COPING STRATEGIES AMONG THE FOOD-INSECURE HOUSEHOLD IN MALAWI, A CASE OF FEMALE AND MALE-HEADED HOUSEHOLD IN SOUTH EASTERN OF MALAWI

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 Abstract

Food insecurity remains a serious concern in most developing countries. The fact that so many households are considered to be food insecure makes pertinent the question as to how these households survive. As food is vital for survival, there is always a minimum amount of food that is needed albeit small and within the food insecurity category. Households that are food insecure use different strategies in order to cope with their situation. There are varied coping strategies that can be applied by the head of household to ration or prioritise who should eat what, when and what amount. The study uses a questionnaire to collect data collected from Malawi in the Eastern region of the country which is among the regions that are characterized by food insecurity. The data is used to assess the coping strategies used by different households, and understand what determines the chosen coping strategy for a given household.

The results of the statistical analysis showed that, food insecure households employed more coping strategies than the food secure households. The regression results show that gender, location, employment status and income are all significant predictors of household vulnerability. The results also show that female heads of households are more vulnerable than the male counterparts. The study, therefore puts to the fore the need to address gender disparities in the effort to deal with food security, and poverty in general.

Key words: Households, food security, coping strategies, vulnerability, survival

JEL Classification: A10, A12

1.   Introduction

Food security, or the lack thereof, has become a topical issue (Olagunju, Oke, Babatunde & Ajiboye, 2012; Makombe, Lewin, & Fisher, 2010). The problem of an increase in the number of cases of food insecurity among households is an uncontested and globally recognised phenomenon, especially in developing countries where this problem is so prominent (World Bank, 2016; FAO, 2002). Tracing the origins of food security shows it is a well-known concept throughout history tracing as far back as the mid-70s when the world experienced

Food crisis, which affected most people, at that time the focus was on food supply and price stability of foodstuff (UN, 1975). Thereafter, the concept of food security metamorphosed considerably incorporating various concepts. In 1974, the term food security was defined as the availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices (FAO, 2003). This definition was an attempt to incorporate all aspects relevant to the understanding of this important issue. Later, in 1983, the concept of food security shifted to access of food and was redefined as the assurance of both physical and economic access to the basic food needed by all people (FAO, 1983). The ongoing trends in shifting of the term food security went on until 1996 at the world food summit when the term food security was redefined as "when all people, at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). Thus, food security was divided into four distinct dimension of availability, access, utilisation and stability (USAID, 1992). If a household is unable to absorb, reduce or mitigate the impact of decline in the four dimensions, making them more vulnerable to food insecurity than others is regarded to be food insecure.

The definitions given so far connote that the term food security is complex as such eradicating food insecurity is likewise complex and need to be given high level of attention. Despite food insecurity being given much attention, there has been an increase in negative impact of food insecurity and hunger in several parts of the world. WFP (2017) reported that, globally, a population of 80 million were reaching the crisis level of severe food insecurity in 2015 but later increased to 108 in 2016 representing a 35 percent increase. When food insecurity is looked at generally the figures are alarming. Those who were undernourished amounted to

750 million globally, with other sources reporting the figure to be 800 or 900 million (UN, 2017). When gender differences are accounted for, reports indicate that female, unlike male-headed households, have been found to be more food insecure (Kassie, Ndiritu & Stage, 2014; Mallick & Rafi, 2010; Babatunde, Omotesho, Olorunsany & Owotoki, 2008). Cases of gender differences on food security status have also been found in Malawi. In the integrated household survey report on Malawi, it is indicated that a majority of food insecure population in the country were from female-headed households (NSO, 2012). Studies like Kakota, Nyariki, Mkwambisi & Kogi-Makau (2015), Kassie, Stage, Teklewold, & Erenstei (2015) and Ragasa, (2014) found similar results and further indicated that issues such as lack of access to assets, resources and services, including education, health care, credit, technology, agricultural inputs, extension services and markets, also constraining socio-cultural norms exacerbate the problem.

When households are faced with food shortages they tend to employ coping strategies to maintain an adequate food access (Wood *et al.*, 2009). The question now arise as to how female and male-headed households in the South Eastern region cope with food shortages and to what extent do these households employ coping strategies.

2. Literature review

2.1 Gender dimension on food security

The fact that there exists a general consensus on the issue of increase in gender inequality on food security, where male-headed households are regarded to be less vulnerable to food insecurity as compared to female-headed households in most developing countries, determines the need for more research in this area. Studies like Agarwal, (2012) Kassie et al. (2014), have shown that, in most developing countries, agriculture is the main source of food both for direct consumption and as raw material for refined foods, and that women unlike men are crucial in the translation of the products of a vibrant agriculture sector into food and nutritional security for their households. Despite the decisive role played by women in this area, they are in most cases not given the opportunity to fully engage in activities that could otherwise contribute to higher productivity, lower levels of poverty, and reduce under-nutrition and the existence of household food insecurity (Kassie et al., 2015; Abafita & Kim, 2014; Babatunde, et al., 2008).

2.2   Food insecurity measuring instruments

As indicated earlier in the definition of food security, a household is regarded as food secure when people have the physical, social and economic ability to access sufficient safe and nutritious food that meet their dietary needs for a healthy life (FAO, 1996). Failure to fulfil the stated requirements, such a household is otherwise regarded as food insecure. To determine the household food security status, there exists different measures recommended by various groups which helps in capturing the state of food security. The choice of the right measure depends on the indicator (dimension) of food security status required to be captured (De Haen, Klasen & Qaim, 2011).

In this paper, two measures of food insecurity were adopted, the Household Food Insecurity Access Scale (HFIAS) and the Coping Strategy Index (CSI). The HFIAS is a food insecurity measure that was developed by (Deitchler, Ballard, Swindale & Coates, 2010) under the project of Food and nutritional Technical Assistance (FANTA). The HFIAS comprises a nine-question food insecurity scale which includes questions measuring anxiety about food supply, quality of food consumed, quantity of food consumed and experiences of hunger (Deitchler et al. 2010). The questions included in the scale are as follows *in the past four weeks, did the household ever worry about food? Were you unable to eat preferred foods? Did you eat just a few kinds of foods? Did you eat foods they really do not want eat? Did you eat a smaller meal? Did you eat fewer meals in a day? Was there no food of any kind in the household? Did you go to sleep hungry and go a whole day and night without eating?* The scale is then calculated as a continuous measure of the degree of food insecurity (access) for the past four weeks (30days), which adds up to a score of 27 for a household that has severe food insecurity to a minimum score of zero for household that are food secure. Households are then classified into four categories, starting with food secure household, then mildly food insecure, moderate food insecure, and lastly, severe food insecure households ranked into categories one to four respectively (Coates, Swindale & Bilinsky, 2007).

The CSI was developed to capture the vulnerability, resilience and sustainability behaviours of the food insecure household. The rationale behind the CSI is that food insecure households adjust their behaviour in the face of lack or perceived lack of food to ensure food security now and in the perceivable future, based on their best judgement of the situation (Maxwell & Caldwell, 2008) contends that

the CSI is a comparative tool rather than an absolute measure of food insecurity, however the CSI has been established to be a perfect indicator which establishes a baseline within a sample and a comparative measure from which changes in food security among households can be monitored overtime (Corbett, 1988). Deveraux, (2001) asserts that a comparison between CSI scores and averages gives a good presentation of overall household food security but also establishes the baseline for monitoring trends and impact of interventions. The CSI is divided into four main categories as follows:

- Firstly, in cases where households may change their diet. For example, households might switch food consumption from preferred foods to cheaper, less preferred substitutes.
- Secondly, in cases where the household can attempt to increase their food supplies using short-term strategies that are not sustainable over a long period. Typical examples include borrowing or purchasing on credit. More extreme examples are begging or consuming wild foods, immature crops, or even seed stocks.
- Thirdly, in cases when the available food is still inadequate to meet needs, households can try to reduce the number of people that they have to feed by sending some of them elsewhere (for example, sending the kids to the neighbours house when those neighbours are eating).
- Fourthly, in cases where households can attempt to manage the shortfall by rationing the food available to the household (cutting portion size or the number of meals, favouring certain household members over others, or skipping whole days without eating).

This paper adopts the HFIAS to measure the food security status of household and the CSI to compare the usage of coping strategies in food insecure male and female households.

3   Methodology and data collection

The study used data that were collected from south eastern region of Malawi. A total of 550 households were involved in the survey with a representation from male and female headed households from rural areas and others from urban areas of the region. The area was considered an ideal place because of its composition of both the rural and urban areas. The households were randomly selected based on the available maps of the dwelling units in the area. A questionnaire was used in the collection of the data. The survey was conducted by experienced enumerators that were first trained on the issues that were of interest. Only heads

of households were interviewed after receiving their consent on food security and coping strategies used in the household. As discussed in the preceding section, the paper adopts two measuring scales of food security, the HFIAS and CSI. The HFIAS was used to measure the prevalence of food insecurity at household level and the CSI was used as a comparative tool distinguishing which households were more food insecure based on the number of coping strategies used. The CSI was also used to determine the vulnerable households.

3.1   Model Specification
Four steps are followed in the data analysis, first, descriptive statistics of the variables are presented, and second a t-tests is done on the coping strategies by gender of head of household. The third level indicates results of food insecurity measure using the HFIAS. Lastly, the paper presents results on the regression analysis. In the regression model, the coping strategies were used as a measure of household vulnerability. In this study, the coping strategy index was employed as the dependent variable which is a weighted sum of reflecting frequency and severity of using coping strategies. The different socioeconomic determinants that may increase or decrease the use of coping strategies were used as independent variable in the ordinary least squares multiple regression model. A similar model was also adopted by Mjonono (2008) who employed CSI as a proxy for food insecurity at household level. The formulation of the regression was indicated as follows;

$$Yi = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{1i} + \beta_3 + \cdots \ldots \beta_n X_{ni} \quad \varepsilon i \ldots \ldots \ldots \ldots 1$$

Where Y is the dependent variable, β, is the coefficient of the first predictor (Xi), β2 is the coefficient of the second predictor (X2), βn is the coefficient of the nth predictor (Xn) and εi error term, field (2009). Applying the discussed model, the regression for the study will be as follows,

$CSI_i = \beta_0 + \beta_1$ Gender head$_i$ + β_2 location$_i$ + β_3 household size$_i$ + β_4 Log Income$_i$ + β_5 Employment statusHead$_i$ + εi

Where CSI is a dependent variable measured as an index based on how many coping strategies the household used in the previous week. These coping

strategies are used as a measure of vulnerability which may help to predict whether the household will be food secure or not.

All independent variables which have categorical values were entered as dummy variables, where the number of dummies were n – 1; n being the number of categories in the categorical variable. This means that where there are three categories, two dummies were created and in that case the third dummy became the benchmark or the reference point. The independent variables are gender of household head, household size, location of household (rural or urban), employment status (employed or unemployed) and income of household.

4   Results and discussion

4.1   Descriptive statistics

Table 4.1 present the descriptive statistics of the household size, age of the head of household, The HFIAS score and household income. The minimum size of household was one person and maximum of 17 members in a household with a mean of 5.1. The minimum age of household head was 18 years and maximum 83 years old with a mean of 41.2 years. The minimum monthly income was 4000 Malawi Kwacha and the maximum was 780500 Kwacha with a mean MWK68000 and a standard deviation of MWK86360.

Table 4.1   Descriptive results of the total sample

Household Variable	N	Minimum	Maximum	Mean	Standard deviation
Household size	501	1	17	5.1	2.14
Age of H/Head	501	18	83	41.2	14.01
HFIAS Score	501	0	27	12.01	7.4
H/income	501	4000	780500	68000	86360

Note: Official exchange rate in 2017: 1 US dollar = 730Malawi Kwacha.

Table 4.2 shows the gender distribution in the sample

Table 4.2   Gender distribution of household head

	Frequency	Percentage
Male	323	64.5%
Female	178	35.5%
Total	501	100%

The results shows that from the total sample of 501 households, 323 households were headed by males and 178 households were headed by females presenting a distribution of 65 percent, 36 percent in male and female household respectively.

Table 4.3 presents results t test for the household variables of interest and gender. The results show that overall there was a significance difference in the household characteristics of the male and female headed households. The average of household size for females was 4.87 and males 5.23. On average, the age of household head was greater in male households than their female counterparts. The average employment status was greater in male headed households than in female headed households. Education level was higher for males than females. This could be pointing to the gender disparity in both education and employment opportunities. The difference in employment and education is also reflected in the income where male-headed households had higher average income. This could be because since the heads in the male households were more educated and most of them employed justifies why their monthly income is higher than the female headed household.

Table 4.3   Sample characteristics by gender

Category	Male household	Female Households	t-statistics
Household size	5.23	4.87	1.855*
Age of household	44.32	39.58	3.4***
Employment status	2.17	1.92	3.0***
Education levels	8.0	5.9	6.1***
Total income(MWK)	79,147.36	47,762.61	4.6***

Table 4.4 presents results of food security status of household using the HFIAS. It shows that 14.4 percent of the households were food secure, 5.6 percent mildly food insecure, 15.4 percent moderately food insecure, and 65 percent severely food insecure. This indicates that, from the total of 501 households that were interviewed, 325 were in the severely food insecure category presenting over half of the total number of households.

Table 4.4:   Household food insecurity in categories

HFIAS Category		Frequency	Valid Percent	Cumulative Percent
Valid	Food Secure	72	14.4	14.4
	Mildly Food Insecure	28	5.6	20.0
	Moderately Food Insecure	77	15.4	35.3
	Severely Food Insecure	324	64.7	100.0
	Total	501	100.0	

4.2   Coping strategies and food insecurity

As previously discussed, households that are faced with food shortages, or those that anticipate imminent food shortages, tend to use coping strategies to mitigate for those shortages. Table 4.5 presents results on how food insecure households cope with food insecurity. The table also shows the correlation between each coping strategy with HFIAS. Results from the Spearman correlation shows that all coping strategies were positively correlated with the HFIAS and were all significant at 1% level of significance. Relying on less preferred food as a strategy had the highest coefficient correlation of 0.613. Reduce number of meals was also frequently used by the households. Borrowing food, purchase food on credit, limiting portion size of meals and restricting adults in favour of small children were also highly used at least once a week by 29, 30, 36 and 27 percent respectively of the sampled food insecure households. The results presented signifies that increases in the household food insecurity levels increases the chances of households to adopt coping strategies and the frequency depends on the category of food insecurity the households are in. The positive correlation also implies that the lower the level of food insecurity, the lower the number of coping strategies needed. Actually, households that are not food insecure may apply income serving strategy as a planning mechanism for future uncertainties other than present insecurities.

Table 4.5   Frequency of coping strategies and correlation with HFIAS

Coping strategy employed	Once/ week	Twice /week	3.5days s/week	Daily	Nev er	Corr. Coeff. With. HFIAS
Relying on less preferred/inexpensive food	17	28	20	16	19	0.613***
Borrowing food	29	26	15	4.4	26	0.345***
Purchase food on credit	30	22	10	.6	37.1	0.267***
Gather wild food	10.2	8.8	2	2.2	77	0.544***

Consume seed stock held for the next season	10	6.8	2.2	0.6	80.4	0.207***
Limiting portion size at meal times	35.5	19	7.6	8.4	28.5	0.546***
Restricting adult consumption in favour of small children	27.1	5.8	5.4	4.8	46.9	0.479***
Reduce the number of meals eaten in a day	38.3	24.6	6.2	5.4	25.5	0.554***
Skip entire days without eating	21.6	15.4	3.2	1.4	58.5	0.463***
Feed working members	5.2	2.8	1.4	1.4	89.2	0.194***
Ration money to buy street food	9.6	10.4	4.6	5	70.5	0.259***
Send household members to eat elsewhere	7.4	6.2	3.8	0.4	80.2	0.223***
Beg for food from neighbours or relatives	11.6	5.6	5.8	0.6	76.4	0.297***
Rely on help from relatives or friends	6.8	3.4	3.2	1.4	85.2	0.213***
Maintain food garden	14.8	12.6	12.8	3.6	56.3	0.171***

*** Significant at 1% ** significant at 5% and * significant at 10%

4.3   Gender and coping strategy

Table 4.7 presents findings on gender dynamics on usage of coping strategies in food insecure male and female-headed households. From the results, it shows that overall, female-headed households employed more coping strategies as compared to their counterparts. The most concerning strategy is skip entire days without eating where 71 percent of female-headed households replied to have used this strategy as compared to 55 percent of male households.

The strategy that was mostly used by both genders was to rely on less preferred food, but when compared between genders, 81 percent of female-headed households employed this strategy as compared to 79.6 percent of male-headed households, despite the fact that the margin in difference is very small, the fact remains that female-headed households employed more of this coping strategy than males. A higher percent of female-headed household (61 percent) responded to have maintained a food garden as a way of coping with food shortages as compared to 48 percent of male=headed household. This strategy could be beneficial to both parties because it would mean cutting costs on expenses of buying other food groups which can be grown at home, for example vegetables. However it is possible that those that do not maintain are garden fail because of shortage of land.

Table 4.7   Frequency on usage of coping strategies by gender

Strategy	Male headed Household	Female headed household
relying on less preferred/inexpensive food	79.6%	81%
reduce the number of meals eaten in a day	59%	67%
borrowing food	47%	56%
limiting portion size at meal times	17%	33%
purchase food on credit	15%	27%
restricting adult consumption in favour of small children	54%	72%
maintain food garden	48%	61%
skip entire days without eating	55%	71%
ration money to buy street food	35%	55%
beg for food from neighbours or relatives	9.6%	12.4%
gather wild food	25%	38%
consume seed stock held for the next season	11%	29%
send household members to eat elsewhere	17%	35%
rely on help from relatives or friends	11%	22%
feed working members	16%	21%

The results in Table 4.8 indicate that there was no significant difference in the use of begging for food from neighbours between male and female-headed households. There was, however, significant differences between the female and male-headed households in terms of all the other remaining coping strategies. Hoddinott (1999), contends that, indices of household coping strategies, directly capture notions of adequacy and vulnerability of households. In a way that households that use a larger number of coping strategies or more severe strategies are likely to be poor and more vulnerable to food insecurity; hence the higher the sum of the coping strategies the more food-insecure the household. The results presented so far indicates that female-headed households used more coping strategies, hence are considered more food insecure but also more vulnerable to food insecurity than the male-headed households.

Table 4.8   Mean differences in coping strategies adopted by Male and female household

Strategy	Male (mean)	Female (mean)	t-statistic
Relying on less preferred/inexpensive food	2.29	3.03	3.6***
Reduce the number of meals eaten in a day	1.40	1.90	3.3***
Borrowing food	0.90	1.56	1.7*
Limiting portion size at meal times	0.41	0.67	2.2**
Purchase food on credit	0.24	0.54	3.0***
Restricting adult consumption in favour of small children	1.26	2.20	3.5***
Maintain food garden	0.99	1.32	1.9**
Skip entire days without eating	1.35	1.67	2.0**
Ration money to buy street food	0.57	1.02	3.7***
Beg for food from neighbours or relatives	0.57	0.29	.50
Gather wild food	0.70	1.02	1.9**
Consume seed stock held for the next season	0.24	0.57	3.5***
Send household members to eat elsewhere	0.32	0.73	3.7***
Rely on help from relatives or friends	0.23	0.54	2.6***
Feed working members	0.98	1.29	2.6***
Total	12.45	18.35	

Source: survey data 2016. ***, **, * indicate that the mean differences between the male and female-headed
Households are significantly different from zero at 1%, 5% and 10% respectively

4.4   Household vulnerability to food insecurity

Table 4.9 presents results on a multiple regression model analysing the vulnerability of households towards food insecurity. In the regression model, gender of head of household, location, household size, income and employment status were used as predictor variables and the coping strategies index as a dependent variable. After running all assumption tests for fitness of the model, Anova test shows $F = 23.187$ and (p<0.001) significant at 1%. Multicollinearity test shows VIF was less than 10 and tolerance levels within specified limits, therefore no signs of the presence of multicollinearity (Field, 2009). The R^2 was 19 percent which implies that 19 percent of the variation in the dependent variable has been captured by the model. The overall model containing all socioeconomic variables as predictor variables was significant at 1 percent. Under the explained assumption the model is regarded as a good fit.

Table 4.9   Regression results for vulnerability to food insecurity.

Variable		B	Std. Error	β	T	Sig.
Constant		39.508	7.404		5.336	0.000
Female households		4.582	1.106	0.177	4.145	0.000
location (urban)		-3.497	1.338	-0.141	-2.613	0.009
Household size		0.825	0.246	0.139	3.359	0.001
Log income		-2.815	0.732	-0.210	-3.849	0.000
Employment status (unemployed)		2.339	1.072	0.092	2.182	0.030

The first predictor variable was gender of household head, being a categorical variable it was coded as 1 for female and 0 for male. Considering the coefficients it shows that gender had a positive coefficient (4.582), but also the most important contributor to the model from all predictors, indicating that female headed households were more vulnerable to food insecurity as compared to male headed households, hence they employed more coping strategies. The predictor of female households was statistically significant at 1 percent (p<0.0000). The regression results on gender and food insecurity are similar to findings presented in table 4.7 and 4.8 of this study where it shows that female headed household had a higher CSI means scores which means they were more vulnerable to food insecurity hence using more coping strategies. Similar findings are also found in studies like (Mjonono, 2008).

Location of household was statistically significant at 1 percent with a p-value of 0.009. As a categorical variable, urban was entered as a 1 and hence the coefficient represented those in the urban areas. The coefficient was -3.497, meaning that the urban households used lesser coping strategies than their counterpart. Household size was statistically significant (p=0.001) at 1% in the model, coefficient value was 0.825 indicating that an increase in members of a household will make a household more vulnerable to food insecurity, which leads to an increase in the usage of the coping strategies. Income of household head was also statistically significant in the model (p=0.009 t=-3.849), the coefficient was -3.497 meaning that an increase in household income is associated with low levels of vulnerability and hence less usage of the coping strategies. Those that had a lower income used more of the coping strategies because they would be more

vulnerable to food insecurity more as compared to those that had a higher income. The last independent variable in the regression model was employment status. As a categorical variable, a dummy was created with 1 for unemployed and 0 for employed head of household. The coefficient therefore represented a score of the unemployed. the results indicate that employment status was a good predictor of vulnerability towards food insecurity (p=0.030, t=2.182) The predictor also had a positive coefficient at 2.339 meaning that unemployed members in the study were more vulnerable towards food insecurity thereby used more coping strategies to cope with food shortages.

4.5   Conclusion

The analysis of the coping strategies as a predictor of household vulnerability to food insecurity is necessary, especially as an alternative to the HFIAS. The results in the descriptive analysis have indicated the level of vulnerability and the associated coping strategies that the households use. The results also show that female-headed households are more vulnerable to food insecurity and hence tend to employ more strategies in order to cope with food shortages. The regression analysis also confirmed the vulnerability of female and rural households who scored high on the coping strategies index. Employment status also proved to be associated with the level of household vulnerability to food insecurity, thus the unemployed were more vulnerable than those with a job. Linked to the employment status was the income which, as expected, showed that the higher the income the less the vulnerability to food insecurity. The study makes a contribution to the understanding of food security in Malawi. The implications of the results are that women are still the most vulnerable category in the society and deliberate effort should be taken to make sure that they have access to land, and to education so as to be employable. The fight against poverty will only succeed if these subsection of the society who are more vulnerable are considered first in all the mitigating policies.

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