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Determinants of Food Security in Rural Households Intervened with Food Security Programme: The Case of Boricha Woreda in Sidama Zone, Southern Ethiopia

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Abstract
This study was conducted to identify determinants of household food security in Boricha woreda, Sidama zone. Objectives designed to identify household characteristics, environment, Food Security Programme and capacity building services related determinants of food security, and assess food security status of households. Cross-sectional household survey method was used to collect data from 180 randomly sampled households. In order to collect data, household and Focus Group Discussion interview schedules were developed. For analysis of collected data, Statistical Package for Social Sciences software for windows version 16 was used. Multiple regressions were used to analyze determinants of food security. In case, eighteen out of 28 explanatory variables were significantly and negatively determine food security in study area. Household characteristics related factors: Not integrating farming system, not using agricultural inputs and credit for investment alone, selling crops immediately after harvest, borrowing money from informal rural money lenders, renting out livestock from neighbors, and lack of confidence were significantly influencing household food security. Similarly, environment specific factors: Recurrent drought, sociocultural practices and high price of food were challenging food security. Likewise, Food Security Programme related factors: Not full targeting household members for, deduction from, unaccountability and predictability of Productive Safety Net Programme transfer and credit sharing with other people were also affecting food security in study area. Moreover, capacity building services related factors: Not training households for market and techniques of investment, not monitoring investment and lacking experience sharing were influencing food security in study area. Majority (72.2%) of respondents were moderate (60%) to most (12.2%) food insecure in study area. The factors related to household characteristics, environment, Food Security Programme and capacity building services were determining household food security in study area. In order to address determinants of household food security, the identified challenging factors: Household characteristics, environment, Food Security Programme and capacity building services related factors should be addressed.
Keywords: Determinants of food security, Household food security status, Sidama Zone, Boricha woreda

Background

Food insecurity in Ethiopia is normally understood in terms of recurrent food crises and famines. The responses to these food crises were conventionally dominated by emergency food-based interventions. However, a high proportion of households that received emergency food aid or food for public work were not only famine prone but also chronically food insecure and they faced predictable annual food deficits (Devereux *et al.,* 2006).

Therefore, in 2003, the government of Ethiopia launched a major consultation process with development partners building on its National Food Security Strategy. This consultation process was aimed at formulating an alternative to emergency relief system to support chronically food insecure households. In case, it has developed Food Security Programme (FSP) for long-term solutions of chronic food insecurity (MoARD, 2010). FSP(Food Security Programme) is one of components of National Food Security Strategy (FSCB M&E Task Force, 2004).

Then, FSP has been intervened since 2005 at chronically food insecure eight regions (Tigray, Amhara, Oromia, SNNPR (Southern Nation Nationalities Peoples Republic), Afar, Somali, rural Harare and Dire Dawa) (MoARD, 2006).

As well, SNNPR is one of the states forming the federal government of the country. This region is divided into 14 zones and 153 districts (woredas) and 4 special woredas. It is one of food insecure regions in Ethiopia. Hence, 79 chronically food insecure woredas have been intervened with FSP.

Boricha woreda is also one of chronically food insecure woredas in the Sidama zone, SNNPR. Hence, the woreda has been intervened with FSP. Likewise, chronically food insecure households in chronic food insecure kebeles have supported from FSP(food security programme).

Statement of Problem

It is now common knowledge that in Ethiopia most subsistence farmers have been challenged by chronic food insecurity. Chronic food insecurity is consistent food deficit at individual, household, communities, districts (woredas), national and regions levels.

Ethiopian government has intervened FSP collaborating with donors. The purpose of FSP interventions

is to bring long run solution on chronic food insecurity by enabling chronically food insecure households to achieve food security within specific period of time, 3-5 years.

However, households intervened with FSP are unable to achieve food security as expected and planned. Study conducted by Berhane *et al. (*2011) notes there was distress sell of household assets from 206-2010 to satisfy food needs at households, for instance, 34 percent of households sold assets for food in 2010. In addition, the study done by Gilligan *et al.(* 2009) indicates that there was no impact on the prevalence of serious household coping strategies i.e. reducing meals served to children. Furthermore, evaluations of the first phase of FSP (2005-2009) suggested that there was minimal graduation of beneficiary households (Sabates-Wheeler & Devereux, 2011). For instance, a total of 280,000 (3.7%) individuals out of 7.5 million households had graduated by 2009 though there was ambitious goal for graduation in the first phase (Catherine Robins & JaRco Consulting, 2011).

In the present study site, the identified factors which challenge household food security are: Household size, accessibility to main economic factors, bullocks owned by household and household income sources (Eden *et al.,* 2009). Moreover, educational status of household head, low land size and less access to service index are also identified factors determining household food security in study area (Regassa, 2011).

Therefore, this study has designed to fill the existing gap of knowledge regarding the determinants of food security in rural household intervened with FSP. In order to identify determinants of household food security, the present study has focused on analyzing household characteristics, environment, FSP and capacity building services related factors determining household food security and assessing food security status of households.

Objectives of the Study

To identify household characteristics, environment, Food Security Programme and capacity building services related factors determining household food security and assessing food security status in rural households intervened with FSP.

Research Hypothesis

Household characteristics, Environment, Food Security Programme and Capacity building factors can determine food security in study area.

Significance of the Study

This study provides findings on determinants of household food security. Based on the findings of this study, the recommendations have been designed to address those determinants of food security. Similarly, this study is used as reference material for other researchers, governmental and nongovernmental organization. In addition it indicates gaps to be filled by further studies.

METHODOLOGY .

Description of Study Area

The area which was selected for this study is Boricha woreda in Sidama zone, SNNPR. It is located at 36 kilometers from the Regional and Sidama Zonal capital city, Hawassa, and 311 kilometer from capital city of Ethiopia, Addis Ababa. The woreda has 588.05 sq.km2 areas.

Woreda is agro-ecologically categorized into two: 25% is midland (*Woynadega*) and 75% is lowland (*Kola*). *Woynadega* has medium altitude, whereas *kola* has low altitude. The altitude of woreda ranges from 1,320 to 2,080m.a.s.l. The range of annual rainfall is between 27.82 to 128.58mm. It is bimodal with short rainy season from March to April which is '*Belg'*, and the long rainy season from June to the middle of August which is '*Kiremt*'. The range of annual temperature of the woreda is between 21.93°c to 25.56°c. The economy of the woreda mainly based on agriculture. Mixed farming system is dominant activity for rural households. It is confined to production of rain-fed crops. The main crops are produced in the study area are maize, haricot bean, *Enset,* coffee, potato and sweet potato. It has 42 kebeles. Out of these kebeles three are urban and the other 39 are rural kebeles. The populations of the woreda are 236,341. From these 118,566 (50.2%) are males and 117,775 (49.8%) are females (FDREPCC, 2008).

Out of 39 rural kebeles 36 are chronically food insecure and the remaining 3 are food secure. Chronically food insecure kebeles have been intervened with FSP.

Likewise, 41,855 chronically food insecure households intervened with PSNP since 2005. In addition, 19,540 beneficiaries (4,885 households) intervened with household package/ asset building credit/ up to 2009 in addition to PSNP in the purpose of graduation. Households which have supported from PSNP and household package/ asset building credit/ simultaneously disaggregated into gender, 3,689 (75%) and 1,196 (25%) are male and female headed households respectively.

Research Design

Community based cross sectional survey was carried out in 36 chronically food insecure rural administrative kebeles of study woreda. In this study, qualitative and quantitative methods were employed. The mixed methods of study helped to triangulate the reliability of the information.

Explanatory variables were collected at one particular point of time related to determinants of household food security through interviewing sample households and members of Focus Group Discussion (FGD).

Data Sources

The required input data of this study was generated from primary data sources. Households intervened with asset building credit (household package) until 2009 in addition to PSNP are primary data sources. The reasons to select this population in time bounded are: Households intervened with asset building credit until 2009 in addition to PSNP are expected to be food secured within predetermined time bound, which is 3-5 years, and it is the first phase of Food Security Programme. Based on selection criteria of study population, 4,885 households are population of present study. In addition, FGD is one of primary data sources in present study. In case, eight elite people, who have supported from FSP, were members of FGD. The reason to select elite people for FGD is that they do not fear to give information in-depth.

Sample Size Determination

In order to conduct this study, size of sample households was determined from 4,885 households (population frame) of study. Sample size determination formula was used to calculate sample size of present study. Then, precision (0.075) was used based on the recommendation of Conroy (2004) and Global HIV/AIDS Initiatives Network (2006).

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

Sources: University of Florida (2009)

Based on the above sample size determination formula, 172 sample households were obtained. In addition, 5% of sample households were added as contingency households. Totally, 180 households were participated in the present study.

Sampling Techniques

Multi-stage sampling techniques were used to obtain representative sample households from study population. The study site, Boricha woreda, was selected purposively because it is one of chronically food insecure woredas and intervened with FSP. Hereafter, four kebeles out of 36 chronically food insecure kebeles are sample of present study. In case, random sampling technique was used to select sample kebeles of this study. Accordingly, sample households were selected by random sampling methods from four sample kebeles. In order to randomize, lists of study households (population frame) were obtained from woreda early warning and food security process. Then, 45 households were selected from each of sample kebeles through writing the name of all study households of each sample kebele on pieces of paper and then picking 45 households from listed names of households on a container i.e. lottery system . So that, 180 sample households were selected for primary data from four sample kebeles.

Furthermore, members of FGD are also primary data sources for present study. They were selected purposely from easily assessable communities of each sample kebele.

Variables of Study

Dependent variable in this study is household food security. Household food security was measured by Months of Adequate Household Food Provisioning (MAHFP).

Independent variables are household characteristics, physical and social environmental factors, PSNP and asset building credit interventions related variables, and household capacity building services specific factors.

Validity of Survey Instruments

A structured questionnaire of household survey was translated from English to regional work language, Amharic. It was pre-tested to check validity by interviewing 5% households. These households were selected from 2 kebeles out of sample kebeles.

Methods of Data Collection

In order to collect required data, 4 enumerators were recruited. The recruiting was based on their level of fluency of local and SNNPR work languages which were Sidamic and Amharic languages respectively. In addition, they were college diploma holders rather than DA's(development agents). The purpose of recruiting other enumerators than DA's is to keep accuracy of information. Then, recruited enumerators were thoroughly trained for two day to bring common understanding among them.

Hereafter, household survey was conducted to collect data from sample households through face to face interviewing household head using pre-tested and structured questionnaire. This was conducted by four enumerators, while researcher was supervising. Similarly, FGD was conducted by researcher through open ended guideline questionnaire. The data which were obtained from FGD are: Experiences of households in crop selling, household trends, ceremonies and festivals of sociocultural practices, targeting for, payment of and deduction from PSNP, and sharing of asset building credit intervention with other people.

The data gathered from members of FGD are qualitative. The qualitative data supplemented the information generated from cross-sectional household survey. Therefore, FGD was needed to know general information in depth which was related to determinants of household food security.

Data Processing and Analysis

After completion of fieldwork, the data were coded and entered into Statistical Package for Social Sciences (SPSS) software for windows version 16.0. Hereafter, data were cleaned and verified for analysis.

The data was analyzed using qualitative and quantitative approaches. The descriptive narrative analysis approach was conducted for the qualitative data generated through FGD. In addition, descriptive analysis method was used to describe data collected from sample households before multivariate analysis. Then, results of univariate data analysis was presented by creating a frequency and percent table format of independent variables.

Multivariate analysis includes a variety of statistical methods used to analyze measurements on two or more variables. Multiple regression analysis is one of multivariate analysis. It predicts the effects of two or more independent variables on a single dependent variable. It was used in this study to predict the effects of explanatory variables on a response variable, household food security, by fitting a linear equation to observed data.

RESULTS AND DISCUSSION

Table 1 presents some basic descriptive statistics of socio-demographic characteristics of sample households. Based on the results (table 1), out of sample households (N=180) majority (76.1%) were male. Similarly, for the age distribution of household head, larger portion (97.2%) of respondents belonged to productive age groups (15-64). In addition, table 1 shows 7-10 and 4-6 household sizes belonged to 46.7 and 32.8 percent of sample households respectively; and 7.37 were average household size of respondents. Moreover, nearer to half (48.2%) of respondents were unable to read and write; majority (84.5%) of sample households owned less than one hectare of farm land.table Zele\Table 1.docx

4.2. Socio-Economic Characteristics

Table 2 shows socio-economic characteristics of sample households. Based on table 2, 91 percent households did not effectively integrate farming system. Similarly, 60.3 percent of households did not use agricultural inputs (improved seed & fertilizers) continuously as recommended; and 71.2 percent of sample households also did not use asset building credit intervention for investment alone. In addition, the table 2 reports more than half (52.1%) of respondents did not conserved soil and water in their farm effectively; and more than three forth (76.2%) of respondents experienced selling crops immediately after harvest without storing. Moreover, 69.9 percent of sample households borrowed money from informal rural money lenders; and 56.2 percent of respondents did not experience in crop sharing.

Selling crop product immediately after harvest without storing was evidenced by FGD conducted at four sample kebeles. FGD indicated that households experienced selling crops by lower price at nearby market immediately after harvest without storing. As reported by FGD, majorities of households sold crops in the purpose to repay loan and for ceremonies and festivals of harmful sociocultural practices. According to FGD, they got low income from selling crop products because price was lower at nearby market during early harvest.

According to FGD, majority of food insecure households were experiencing borrowing money from informal rural money lenders. As FGD discussion, the repayment rate of loan was per month i.e. during PSNP payment. Members of FGD reported that interest rate of loan was in average 100 percent per month. Furthermore, as members of FGD discussion, households borrowed money from informal rural money lenders to repay during harvesting season in kind or cash. table Zele\Table 2.docx

4.3. Household Trends

Based on the table 3, majority (71.9%) of respondents rented out livestock from neighbors. Similarly, 58 percent of sample households lacked confidence to escape from food insecurity trap. In relation to renting out livestock from neighbor, members of FGD noticed majorities of households rented out livestock from their neighbors to receive cash at hand by taking livestock to market. According to this discussion, they allocated the money for nonproductive activities, for instance, for household consumption, constructing residing house, harmful sociocultural practices and non-food household consumption. Based on FGD, they faced extra cost by renting out livestock. table Zele\Table 3.docx

4.4. Physical Environment Specific Challenges

Table 4 illustrates physical environment specific factors which are land infertility, recurrent drought and livestock disease. According to this table, larger portion (65.3%) of respondents owned infertile land. In addition, 74.4 percent of sample households were seriously challenged by recurrent drought. Moreover, 56.1 percent of respondents were influenced by livestock diseases. table Zele\Table 4.docx

4.5. Social Environment Related Challenges

Based on the table5, majority (82.8%) of sample households were seriously challenged by sociocultural practices; and more than half (58.3%) of respondents were also challenged by shortage of finance for investment. Likewise,

majority (78.3%) of households participated in this study were seriously challenged by high price of food for secure access of adequate food. Moreover, less than half (40%) of sample households faced human shocks; and 42.8 percent of respondents were unable to access market easily.

According to FGD conducted at sample kebeles in study area on harmful sociocultural practices, food insecure households were seriously challenged by harmful sociocultural practices. As reported by FGD, they eroded household assets through selling for the purpose of ceremonies and festivals of harmful sociocultural practices. For instance, they lost crop products by selling, preparing food and making drinking. Similarly, they experienced borrowing money from informal rural money lenders at high interest rate for the mentioned purpose. Likewise, they used household asset building credit intervention for those ceremonies and festivals than investing. FGD reported that ceremonies and festivals of graduation of students and new constructed house, and marriage processes were the most seriously challenging sociocultural practices in study areas. table Zele\Table 5.docx

4.6. Productive Safety Net Programme Related Factors

4.6.1. Not full targeting household members for PSNP

According to the table 6, 1-3 household members of more than half (52.2%) of sample households were not targeted (registered) for PSNP; and followed by 4-5 household members of 33.3 percent of respondents were also not registered for PSNP; in average, 46 percent of the household members were not targeted for PSNP.

Discussion conducted with FGD participants noticed members of majority households were not fully targeted for PSNP. In addition, not only not full targeting household members but also registered (targeted) household members were reduced time to time. Based on FGD, the reasons for reducing of registered household members for PSNP were using as punishment for those households and to take acceptance by targeting non-eligible households or by adding to other households.table Zele\Table 6.docx

4.6.2. Accountability and predictability of , deduction from and purchasing power of PSNP payment

Moreover, table 7 illustrates unaccountability and predictability of, deduction from and purchasing power of PSNP payment. According to results (table 7), greater portion (83.3%) of sample households responded that PSNP payment was unaccountable and predictable; and majority (88.3%) of respondents reported that deduction was undertaken from PSNP payment. Similarly, larger portion (82.8%) of sample households responded that per day per person payment of PSNP has not purchased 3kgs cereals.

FGD evidenced that the payment of PSNP was not on time i.e. delayed payment. Based on FGD, majorities of households were borrowing money from informal rural money lenders per month repayment rate at high (100%) interest rate, as result, late payment of PSNP to meet food need. As discussed by members of FGD, households, which are remote from kebele administration office (farmer research center), were unable to receive the wage of PSNP during the time. As result, those households faced extra cost to receive PSNP payment from woreda finance and economic office.

FGD, which was conducted at four sample kebeles, reveals that deduction has been undertaken from PSNP payment. According to FGD, the reported reasons for deduction were: In the purpose of saving and loan repayment of FSP intervention (for matured loan). table Zele\Table 7.docx

4.7. Household Asset Building Credit Related Challenges

This subsection covers size of asset building credit, unaccountability and predictability of disbursement, sharing of asset building credit with other people and choices of packages.

4.7.1. Size, accountability and predictability of asset building credit intervention

The table 8 presents size, accountability and predictability of asset building credit intervention. Based on results (table 8), 57.8 percent of sample households said that size of credit intervened was not enough to start investment. Moreover, the majority (63.3%) of respondents reported disbursement of credit was unaccountable and predictable. table Zele\Table 8.docx

4.7.2. Asset building credit sharing and choices of packages

Furthermore, table 9 presents asset building credit intervention sharing with other people and choices of packages. According to this table, majority (71.7%) of sample households shared asset building credit intervention with other people. Similarly, the findings of this study indicate that nearly half (45.6%) of sample households responded that the choices of packages were not based on their needs.

FGD reported that majorities of households shared asset building credit intervention of FSP with other people. FGD documented that households were negotiating with kebele administrative before targeting how much to share and how they give the negotiated amount. They gave negotiated money to other either borrowing before intervention or from intervention. table Zele\Table 9.docx

4.8. Training Households for Techniques of Investments and Market

Table 10 reports not training households for techniques of investment and market. According to results (table 10), larger portions (71.1%) of sample households were not trained for techniques of investments. In addition, findings

of present study indicate that majorities (85%) of respondents were not trained for market effectively. table Zele\Table 10.docx

4.9. Monitoring of Investment and Implementation of Intervention and Experience Sharing

Moreover, table 11 notices monitoring investment of intervention and experience sharing. Findings (table 11) indicate that majorities (73.3%) of respondents reported that investment of intervention was not monitored. Furthermore, larger fraction (86.1%) of sample households did not obtain (get) experience sharing. table Zele\Table 11.docx

4.10. Empirical Results and Discussion of Determinants of Household Food Security in the Study Area

Correlation of each independent variable with dependent variable was checked by Pearson product-moment correlation tool before analyzing with model. Based on this, significant explanatory variables were entered into multiple linear regression models to analyze determinants of household food security using SPSS version 16. Hence, table 12 presents b coefficients and p values. Eighteen of twenty eight explanatory variables were negatively and significantly determine household food security. In the whole, the model performed well. The effects on household food security and interpretations of significant explanatory variables of multiple linear regression analysis are the followings:

4.10.1. Not integrating farming system

In order to answer the first objective of this study, the results (table 12) of model reveals that not effective integrating farming system was negatively associated with Months of Adequate Household Food Provisioning (MAHFP). This implies that one unit increase of not effective integrating farming system results in decrease of MAHFP by 0.420 units. The study conducted by Mamun *et al.* (2011) quoting (Lightfoot, 1997) concluded that most farmers did not integrate farming system, because of integrating farming system take long transition period (3-10), labor shortages and lack of incentives to adopt integrated farming. It is now common knowledge that majorities of food insecure households do not integrate farming system effectively. Thus, they lack diversified income sources. In this study, negative association indicates that households which do not integrate farming system effectively are more challenged by food insecurity.

4.10.2. Agricultural inputs use

Similarly, based on results (table 12) of multiple regression analysis, not continuous use of agricultural inputs negatively associated with MAHFP. This association shows one unit increase of not continuous use of agricultural inputs (improved seeds & fertilizers) as recommended results in 1.710 unit decrease of MAHFP, while holding other variables constant. Ministry of Agriculture and Animal Resources (2009) concluded that poor farmers did not use agricultural inputs because of principal influences: Lack of sufficient awareness and skills of the value of applying inputs, high costs of inputs for small holder farmers, inefficient agricultural inputs supply and distribution system, and large sized package of inputs. In general, majorities of rural food insecure farmers were constrained from continuous use of agricultural inputs as recommended by various factors: Lack of finance at hand to buy inputs during peak farming seasons, high prices of inputs, lack of awareness for inputs and fear of crop failure. According to finding of this study, households do not use agricultural inputs continuously as recommended are more challenged by food insecurity though they intervened with FSP.

4.10.3. Use of household asset building credit for investment

Likewise, multiple regression analysis results (table 12) notices there was negative relationship between not use of asset building credit intervention for investment alone and household food security. This relationship reveals that one unit increase of not using asset building credit for investment alone results in decrease of household food security by 1.814 units, while effects of other variables controlled. Households used their credit intervention for non-productive investments, for instance, for construction of improved housing, purchasing food and non-food household consumption (Sabates-Wheeler & Devereux, 2011). It is now common knowledge that majorities of households use credit intervention as immediate solution for challenges they faced than investing. Present study notices households which do not use intervened credit for investments alone are more influenced by food insecurity.

4.10.4. Selling crops immediately after harvest

In addition, table 12 shows selling of crop products immediately after harvest without storing was negatively associated with MAHFP. This association indicates that one unit increase of selling crops immediately after harvest without storing causes 2.141 unit decrease of MAHFP, while controlling contributions of other variables. The study done by Gyawali & Ekasingh (2007) shows Tharu people in Nepal experienced selling crops immediately after harvest at lower price nearby market. It is known that crop product is a main source of household income for rural households. Thus, majorities of them experience selling crop products immediately after harvest without storing. This finding indicates that households which experience selling crop productions immediately after harvest without storing are more vulnerable to food insecurity though they intervened with FSP.

4.10.5. Borrowing money from informal rural money lenders

Moreover, there was negative relationship between borrowing money from informal rural money lenders and

household food security, as findings (table 12) analyzed by multiple regressions. This association shows one unit increase of borrowing money from informal rural money lenders results in decrease of household food security by 0.602 units, while holding influences of other variables constant. Study conducted by Kadale Consultants (2012) reported that poor farmers eroded assets through borrowing money from informal rural money lenders by 75-100% interest rate per month repayment rate. In general, majority of rural poor households experience borrowing money from informal rural money lenders as immediate solution for challenges they faced. In case, they erode their assets through repaying the loan with high interest rate. This study indicates that households, which experience borrowing money from informal rural money lenders, are more affected by food insecurity though they intervened with FSP.

4.10.6. Renting out livestock

As well, the relationship between renting out livestock from neighbor and household food security was negative, as results (table 12) of multiple regression analysis. This implies that one unit increase of renting out livestock from neighbor causes 0.769 unit decrease of food security, while controlling influences other variables. It is now common knowledge that in rural areas majorities of households rent out livestock from neighbors to receive cash at hand when they intervened with livestock. In this process, the owners of livestock took livestock to market as seller and receive the cash from cashier. Then, the client households have allocated asset building credit intervention for nonproductive activities than investing, for instance, consumption smoothing, ceremonies and festivals of harmful sociocultural practices, non-food household expenditure, repaying debt and constructing house. Even though previous studies documented were not found to compare and contrast with this finding, households which rent out livestock from neighbors are more challenged by food insecurity.

4.10.7. Confidence of households

Furthermore, the results (table 12) of multiple regression analysis, lacking confidence negatively associated with MAHFP. This negative association reveals that one unit increase of lack of confidence results in decrease of MAHFP by 0.720 units, while holding contributions of other variables constant. A study conducted by Frankenberger *et al*. (2007) shows chronically food insecure households were characterizing low motivation and confidence in regard to changing their chronic food insecurity. In general, majorities of food insecure households are lacking confidence to escape from food insecurity trap; because of they fear for risk of investment. The present study shows households, which lack confidence, are more exposed to food insecurity in study area.

4.10.8. Challenges of drought

In order to answer second objective of present study, the findings (table 12) of multiple regressions analysis notices drought was negatively related with food security. Negative relationship shows one unit increase of drought results in 1.211 unit decrease of food security. This study agrees with the previous study conducted by Frankenberger *et al. (*2007), recurrent drought challenged food insecure households. It resulted in: Poor crop production, shortage of livestock feed, debt-taking to meet food needs, selling livestock, consuming their productive inputs (seed stocks), minimizing other household expenses, loss of income and consumption. In general, drought seriously challenges agricultural production. In this case, majorities of food insecure households are seriously influenced by drought in study area.

4.10.9. Ceremonies and festivals of harmful sociocultural practices

Similarly, table 12 shows sociocultural practices negatively associated with household food security, as indicated by multiple regression analysis. The negative relationship notices one unit increase of sociocultural practices causes 2.032 unit decrease of household food security. This study agrees with study conducted by Gyawali and Ekasingh (2007), Tharu people in Nepal used 28% of cereals for ceremonies and festivals by making alcohol and selling crops. In case, majorities of them were food insecure. It is obviously known that in rural areas households erode their assets for ceremonies and festivals of sociocultural practices through various ways: First, they experience selling productive assets and crop products. Second, they use crop products to prepare excess food and making drinking for ceremonies and festivals. Third, they borrow money from informal rural money lenders for this purpose. According to this study, households, which are seriously challenged by sociocultural practices, are more vulnerable to food insecurity.

4.10.10. Price of food

Moreover, findings (table 12) of this study notices there was negative relationship between high price of food and food security. This relationship illustrates that holding contributions of other variables constant, one unit increase of price of food causes 0.835 unit decrease of food security. The study conducted by Frankenberger *et al*. (2007) suggested that seasonal price fluctuation of staple food contributed to the vulnerability of many rural poor households because they depend on market and have relatively limited purchasing power. In general, there are clear reasons that high price of food negatively challenges household food security. First, majorities of households are unable to provide enough food from domestic production throughout the year. Second, majorities of them have no diversified income sources to purchase consumption food at high price. In whole, food insecure households have low purchasing power, thus they are unable to access adequate food at high price in study area.

4.10.11. Not full targeting household members for PSNP

In order to answer third objective of this study, findings (table 12) indicate that a number of not registered

household members for PSNP were negatively associated with dependent variable. This association shows while keeping influences of other variables constant, one unit increase of not full registering (targeting) household members for PSNP causes 0.149 unit decrease of dependent variable. The present study evidenced by previous study done by Sharp *et al.* (2006), dilution has been still occurred through targeting by lower number of members of a household than the actual average household size. It is known that members of major food insecure households are not fully targeted for PSNP. This finding indicates that households which members are not targeted fully are more challenged by food insecurity.

4.10.12. Unaccountability and predictability of PSNP payments

Similarly, results (table 12) indicate that unaccountability and predictability of PSNP payment was negatively associated with MAHFP, as documented by multiple regressions. This association illustrates that one unit increase of unaccountable and predictable payments of PSNP results in 0.332 unit decrease of MAHFP, while holding influences of other variables constant. PSNP transfer payments were sometimes delayed more than two months and often coinciding with high prices of staple food, which resulted in forcing households to take loans or sell existing assets and/or labor in order to purchase food (Frankenberger *et al*., 2007). It is obvious that PSNP has not been paid in accountable and predictable manner for households in rural areas. In this case, households experience in borrowing money from informal rural money lenders and deplete household assets to smooth household consumption. Moreover, they use asset building intervention to purchase food.

4.10.13. Deduction from wage of PSNP payment

In addition, cross-sectional household survey results (table 12) analyzed by multiple linear regressions shows there was negative relationship between deducting from PSNP payment and MAHFP. This association indicates that one unit increase of deduction from PSNP payment causes 0.582 unit decrease of MAHFP. This finding agrees with previous study conducted by Slater *et al.* (2006), PSNP payments were sometimes used for savings and repayment of loan of intervened credit. In general, deductions from PSNP payment are occurred for various reasons in rural areas: For loan repayment of asset building credit/household package/, saving purpose and community development activities. Finding of present study indicates that households, which payments of PSNP have been deducted, are more influenced by food insecurity in the study area.

4.10.14. Sharing of household asset building credit with other people

Moreover, findings (table 12) of present study indicate that sharing of household asset building credit intervention with other people was negatively associated with food security. This implies that keeping influences of other variables constant, one unit increase of sharing credit with other people results in decrease of food security by 0.664 units. Households were shared resources of FSP interventions among as many people because of pressure by administrative (Sharp *et al.,* 2006). It is now obvious that majorities of households share asset building credit intervention with other people by force of kebele administration. In case, they have not received full intervention of asset building credit for investment. In whole, this finding indicates that households, which shared intervention with other people, are more exposed to be stayed under food insecurity trap.

4.10.15. Training households for techniques of investment

In order to answer the forth objective of present study, findings (table 12) of this study indicate that not training households for techniques of investment was negatively related with dependent variable. The implication of this relationship is one unit increase of not training households for techniques of investment causes 0.418 unit decreases of dependent variable. This study evidenced by previous study conducted by Slater *et al*. (2006), most households received insufficient technical training which capacitate them to improve agricultural activities and increase production. There are good grounds to believe that not training households for techniques of investment is negatively associated with dependent variable: First, in general, majorities of chronically food insecure rural farmers have lower educational status and they are unable to read and write. Second, they lack opportunity to participate in intensive technical trainings. Third, they are unable to/less access to updated information sources. Thus, they have gap of skills and knowledge for effective investment based on demands of market.

4.10.16. Training households for market

Similarly, not training households for market was negatively associated with household food security, as results (table 12) of multiple regressions analysis. This association notices holding contributions of other variables constant, one unit increase of lack of training for households on market results in household food security decreasing by 0.403 units. Chronically food insecure households lacked important updated market information about job opportunities, changes in input or output prices and new techniques (CPRC, 2008). It is common knowledge that food insecure households in rural areas have gap of skills and knowledge of market to invest based on the market demands. In addition, they have gap of business skills to enter higher-priced markets or create employment. In whole, households which have gap of skills and knowledge for market are more exposed to food insecurity in study area though they intervened with FSP.

4.10.17. Continuous and effective monitoring of investment and implementation of FSP intervention

In addition, findings of this study presented on table 12 reveals that there was negative relationship between not continuous monitoring investment of intervention and household food security. The negative relationship indicates

that one unit increase of not continuous monitoring investment results in decrease of food security by 0.562 units. This study agrees with study conducted by Frankenberger *et al. (*2007), targeting for and graduation from PSNP and implementations of FSP were exacerbated by lack of consistent monitoring and evaluation. In general, there are good grounds to believe that lack of continuous monitoring of investment are negatively affecting household food security: First, households use credit intervention for nonproductive purposes. Second, majority of them lack confidence to invest. Third, sharing of asset building credit intervention with other people has been occurred. In summary, this study shows that households, which investment of intervention has not been monitored continuously, are more exposed to be under food insecurity trap.

4.10.18. Experience sharing

Finally, findings (table 12) analyzed by multiple regression indicate that there was negative relationship between lack of experience sharing and household food security. This association indicates that one unit increase of lack of experience sharing causes 0.377 unit decrease of household food security. Experience sharing –"seeing believes" was not undertaken (Weidemann Associates, Inc., 2006). It is known that majorities of poor rural households have less opportunity to participate in experience sharing of best practices which create motivation and confidence i.e. build capacity. Thus, they lack motivation and confidence to invest effectively. To sum up, households which lacked experience sharing are more challenged by food insecurity. table Zele\Table 12.docx

4.11. Household Food Security Status in Study Area

To address fifth objective of present study, table 13 reports food security status of 180 sample households based on MAHFP index in last 12 months. According to table 13, 27.8, 60 and 12.2 percent of sample households belonged to providing adequate household food for 12, 4-11 and 0-3 months in the last year respectively. Furthermore, an average number of MAHFP was 8.8 on sample households in the study area.

Based on MAHFP index, households categorized into food secure, moderate food insecure and most food insecure households belonged to providing adequate household food for 12, 4-11 and 0-3 months respectively (Bilinsky & Swindale, 2007; Konda *et al.,* 2008; & Sidibe *et al*., 2008). According to these recommendations, results (table 13) of present study shows 27.8, 60 and 12.2 present of sample households belonged to food secure, moderate food insecure and most food insecure households respectively.

Accordingly, households categorized into food secure households which provide adequate household food for 12 months in last year and food insecure households which also provide adequate household food for less than/not full/ 12 months in last year (Devereux *et al*., 2006; Gilligan *et al*., 2009; & Sabates-Wheeler and Devereux, 2010). Based on these suggestions, the majority (72.2%) of sample households of present study are food insecure (moderate food insecure (60%) & most food insecure (12.2%)) and 27.8 percent of sample households are food secure.

The figure of food insecure households in this study is higher to some extent than study conducted by Regassa (2011), 54.1 percent of respondents were mild to severe food insecure. The expected reason for this variation of figures might be populations of studies. Sample households of previous study represent whole rural households in the study site. As mentioned in methodology section, sample households of present study represents only households intervened with FSP especially asset building credit and PSNP simultaneously.

In addition, the present study agrees with previous study conducted in Rwanda by Sidibe *et al. (*2008), using MAHFP to assess the impact of interventions, 60 percent households were moderate food insecure. Moreover, 79 percent of households in Burkina Faso were moderate to most food insecure, which was measured by MAHFP (Badiel *et al*., 2008). To conclude, majorities of households participated in this study are more exposed to food insecurity trap though they have been intervened with FSP.table Zele\Table 13.docx

* NB: 72.2% of sample households are food insecure (the sum of moderate food insecure (60%) and most food insecure (12.2%) households)

5. CONCLUSION AND RECOMMENDATIONS

5.1. CONCLUSION

The present study conducted in rural households intervened with FSP indicates that household characteristics specific factors which categorized into socio-economic characteristics. Did not integrate farming system effectively, not continuous use of agricultural inputs, not using asset building credit intervention for investment alone, selling crops immediately after harvest and borrowing money from informal rural money lenders were negatively and significantly influencing household food security in study area. In addition, household characteristics related factors which categorized into household trends: Renting out livestock from neighbor and lack of confidence were also significantly and negatively affecting household food security in study area. In whole, household characteristics specific factors challenged household food security through influencing own production, stocks and household purchasing power of food. Households, which were influenced by those factors, were more vulnerable to food insecurity though they intervened with FSP. Therefore, household characteristics related factors were challenging food security in study area.

Similarly, this study investigated on environment specific determinants of food security. Physical and social environment related factors: Drought, sociocultural practices and high prices of food were negatively and significantly challenging household food security through affecting own production, stocks and household purchasing power of food. Households, which were challenged by environment specific factors, were more influenced by food insecurity though they intervened with FSP. Thus, environment specific factors were affecting household food security in study area.

In addition, FSP related factors: Not full targeting household members for PSNP, unaccountability and predictability of PSNP payment, deducting from PSNP payment and sharing asset building credit (household package) with other people were influencing household food security. FSP specific factors also affected household food security through influencing interventions (transfers) of FSP. Hence, FSP specific factors were determining household food security in study area.

As well, capacity building services related factors: Not training households for techniques of investment and market, not monitoring investment of intervention, and lacking experience sharing negatively and significantly affected household food. Capacity building services related factors influenced household food security through challenging own production. Household, which lacked those capacity building services, were more affected by food insecurity. Therefore, lacking capacity building services related factors were challenging household food security in study area.

Finalizing, majorities of sample households were food insecure in study area. These are categorized into moderate and most food insecure households.

5.2. RECOMMENDATION

In order to address findings which challenged significantly and negatively household food security, the following recommendations designed:

- Farming system should be integrated to address recurrent drought and diversify household income sources.
- Households should use agricultural inputs (improved seeds and fertilizers) continuously as recommended. Strategy designed to address this is:
  - Agricultural inputs (especially fertilizers) should be supplied for food insecure households in credit through partial prepayment system.
- For household asset building credit intervention to be used for investment alone, crop products not to be sold at early harvest (to be stored), households not to borrow money from informal rural money lenders and not rent out livestock from neighbors, there should be:
  - Alternative income sources and continuous training households to create awareness.
- Sociocultural practices should be addressed through establishing social capital, training households to create awareness and conducting community conversion.
- High price of food should be addressed through:
  - Increasing own production and shifting payment of PSNP from cash to kind based on needs of households and market supply of stable food.
- Partial targeting (not full targeting) of household members for PSNP should be addressed through retargeting.
- Payment of PSNP should be predictable and accountable.
- Deduction from PSNP payment should not be undertaken.
- Household asset building credit intervention/household package/ should not be shared with any other people.
- Continuous training, monitoring and experience sharing should be undertaken to:
  - Increase confidence, develop business skill of market and develop knowledge and skill of investment i.e. capacitate households.

Finalizing, present study suggested directions for future researches to fill the gaps of this study. Areas need further study are: The effects of FSP intervention year differences on household food security; sustainability of graduated household food security; intra-household food security status; and effects of administrative, staff and DA's on food security of households intervened with FSP.table Zele

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