Food Security Intervention Packages Versus Household Food Security Status in Central Gondar Zone, Ethiopia

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Abstract

Food security becomes a critical challenge for sub Saharan countries and the problem has remained to be a big challenge in Ethiopia in the current times. A number of interventions were provided despite the long term impact of food security persists. Different factors are accounted for this challenge and the major factor is the preference of food security interventions for rural households since all the interventions are not in line with the preferences of rural households. Preference for food security interventions can be affected by demographic, institutional and socio economic contexts. The subjective ranking of rural households' food security interventions and factors influencing their preferences are determined using multinomial logistic regression model. The study was based on a survey conducted in North Gondar zone. Semi-structured interviews were conducted with 200 randomly selected rural household heads. The study suggests that access to information, fertility decline, shortage of cultivable land, participation in an intervention, technical support problem, tropical livestock unit and access to information are determinant factors for rural households to decide among food security interventions. Rural households’ preferences for food security interventions were fall into four major categories. The study suggests that material support, agricultural input, skill training and financial support are highly prioritized food security interventions of rural households. Multinomial logistic regression analysis of the factors influencing preferences revealed that rural household’s specific demographic and socio-economic circumstances affects subjective ranking of food security interventions. It is also shown that preferences for some interventions are complimentary and need to be addressed simultaneously. Recognition and understanding of these factors and the acceptability of food security interventions for micro level implementation will have significant contribution to improve macro level policy formulation.

Key words: food security intervention, preference, and rural households.

1. Introduction

Food security is a situation in which where “access by all peoples at all time to sufficient food for active and health life” (World Bank, 1986). The reverse term food insecurity is seen as an evil experience at individual level. According to Eleni (2003), it is becoming both the most critical issue in the developing world and the most critical issues of this day’s development agenda. The issue of food security even becomes the issue of human right as Walter argue that human right begins with breakfast.

Ethiopia is an agrarian economy based country where the agricultural sector plays an important role in the national economy, livelihood and socio-cultural system of the country. The sector supports employment of over 80% of the population, accounts for 45-50% of the National GDP, and makes the largest contribution to raw materials for agro-industries, food security and foreign exchange earnings. While the commercial farming sub-sector is limited, the dominant sub-sectors are mixed farming of the small holder agriculture, and the past or allive stock system. The smallholder mixed farming system is dominant in the highlands and medium altitude zones while the pastoral livestock production system prevails in most of the warmer lowland areas of the country (Birara, 2015).

In Ethiopia, food security has been a big challenge since 1970s. Ethiopia is one of many African countries deeply affected by food insecurity, where 3 million populations live without secure access to food. That means that in a given year, almost 1 in 10 Ethiopians will struggle to have access to sufficient, safe and nutritious food for themselves and for their family. To solve the problem of food insecurity the currently Ethiopian government or EPDRF developed several food security and
nutritional polices and strategies. The target of this policy in food security can be classified in to four. These are, improving access to agricultural input, increasing tenure security for small and large scale rural investment, building resiliency to promote graduation first from PSNP and then FSP and investment benefit and incentive. The aim of these three components of PSP can be grouped in to two. Thus are, according to the World Bank’s terminology, the resettlement and extension packages interventions are classified as instruments of risk reduction, while social transfers (direct support or public works) contribute to risk coping and has elements of risk reduction, risk mitigation and risk coping (Holzmann and Kozel, 2007).

However, on top of all these interventions, still a large portion of population at federal, regional and in particular, in the study area has been affected by chronic and transitory food insecurity. The incidence of food poverty is higher, estimated at 50% of the population; 52% in the rural areas and 37% in the urban areas. More than 50 percent of the total population, of whom the majority reside in rural areas, does not have access to the medically recommended minimum average daily intake of 2100 calorie per person per day (FDRE, 2002).

Therefore, it is important and logical to investigate what the end users, in this case the rural households, experience and feel about the interventions. Although it is often not explicitly noted, the first level of decisions about preference choice concerns the strategy by which food security and nutritional status will be protected in emergencies. Some agencies label this the ‘objectives getting’ step. This is the decision whether to intervene to address malnutrition or protect food security directly through food aid or cash-based transfers, or more indirectly through protecting livelihoods (or some other kind of intervention, including water, health or protection interventions. This first order of decision-making tends to set the boundaries of the intervention, but it does little to fill in the details, what the rural household prefers is still unknown. This choice, or set of choices, should be informed by good contextual analysis, causal analysis and needs assessment information (Beyene, 2010). It is important to note that even in the same locality, there can be a big contrast between the strategies of those with different socioeconomic background, for example, for those with more land and those who are with less land or landless. Thus, it is necessary to know rural households preferences for food security interventions and examine its linkage with their food security/food insecurity situation.

2. The study area

This research is conducted in Dabat woreda. Dabat woreda is one of food insecure woredas of north Gondar zone. The majority of the woreda lies in the high altitude range and traditionally classified as “dega” agro ecology. The woreda is located near ‘mount Ras Dashen’, the largest pick of the country. The farming system of the woreda follows a typical cereal-livestock mixed farming system predominantly rain fed. The rainfall distribution of the woreda is characterized by erratic rainfall. Because of this, the woreda is traditionally classified as “moisture stress area” though the annual total rainfall is sufficient for good crop production. Major crops grown in the area are wheat, barley fababean, vetch, lentils. The soil type is variable and the major ones are the black soils (vertisol), which occupies the flat land and the red soil, which found around the hillside. The topography is more mountainous.Part of the Semen Gondar Zone, Dabat is bordered on the south by Wegera, on the west by Tach Armachih, on the northwest by Tegeda, and on the northeast by Debarq. Towns in Dabat include Dabat and Wekin. The highest peak in Dabat is also the highest peak in Ethiopia: Mount Ras Dashan. It is a member of the Semien Mountains, which cover most of this woreda. Due to its inaccessibility and the lack of the most basic infrastructure, in 1999 the Regional government classified Dabat as one of its 47 drought prone and food insecure woredas. Both Dabat and Wekin lie on the Gondar-Debarq highway.

3. Methods and data

The Stochastic Dominance (SD) analysis technique described in Urcola and Lowensberg-DeBoer, (2006) was used to obtain the most relevant intervention. It uses non-parametric principles to rank alternatives based on distribution of a parameter such as intervention outcomes. The ranking
method allocates scores to different alternatives subject to the utility perceived by an individual. The alternative with the highest score is considered the most relevant.

The SD uses two rules based on human behaviour. The first rule is based on the observation that humans prefer more to less (Chavas and Holt, 1996). It is translated into statistical terms by the first degree stochastic dominance rule (FDSD). The FDSD states that if the cumulative probability of the outcome of an alternative is larger than the cumulative probability of another alternative for all levels of outcome, then the alternative with smaller probabilities dominates the alternative with larger probabilities (Chavas and Holt, 1996). Graphically, it means that if one cumulative distribution is to the left of another cumulative distribution for all levels of outcome, then the one to the right (Urcola and Lowensberg-De Boer, 2006) dominates the alternative with the cumulative distribution to the left. The alternative whose distribution is to the right will be preferred by both risk neutral and risk-averse decision makers. The second rule is based on the fact that, in addition to preferring more to less, most individuals are risk averse. In statistical terms, the area under the cumulative distribution curve indicates the tendency of an alternative to produce low value outcomes (Chavas and Holt, 1996). The alternative with the greatest area under its curve at any given level of outcome has the highest probability of producing low value outcomes. Therefore, an alternative is said to dominate according to the second degree stochastic dominance (SDSD) if the area under its cumulative distribution probability is smaller at every outcome level of outcome, than that of the other alternative. The SDSD is used when the cumulative distributions of two alternatives cross each other and the first degree stochastic dominance (FDSD) rule cannot rank them (Urcola and Lowensberg-De Boer, 2006).

4. Results and discussions

**Household Food security status**

To quantify the net available grain of food by each of the 200 sampled rural households, Household food balance method was used. The model was used by Ramakrishna and Assefa (2002), Haile et al. (2006), Shiferaw et al. (2005) and others for similar types of research. In order to assess the sufficiency of available energy to meet the dietary needs of household members a household's energy availability was compared with a requirement that is based on recommended minimum food energy. Hence, following FDRE (1996), 2,100 kilo calories per person per day was used as a measure of calories required (i.e., demand) to enable an adult to live a healthy and moderately active life (Braun et al., 1990). However, the correct energy requirement is the subject of much debate because any individual's energy need is based not only on age and sex but also on body weight, body composition, disease state, genetic traits, pregnancy and lactation status and activity level. However, data on these characteristics were not collected in the survey.

Therefore, comparison between the available (supply) and required (i.e., demand) grain food was made. A household whose daily per capita caloric available (supply) is less than his/her demand was regarded as food insecure, while a household who did not experience a calorie deficit during the year under study was regarded as food secure.

**Food security status of sample households**

![Chart showing food security status](image)

Source: Field Survey (2018)
Based on the HFBM and as indicated above in the diagram, among the respondent’s two thirds of the sample were food insecure whereas only one third, which is 25% were found to be food secured during the specified period (2016/17). As depicted from above, the study area could be regarded as food insecure given the fact that 75% of the household were unable to meet the recommended calorie intake of 2100 kilo calorie per day per adult equivalent. From this 75%, 41% from the total household are extremely food insecure with less than 1500 kilocalories availability per day per person. This classification among the food insecure categories is to show the extent of food insecurity as used by Shiferawet al. (2004). Therefore, in these study areas there is a probability that two households is food insecure out of three households. The sample respondents raised that among others and high population density, which lead to very fragmented and low land ownership as main reasons for food insecurity in the study area. Other includes change in weather condition, low productivity and low credit access.

Stated Preferences for food security interventions by rural households

To measure the extent of sustainability in the intervention designs, scoring techniques were used as applied in Bojo and Reddy (2002). The ranking was based on data gathered from project documents supplemented with that collected by questionnaires from the managers (see annex 3.1) of the various interventions. The data covered the criteria proposed for social sustainability namely, strong political support, multi-sector collaboration, community participation, use of existing community institutions and local practices; all relating to popular participation that encourages non-dependence on external knowledge (Bhatnagar et al., 1992; Eade and Williams, 1995; Mulwa, 2004).

For analysis, the researcher gave a score of 0-3 categorized thus: 0 = not mentioned in the intervention plan; 2= mentioned in the plan but not incorporated during the implementation; and 3 = incorporated in the implementation. An average score for each intervention was computed and the interventions were ranked according to the average scores (0-1.0 = Not sustainable; 1.1-2.0 = moderately sustainable; 2.1-3.0 = sustainable).

The relevance ranking of the intervention strategies based on both “High-score” and “Aggregate- score”. The rankings show that there is no variation between the “High-score” and the “aggregate score”. In either case, the first five most relevant intervention strategies for food security were (aggregate score > 96), in order of importance water supply, development of SMEs, Irrigation, market organization and technology transfer. According to the survey result among different food security interventions the four are found to be relevant by rural households. Those interventions are material support, agricultural input provision, financial support and skill training. The rank of rural household’s preference in line with respective intervention is discussed in the below (see table 1).

<table>
<thead>
<tr>
<th>Rank</th>
<th>Material support</th>
<th>Agricultural input support</th>
<th>Financial support</th>
<th>Skill training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank</td>
<td>Frequency</td>
<td>Percentage</td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>1st ranked</td>
<td>50</td>
<td>25.0</td>
<td>49</td>
<td>24.5</td>
</tr>
<tr>
<td>2nd ranked</td>
<td>51</td>
<td>25.5</td>
<td>30</td>
<td>15.0</td>
</tr>
<tr>
<td>3rd ranked</td>
<td>36</td>
<td>18.0</td>
<td>32</td>
<td>16.0</td>
</tr>
<tr>
<td>4th ranked</td>
<td>23</td>
<td>11.5</td>
<td>53</td>
<td>26.5</td>
</tr>
<tr>
<td>5th ranked</td>
<td>16</td>
<td>8.0</td>
<td>18</td>
<td>9.0</td>
</tr>
<tr>
<td>6th ranked</td>
<td>12</td>
<td>6.0</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>7th ranked</td>
<td>3</td>
<td>1.5</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>8th ranked</td>
<td>9</td>
<td>4.5</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100.0</td>
<td>200</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source (survey result, 2018)
As indicated in the table (1) above majority (23%, 24.5%, and 26%) of the respondents rank skill training as their first, second and third choice respectively. This indicates that most of the respondents need to build their capability in order to perform their agricultural activities.

Capacity Improvements like education can also go a long way in improving food security and nutrition. Education influence the rates of technology adoption, increases employment and income opportunities yielding higher returns, but it is also associated with better caring and nutrition practices, particularly in the case of women education. Improvements in community knowledge on nutrition or female education can have as much or more impact on nutrition that changes in income or food prices. Only 2%, 7% and 4% of the respondents put skill training as their 8th, 7th and 6th option.

Like that of skill, training most of the respondents (23.5%, 22.5%, 23.5%) put financial support as their first, second and third choice. This indicates that financial support as if credit services and loan are essential for overcoming food insecurity. Only 1.5%, of the respondents put financial support as their last option.

Growth in the rural areas at large reduces poverty in both rural and urban areas, while urban growth only reduces poverty in urban areas; not only did the number of people in poverty decline but poverty also became less severe. The consumption of the poorest of the poor also increased; higher average farm-yields benefited poor people both directly and indirectly via higher real wages. Agricultural input support like fertilizer, improved seed and then like are highly preferred by the respondents as shown in the table above. Majority of the respondents (24.5%, 15%, 16% and 26.5%) rank agricultural input support from first to fourth option. Only 2%, 4.5 and 2.5% of respondents’ rank agricultural input support as eighth, seventh and sixth option respectively. Material support also preferred as the most relevant intervention by the respondents as shown in the table below. Most of the population (25%, 25.5% and 18%) ranks it as first, second and third option respectively.

5. Conclusion and policy implication

Realizing the magnitude and severity of food insecurity/livelihood challenge, the regional government has developed food security policy under the framework of the national government’s overall development policy to address the problems of food insecurity in the district. Accordingly, different programs have been carried out to address food insecurity at household level. Thus, government’s intervention carried out to achieve food security is necessary to evaluate as to how these intervention mechanisms are effective in addressing food insecurity. The area has been subject of blanket intervention of selected packages like PNSP. One aspect is the input supply for small holder agriculture mainly comprising of fertilizers and improved seed supplemented with credit. Despite long experience of intervention in the area, food insecurity persists in the area. Relevant food security interventions are organized under the broad umbrella of national extension system. Based on empirical evidence, the study categorized intervention types into four. These four major categories are material support, agricultural input, skill training and financial support. Aggregate and high score of farm household preferences was computed after sample respondents ranked a set of alternatives.

The objective of this paper was to assess intervention preference of rural households’ food security interventions in line with their local contexts. Intervention policy and strategy might fall to achieve the intended goal for a long period of time if local contexts are not considered. The rural households have different socio-economic background, demographic background; the district has different agro-ecological zones, engage themselves in different economic activities with different farm characteristics. The results of this study give insights into issues and variables to be considered at grass root level context of rural households. The results also imply that dependency ratio, access to information on food security interventions, participation in any kind of food security intervention, agro-ecological zone, tropical livestock unit, significantly affects the preference of rural households for food security interventions. This study suggests that rural households’ specific socioeconomic circumstances and local contexts influence their preferences for food security intervention and thereby affect the success of reducing food insecurity in the study area. Though the analysis is made for a small area, the framework of the analysis could be used as an instrument for preference analysis in larger areas and, the specific results could be applicable for areas with similar settings.
References
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