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Household food security and coping strategies: a case study of Tembisa Township of Ekurhuleni Municipality, Gauteng Province, South Africa

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Abstract:

This study was designed to analyse factors determining household food security and coping strategies in Tembisa township of Ekurhuleni municipality, Gauteng Province, South Africa. The systematic random sampling technique was to collect primary data using well-structured questionnaire and oral interview. Data was analysed using descriptive statistics, logistic regression model, coping strategy index and Household Food Insecurity Access Scale (HFIAS). Results from descriptive statistics showed that male headed household were more than female headed household, and the maximum household size were nine (9), minimum were one (1). Results from HFIAS revealed that 38% of the households are food secured, while 28% being mildly food insecure, 26% being severely food insecure, and 8% were moderately food insecure. The results further revealed that household size, source of income, own house, total monthly income and age of the household head influence household food security negatively and positively. Coping strategy index results showed that "Rely on less expensive and preferred food has been used by 86% of the population, followed by reduce number of meals eaten in a day (60%). Since the source of income found influencing household food security, the study recommends the creation of employment through development programmes such as Expanded Public Works Programme (EPWP). The study further recommends that household should practice back yard farming.

KEYWORDS: Food security, Household food insecurity access scale, socio-economic characteristics.

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HOUSEHOLD FOOD SECURITY AND COPING STRATEGIES: A CASE STUDY OF TEMBISA TOWNSHIP OF EKURHULENI MUNICIPALITY, GAUTENG PROVINCE, SOUTH AFRICA

ABSTRACT

This study was designed to analyse factors determining household food security and coping strategies in Tembisa township of Ekurhuleni municipality, Gauteng Province, South Africa. The systematic random sampling technique was to collect primary data using well-structured questionnaire and oral interview. Data was analysed using descriptive statistics, logistic regression model, coping strategy index and Household Food Insecurity Access Scale (HFIAS). Results from descriptive statistics showed that male headed household were more than female headed household, and the maximum household size were nine (9), minimum were one (1). Results from HFIAS revealed that 38% of the households are food secured, while 28% being mildly food insecure, 26% being severely food insecure, and 8% were moderately food insecure. The results further revealed that household size, source of income, own house, total monthly income and age of the household head influence household food security negatively and positively. Coping strategy index results showed that "Rely on less expensive and preferred food has been used by 86% of the population, followed by reduce number of meals eaten in a day (60%). Since the source of income found influencing household food security, the study recommends the creation of employment through development programmes such as Expanded Public Works Programme (EPWP). The study further recommends that household should practice back yard farming.

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1. INTRODUCTION

South Africa is largely seen as a food secure nation producing enough staple foods and having the capacity to import food, if needed in order to meet the basic nutritional requirements of its population (FAO, 2008). Hart *et al.* (2009) supports the argument that South Africa seems to be food secure at national level but the same cannot be said about

households in rural areas (Du Toit, 2011). South Africa is experiencing the natural social phenomenon of migration, people move from rural to urban areas. Through this process of migration large-scale urban influx is reaching increasingly higher levels (van der Merwe, 2011).

Food security in areas where population is very high is not easy to maintain because of increased level of competition for every resources or activities aimed at addressing food insecurity. Du Toit (2011) revealed that national foods security indicators showed that South Africa has been able to meet the food needs of its growing population over the 8 past years. However, there are no clear statistics to clarify that the food insecurity condition is the same at household level. There is little empirical evidence that quantifies the prevalence of food insecurity in the towns and cities of South Africa in general (Frayne *et al.* 2009).

The food security status of a household and its members is very sensitive to livelihood stressors, and thus changes over time. Rapid food price inflation during 2007-2008 raised the number of food insecure people around the world, from 9000 million to more than 1 billion. Rising food prices, particularly of maize and wheat which are the staple diet of the poor in South Africa, pose serious problems for the urban and rural poor as most are net buyers of food. Household is defined as a net buyer when the value of food stables it produces is less than the value of food staples it consumes. Poor household tend to be the net buyers of food, and stands to lose from an increase in the price of food staples (FAO, 2009).

Urban food security is highly dependent on money, meaning that urban residents purchase most of the food they consume. Thus, it becomes vital that sufficient attention be given to the challenges of generating efficient and stable income as prerequisite for ensuring food security in urban areas (van der Merwe, 2011). Poor families in urban areas spend up to 60% of their budget on food, and low incomes combined with high prices can increase their risk of hunger and malnutrition (Population Action International, 2011).

2. OVERVIEW OF FOOD SECURITY IN SOUTH AFRICA

South Africa is unlikely to feature at the top of the agenda at any international dialogue on food security. The country is a net exporter of agricultural commodities and has a high per capita income, even for an emerging economy (Koch, 2011).

General Household Survey, 2016 The percentage of South African households with inadequate or severely inadequate access to food decreased from 23,9% in 2010 to 22,3% in 2016. The percentage of households that experienced hunger decreased from 23,8% to 11,8% while the percentage of individuals who experienced hunger decreased from 29,3% to 13,4% over the same period (General Household Survey, 2016).

3. RESEARCH METERIAL AND METHOD

3.1. Study Area and data collection method

The study on factors determining household food security and coping strategies was conducted in Tembisa township of Ekurhuleni municipality, Gauteng Province, South Africa. The area is 42, 80 km^2. Tembisa is divided in to sections; informal and formal settlements. The systematic random sampling technique was to collect primary data using well-structured questionnaire and oral interview. 200 household were sampled from 463110 with the interval of 2315.

3.2 Analytical techniques

3.2.1 Household Food Insecurity Access Scale (HFIAS)

Household food insecurity access scale (HFIAS) has been used to determine the household food security status. The HFIAS consists of two types of related questions, nine occurrence questions that ask whether a specific condition associated with the experience of food insecurity ever occurred during the previous four weeks. Each severity question is followed by a frequency-of-occurrence question, which asks how often a reported condition occurred during the previous four weeks (Coates et al., 2007).

3.2.2 Logistic regression model

The study used logistic regression model to determine factors that influence household food security status. This model check whether the relationship between dependent and dependent is positive or negative. The choice of logistic function is influenced by the nature of the dependent variable. The dependent variable is dichotomous. Logistic distribution (Logit) has

got advantage over other models in the analysis of dichotomous outcome variable in that it is extremely flexible and easily used function (Greene, 2012).

The cumulative logistic probability function is as follows:

$$P_i = F(Z_i) = F[\propto + \sum (\beta_i X_i)] = \frac{1}{1+e^{-[\alpha + \sum(B_i X_i)]}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where:

e = Base of the natural logarithms

X_i = the i[th] explanatory variable

P_i = probability that a household is being food secure

B_i and α = regression parameters to be estimated

Specific logistic model

$$(1 - P_i) = \frac{1}{1+ e^{-Z_i}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

Putting natural logarithm

$$Z_i = \left(\frac{P_i}{1- P_i}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + U_t \ldots\ldots\ldots 3$$

Where:

Z_i = function of the explanatory variables

α = intercept

B_i = slope parameters in the model

P_i = odd ratio that household would be food secure

$1-P_i$ = odd ratio that household would be food insecure

X_i = the i[th] explanatory variable

U_t = error term

3.2.3 Coping strategy index

The Coping Strategies Index is an indicator of household food security that is relatively simple and quick to use, straight forward to understand, and correlates well with more complex measures of food security. A series of questions about how households manage to cope with a shortfall in food for consumption results in a simple numeric score. In its simplest form, monitoring changes in the CSI score indicates whether household food security status in declining or improving. It is much quicker, simpler, and cheaper to collect information on coping strategies than on actual household food consumption levels (Maxwell *et al*., 2003).

4. RESULTS AND DISCUSSION

This section represents the results of the study. It is divided into three sections, 3.1 results from descriptive statistics, 3.2 results from household food insecurity access scale, 3.3 results from logistic regression model, and results from coping strategy index. The results are presented in the form of tables and figures.

4.1 Descriptive statistics

4.1.1 Descriptive statistics for age, household size, and total monthly income.

Table 1 of the study shows the descriptive statistics for age, household size, and total monthly income. The study found that the oldest household head from the sampled population within Tembisa township is 80 years old, the youngest is 20 years old, and the average age is 41. The maximum household size found being 9, minimum 1, and average was 4. The total monthly income has a minimum of 150, maximum of R45000, and average R5695.08.

descriptive statistics for age, household size, and total monthly income Source: Survey data (2018).

Variable	Min	Max	Mean	Std deviation
Age	20	80	40.91	12.478
Household size	1	9	3.76	1.907
Monthly income	150	45000	5695.08	2895.352

4.1.2 Sources of income of the household head

Figure 1 shows that wages/salaries are the main income of the household heads in Tembisa Township since 53.5% of the sampled population do receive wages/salaries and only depend

on it. Social grants and others found to be the second main source of income by 17, followed by remittance and pension by 7% and 5.5% respectively. Wages/salaries found to be the most received source of income because most of the household heads are employed. Pension is the lowest source of income that is being received by the household heads because most of the household heads goes back home after they reach pension age because they are now regarded as inactive labour force. Van der Merwe (2011) said that poverty, hunger, food insecurity and less employment are shifting to urban areas. The reliance of many poor households on social grants has been identified as a mechanism that drives the purchasing of food (Pereira, 2014). 17% of the sampled population rely on social grants to access food.

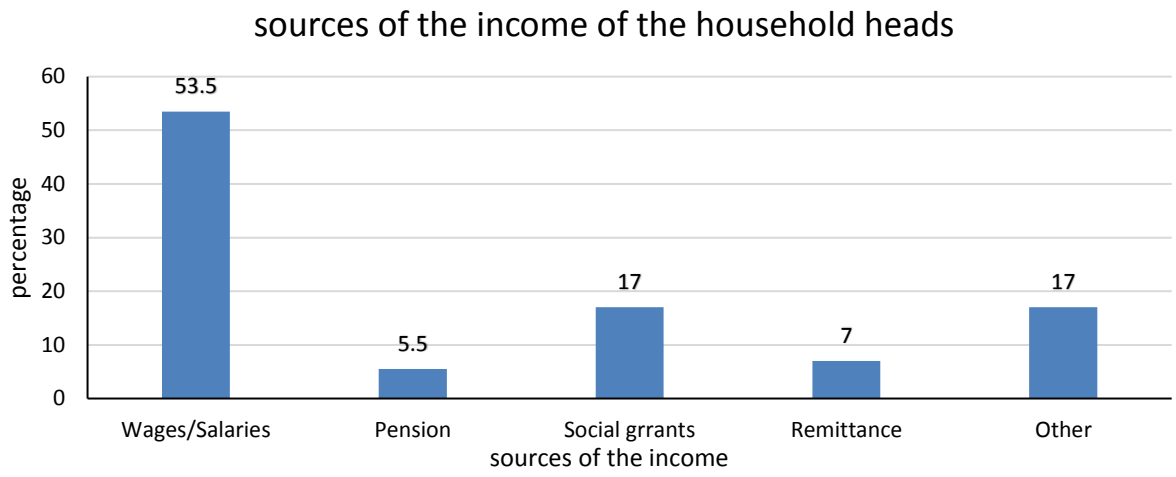
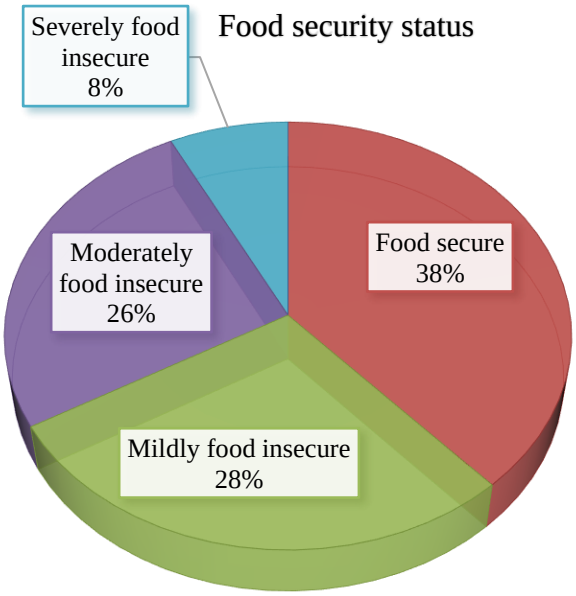


Figure 1 source of income of the household head (Source: Survey data (2018)

4.2 Household Food Security Access Scale results

The figure 2 shows the household food security status of the in Tembisa township. These results were found using the household food insecurity access scale (HFIAS), where the dependant variable is divided into four categories. The results revealed that 38% of the households are food secured, 28% being mildly food insecure, 26% being moderately food insecure, and 8% were severely food insecure.



Source: Survey data (2018)

4.3 Logistic regression model results

The table below shows a summary of the results showing nine variables which were hypothesised to be influencing the household food security status in Tembisa township. Log likelihood is 209.834, Chi-Square is 56.749 and R Square is .336. These indicate lower probabilities of making mistakes in rejecting the null hypothesis; that says socio economic factors has no influence on food security status of the household in Tembisa township. Five out of nine variables significantly influenced household food security status and these were household size, source of the income, age, total monthly income and house ownership.

Variables	B	S.E.	Wald	Sig.	Exp(B)	t-values
Constant	-.736	1.047	.494	.482	.479	.703
Age of the household head	-.035	.020	3.190	.074*	.965	1.75
Gender of the household head	.426	.377	1.273	.259	1.531	1.129
Marital status of the household head	.558	.388	2.068	.150	1.747	1.438
Household size	-.188	.106	3.134	.077*	.829	1.774
Employment status of the household head	-.287	.624	.212	.646	.751	0.446
Education level of the	.025	.543	.002	.963	1.025	0.046

household						
Source of income of the household head	1.428	.661	4.666	.031**	4.171	2.160
Total monthly income	.0001	.0001	9.602	.002***	1.000	1
Own house	.796	.382	4.350	.037**	2.216	2.03
Log likelihood						209.834
Chi-Square						56.749
R Square						.336

*** Significant at less than 1% probability level; ** Significant at less than 5% probability level; * Significant at less than 10% probability level.

Source of income of the household head

Source of the income of the household head found to have a positive relationship with household food security status being significant at 5% level. The positive relationship between source of income of the household head and food security status means that a unit increase in source of income lead to an increase in chances of the household to be food secure. The study goes in hand with the study conducted by Ndobo (2013) in Kwakwatsi of North West. According to (Pereira, 2014) having limited income to spend on food inevitably leads to an inadequate food basket.

Household size

Household size had a negative relationship with the household food security being significant at 1% level. The result implies that a unit increase in household size of the respondents will results in a decrease of 18.8% of the food security of the household. This means that the household size influence household food security negatively. Household size and household food security have inverse relationship. This may be caused by the expensive of stable food. When the population increases, the production of more food should also increase to meet the demand. Omonona *et al.,* (2007) found that food insecurity incidence increases with increase in household size. Also, the study that was conducted by Sulaiman *et al.,* (2015), Muche *et al.,* (2014) in Nigeria, and Ndobo (2013) in South Africa found household size having the inverse relationship with household food security. In most previous studies this variable has found having an inverse relationship with household food security. Guja (2012) also found the same results.

Total monthly income

The variable total monthly income found having a positive relationship with household food security. When the total monthly income increases, household food security also increases.

The results of the study contradict with the results found by Ndobo and Sekhampu (2013), Their results of the regression analysis on the factors influencing vulnerability to household food security shows that an increase in household income decreases the chances of a household being food insecure in both male and female headed households. The results of this study contradict with the results of the study conducted by Grobbler (2015) at North West, in his study he found income having a negative relationship with household food security. Meaning that higher income lowers the probability of being food insecure. This study is in line with Ndobo (2013), he revealed that income is the most significant predictor of household food security and was found to be positively related to household food security.

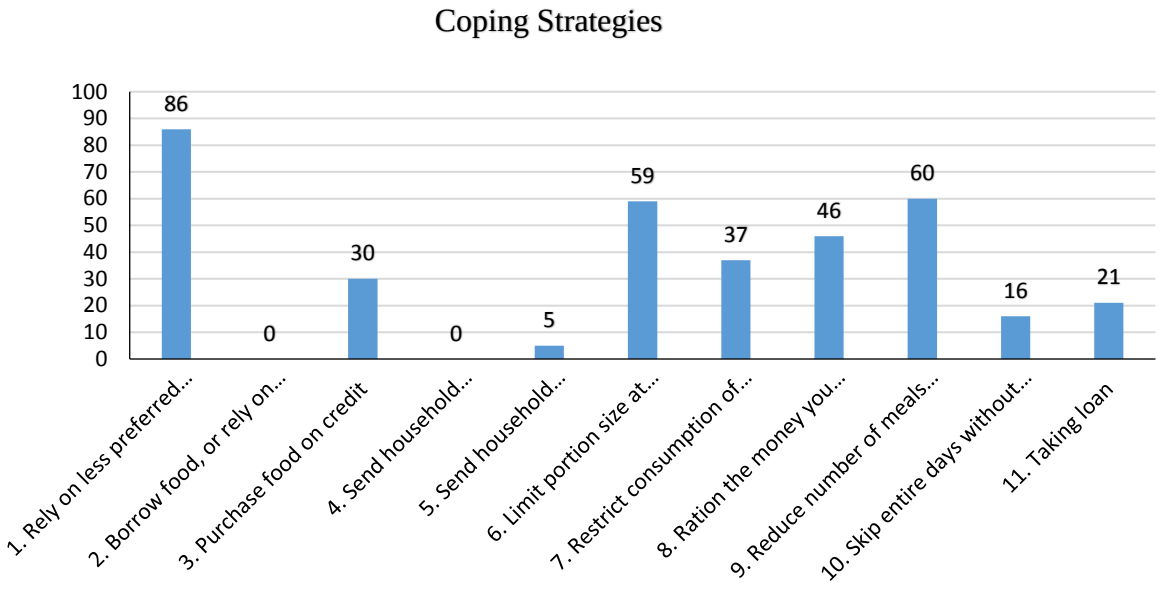
Own house

This variable found significant in explaining the household food security status. The positive sign of the coefficient indicates that an increase in ownership of the house leads to an increase in household food security. The study took own house as a proxy for assets ownership. Owning a house especially at active economic place it is very important because the money you were supposed to use to pay for residents can be used to buy some other necessities like food. The results of this study contradict with the results from the study that conducted by (Zakari *et al.,* 2014).

Age of the household head

Age of the household head was significant at less than 10% probability level and showed negative relationship in explaining the household food security status. Which means, as the age of the household head increases by a single year, keeping other factors constant, the likelihood of the households being food secure decreases by a factor of 0.965. The results are in line with (Guja, 2012) and contradicts with (Omonona *et al.* 2007). Ndobo and Sekhampu (2013) found age of the household head being positively related to the probability of the household being food insecure in both groups (males and female headed households). The ageing of the household head might mean a decrease in income earning potential, thus increasing vulnerability to food insecurity

4.4 Coping strategy index results



Source: survey data (2018)

The above figure shows the coping strategies employed by households in Tembisa township to deal with the presence of food shortage. Rely on less expensive and preferred food has been used by 172 households of 200 sampled population, which make 86% of the population. Second strategy that has been used more is reduce number of meals eaten in a day, it is followed by limit portion size at meal times, ration the money they had and buy prepared food, restrict consumption of adults for small children to eat, borrow food or rely on help from relative or friend. The strategies that were never implemented by 70% and more of sampled population are; purchase food on credit, taking loan from local money lenders, skip entire days without eating, send household members to eat elsewhere, and send household members to beg.

5. CONCLUSION

The study examined the influence of socio economic characteristics on household food security and coping strategies. Based on the results that was found, the study concludes that 38% of the households in Tembisa township are food secured while 8% is severely food insecure. The study also concludes that household size, source of income, own house, total monthly income and age of the household head influence household food security negatively and positively. The study further concludes that “Rely on less expensive and preferred food has been used by 86% of the population as the strategy to cope with food insecurity.

Source of income was found as one of the factors that influence household food security status, so the study recommends the creation of employment opportunities to increase level of income of the household head. The creation of employment through long term government projects such as expanded public works programme (EPWP). The study also recommends the proper and fully education about the family planning programmes to be introduced at schools to teach learners about them, and the introduction of one or two seminars per trimester in every local and metropolitan municipality to teach the community about family planning programmes. Limit population size through integrated health and education services. To the government of republic of South Africa, the study recommends the killing of recruitment agencies that shares the salary of the employees, if not killing they must at least decrease the percentages that they are taking from each employee. The government and the private companies that employ people through agencies should work together to achieve the goal of decreasing the percentage taken from the salary of the employees. This could result in increase in the total monthly income of the Tembisa residents. The study also recommends the more attention to be paid more on people who don't have homes. The people should be given RDP houses for free, so that they can buy food with the money they use to pay for residents. Strengthen household asset building programs.

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