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Food insecurity and copping strategies: a perspective from Kersa district, East Hararghe Ethiopia

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Abstract
This study was particularly conducted to measure food security status of farming households, to identify factors influencing rural households' food insecurity status and to find out the coping strategies. Thus, 120 household heads were selected from three Peasant Associations in the district using probability to proportion size stratified random sampling technique. A survey was conducted to collect the primary data from sample respondents and supplemented by secondary data. A binary logistic regression model was fitted to analyze the potential variables affecting household food insecurity in the study area. The model estimate correctly predicted (84%) of the sample cases, (88.9%) food secure and (96.4%) food insecure. On the other hand, sale of livestock, selling of firewood and charcoal, and seasonal migration, were found to be more frequently practiced copping strategies of the study districts. Finally, limiting population size and giving priority to gender mainstreaming, provision of water harvesting technologies, creating enabling economic and institutional environment were recommended.
Keywords: Food insecurity, copping strategies, Kersa distract, East Hararghe

1. Introduction

The issue of food security has been understood by many development workers as the availability of food in the world marketplace and on the food production systems of developing countries (FANTA, 2003). However, global food availability does not ensure food security in any particular country because what is available in the world market may not necessarily be accessible by famine affected people in African countries, as the economies of these countries, in general, cannot generate the foreign currency needed to purchase food from the world market. One of the most influential definitions of food security is that of the World Bank in 1986. The Bank defined it as the "access by all people at all times to enough food for an active and healthy life." This definition encompasses many issues. It deals with production in relation to food availability; it addresses distribution in that the produce should be accessed by all; it covers consumption in the sense that individual food needs are met in order for that individual to be active and healthy. In addition, the availability and accessibility of food to meet individual food needs should be sustainable. The recent World Food Program report also emphasized that increasing food production in the developing countries would be the basis on which to build their food security (IFPRA, 2002; Windfuhr, 2005).

In order to address the challenges of food insecurity in East Hararghe districts and other parts of the country, Federal Democratic Republic of Ethiopia (FDRE) issued Ethiopia's Food Security Strategy (EFSS) in November 1996 and updated it in January 2002. But the EFSS was revised in 2002, the government tried to elaborate on the above-mentioned issues (Beruk, 2003a). In general, the objective of EFSS is to ensure food security at the household level. The strategy document highlights the government's plan to address problems of food insecurity in the country. To ensure sustainable food security in the country rural development policies and strategies were also formulated. The rural development policy envisages that development and food security would be ensured through agriculture-led and rural-centered development. The policy emphasized targeted interventions for drought-prone and food insecure areas, such as Kersa district, which are characterized by erratic rainfall, vulnerability, soil degradation, low per capita, *etc.* (Food Security Programme Proposal/FSPP, 2003). Therefore, this study aimed to assess the households' food security situations in the Kersa districts and copping strategies.

2. Food Security concepts and practices

Many definitions and conceptual models all agree in that the defining characteristics of household food security are secure access at all times to sufficient food. Moreover, there are four core concepts, implicit in the notion of "secure access to enough food all the time." These are sufficiency of food, defined mainly as the calories needed for an active,

healthy life; access to food, defined by entitlement to produce, purchase or exchange food or receive as a gift; security, defined as the balance between vulnerability, risk and insurance; and time, where food insecurity can be chronic, transitory or cyclical (Maxwell and Frankenberger, 1992). Food security has three major components: availability, access and utilization (Kifle and Yoseph, 1999). And food availability refers to the need to produce sufficient food in a way that generates income for small-scale producers without depleting the natural resource base, and to the need to get this food into the market for sale at prices that consumers can afford (Haddad, 1997). According to Kifle and Yoseph (1999), availability is basically the household's capacity to produce the food it needs. The second component relates to people's ability to get economic access to this food (Haddad, 1997; World Bank, 2001).

Basically, there are two forms of food insecurity, namely chronic undernourishment and transitory food insecurity. Chronic food insecurity implies a persistent inability on the part of the household to access adequate food. Chronic food insecurity generally arises through inadequate access to resources, and is therefore structural in character. Transitory food insecurity come about as a result of shocks due to economic failures and human induced as well as natural disasters creating food shortages that affect, temporarily, all or part of the country population. In addition, even in the absence of chronic and transitory hunger the population may suffer from the lack of essential micronutrients. This is often referred to as hidden hunger (Maxwell, 2000).

The incidences of food insecurity and poverty are particularly devastating in the developing countries and a lot of resources are being channeled towards programs aimed at eradicating food insecurity and poverty by various international organizations and government of the developing nations. Adequate nutrition is the first requirement for development. Without proper nutrition, children are stunted mentally, physically, and socially; and adults are faced with lives that fall short of their potential to the detriment of society as a whole. In terms of food insecurity, 852 million people worldwide are still chronically undernourished. In Africa, an estimated 200 million or 27.4 percent of the people on the continent are undernourished (IFPRI, 2002; FAO, 2003). This figure is expected to increase to 30 percent by 2010. Some empirical studies argue that food security policies have failed to address the core livelihood risk issues of inadequate nutrition, malnutrition and poverty in developing countries (Pretty and Koohafkan, 2002; Ruivenkamp, 2005 and Windfuhr, 2005).

The major complaint is that food security policies have forced markets open to dumping of agricultural produce, privatized communal and public natural resources and concentrated resources in the hands of the rich minority. Although some of the rural poor may be helped by transfers from cities, for most poor households any improvement in their incomes will depend on generating more and better jobs in rural areas (IFPRI, 2007). Agriculture is likely to be central to rural development and rural poverty alleviation. Farming has high potential to create jobs, to increase returns to the assets that the poor possess—their labor and in some cases their land—and to push down the price of food staples, which is crucial when so many of the poor are net buyers of food. The poor face the most severe difficulties in relation to the production of food for home consumption and to access marketed food, which make them the most vulnerable to the food security crisis (Maxwell, 2000; Nyanteng and Asuming-Brepong, 2003).

3. Households' copping strategies

Households adopt and develop diversified coping strategies and sequential responses through which people used at times of decline in food availability. Degnew (1993) defined copping strategies as "a mechanisms by which households or community members meet their relief and recovery needs, and adjust to future disaster-related risks by themselves without outside support". Households use different means to cope when a food crisis hits them. Their coping mechanisms are adapted depending on how bad the crisis are and what is available to help them manage their situation. Some sale their assets, look for part time work, turn to their social network, venture into income generating activities, engage in food for work activities and others get food relief from NGOs and the government (Chlembo, 2004).

Coping mechanisms used by farm households in rural Ethiopia include livestock sales, agricultural employment, certain types of off-farm employment and migration to other areas, requesting grain loans, sale of wood or charcoal, small scale trading, selling cow dung and crop residues, reduction of food consumption, consumption of meat from their livestock, consumption of wild plants, reliance on relief assistance, relying on remittances from relatives, selling

of clothes, and dismantling of parts of their houses for sale. Some of them are likely to be implemented only after the possibilities of certain other options have been pursued (Cutler and Stephenson, 1984). The pattern of copping is largely determined by the pre-crisis characteristics of individual households that involve a succession of responses to increasingly severe conditions (Cutler and Stephenson, 1984). This doesn't represent an overnight awakening to danger, rather a progressive narrowing of options that leads from broad attempts to minimize risk in long term through actions designed to limit damage caused by a crisis, to extreme measures aimed at saving individual lives, even at the expense of household dissolution (Webb and von Braun, 1994).

The pattern of household responses to food crisis generally involves a succession of stages along a continuum of "copping" that runs from long-term risk minimization through crisis damage contained to the extreme instance of household collapse. These stages are grouped under three headings: risk minimization, risk absorption and, if necessary, risk-taking to survive. The first stage involves insuring against risk in a pre-crisis period in an environment of limited credit and insurance markets. It incorporates measures of savings, investment, accumulation, and diversification. The second stage of copping involves accumulating earlier investment, calling in loans, and searching for new credit. As capital for investment dries up, consumption (both food and nonfood) is restricted, stores of food are drawn down, and the number and variety of potential income sources that are available become crucial to survival and the ability to protect past investments decreases(Windfuhr, 2005).

4. **Research methodology**

The study site

Kersa is one of the 180 districts in the Oromia Region of Ethiopia. The altitude of this districts ranges from 1400 to 3200 meters above sea level. A survey of the land in Kersa shows that 28.5% is arable or cultivable, 2.3% pasture, 6.2% forest, and the remaining 56.3% is considered built-up, degraded or otherwise unusable. Khat, fruits and vegetables are important cash crops. Coffee is also an important cash crop; over 50 square kilometers are planted with this crop. Based on figures published by the Central Statistical Agency in 2005, this district has an estimated total population of 169,330, of whom 82,537 are men and 86,793 are women; 12,203 or 7.21% of its population are urban dwellers, which is about the same as the Zone average of 6.9%. With an estimated area of 463.75 square kilometers, Kersa has an estimated population density of 365.1 people per square kilometer, which is greater than the Zone average of 102.

Sampling technique, data sources and collection methods

Out of 20 kebeles in the district, three kebeles were selected. Finally, 120 respondents were selected from three *kebeles* using probability proportional to size sampling. Both primarily and secondary type of data were used. The primary data sources were obviously the sampled household heads. The secondary data sources were government regional offices like food security and disaster prevention and preparedness bureau reports, from NGOs and libraries and Internet sources. Primary data collection was conducted using survey by means of structured interview schedule for the quantitative part of the data. The interview schedule was pre-tested among the non-sampled respondents of matching characteristics and depending on the results of the pre-test; it was revised in the lights of suggestions received.

Data analysis method

One of the purposes of this study was to assess the determinants of food security status of the rural households. The dependent variable in this case is a dichotomous variable, which takes a value of zero if the household is food insecure and one if it is food secure. Therefore, Logit econometric model was selected. The logistic function was used because it represents a close approximation to the cumulative normal distribution and is simpler to work with (Train, (1986).

5. Result and Discussion

Food security status of the households

The households' food security status can be measured by direct survey of income, expenditure and consumption. In this study, households' food or calorie acquisition/consumption per adult per day is used to identify the food secure and food insecure households. The calorie consumed by the household is compared with the minimum recommended

calorie of 2100 kcal per adult per day. If the consumption/acquisition is less than the recommended amount then, the household is categorized as food insecure and if greater than, as food secure.

The reason for use of this measure was that it produces a crude estimate of the amount of calorie available for consumption in the household. Moreover, it is not obvious to respondents how they could manipulate their answers. Because the questions are retrospective, rather than prospective, the possibility that individuals or households will change their behavior as a consequence of being observed is lessened (Hoddinott, 2001). In addition, the reliability of income data in subsistence farming where record keeping is limited is always questionable (Tesfaye, 2003). Of course, it cannot be denied that measuring food security in terms of income is consistent with objectives of many rural development interventions aimed at raising the level of income of rural households. However, the correlation between income and food security status of household is not always strong (Hoddinott, 2001).

The households' food security status was measured by direct survey of consumption. Data on the available food for consumption, from home production, purchase and /or gift/loan/wage in kind for the previous seven (7) days before the survey day by the household was collected. Then the data were converted to kilocalorie and then divided to household size measured in AE. Following this, the amount of energy in kilocalorie available for the household is compared with the minimum subsistence requirement per adult per day (i.e. 2100 kcal). As a result, from all respondent households, 84 households were found to be food insecure and 36 of them food secure. It means that (70%) of the respondent households were food insecure and (30%) of them were food secure (Table 1).

The results of the logit model

The binary logit model found out six significant variables out of 11 variables which were thought to influence the food security status. Those variables that showed significance in the model were: age of the household (HH) head, sex of the HH head, HH size in AE, total cropping land in Ha, oxen owned and remittances in Birr (Table 2).

The education status of the head of the household was expected to have positive coefficient. Unfortunately, the result of the logit model revealed that the sign was negative and insignificant (Table 2). This was due to the unfavorable environment to benefit from the qualities of education. But the odds ratio shows that a unit increase in the age of the household head increased the likelihood for the household to be food insecure. One possible reason may be that older household heads have larger number of family size as polygamy is a common practice. This opens up a chance for bearing children even at latter ages (Abebaw, 2003).

Empirical findings consistently indicated that female headed households do not have the required labor force to produce what needed by the household. Several empirical studies (Ayalew, 2003; Mulugeta, 2002; Tesfaye, 2005 and Yilma, 2005) showed that the family size was significant in determining the probability of a farm household's food security status. Moreover, this study agrees with the expected that household size with high dependency ratio had role to play in affecting the probability of households to become food insecure. The study also reportedly underlined that the household who got more hectares of cropping land would be in a position to cope with food insecurity. The reason may be that, the farmer who got more hectare of cropping land planted with crops, the probability of getting enough harvest for home consumption increases.

Many empirical studies show that oxen ownership is an important variable in food security studies, since ox is mainly used in farm operations. For instance, according to Tesfaye (2005), the possession of ox is a critical production factor. This study found out that the more the number of oxen available to households, the higher is the probability of being food secure. The positive sign of this variable indicated the contribution of this resource towards ensuring food security. The binary logit model indicated that remittance had positive contribution to the food security status of the rural households. This implied that the society got a strong social network in which they send money to one another.

Households' copping strategies

In any stage of food insecurity (initial or severe), rural households practice different copping strategies but with low frequency.

By initial stage of food insecurity, we refer to the beginning time of the situation where different conditions are responsible for it. For instance, rainfall shortage for a year, other factors kept constant, is likely to cause crop failures which result temporary/initial stage food insecurity. But when the shortage of rainfall, for instance, lasts for two and more consecutive years, severe food insecurity is likely to occur. In both situations households used to cope with by practicing different copping strategies. The households in the study area also used to practice various second stage copping strategies in a different manner at severe stage of food insecurity.

6. Conclusion

Family size and food security were strongly and negatively related. Age of the household head and being women headed household had negative impact on food security. This means old household heads and female headed households are less likely to be food secure. Cultivated land size was found to be significant. But this did not drive to a conclusion that states to increase total cropping land size. Rather intensified agriculture and livestock production have to be introduced and implemented in the area. In addition, opening money transferring agencies such as banks and micro-finance institutions in appropriate towns in the districts will have an important implication By doing that, they should be given technical training on saving and credit schemes, they should also be linked to good market and given technical assistances as well. Generally, strengthening the institutional and organizational capacity as well as creating conducive environment for socio-economic and demographic factors should be prior attention.

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Tables

Table. 1. Energy available per AE in kcal for sample households

Energy available per AE in (kcal)	Food insecure (N=84)	Food secure (N=36)	Total (N=120)
Minimum	1643	2203	1643
Maximum	2092	2886	2886
Mean	1901	2429	2060
Standard Deviation	119	194	283

Source: survey result.

Table.2. Logit regression estimates of factors affecting food security of the households

Variables	Coefficients	Odds ratio	Wald statistics	Significance Level
Constant	13.219			0.006
Age of HH head	-0.201***	0.801	8.352	0.003
Sex of HH heads	-5.355**	0.004	4.184	0.041
HH size in AE	-0.960**	0.383	6.069	0.014
Dependency Ratio	-3.216	0.040	2.048	0.152
Education level of HH head	-0.244	0.784	0.627	0.428
Total cropping land in Ha	0.414**	1.513	3.986	0.046
Location of cropping land	0.486	1.626	0.265	0.607
Livestock in TLU	0.033	1.033	0.057	0.811
Oxen owned in No.	2.102***	9.996	7.149	0.008
Market distance in Hrs of walk	0.377	1.458	0.807	0.369
Remittance in (Ethiopian Birr)	0.014**	1.014	4.621	0.032
- 2 Log likelihood			36.870	
Chi-squared (χ^2)			119.547***	
Pseudo R^2			84.2	

*** and * *are significant at less than 1% and 5% probability levels, respectively.
Source: model output

Table 3. Types of coping strategies at initial stage of food insecurity

Practiced Strategies	Food insecure (N=84)		Food secure (N=36)		Total (N=120)	
	Number	Percent	Number	Percent	Number	Percent
1. Sales of Livestock	46	54.8	16	44.4	62	51.7
2. Borrowing cash	63	75	27	75	90	75
3. Reducing number of meal	53	63.1	30	83.3	83	69.2
4. Reducing size of meal	51	60.7	23	63.9	74	61.7
5. Sale of firewood and charcoal	32	38.1	12	33.33	44	36.7
6. Participate in food for work	7	8.3	1	2.8	8	6.7
7. Received Food aid	5	6	1	2.8	6	5
8. Seasonal migration	7	8.3	2	5.6	9	7.5
9. Making mortar and selling	4	4.8	2	5.6	6	5
10. Becoming temporary trader	11	13.1	27	75	38	31.7
11. remittances	18	21.4	18	50	36	30
12. Become daily labor	7	8.3	1	2.8	7	5.8

Source: survey result

Table. 4. Types of coping strategies at severe stage of food insecurity

Practiced Strategies	Food insecure (N=84)		Food secure (N=36)		Total (N=120)	
	Number	Percent	Number	Percent	Number	Percent
1. Sales of Livestock	61	72.6	34	94.4	95	79.2
2. Borrowing cash	29	34.5	8	22.2	37	30.8
3. Reducing number of meal	35	41.7	16	44.4	51	42.5
4. Reducing size of meal	33	39.3	17	47.2	50	41.7
5. Sale of fire wood	33	39.3	28	77.8	61	50.8
6. Participate in food for work	24	28.6	8	22.2	32	26.7
7. Received Food aid	19	22.6	6	16.7	25	20.8
8. Seasonal migration	57	67.9	23	63.9	80	66.7
9. Making mortar and selling	9	10.7	5	13.9	14	11.7
10. Becoming temporary trader	24	28.6	11	30.6	35	29.2
11. remittances	27	32.1	36	100	63	52.5
12. Become daily labor	30	35.7	13	36.1	43	35.8

Source: survey result

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