ASSOCIATION OF FOOD SECURITY AND HOUSEHOLD DEMOGRAPHICS IN A SOUTH AFRICAN TOWNSHIP

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─Abstract ─

Research shows that food insecurity is one of the challenges that post-apartheid South Africa faces. Food security indicators note that South Africa as a country has an apparent state of sufficiency, while household indicators show great disparities between urban and rural households. The purpose of this study was to analyse the food security status of households in the township of Kwakwatsi, Free State province. Data were collected through a household survey to determine the association between household food security and the demographic variables of a household. Of the sampled households, 51.1% were found to be food secure according to the Household Food Insecurity Access Scale (HFIAS). Logistic regression analysis revealed that there is a clear correlation between household size, household income, and gender and marital status of the household head and household food security. While household size, and the gender and marital status of the household head were associated with food insecurity, an increase in household income and the age of the household head were associated with food security. The study offers trends in food security and can be used as a reference source when addressing socio-economic challenges that low-income households in South African townships face.

Keywords: *food security, household, socio-economic*
JEL Classification: D13, R2, Q18

1. INTRODUCTION

Food is one of the most important basic human needs because its nutritional value is needed to live productive lives. Research (FAO, WFP & IFAD, 2002; Smith & Subandoro, 2006; Ostry, Rose, Enns & Miro, 2010) points out that access to enough quality food is an important determinant of a country's human and economic development. The concept of food security or insecurity includes elements of both physical access and economic access. Economic access refers to the availability of resources to acquire food, while physical access refers to having a place where food is available at all times. The United Nations defines food security as a condition in which all people at all times have access to enough food to live an active and healthy life. Food insecurity includes having limited access to food intake, as well as hunger and vulnerability (FAO, 2011).

A country is considered food secure when it is able to produce or acquire, and distribute, adequate food to its citizens. Thomson and Metz (1993) suggests that a country with an equal balance between food demand and food supply at acceptable prices can be described as food secure. However, food security at a national level does not necessarily mean that all households in a country would be food secure. This is because food distribution or access might be skewed towards those with resources. It is also important to note that an imbalance between food demand and supply would not automatically imply that all households in a country are food insecure either.

Household food security refers to physical and economic access to sufficient food that is adequate in terms of quantity and quality to lead healthy lives. Household food security is also closely related to the ability to secure sufficient food through production or purchasing for all members of the household. Andersen (2009) notes that overall household food security might not include food security for all its members because intra-household food distribution could be unfair and not all members would get their fair share of the available food.

Food security has been a topic of interest in a number of studies (Shala & Stacey, 2001; Knueppel, Demment & Kaiser, 2009; Hendricks, 2005; Rudolph, Kroll, Ruysenaar & Dlamini, 2012) and the general conclusion is that sub-Saharan Africa withstands the worst of food insecurity. A study on food security in Tanzania (Knueppel et al., 2009) found increased incidents of food insecurity –

under half of the sampled population were found to be severely food insecure. The problem of food insecurity was found to be more prevalent in households where the household head had poor educational outcomes. In Nigeria, Bashir, Schilizzi and Pandit (2012) found a negative relationship between a household head's educational levels and their household's food insecurity. This means the higher the level of education the lower the likelihood of food insecurity in the household.

Studies on food security in South Africa suggest disparities between national food security and household food security (Hendricks, 2005; Jacobs, 2009). Shumiye (2007) reported that the educational attainment of the head of the household has positive effects on household food security in Addis Ababa. A study by Rudolph et al. (2012) found correlation between employment, income and food security in Johannesburg. Full-time employment was associated with increased chances of being food secure. Other studies (D'Haese, van Rooyen, Vink & Kristen, 2011; De Cock, D'Haese, Vink & van Rooy, 2013) found female-headed households more likely to be vulnerable to food insecurity, compared to their male counterparts. The number of household members is another predictor of food security. Households with a large number of members are expected to consume more food than smaller households (Feleke, Kilmer & Gladwin, 2005; Adebayo, 2012).

South Africa's well-documented past of racial segregation resulted in the majority of the population being excluded from meaningful economic participation. The ushering in of democracy in 1994 brought hope to address the injustices of the past, however, poverty and hunger in South Africa continue to be shaped by the legacy of apartheid. Over the years, a number of policies and programmes have been implemented. Though they were met with some success, the indicators of poverty and food security still have a rural and racial dimension. Altman, Hart and Jacobs (2009) reviewed studies conducted by the Human Sciences Research Council on food security. They concluded that a large proportion of South African households were found to be food insecure. Their review notes difficulties to monitor progress towards greater food security due to the sampling and methodological constraints in the various studies.

Rising food prices and a subdued global economy are key contributors to the challenge of food insecurity. The country's unemployment rate has remained stubbornly around 26%, with the majority of the unemployed being young people.

Food security is central to Section 27 1(b) of the bill of rights in South Africa. The Constitution notes that every citizen has a right to access sufficient food and water. The country's Integrated Food Security strategy diagnosed the challenge faced by South Africa as containing two elements. The first element is the need to maintain and increase South Africa's ability to meet its national food requirements. This involves measures to improve domestic agricultural resource outputs, to import food items that cannot be produced efficiently, and to export commodities with comparative advantage. The second element seeks to eradicate household level food insecurity brought about by inadequate and unstable food supplies, lack of purchasing power, weak institutional support networks, poor nutrition, inadequate safety nets, weak food emergency management systems, and unemployment.

In view of this, the study reported here analysed the food security status of households in the township of Kwakwatsi. The specific objectives of the study were to:

i) determine the outcomes in terms of food security for the township of Kwakwatsi

ii) profile households in terms of their food security status

iii) identify predictors of food security by determining the association between a household's socio-economic and demographic variables, and food security

2. MATERIALS AND METHODS

2.1. Study area and design

The township of Kwakwatsi is in the Free State province of South Africa. This province has one of the highest unemployment and poverty indicators when compared to the other provinces. The township is semi-urban and falls under the Ngwathe Municipality, located about 180 kilometres from Johannesburg. Census data (Statistics South Africa, 2012) showed a total population of 13 000 for the township. The majority of the inhabitants are female (53%), while 49% of the households were headed by females and 6% of the population were elderly (65 years and older). The average household size was four.

The study design was descriptive in that data were collected by interviewing a sample of randomly selected households. To obtain a sample size that would supply statistically reliable results and be representative of the population of the area, a systematic random sampling technique which involves drawing every n^{th} household in the population, starting with a randomly chosen household in the area, was used. These households were the 13th households in each chosen strata. The respondents were the head of the household or any available adult. A total of 250 questionnaires were distributed in the area through face to face interviews between June and October 2016. Field workers completed the surveys via a structured questionnaire. Data from a total of 225 households were deemed legible for analysis and served the purpose of this study.

2.2. Instruments

A food secure household is defined as one able to secure enough food to ensure adequate intake for all its members. The Household Food Insecurity Access Scale (HFIAS), developed by the USAID, is used to measure food security. The HFIAS questionnaire consists of a set of questions about concern and availability, and accessibility of food. Its aim is to assess whether households have experienced problems with accessing food during the last 30 days. There are two sub-questions in the questionnaire. The first group of questions are called the nine occurrence questions and the respondent can reply either 'yes' or 'no' (where no = 0 and yes =1). The second group of questions refer back to the nine occurrence questions and are asked to follow up on the occurrence questions and to establish whether food insecurity has ever occurred.

Next to the 'no' response option there is a skip code, which means the interviewer can avoid the related frequency-of-occurrence follow-up question if the participant answers 'no' to the occurrence question. The HFIAS score was calculated using the answers to the nine frequency-of-occurrence questions. Participants whose scores were 'never', 'sometimes' and 'often' received scores of 1, 2, and 3, respectively. Therefore, when adding them together, the highest possible score would be 27. This means that the higher the score a household gets, the higher the probability that it is vulnerable to food insecurity (Coates, Swindale & Bilinsky, 2007).

The HFIAS highlights a household's concerns about the likelihood of food insecurity, which includes inadequate quality and inadequate amount of food.

Other studies (Deitchler, Ballard, Swindale & Coates, 2011; Mohammadi, Omidavar & Househiar-Rad, 2011) indicated that the HFIAS method produces accurate results of household food insecurity because of its internal consistency, criterion validity and reliability.

2.3. Regression model

A key objective of this study was to determine the food security status of households to link the impact of a household's socio-economic and demographic variables to the reported status. To achieve this objective, this study considered the use of both linear and logistic regressions. The descriptive data were used to profile participants with the aim of determining potential predictors of food security. Results from these two models were compared to decide which model best suited the data. Logistic regression provided better results; therefore this study proceeded with logistic regression to determine the association between food security and the participants' demographic and socio-economic variables. The statistical model used in this study is as follows:

$$\text{FoodSecure}_i = \beta_0 + \beta_1 G\_\text{Head}_i + \beta_2 A\text{ge\_Head}_i + \beta_3 HH\_S\text{ize}_i + \beta_4 M\text{arital\_Head}_i + \beta_5 E\text{duc\_Head}_i + \beta_6 ES\_H\text{ead}_i + \beta_7 \text{Total\_HHY}_i + \varepsilon_t$$

Where:

- FoodSecure$i$ is the food security status of the household (0 for food insecure; 1 for food secure)
- Age_Head$i$ represents the age of the head of the household
- HH_Size$i$ is household size, representing the number of people in each household
- Educ_Head$i$ is the number of years of schooling of the head of the household
- $ES_$Head$i$ is the employment status of the head of the household (0 for not employed; 1 for employed)
- Total_HHYi is the total household's income (monetary value, Rands per month)
- Marital_Head$i$ is the marital status of the head of the household (1 for married; 0 for otherwise)

- G_Head*i* is the gender of the head of a household (1 for female and 0 otherwise)

3. RESULTS

3.1. Demographics

Table 1 provides a summary of the descriptive statistics of the participants. The following were revealed:

- *Age of the head of household*: the majority (65.8%) of the participants were between the age of 40 and 60. The mean age was 50, with the youngest household head being 29 years old and the oldest 80.
- *Gender of the head of household*: households headed by females were in the minority (25.3%). The average age of a female head of household was 47 compared to 51 for males. There was a difference in incomes between male headed households (average R4 940) and female headed households (R3 254). Female-headed households were on average smaller (4 members) than their male counterparts (5 members).
- *Marital status of the head of household*: 71.6% of the participants were married. Households with married heads had more income (R5 034) than those who are not married (R3 200). The variable for not married included single, divorced and widowed.
- *Employment status of the head of household*: the majority of household heads were employed (72.6%) A large percentage of the employed (40%) had informal employment.
- *Household size*: the average household had four members while the largest one had 10 members. Statistics South Africa (2012) reported an average household size of 4 members for the area.
- *Total household income*: on average, household income was made up of salaries (57%), social grants (23%) and informal income (20%). The average household income was R4 513 and the lowest household income was R370.

Table 1: Demographics of the participants

Variable	Category	FREQ	%
Age	< 40 years old	35	15.6%
	40–60 years old	148	65.8%
	60+ years old	42	18.7%
Gender	male	168	74.7%
	female	57	25.3%
Marital status	not married	64	28.4%
	married	161	71.6%
Educational attainment	primary schooling	137	60.9%
	secondary schooling	75	33.3%
	tertiary education	13	5.8%
Employment status	not employed	61	27.1%
	employed	164	72.9%
Household size	1 to 3 members	66	29.3%
	4 to 6 members	137	60.9%
	7+ members	22	9.8%

3.2. Food security status

Table 2 presents the data gathered by the questionnaire, based on the HFIAS scale. Food secure households are defined as having no concern about access to food. Based on the HFIAS classification measure of food insecurity, about 51.6% of the sampled households were classified as food secure, 11.1% were mildly food insecure, 8% were moderately food insecure and 29.30% were severely food insecure.

Table 2: Descriptive statistics on food security

Variable	FREQ	%
Food secure	116	51.6%
Mildly food secure	25	11.1%
Moderately insecure	18	8.0%
Severely food insecure	66	29.3%

The households where the head was older than 60 made up a large share of the food insecure households. About 52.4% of households in this group were found to be food insecure. When looking at the total sample, 64.5% of households which

were found to be food insecure were headed by people of 40–60 years old. About 63.2% of female headed households were food insecure, while 44% of households headed by a male were food insecure.

3.3. Associations of food security

As explained in the methodology, one of the main aims of the study was to determine the association between socio-economic and demographic variables of the household, and its level of food security. Table 3 provides a summary of the results.

Table 3: Results of the binary logistic regression

Variable	Coefficient	Std. Error	Marginal effects (dy/dx)
Gender of head	-0.857*	0.486	-0.105
Household size	-0.220**	0.140	-0.092
Marital status of head	-0.708*	0.495	-0.115
Total household income	0.067***	0.001	0.132
Age of head	0.114*	0.122	0.050
Educational attainment of head	-0.148	0.149	
Employment status of head	-0.628	0.564	
N = 225 Prob>F = 0.000 Pseudo R^2 = 0.436 Log likelihood – 129.007			

***Significant at 1% level, **Significant at 5% level, *Significant at 10% level

- *Gender of the head of household*: the impact of the gender (1 = female) of the household head in predicting the food security status of the household was of interest. This variable was negative and a significant predictor of food security ($p < 0.1$). The results point to the fact that female-headed households are less likely to be food secure. Other studies (Bashir et al., 2012; Olagunju, Oke, Babatunde & Ajiboye, 2012) also found household headship an important predictor of food security, and that households headed by a female

had increased food security vulnerability. A key consideration in these studies is that female-headed households generally have high dependency ratios, thus increasing the burden of providing for an increased number of family members.

- *Household size*: larger households were associated with lower chances of being food secure. The coefficient for the variable was negative and significant at the 5% level. It was expected that larger households would have a need to acquire more food. This finding is consistent with other studies that found a significant and negative relationship between household food security and household size. An additional member of a household was associated with a 0.9% decrease in the probability of being food secure.
- *Total household income*: the variable for income included all types of incomes received by the household. The average household income was R4 513 per month. An increase in household income was positively associated with the probability of being food secure ($p < 0.1$). This was an expected outcome as income provides the means to maintain the livelihood of a household. The marginal effect for income was 13.9%, which indicates the potential increase in the chances of being food secure due to an increase of total household income.
- *Marital status of the head of household*: the marital status of the household head was recorded as 1 for those who were married and 0 for otherwise. The marital status of the household head reduced the chances of being food secure. The coefficient for marital status was negative and significant at the 10% level. This finding seems to contradict other studies (Chege, Ndungu & Gitonga, 2016; Yusuf, Balogun &Falegbe, 2015) which found a positive and significant relationship between food security and the marital status of the household head. The argument in these studies is that joint attempts to provide for the food requirements of the household improve the chances of being food secure. A change in marital status reduced the probability of being food secure by 11%. It is posit that married couples had an additional person to feed, thus adding a burden on the resources of a household.
- *Age of the head of household*: the coefficient for age was positive and significant at the 10% level. A one-year increase in the age of the household

head was associated with a 5% improvement in the probability of being food secure. This is in line with other studies (Olagunju et al., 2012; Bogale & Shimelis, 2009; Asogwa & Umeh, 2012) which found association between age and accumulation of wealth.

- *Educational attainment of the head of household*: the education of the household head was not significant to explain variations in the food security status of the participants. The majority of the household heads had primary education and this did not improve their chances of providing for their families due to limited employment opportunities in the area.
- *Employment status of the head of household*: this variable was negative but did not explain variations in food security. The coefficient for the variable was not statistically significant. Other studies (Arene & Anyaeji, 2010) reported positive associations between the employment status of the head of household (employed) and the chance of being food secure.

The coefficient of determination, R^2 was found to be 43%, implying the variation in food security status explained by the stated socio-economic characteristics of the participants. The implication of the results observed suggests that the probability of a food secure household depends on various factors such as household size, household income, and the gender, marital status and age of the household head.

4. CONCLUSION

The aim of the study reported here was to determine the status quo of food security for the residents of Kwakwatsi. Further analysis was undertaken to determine the association between the socio-economic and demographic variables of a household, and its reported food security.

The outcome of the analysis showed variations in food security amongst the surveyed households. The majority of the participating household heads were male, between the ages of 40 and 60, and married. About 51% of the sampled households were found to be food secure according to the HFIAS scale. Household food insecurity in the area can be categorised by female headship, household heads with low educational attainment, household heads who are not married, and lower household income. Regression analysis indicated association between food security and the selected variables. There was a significant

association between food security and gender, household size, marital status and the age of the head of household. There was a negative relationship between food security and variables of educational attainment and the household head's employment status. This association was not statistically significant.

Households in semi-urban townships like Kwakwatsi are prone to be vulnerable to food insecurity due to limited employment opportunities, or little to no economic activity in the area. Research on food security can go a long way to magnify what lack of sufficient food entails. Rising food prices and low outcomes in economic growth contributes to household food insecurity, and present increased challenges for an economy like that of South Africa. The South African constitution guarantees socio-economic rights, but this study indicates that many households struggle to survive as their lives are marked by limited access to basic necessities. This study sought to provide a brief insight into the experiences of many South Africans and how legislated outcomes might lack practical outcomes, which become more so in low-income areas like Kwakwatsi.

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