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Household Coping Strategies during Food Scarcity in the Upper East Region of Ghana

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Abstract
This study investigates the coping strategies during food shortage in the Upper East Region of Ghana. The results revealed that coping strategies in the event of food scarcity to a large extent is determined by the Communities, the individuals resides in the region and the household size.
Keywords: Food Scarcity, Coping Strategies, Upper East Region, Ghana, Discriminant analysis.

1. Introduction

The primary objective of every nation is among other things, the need to feed its citizens. Deductively the quality of life of the citizens depends much on, the quality of food they eat. It is relevant therefore one to study the strategies employed when there is food shortage. Adequate nutrition is the first requirement for development. Without proper nutrition, children are stunted mentally, physically, socially and adults are faced with lives that fall short of their potential to the detriment of society as a whole. According to the United Nations World Food Programme, nutritional status is the best composite indicator of food security utilization. The prevalence of chronic malnutrition ranges from about 15% to nearly 50% within the country, with the highest prevalence found in Northern region followed by the Upper East, Upper West and Central regions [6].

According to the United Nation Development Programme (UNDP) human development report, Ghana is ranked 129th of 175 countries and approximately 45% of the population live below the poverty line of one USD per day [1]. A number of factors contributed to this rank with food shortage being one of the main factors.

During the 1990s, poverty decreased nationally in Ghana but with striking regional differences. While poverty in other parts of Ghana decreased slightly as a result of the Economic Recovery Programme (ERP) of the 1990s, it increased in northern Ghana during the same period. From the variation in poverty and poverty changes by region, the lowest levels of poverty lie in the Greater Accra region, followed by Western, Ashanti, Volta and Brong Ahafo regions. Poverty increased in the 1990s in Central, Northern and Upper East regions and remained the same in Eastern and Upper West regions. However, the highest levels of poverty remained, by 1999, in Upper East, Upper West and Northern regions of the country [2].

Poverty and food security are not mutually exclusive. Food shortage is a determinant in assessing the poverty level of a community. It is therefore imperative that a study of coping strategies of communities in the Upper East and the Northern Region as a whole be conducted to identify ways to reduce their poverty levels.

2 Materials and Methods

2.1 Study Area

The Upper East Region of Ghana is located in the north-eastern corner of the country and bordered by Burkina Faso to the north and Togo to the east. The capital is Bolgatanga, sometimes shortened to Bolga. Other cities include Bawku and Navrongo.

2.2 Sample Size Determination

A sample size of four hundred (400) was used for the study, of this number, fourty eight (48) questionnaires were administered in Bawku west, fifty five (55) Talensi-Nabdam, one hundred and sixty three (163) Bolgatanga Municipal, one hundred and ten (110) Kassena-Nankana and sixty four (64) to Builsa district of which fourty (40) questionnaires were included for non-respondent. Proportions were used to allocate the sample sizes to the five selected districts then simple random sampling was used for each stratum.

2.3 Discriminant Analysis

Discriminat analysis is a multivariate technique that is concerned with separating distinct sets of objects. Discriminant analysis is more of exploratory in nature. The goal of discriminant analysis is to describe either graphically (in few dimension) or algebraically the differential features of observations from several known collections (populations). Basically, discriminants whose numerical values are such that the collections are separated as much as possible are found. This numerical discriminant value is known as the discriminant score. The discriminant analysis model involves linear combinations of the following form:

$$D = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \cdots + b_kX_k$$

where

D is the discriminant score
$b_0, b_1, b_2, \cdots, b_k$ is the discriminant coefficients or weights
$X_1, X_2, \cdots, X_k$ are the predictors or independent variables

3 Results and Discussion

Out of 400 persons sampled for the study, about 35% are males and 65% are females. With respect to the educational status, it came out that 40.31% of the people had primary education, 34.18% had secondary education and 25.51% had tertiary education. About 13% of the households estimated total income per week is less than GH¢6.20. Whilst 30.23% of the households estimated income per week is between GH¢6.20 - GH¢12.40, about 56% of the households earn an income of GH¢12.40 and above per week.

It was observed that 181 out of 400 households eat three times daily, 191 out of 400 households eat twice daily and 28 out of 400 households eat once daily. About 90% of households experience food shortage and 10% of households do not experience food shortage. As a way of sustaining the household during food shortage, households adopt some coping strategies for surviving the annual unavailability of food in the region. These strategies include, borrowing, utilize food resources and utilize their saving. Whiles 41.71% of the households borrow, 38.95% households utilize food resources and 19.34% utilize their savings.

From the data it was observed that adults who constitute 90.08% are the main people involved in these coping strategies. However 302 households which constitute about 76.84% of the households consume millet/maize/sorghum during food shortage. This is because they are less expensive, they cultivate it themselves and are easier to store. However, 67 households which constitute about 17.05% of the total number of households consume Okro/Alefu/Bitter leaves because they are available on their farms. It was realized that out of the 400 households, 340 which represent 87.18%, give priority to children when there is food shortage. Other priorities were given to household heads, females, males and old people as shown in the table above. This may be as a result of children not being able to fend for themselves; moreover they need food to grow hence the reason why priority is given to children. However out of the 400 households 377 cultivate food crops and the rest do not cultivate. About 54% of food cultivated is normally consumed by the household.

In order to know the group of people involved in these coping strategies that is considered in the event of food scarcity, the variable strategic group was used as the discriminating variable. As there are three groups, two discriminating functions were observed. The first function has the highest ratio of between-group to within group sum of squares. The second function which is uncorrelated with the first has the second highest ratio. It can also be observed that the eigenvalues associated with the first function is 0.321 and this accounts for about 77% of the variance explained. The fairly large size of the eigenvalue shows that the first function is likely to be superior. The second function has an eigenvalues of 0.96 and accounts for only 23% of the explained variance.

From the group means, the community appear to separate the groups more widely than any other variable. It can also be observed that there is separation with household size. The separation groups 1 and 2 are close in terms of priority group, food type consumed, source of food, and income. The pooled within group correlation matrix indicates correlation values of 0.301 and 0.375 between income and income spent on food with the number of times in a day household eats respectively. Also, there is a correlation value of 0.391 between income and income spent on food. The two functions together significantly discriminated among the three groups since the Wilk's lambda for both groups are significant at 0.05 level. The standardize coefficients indicate a large coefficient for household size, and marital status on function 1. Function 2 also has relatively large coefficient for priority groups, source of food, and number of times household eats. The classification results based on the sample analysis indicate about 75% of the cases were correctly classified. The leave-one-out cross-classification correctly classified about 72% of the cases. From the two functions, two discriminant scores can be estimated using the model equations below.

$$D_1 = 0.192 - 0.431Fodshort + 0.425Mstat - 0.955Income + 0.177Incomefd +$$

$$0.346Eattimes + 0.491fodsorce + 0.147Fodconsg + 0.192\,\mathrm{Pr}iorgp - 0.481Perfood$$

$$- 0.172Edustat + 0206hhsize - 0.447Gender - 0.019comm - 0.032District$$

$$D_2 = -0.5418 - 0.448\,Fodshort - 0.142\,Mstat + 0.096 Income - 0.407\,Incomefd$$

$$+0.346 Eattimes + 0.676\,fodsorce - 0.163 Fodconsg + 1.046\,\mathrm{Pr}\,iorgp - 0.078 Perfood$$

$$-0.246 Edustat + 0.022 hhsize - 0.006\,Gender - 0.012\,comm - 0.010\,District$$

where

Fodshort means food shortage, Mstat means Marital status, Incomefd means income spent on food, Eattimes means number of times group eat, fodsorce means food source, Fodconsg means food consumed by group, Priorgp means Priority group, Perfood means Percentage of food consumed, Edustat means Educational status, hhsize means Household size and Comm means Community.

From the two equations the group involved in coping strategies that is considered in the event of food scarcity can be calculated when the necessary substitutions are made. Hence from the discriminate analysis of the data, it can be observed that, community separated the sample best. This is followed by household size. Thus the coping strategy in the event of food scarcity to a large extent is determined by the communities the individual resides in and the household size. Also, from the analysis, it was observed that the number of times household eats is positively correlated with the household income and the income spent on food. The number of times an individual in the sampled population eats depends on the income and the income spent on food. The classification value of 75% of correctly classifying cases is an improvement over chance of about 40%. The discriminant scores can accurately predict the nature of the coping strategies that is implemented in the event of food scarcity in the family.

4 Conclusion

The problem of inadequate availability of food in the Upper East Region has so far been an annual occurrence. This problem emanates from rapid population growth, inadequate / lack of modern storage facilities, unfavourable rainfall pattern and many others. The objectives of this research work were to come out with effective household coping strategies adopted in the region when there is food shortage. This study was also designed to determine the relationship that exists between household income level and coping strategies preferred. At the end of this research work, it came up that individual household in the districts had coping livelihood strategies to sustain themselves during periods of food shortage in the Region. No matter how insignificant these strategies might be, these strategies have kept households on for so long a time and improvement. Out of 400 households sampled from five different districts, 55% of them revealed that in times of food shortage, their households reduced the number of times they eat daily to twice. It also came up that about 52% of the sample spent 31% to 50% and above of household income on food. Much of these amount goes into stocking households for the periods of less or expensive food in the market. Majority of the household members who were sampled, revealed that unemployment was a serious issue in the region, few engaged in activities that will earn them additional income for household up keep. Some of these include: pito brewing, selling and dry gardening. It came up that during that times most households seek to borrowing, utilize food reserves and utilize their savings. Some of them are coping by selling off livestock, others to get support from relatives and friends outside the region and others reduce their food intake and consumption of less preferred food. After running statistical test on selected parameters, it was statistically confirmed that each of the coping strategies preferred by individual households depended so much on the income level of that particular household. It can be concluded that this is a poverty-striken region with household food insecurity where the caregivers changed their food consumption patterns to cope, resulting in compromised nutrition.

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