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THE DETERMINANTS OF URBAN FOOD SECURITY: INSIGHTS FROM A LOW INCOME NEIGHBORHOOD IN SOUTH AFRICA

Abstract:

Heads of state attending the 1996 World Food Summit in 1996 signed the Rome Declaration on World Food Security re-affirming ”the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food, and the fundamental right of everyone to be free from hunger (FAO,1996). Despite this more than 900 million people across the world were still food insecure in 2010 (FAO, 2010). Food Security is a critical problem facing policy makers in Sub Sahara Africa as more than 45 present of households have moderate to severe household food insecurity.. Research indicates that Africa’s population is moving to the cities and that by 2030 more than 50 percent of the population may reside in urban areas. Furthermore, food insecurity is becoming recognised as increasingly urban, with a lack of policy focus by governments to address the growing food insecurity problem in urban settings. Studies on the extent of poverty in South Africa show that almost half of its population lives in poverty. Food availability is not the only condition for food security in urban settings if households do not have financial resources to access food. Households rely on income for their food security, spend a large proportion of household s budget on food, and have little access to other safety nets like agriculture or land to ensure food access.. This paper examines the socio economic determinants of households which may impact on food insecurity in urban settings. A quantitative research method was deployed and a stratified random sample of 600 was used to determine which socio economic determinants determine food insecurity in an urban setting. Regression analyses were used to determine the effects of socio-economic determinants on household food insecurity. The results show that household food insecurity is influenced by the age of the head of the household, education of the head of the household, employment status of the head of the household, income of the head of the household, social grants received by the household and spending patterns of the household The study recommends that government should develop a more comprehensive strategy, focusing on urban areas in South Africa to increase access to food in the absence of available land to ensure access to food.

Keywords:

Food Security, Economic Development, Welfare Economics, Spending Patterns, Socio Economic Determinants.

JEL Classification: I15, O10, Q18

Introduction

Heads of state attending the 1996 World Food Summit in Rome signed the Declaration on World Food Security re-affirming " the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food, and the fundamental right of everyone to be free from hunger" (FAO, 1996). Further to this, mayors, city leaders and representatives of city and local governments from all over the world signed the Barcelona Declaration in 1999 to "Recognize the importance to ensure access to food by low–income constituencies in developing countries as a main objective of local development policies and programmes"(FAO, 1999). Despite this more than 900 million people across the world were still food insecure in 2010.

Although the number of food insecure people decreased to 805 million in 2014 as recorded by the Food and Agricultural Organization (FAO), most African cities will double their populations in the next decade with a growing number of low-income urban households. Research indicates that Africa's population is moving to the cities and that by 2030 more than 50 percent of the population may reside in urban areas. (Crush and Frayne, 2010). Furthermore, food insecurity is becoming recognised as increasingly urban (May and Rogerson, 1995; Hampwaye, 2008; Frayne et al, 2010), with a lack of policy focus by governments to address the growing food insecurity problem in urban settings. In this regard, the International Development Research Centre (IDRC, 2006) indicated "The cities of the South are growing fast as people move from the countryside to seek a better future. So fast that the municipalities cannot keep up with the influx. Many of these new arrivals face poverty and malnutrition"

In urban settings, accessibility to food can be considered as the most important driver towards food security. In this regard, urban food buyers rely on income to buy food, and have almost no access to safety nets as available land to cultivate and ensure food access (Ruel *et al*, 2010). Employment status can also be regarded as a key to food security in urban areas. Kumar (2003) indicate that low returns on labour in urban areas may result in becoming part of the "working poor". Several other studies (Gheblawi and Sherif, 2007; Fanning et al, 2004; Barnes and Gillingham, 1984) conclude that besides income and employment status age, education level and household size impact on food security.

This paper asks what role socio-economic variables play in the food security of urban households. This paper presents and discusses the results of a survey on food security conducted in a low income area in South Africa. The results show significant levels of food insecurity in the area surveyed. Socio-economic variables in this urban area impact on food security in a positive and negative way. Variables analysed include age of the head of the household, household size, education of the head of the household, gender of the head of the household, employment status, expenditure on food and non-food items in the household and income of the household.

Literature Review

Food security was first defined by USAID in 1992 and adopted by the Food and Agricultural Organization (FAO) in 1996 as a state in which all people, at all times, have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy live. (FAO, 1996; USAID, 1992). Considering physical and economic access to food as central to this definition, no common understanding amongst researchers exist on how to measure and interpret food insecurity (Bilinsky and Swindale, 2007; Coates et al, 2003). The World Food Summit (1996) established four dimensions of food security in this regard: availability, access, stability and utilization. To get a comprehensive understanding of food insecurity the FAO (2014) recommends an analyses of the four dimensions of food security. The food insecurity experienced–based scale of the Food and Nutrition Technical Assistance (FANTA) (Coates *et al*, 2003; 2007) measures food insecurity at the household level in terms of food insecurity by way of access, feelings of uncertainty over food, perceptions that food is of insufficient quantity or perceptions that food is of insufficient quality.

By using the Household Food Insecurity Access Scale (HFIAS) of the FANTA project an understanding of the status of access to food, central to this study can be determined. In urban settings accessibility to food can be seen as key to food security. In this regard, Ruel, *et al* (2010) state that buyers of food in urban areas rely on income for their food in the absence of access to other safety nets like agriculture or land to ensure food access.

In South Africa's cities, the Johannesburg Poverty and Livelihoods Study (2008) states that urban poor who reside in certain pockets of the city such as informal settlements are particularly vulnerable to access opportunities to improve their livelihoods. The challenge of urban households towards food insecurity has been recognised by many researchers (Atkinson, 1994; Briggs, 1991; Mbiba, 1995; Drakakis-Smith 1994; Mudimu, 1997). A recent baseline survey of poor communities in 11 cities in 9 different countries of Southern Africa by Frayne et al (2010), using the HFIAS scale, revealed that in some cities in Southern Africa over 60 percent of households in sample poor communities were severely food insecure. In low income developing countries, out of 18 samples it was found that in 12 samples food insecurity in urban areas was either the same or higher than in rural areas (Ahmed *et al*, 2007).

Literature suggests several socio-economic variables impact on food insecurity on the household level (however, most of the studies were on rural food insecurity), namely age of the household head (Bogale and Shimelis, 2009; Mitiku *et al*, 2012; Obamiro *et al*, 2003; Babatunde *et al*, 2007) where all studies found a positive relationship between age and food security of the household, and gender of the head of the household (Knueppel *et al*, 2009; Joshni and Maharjan, 2011; Mutuonotzo, 2006; Amaza *et al*, 2006; Horell & Krishnan, 2007) where all studies found a positive relationship between male-headed households and food security pointing out the fact that female headed households may be more vulnerable towards food insecurity;

Education of the head of the household (Makombe *et al*, 2010; Idrisa, 2008; Haile *et al*, 2005) where studies show the positive impact of being educated on food security; Income of household (Davis *et al*,1983.) showing the positive impact of income on food security, household size (Bogale & Shimelis, 2009; Mitiku *et al*, 2012; Babatunde *et al*, 2007; Mutunotzo, 2006; Amaza *et al*, 2006) showing the negative impact of larger households on food security.

Background of the Study Area

The study was conducted in the Emfuleni Municipal area in southern Gauteng, South Africa. The total population in the Emfuleni area is 721,663 and is one of three local municipalities comprising the Sedibeng District in Gauteng, South Africa. The area also includes six large semi-urban areas from the pre-1994 apartheid era namely, Evaton, Sebokeng, Sharpeville, Boipatong, Bophelong and Tshepiso. Sharpeville and Bophelong, as low income neighbourhoods in the Emfuleni area, were chosen for the study. The population in Sharpeville was estimated at 41,031 with an average household size of 4.9 (8374 households) of this 8374 households 3609 households live in poverty (Stats SA, 2011). The population in Bophelong is 37,779 with an average household size of 3.05 (12352 households). Of this, approximately 8152 households live in poverty (Stats SA, 2011).

Research Methodology and Data

Sample and Data collection

In order to measure the perceptions on food access, food insecurity and socio-economic background of households, a self-administered, on-site, structured questionnaire was used. A stratified sample of participants was drawn from the area and every second household was sampled in each street, selecting both male- and female-headed households. A total of 600 households were interviewed and 580 questionnaires were used for the analyses. Fieldworkers proficient in English and African languages attended training sessions in order to collect the data as accurately as possible. Participation was voluntary.

Measuring Instrument

The Household Food Insecurity Access Scale (HFIAS), a nine-item food insecurity scale, developed by the FANTA project, was used to measure food insecurity. The scale measures anxiety about food supply, quality of food, quantity of food consumed, and hunger at the household level (Deitchler, Ballard, Swindale and Coates, 2010). The HFIAS score is a continuous measure of the degree of food insecurity in the household in the past four weeks. The score measures between 0 (food secure) and 27 (severely food insecure). The scale categorise households then in terms of the degree of food insecurity namely: food secure, mildly food insecure, moderately food insecure and severely food insecure. The first section of the questionnaire was used to gather socio-economic data about the household.

Model

A multiple linear regression model was used to determine which socio-economic variables affect positively and which socio-economic variables affect negatively on food security. Household Food Insecurity Access Scores (HFIAS) were calculated as a continuous variable from 0 to 27 per household and seen as the dependent variable. Household size, age of head of household, marital status of head of household, employment status of head of household, income of head of household, education of head of household and expenditure on food and other expenditure were estimated as predictor variables.

The linear regression model is specified as follows:

$$HFIAS_i = \beta_0 + \beta_1 HS_i + \beta_2 AH_i + \beta_3 GH_i + \beta_4 MS_i + \beta_5 ES_i + \beta_6 Log\ IH_i + \beta_7 Log\ EH_i + \beta_8 Log\ FE_i + \beta_9 YS_i\ \varepsilon_i \quad \text{.....(1)}$$

Table 1 below provides an explanation of the variables in the linear regression model.

Table1: Variable Description

Variables	Description
HS	Household Size
AH	Age of Household Head
GH	Gender of Household Head(0= Male, 1 =Female)
MS	Marital Status of Head of Household (0 = Married, 1 = Unmarried)
ES	Employment Status of Head of Household (0 = Employed, 1 = Unemployed)
IH	Income of Household
YS	Years Schooling of Head of Household
EH	Expenditure of Household (Excluding Food)
FE	Food Expenditure of Household

Source: Own description

Interpretation of findings

Descriptive statistics of Sample

The sample was based on the responses of heads of households. A total of 580 households were analysed. Table 2 shows the descriptive statistics of the number of households in the different categories of food security, ranging from food secure to severely food insecure. A total of 227 or 39.14 percent of the households are food secure, while 353 or 60.86 percent of the households are either mild, moderate or severely food insecure. A total of 35.00 percent of the households are severely food insecure.

Table 2: Food Secure Households

HFIAS Category	Number of Households	Percentage
Food Secure	227	39.14
Mild Food Insecure	64	11.03
Moderately Food Insecure	86	14.83
Severely Food Insecure	203	35.00
Total	580	100.00

Source: Own Sample 2015

The average household size of the households in the sample is 4.16 households, with a maximum number of members per household of 11. The mean age of the head of the household in the sample is 49.16 years, with a minimum age of 22.0 and maximum age of 83.00, and standard deviation of 13.8 years. The average number of years schooling of the head of the household in the sample is 9.49 years which is equivalent to secondary school. The average monthly income per household is R 7264.20, with a maximum income of R 35000.00 and a minimum of R 320.00, with a standard deviation of R 5909.10. The average household expenditure is R 5324.60, with a standard deviation of R 4720.30. The minimum household expenditure in the sample is R 305.00. Households in the sample spend on average R 1203.80 on food, while the minimum expenditure on food is R 95.00. The average Household Food Insecurity Access Scale (HFIAS) score is 6.7, with a standard deviation of 6.9.

Table 3: Descriptive statistics of Sample

	N	Min	Max	Mean	Std Deviation
Household Size	580	1.0	11.0	4.16	1.6
Age of Head of Household	580	22.0	83.0	49.4	13.8
Years Schooling of Head	580	0.0	15.0	9.49	3.6
Household Income	580	320.0	35000.0	7264.2	5909.1
Household Expenditure	580	305.0	25900.0	5324.6	4720.3
Household Food Expenditure	580	95.0	5870.0	1203.8	672.7
HFIAS Score	580	0.0	27.0	6.7	6.9

Source: Own Sample 2015

Table 4 provides a comparison of the descriptive statistics of socio-economic variables and food secure and food insecure households. A total of 353 households are mild, moderate or severely food insecure. The average household size of food insecure households are 4.32 compared to 3.93 of food secure households. The number of years schooling of the household head of food insecure households are 8.44 years compared to 11.14 years of schooling for food secure households. The average income of food insecure households are R 4165.84 compared to R 12082.48 per food secure household. Food expenditure of food secure households are on average R 1668.77 compared to R 904.87 of food insecure households. Household total

expenditure of food insecure households are R 3138.09 compared to R 8724.87 expenditure of food secure households.

Table 4: Descriptive statistics of Food Secure and Food Insecure Households

		N	Mean	Std Dev.
Food Insecure Households	Household Size	353	4.32	1.73
	Age of Head of Household	353	51.45	14.71
	Education of Head of Household	353	8.44	3.50
	Income of Household	353	4165.84	2888.38
	Expenditure of Household	353	3138.09	2461.45
	Food Expenditure of Household	353	904.87	397.66
Food Secure Households	Household Size	227	3.93	1.51
	Age of Head of Household	227	47.51	12.55
	Education of Head of Household	227	11.14	3.63
	Income of Household	227	12082.48	6176.76
	Expenditure of Household	227	8724.87	5344.86
	Food Expenditure of Household	227	1668.77	746.01

Source: Own Sample 2015

Determinants of Urban Food Security

The multiple regression model show all the predictors were significant at the 1 percent level in explaining food insecurity. The F value of 152.659 is significant in the model ($p< 0.001$). The Durbin-Watson statistic show us at a value near 2 of 1.868 that the assumption in the model of independent errors is tenable (Field, 2009:236) The R^2 value of 0.711 means that 71.1 percent of the variance in food insecurity of households can be explained by household size, age of head of household, marital status, employment status, income of head of household, number of years schooling of the head of the household and expenditure on food. Collinearity diagnostics of the model shows an average VIF of 1.13 confirming that collinearity is not a problem in the model (average VIF value near 1). Tolerance values in the model were all above 0.2 and no VIF values were greater than 10. Table 5 shows the results of the linear multiple regression model. Household Food Insecurity Access Scale Score (High Score = Food insecurity, Low Score = Food security) was used as the dependent variable in the model. The coefficient for household size in the model is positive meaning that an increase in household size will also increase the food insecurity score. Household size in the model is a significant predictor ($t =4.216$, $p<0.001$), meaning that it contributes significantly towards explaining food insecurity in the model. Gender of the head of the household was not significant ($p>0.1$) however, the sign of the standardised coefficient shows that having a female-headed household increase the probability of being food insecure ($t=-.636$) as compared to male headed households. The coefficient for marital status is positive ($t= 2.930$) meaning being married increases the probability of being food secure. Marital status as predictor were significant ($p< 0.05$), in explain the model.

Employment status was significant at the 1 percent level (t= 12.369, p<0.001). The coefficient is positive meaning that being employed lowered the probability of being food insecure. Household income was a significant predictor at the 1 percent level (t=-7.172, p<0.001), with a negative coefficient meaning that higher income lowers the probability of being food insecure. Food expenditure was significant at the 1 percent level (t=-6.481, p<0.001), with a negative coefficient meaning that higher food expenditure will impact positively on food security. The number of years schooling of the head of the household was not significant (p>0.1) in predicting food insecurity, however the negative coefficient (t= -.917) indicate that schooling impact positively on food security.

Table 5: Coefficients of Model

Model	B	Std.error	β	t	Sig.
(Constant)	44.160	2.865		15.415	.000
Size	.440	.104	.105	4.216	.000*
Gender	-.216	.340	-.016	-.636	.525
MaritalS	1.139	.389	.081	2.930	.004*
EmployS	5.726	.463	-.409	12.369	.000*
HHIncomeLog	-3.155	.440	.382	-7.172	.000*
HHExp Log	1.044	.414	-.126	2.523	.012**
HHFoodExpLog	-3.199	.494	-.245	-6.481	.000*
YearsSHead	-.057	.062	-.029	-.917	.360
HeadAge	-.018	.494	-.036	-1.227	.220
*Significant at the 0.01 level **Significant at the 0.05 level F value significant at 0.01 level F value= 152.659 R^2= 0.711 Durbin Watson =1.868 (upper limit = 1.863, lower limit = 1.675)					

Source: Own Sample 2015

Conclusion

The objective of the study was to determine the extent of food insecurity in urban low income areas. The socio-economic determinants that impact negatively or positively on food security in the urban area were analysed. The data shows that only 39.14 percent of the households in the sample are food insecure, with 35.00 percent of the households severely food insecure. The results of the analysis show that a very high percentage (60.86 percent) of the households is food insecure. A difference exists in the mean income of food secure and food insecure households. The mean education of heads of households of food secure households are also higher than those of food insecure households. The mean household size of food insecure households were higher than those of food secure households. The model shows that employment status, income of households, food expenditure of households, household size and education of the head of the household significantly predicts food security status of households. Improving food security in urban areas therefore needs a policy that will

significantly impact on heads of households to find employment and to increase their ability to earn more income. Expenditure on food in the model was significant in predicting food security therefore households should prioritize spending to ensure food security on the household level. Policy makers should therefore focus policy on job creation and improvement of skills in urban areas to increase access to food via increased income. Social security should also be directed towards prioritized expenditure on food. Conditional cash grants to focus spending on food should be considered by government.

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