of significance, size of landholding, distance from farm land to homesteads and membership in cooperative affect negatively and significantly at less than 5% significant level. The resettlement and the Livelihood restoration programs have the potential to strengthen local capacities. This is particularly through increased access to social services, infrastructure and administrative service such as school, health center, roods, extension service and communication and access employment and the finical compensation create household's asset.

Keywords: livelihoods restoration, resettlement, logit model, determinate, livelihoods, compensation

1. INTRODUCTION

1.1 Background to Study

Development projects create opportunities for socio-economic development. On the other hand, the acquisition of land by government or investors in poor and vulnerable countries poses a threat to their economies and livelihoods and endangers their chances of achieving food security and improved life. Some of the recent empirical studies indicate that many of the development investments and projects carried out in recent years have not only failed to increase the well-being of resettled people, but have actually furthered their multigenerational marginalization (Robinson, 2003).

World Bank (2010) study indicated that involuntary resettlement under development projects, if unmitigated, often leads to severe socio-economic and environmental risks; give raise to failure of production systems (which leads to impoverishment of people); people are relocated to environments where their productive skills maybe less applicable and the competition for resources greater; community institutions and social networks are weakened; kin groups are dispersed; and cultural identity, traditional authority, and the potential for mutual help are diminished or lost.

Studies conducted by Berhanu (2006), Nebiyu (2000) and Etenesh (2007) focused on urban displacement and relocation. The first study focused on the impacts of urban redevelopment on the livelihoods of displaced people in Addis Ababa while the other two emphasized the impacts of development induced displacement and relocation on household's livelihoods. The last one gave special emphasis for the impacts of displacement on female headed displaces.

Desalegn (2013) and Obsa (2010) conducted studies on the impacts of large scale agricultural investment on the livelihoods of local people in rural areas of Bako. The studies focused on the effects of agricultural investment induced land acquisition on the livelihoods and food security of rural households. They focused on the impacts of expropriation of rural land and land related resources of displaced households. The studies also explored the positive impacts of agricultural investment through expanding agricultural technologies to local people including displaced households.

The previous studies emphasis on the impact of development induced displacement and relocation on livelihoods of displacer. *What about the contribution of compensation and rehabilitation strategies that have*

done on the livelihoods of displaced households? No empirical studies were conducted so far in Ethiopia on the issue of the contribution of compensation and rehabilitation on the livelihoods of farmers displaced by development projects.

To fill the above mentioned gaps the study is intended to assess the contribution of compensation and rehabilitation that have done on the livelihoods of farmers displaced by Belese sugar development project.

Belese sugar development project (BSDP) had expropriated title holders and informal holders for sugar cane plantation and resettled in new areas. Due to this the sugar corporation, the regional government and the local government can take mitigation measure to restore the livelihoods of settlers by compensation for expropriated assets and rehabilitation measures to help improve or at least, restore income and standards of living.

1.2 Objective of the study

The general objective of this study is to analyze the contribution of rehabilitation program to the livelihoods of settlers in the new resettlement areas.

The Specific objectives of the study are
- ✓ To analyze the contribution of compensation to livelihoods of settlers.
- ✓ To identify the main determinants of Livelihoods strategies of the setters.

1.3 Research questions

In this research the following questions will be addressed;
- ✓ What is the contribution of compensation either in kind or in birr on the improvement the livelihoods of settlers?
- ✓ What are the main determinants of livelihood strategies of settlers?

2. METHODOLOGY OF THE STUDY

Mixed method research design that combines both quantitative and qualitative approaches has adopted in this research. Scholars also agree that a combination of quantitative and qualitative methods is the most effective to triangulate objective information with subjective one to increase the accuracy of data (Prowse, 2010).

2.1 Description of the study area

The study area Jawi District located 576 Km to the North West of Addis Ababa and around 150 km east from the regional city of Bahirdar. The district is part of Awi Nations Administrative zone in the Amhara national regional state.

The geographical feature of the district are Flat area cover 512,623ha, mountainous area covers 2,347ha, and valley part cover 30ha. The soil type mostly black soil in local language (mezga). Amount of annual temperatures maximum 40^o_c, minimum 32^o_c. medium 36^o_c .and average temperature 38.5^o_c Annual rainfall of the district minimum 700 mm medium 950 mm and maximum 1200 mm .The predominate crops produce were commercial crop such as sesoam, soyapean, grownd-net and nuge for domestic consumption Maize, Rice, Surgam, millet, chickpea and teff, potato. Based on the productivity level per hectare are maize, surgam, rice, millet, rice, soyapean, teffe etc. (source: the woreda agriculture office).
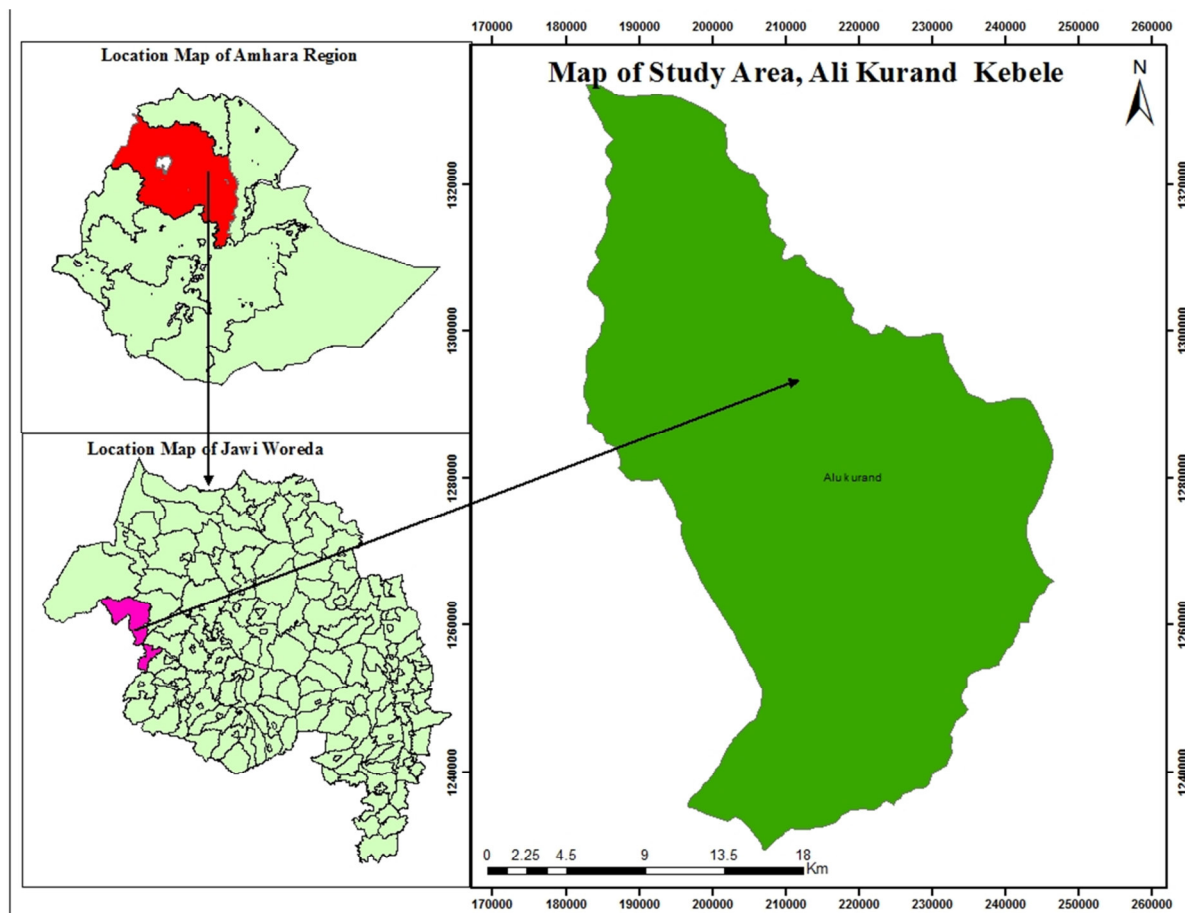
Figure 2; location map of the study area

2.2 Population and Sampling Technique
A random sampling technique has been employed in this study. Accordingly, Belese sugar development project displaced farmers resettlement scheme consists of six resettlement sites such as Kumber and Alkurand in Amahara and Abaybari, Hidasa, Keystone and Ankasha gebreil at Benishangul region. From these resettlement sites, two resettlement kebeles Alkurand and Kumber in Amhara region were selected for a study site. Because I select the Amhara region resettlement site of the project due to time limitation and data limitation in Benshangul region and this resettment site recent than the Amhara.

From of total population of 2520 household heads 127 households heads (above 5%) were selected as a representative sample.

Table 1.1 illustrates the study areas size of total population and the sample size selected from the entire population.

Region	Woreda	Study areas	Year of resettlement	No. household heads	Sample no households
Amhara	Jawi	Kumber	2010/11	251	14(above 5%total)
		Alkurand	2010/11	2269	113(5%total)

Source: Belese sugar development basic annual data

To determine the sample size the formula (Air University, 1996) applied is:

Sample size (n) $= \dfrac{[N*Z^2] P^2}{[B^2*(N-1)] + [Z^2 * q^2]}$ + 10%of the value

Where: n is the sample size;
    N is the population size and
    B is the level of precision provided by Yemane (1967) to determine the required sample size at 95% confident level and 90% level of precision.
    The desired level of confidence is 0.95, which corresponds to a Z value of 1.96.
    At the 90 percent level of precision which is B= 0.1 precision level
    Tolerable error margin in our estimate= an estimate of the population proportion assumed to perceive and response is q=p=.05

Contingency 10 percent

Then N=2520 Z=1.96 p=q=.05 B=0.1

$$= \frac{2520*(1.96)^2*0.5^2}{(0.1)^2*(2520-1)+[(1.96)^2*0.25} \quad +10\% \text{ of the value}$$

$$= \frac{2520*3.8416*.25}{.01*2519 +3.8416*.25} \quad +10\% \quad = \frac{2420}{26.15} +10\%$$

$$=93+93*.1= \underline{102 +25} \quad =127 \text{ sample farm households.}$$

The researcher added 25 households to be more than 5 percent of the total population.

In Alkurand resettlement site had seven blocks random probability proportional to sample size sampling procedure has been employed to select total of 113 sample farm households (16 households per block in one bloke17 households randomly).where as Kumber randomly select 14 household heads.

2.3 Data Gathering Instruments

The primary data require for this study have been gathered by employing methods such as survey questionnaire, interview, focus group discussion and direct observation. Secondary data about the program are also retrieved from different official documents of at the regional level, project site, and zonal level and woreda administrative sectors. The qualitative data gathered through focus group discussion, interview and observation have been summarized and analyzed thematically in the way to support quantitative data.

2.4 Model Specification and Functional Relationship

In this study about 15 explanatory variables were be used to identify the factors that determine the livelihoods strategies of displacer and the impact of rehabilitation program on the annual income of households ; 127 household samples were used throughout the survey. 5(five) percent of significance level was considered while examining statistical results.

Econometric analysis

1. Logistic Regression model has been used to identify determinants of livelihood strategies of settlers.

The functional relationships between the livelihood strategies are:

$Y=f (X_i, U_i)$ ---------------------- (1)

The model is specified as:

$Y_i= \beta_o+\beta_1 X_i+\alpha D_i+U_i$ Where: -------------------------- (2)   Where

Y_i=livelihoods strategies used by settlers either agriculture or non-agriculture.

X_i=is a vector of explanatory variables that include:

X_1= Age of the household head in years

X_2= Family size after displacement in numbers

X_3= Dependency ratio after displacement in numbers

X_4=Total livestock unit of the respondent after displaced in TLTU

X_5= Land size after displacement in hectare

X_6=Distance from farm land to homesteads in k.m

D_i= dummy variables

D_1=Sex of the household head

D_2=Ethnicity

D_3= Education level

D_4=Level of land fertility after displacement,

D_5=Access to credit

D_6= Social network

D_7= Input use

D_8=Membership in cooperative

D_9= frequency of extension contact per year after displace and

U_i= error term

While specifying the distribution of the model, the steps followed by Gujarati (1992) were considered, as shown below: the probability of p_i is

$$\text{Prob } (y_i= {}^1\!/\!_{xi}) = pi = \frac{1}{1 + e^{-zi}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

$$\text{Where} \quad Zi = \beta_0 + \beta_1 X_{1i} +\beta_2 X_{2i} +\dots\dots +\beta_n X_{ni} \quad \dots\dots\dots\dots\dots\dots\dots\dots \quad (4)$$

$$Then \quad P_i = \frac{1}{1 + e^{-(Bo + B1x1i + B2x2i + ... Bnxni)}} \quad ....(5)$$

$$1-P_i = Prob(y_i = {}^{0}\!/\!{}_{xi}) \quad = 1 - 1/1 + e^{-zi} \quad ....(6)$$

$$= 1 + e^{-zi} - 1/1 + e^{-zi} \quad ....(7)$$

$$= e^{-zi}/1 + e^{-zi \;...} \quad ....(8)$$

Note that the response and non-response probabilities both lie in the interval [0, 1].hence, are interpretable for the logit model the ratio

$$\frac{Pi}{1-Pi} = prob(y_i = 1/x_i)/prob(yi = 0/x_i) = {}^{1}\!/\!{}_{1+e^{-zi}} \Big/ {}^{e^{-zi}}\!/\!{}_{1+e^{-zi}} \quad ....(9)$$

$$=1/e^{-zi} = e^{zi} \; where \; zi = xi\beta \; then \; e^{xi\beta} = e^{x1i\beta1 \; + \; x2i\beta2 \; +---+ \; xki\beta k} \quad ....(10)$$

Is the ratio of odds of Yi =1 against Yi =0. The natural logarithm of odds (log-odds) is;

$$Ln \left(\frac{Pi}{1-Pi}\right) = x_i\beta = x_{1i}\beta_1 + x_{2i}\beta_2 + ... + x_{ki}\beta_k \quad ....(11)$$

Thus, the log-odds are a linear function of explanatory variables. The above transformation has certainly helped the popularity of the logit model. Where
$P_{i\,=}$ *probability of improvement their livelihoods strategies*
e^{zi} *=irrational number to the power of zi*
z_i *= a functional of n explanatory variables*
β'S are coefficients of explanatory variables

2. Using the logit regression model the study also show the impact of rehabilitation program on the annual income of households after displacement.
The functional relationship between the annual incomes of displaced households.

$Y_i = f(x_i, u_i)$

The Logit model was specified as (Gujarati, 1995):

$Yi = \alpha o + \alpha 1X1 + \alpha 2X2 + \alpha 3X3 + \alpha 4.X4 + \alpha 5X5 + \alpha 6X6 + \alpha 7.X7 + \beta 1D1 + \beta 2D2 + \beta 3D3 + \beta 4D4 + \beta 5D5 + \beta 6D6 + Ui$

Y_i= annual income of households after displacement (1= improved 0= not improved) by comparing the data before displacement.

Di =dummy variables
X1=Age of the households' heads
X2= Family size after
X3= Land size in hectare after,
X4=Distance from farmland to homesteads in k.m after
X5= Livestock holding in number after
X6= Amount of compensation paid in birr
X7= Dependency ratio after
D1=Land fertility after
D2= Education level after
D3=Input user after
D4=Frequency of extension contact after per year
D5=Sex of the households' heads
D6=Credit use after
D7=Membership to cooperative after
D8=Social network after
u_i=error term
α &β's are the coefficient of the variables(estimators)

Variables description and expected sign

Variables and expected sign	Description
Dependent variables	
(1) livelihoods strategies used by settlers after	(1=Agriculture 0=otherwise)
(2) estimated Annual income of a farmers after displacement	(1= improved 0=otherwise)
Independent variables	Description
Age -/+ Family size + Dependency ratio - Total livestock unit + Land size + compensation paid + Sex + Ethnicity +/- Education level + Level of land fertility +- Access to credit + Social network + Input use + Membership in cooperative + Distance + frequency of extension +	Age of the household head in years Family size after displacement in numbers Dependency ratio after displacement in numbers Total livestock unit of the after displaced in TLTU Land size after displacement in hectare Amount of compensation paid in birr Sex of the household heads (male =1,female = 0) Ethnicity of the displaced households(1= Amara 2= Awi) Education level of displaced households(1=literate 0 illiterate) Level of land fertility after displacement(good=1 poor=0) Access to credit after (1=yes 0 no) Social network after (yes = 1, no = 0) Input use after(yes=1 no=0) Membership in cooperative (yes = 1, no = 0) Distance from farm land to homesteads in k.m frequency of extension(1=yes 0 no)

2.5 Analytical framework of the study

The livelihoods framework provides a comprehensive, approach to understanding how people make a living. It can be used as a loose guide to a range of issues which are important for livelihoods or it can be rigorously investigated in all its aspects (Kanji *et al*, 2005). Livelihood Approaches (LA) emphasizes understanding of the context within which people live, the assets available for them, livelihood strategies they follow in the face of existing policies and institutions, and livelihood outcomes they intend to achieve (DFID, 2000). The key question to be addressed in any analysis of livelihood is given a particular *context* (of policy setting, politics, history, agro ecology and socio-economic conditions), what combination of *livelihood resources* (different types of 'capital') result in the ability to follow what combination of *livelihood strategies* (agricultural intensification/ intensification, livelihood diversification and migration) with what *outcomes*? (Scoones, 1998). Basically the sustainable livelihood framework which is depicted in the diagram below (figure 2) discusses about the interrelationship among the following main components; vulnerability context, livelihood assets, transforming structures and processes, livelihood strategies and the outcomes.
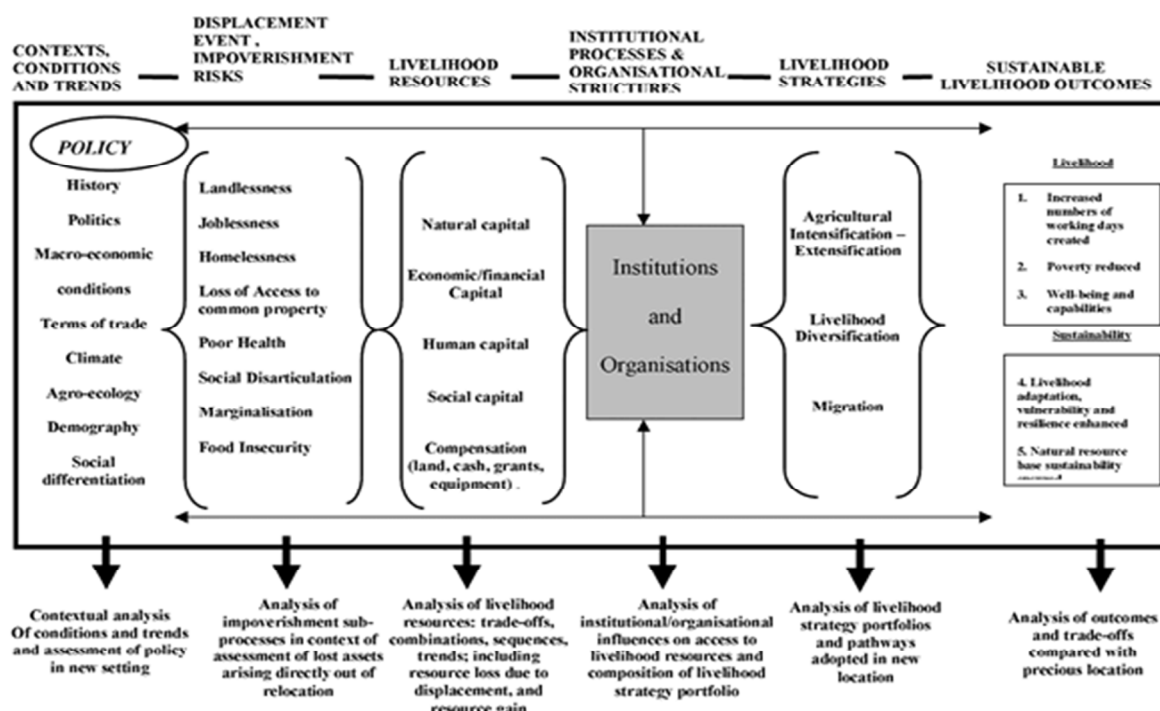
Figure1: Sustainable Livelihood Frameworks analyses Source: DFID

Therefore, the study is analyzing in light of the livelihood framework to understand the contribution of rehabilitation program on the livelihoods of the settlers. This framework also identifies five core asset categories or types of capital which is vital to build the livelihoods. According to DFID (1999), the approach is founded on a belief that people require a range of assets (such as human, natural, physical, social and financial capitals) to achieve positive livelihoods. Thus, the livelihood framework suggests a suitable analytical framework to analyze this study.

3. Results and discussion
3.1 Income of the displaced households
Resettled communities have the right to be compensated for the loss of their physical assets according to the proclamation to provide for the expropriation of land holdings for public purpose and payment of compensation (Proc. No. 455 /2005), Regulation No.135/2007 and regional directives . The loss of their physical assets will be compensated for in land or money. Various decrees have been issued to provide detailed instructions on the planning and implementation of these resettlement policies. Due to for the purpose of the sugar cane plantations the Alkurand and Elala kebele farmers expropriate landholding right. As the result the sugar corporation, the regional and the local governments have done the compensation payment, the relocation and the rehabilitation program of displaced farmer.

From the sample household's survey before displacement agriculture was the only income source of households after displacement the study implied two source of income agriculture and non-farm activities as labor, temporary and permanent employer in the project.

Annex1 Using the logit regression model the study show the impact of rehabilitation program on the annual income of households after displacement.

Dependent variables	Independent variables
Estimated annual income after displacement (1=improved , 0=otherwise)	Age of a households heads in years
	Land size after in hectare
	Education level of a households heads (illiterate , literate)
	Sex of a households (male ,female)
	Family size in number
	Dependency ratio in number Amount of compensation paid in birr
	Livestock holding in number credit use (yes, no)
	membership to cooperative (yes, no)
	social network (yes, no)
	ethnicity (Amhara, Awi)
	u_i=error term

Before undertaking the logistic regression, the variables must be screened from the problems of multi-co linearity that could affect the result of the model. Since there are two types of variables as continuous and discrete both the variance inflation factor (VIF) and correlation are employed respectively for both types of the variables to detect the multi-co linearity problem. The result of the out-put indicated that the pair-wise correlation for all discrete variables is below 0.8 that means there is no as such problematic coli linearity among discrete variables. The continuous variables were tested using variance inflation factor. VIF shows how the variance of an estimator is inflated by the presence of multi co linearity. As R^2 approaches 1, the VIF increased tremendously. That is, as the extent of co linearity between the variables increases, the variance of an estimator increases, and in the limit it can become infinite (Gujarati, 2004). Obeying this rule each continuous variable regressed against the remaining continuous variables and as shown in annex1, the values of VIF for all variables were found to be below 2.00, which imply the absence of serious multicollinearity problem for all continuous variables.   VIF $= =1/1-R2$.

From the model specification in chapter three

$Y_i = \beta_o + \beta_l X_i + \alpha D_i + U_i$

Then using SPSS the result of the model from annex 1 is

$4.59 + -.04x_1 + 1.56D_1 + -.22x_2 + 1.58x_3 + -.59x_4 + -.7x_5 + -.18D2 + -.3x_6 + -Se(2.59)*** \quad (.029) \quad (.840)*** \quad (.414)$
$(.621)* \quad (.237)* \quad (.335)* \quad (.418) \quad (.356)$
$.8x_7 + -1.1D_3 + -.32x_7 + .65D_4 + .59D_5 + -1.86D_6 + .46D_7$

$(.54) \quad (.615)*** \quad (.567) \quad (.751) \quad (.696) \quad (.793)* \quad (.749)$

*at 1% sig. level, **at 5% sig. level ***at 10 % sig. level

The result of variables in the equation annex1 were size of landholding, distance from farm land to homesteads, membership to cooperative significantly and negatively affected the annual income of farmers after displacement at 5 percent significances level(p<.05). Amount of compensation paid for displaced farmers significantly and positively affect the annual income of farmers at 5 percent significances level (p<5).

Amount of compensation: paid for displacers is positively and significantly related to the probability of being improved annual income of farmers . The positive relationship is explained by the fact that farmers that have got compensation may create opportunities of more income by providing agriculture/off/non-farm employment. On the other hand, farmers who have not got the compensation may not improve its annual income.

Size of landholding after displacement: is negatively and significantly related to the probability of being improved the annual income of farmers. Other factors constant as the size of landholding of the displaced households decrease then the probability of income improvement of the displaced household's reduced.

Distance from farm land to homesteads: after displacement is negatively and significantly related to the probability of being improved the annual income of farmers. The implication of this other factors constant as the farm land of the households far from the homesteads the farmers cannot properly manage the farm starting from plow the lands up to cropping this leads to a decline annual income of the households on the other hand to the probability of annual income increment.

Membership to cooperative: after displacement is negatively and significantly related to the probability of being improved the annual income of farmers. The possible explanation of this is other factors constant as the displaced farmers become a membership of cooperative such as the member of credit association then the probability of the farmers to diversify their income generating activities increase then the annual income of displaced farmers incremental on the other hand as not a membership of cooperative a probability of annual income decline.

3.2 Factors determine the livelihoods strategies of displaced households

There are various factors that determine the food security status of displaced households. These variables are social and Economic factors. Binary logistic regression was the prime tool to identify the factors that are responsible for the determinate of livelihoods of settlers However, before undertaking the logistic regression, the variables must be screened from the problems of multi-co linearity that could affect the result of the model. Since there are two types of variables as continuous and discrete both the variance inflation factor (VIF) and correlation are employed respectively for both types of the variables to detect the multi-co linearity problem. Annex 1 indicated that the pair wise correlation for all discrete variables is below 0.8 that means there is no as such problematic coli linearity among discrete variables. The continuous variables were tested using variance inflation factor. VIF shows how the variance of an estimator is inflated by the presence of multi co linearity. As R^2 approaches 1, the VIF increased tremendously. That is, as the extent of co linearity between the variables increases, the variance of an estimator increases, and in the limit it can become infinite (Gujarati, 2004). Obeying this rule each continuous variable regressed against the remaining continuous variables and as shown in annex 1, the values of VIF for all variables were found to be below 2.00, which imply the absence of serious multicollinearity problem for all continuous variables. VIF $= =1/1-R2$. The regression model, the livelihoods strategies used by displaced households was treated as a dichotomous dependent variable by taking 0 for

agriculture and 1 nonfarm.

The functional relationship between the livelihood strategies and explanatory variables are specified as follows:

Dependent variable after	Independent variables after
Livelihoods strategies either agriculture or non-agriculture.	age of the household head in years sex of the household head either male or female ethnicity of households either amahara or awi amount of compensation in birr education level either illiterate or literate family size in number total livestock unit in numbers land size in hectare dependency ratio in number distance from farm land to homesteads in kilometers access to credit either yes or no input use either yes or no membership in cooperative either yes or no fertility level of land either poor or good Frequency of extension contact per year after displaced. Error term

From the model specification

$Yi = \alpha o + \alpha 1X1 + \alpha 2X2 + \alpha 3X3 + \alpha 4.X4 + \alpha 5X5 + \alpha 6X6 + \alpha 7.X\,7 + \beta 1D1 + \beta 2D2 + \beta 3D3 + \beta 4D4 + \beta 5D5 + RiD6 + Ui$

The result of the model from the SPSS output in equation 4.2.5.1 below is

$Y_i = 1.08 + -.10x_1 + -1.63D_1 + 3.07D_2 + 1.02x_2 + .46x_3 + -.8x_4 + 1.16D_3 + -$

se(3.506)   (.042) *   (1.016)   (.778)*   (.456) *   (.208)*   (.375)*   (.555)*

$.07x_5 + -1.17x_6 + .88D_4 + -.52x_7 + 1.6D_5 + -2.47D_6 + 2.4D_7 + -3.04D_8$

(.051)   (.567)*   (.728)   (, 697)   (.833) **   (.842*)   (.993)**   (1.062)*

*at 1 % sig. level, ** at 5 % sig. level and ***at 10 % sig level

4.2.5.1 Continuous and discrete Variables in the Equation

Variables	B	S.E.	Wald	Sig.	Exp(B)	95% C.I.for EXP(B)	
						Lower	Upper
Age	-.106	.042	6.456	.011	.899	.829	.976
Sex	-1.631	1.016	2.577	.108	.196	.027	1.434
Ethnicity	3.069	.778	15.578	.000	21.524	4.688	98.815
Education	1.022	.456	5.025	.025	2.779	1.137	6.792
Size .land .after	.462	.208	4.930	.026	1.587	1.056	2.386
Distance .after	-.800	.375	4.535	.033	.450	.215	.938
L. productivity .after	1.163	.555	4.383	.036	3.199	1.077	9.500
Livestock .after	-.067	.051	1.694	.193	.935	.845	1.034
Family size .after	-1.173	.576	4.147	.042	.310	.100	.957
Credit use .after	.881	.728	1.468	.226	2.414	.580	10.049
Dependency ratio .after	-.519	.697	.555	.456	.595	.152	2.332
Input use .after	1.605	.833	3.708	.054	4.976	.972	25.479
Frequency of extension .after	-2.466	.842	8.585	.003	.085	.016	.442
Membership .after	2.400	.993	5.839	.016	11.024	1.574	77.231
social network .after	-3.037	1.062	8.179	.004	.048	.006	.385
Constant	1.083	3.506	.095	.757	2.954		

Source: Model outputs or results based on survey data (2016)   Chi-square =56 -2 Log likelihood =94.744 Cox & Snell R Square =.36 Nagelkerke R Square =.517 n=127

a.   Variable(s) entered on step 1: age, sex, ethnic group, education level, and Family size after, dependency ratio after, amount of compensation, size of landholding after, distance from farmland to homesteads .after, Level of land productivity after, Livestock holding after, credit used .after, input use. After, frequency extension contact. After, membership in cooperative. After, social network after.

The result of table 4.2 shows Out of all the fifteen variables entered in to the logit model ten of them found to be significant that affected the livelihood strategies of displacer at one and five percent significance level and

at different direction.

Age of household head: affect the livelihoods strategies of farmers negatively and significantly at 5 percent significance level (p<.05). Farmers, whose age is relatively younger, leaving other factors constant, could be pushed to engage more in non-farm activities than agriculture alone. This is because, younger farm households cannot get enough land to support their livelihood compared to the older farm households. This result is congruent with previous studies by Barrett *et al*, (2001); Destaw, (2003), Rao *et al*., (2004); Adugna, (2005); Mulat *et a*l., (2006), Berhanu (2007), and Khan (2007).

Ethnic group: found to influence the livelihoods strategies of settlers positively and significantly at less than 1% probability level (P<0.01). The explanation of this after displacement the livelihoods strategies farmers' increase both community   participate in nonfarm activity after displacement.

Family size of the households: found to influence the livelihoods strategies of settlers negatively and significantly at less than 5% probability level (p<.05). The possible explanation after displacement the size of landholding was small than before as the unproductive age of family size increase the probability to be improve livelihoods decline.

Sizes of landholdings: of displaced farmers Influence the livelihoods strategies of positively and significantly at 5 percent (p<.05).   The explanation of this that as the less farm landholding size of the households the probabilities to diversify the livelihoods   out of agriculture.

Frequency of extension contact: influences the livelihoods of settlers negatively and significantly at 5 percent level of significance (p=.05). Other factors remain constant those displaced farmers who have more contact the extension agent the probability of diversification non-farm livelihoods strategies influence negative.

Social network: of the displaced farmers influence the livelihoods of the farmers negatively and significantly at 1 percent level (p<.01). The possible explanation of this as the network society more (edir, church) they waste more time on this activities (waste the working days). Then probability of diversify the livelihoods strategies decline.

Fertility level of farm land: influences the livelihoods strategies of displaced households positively and significantly at 5 percent. Other factors constant as the displaced farmers' farm landholding become more fertile the probability their livelihoods improve and become food secured.

Membership in cooperatives: significantly and positively affect the livelihoods of displaced farmers' agriculture and nonfarm strategies since cooperatives promote access to social capital in which off/ nonfarm options are gained. As the group discussants revealed, cooperation with in union has positive effect to improve the livelihoods.

Education level: of the households found to influence the livelihoods strategies of settlers positively at less than 5% probability level (P<0.05). Educational attainment proves one of the most important determinants of nonfarm earnings, especially in more remunerative salaried and skilled employment in rural Africa (Barrett *et al*, 2001). Education is critical since the better-paid local jobs require formal schooling, usually the completion of secondary school or beyond. This shows that as the education level of displaced households increase the probability to diversification of the livelihoods strategies especially on non-farm increase.

Distance from farm land to homesteads: influences the livelihoods strategies of farmers negatively and significantly at 5 percent. The possible explanation of this from personal interview as farm land far from the homesteads the displaced farmers not plow the land this implies distance influence negatively the livelihoods.

4. Summary

The relocation program has positively contributed to the human capital of settlers by improving their access to social service compared with status before the program. And the cash compensation program also improves some household's finical constraint and become asset ownership but cash compensation of displaced households should be complemented with training skill and a continuous follow up of the cash management. The result of the logistic regression model revealed that out of 15 variables included in the model, 10 explanatory variables are found to be significant up to less than 5 % probability level. Accordingly, Age (<.05) Family size (<0.05) distance from farm land to homesteads (< 0.05), Frequency of extension contact per year (<0.01) and Social network (<0.01) were found to have negative association with agriculture plus nonfarm livelihood strategy. Whereas, Input use and Membership to cooperative at 10 % (p<.1) fertility level of land, size of landholding, education level at 5% (p<.05) and ethnic group at 1% (p<.01) was found to be significant and positively influence households choice of agriculture plus nonfarm livelihood strategy. And four explanatory variables are found to be significantly affecting the annual income of the farmers'. Amount of compensation positively and significantly, Size of landholdings, distance from farm land to homesteads and membership to cooperative affects the annual income negatively and significantly. The finding of this study after displacement the major factors affecting annual income of settlers are size of landholdings ; farm land fertility level , and distance from settlement center to farm land in km in the study area.

And based on the present study it is possible to conclude that the constraints of the displaced households in

choosing livelihood strategies that will lead them achieve food security goal should not be put aside since food security problem cannot be overcome by simply concentrating on the farm sector alone; intersect oral issues and farm and non-farm linkages need to be addressed as well. Moreover, the contribution made by non-agricultural sector to rural households is a significant; although for the poor these activities are survival oriented and have little to do with wealth accumulation.

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Annex1 estimated annual income of sample households after displacement (1=improved 0= otherwise) Variables in the Equation

Variables	B	S.E.	Wald	Sig.	Exp(B)	95% C.I.for EXP(B)	
						Lower	Upper
Age	-.035	.029	1.487	.223	.965	.912	1.022
Sex	1.560	.840	3.449	.063	4.761	.917	24.712
Ethic	-.732	.629	1.354	.245	.481	.140	1.651
amount.com	1.584	.621	6.511	.011	4.874	1.444	16.455
Size. Land. After	-.595	.237	6.274	.012	.552	.346	.879
Distance .after	-.704	.335	4.420	.036	.495	.257	.953
L. produce .after	-.179	.418	.184	.668	.836	.368	1.898
Livestock .after	-.297	.356	.695	.404	.743	.369	1.494
Family. After	-.814	.540	2.277	.131	.443	.154	1.276
Credit .after	-1.029	.615	2.796	.095	.357	.107	1.194
Dependency .after	-.322	.567	.323	.570	.724	.238	2.202
Input after	.651	.751	.750	.386	1.917	.440	8.354
Frequency .after	.590	.696	.719	.396	1.804	.461	7.055
Membership .after	-1.862	.793	5.517	.019	.155	.033	.735
Social network .after	.463	.749	.382	.536	1.588	.366	6.889
Constant	4.586	2.590	3.137	.077	98.144		

Source: model outputs or results based on survey data (2016)

Chi-square= 40.99   Nagelkerke R Square =0.414   n=127   Dependent variable annual income

-2 Log likelihood =97.948   Cox & Snell R Square =.275

Significant at <1%, 5% probability level.

a. Variable(s) entered on step 1: age, sex, education level, amount of compensation, size of landholding .after, and distance from farmland to homesteads after, farm Land fertility level after, Livestock holding after, Family size after, credit use after, dependency ratio after, input use after, frequency of extension contact after, membership in cooperative after, social network after.