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Article

Assessment on the State of Household Food Security in Bahi District, Tanzania

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Abstract: This paper is an attempt to assess the variations on the state of household food security in Bahi district, Tanzania. A cross sectional research design with quantitative and qualitative methods was employed to 130 household heads. Interviews, focus group discussions, documentary review and field observations were used in data collection. Descriptive statistics including frequencies and percentages were used to analyze quantitative data while content analysis has been used to analyze qualitative data. Findings indicate that the total actual grain available during the time of survey was 740 bags, meeting only 61.1% of the total requirements of 1210 bags. Analysis on the number of meals eaten per day during the time of this study affirmed that only 20.8% of the sampled households could afford the normal three meals a day. The study concludes that, transitory household food insecurity is real in the study area calling for viable measures to be taken including improvement in food production, availability, proper storage, supply, proper use of the harvested crops and improvement of peoples' livelihoods are inevitable. This can be done through provision of soft credit, agricultural inputs, farming and storage education and improvement of transport systems to ensure timely supply and distribution of food in times of critical food shortage.

Keywords: household**,** food security, food insecurity, food consumption, food shortage, Tanzania

1. Introduction

Despite improvement in the current state of global food situation, household food security has remains a serious social and public health problem in the world including Tanzania. The current global statistics indicates that about 1 billion people in the world endure food insecurity (The Economist Intelligence Unit's, 2015; Coleman, Alisha and Anita, 2014; FAO and W F P, 2014; Conway, 2012). Developing countries account for 98% of the global food insecure and hungry people in which most of these live in Asia and the Pacific 16%, Sub-Saharan Africa 30%, North Africa 8%, and Latin America and the Caribbean 9% (FAO, 2015; Mequanent, Birara, Tesfalem,2014; Ikeno, 2010). Conversely, 870 million people in the world are estimated to have been undernourished in the period 2010–12 of which 852 million people are living in developing countries (FAO, 2013; FAO, 2012).

According to Kayunze and Mwageni, (2013), a household is food secure if it can reliably gain access to food of a sufficient quality and quantities that allow all its members to enjoy a healthy and active life. However, this relies on food availability which is measured in terms of the amount of grains produced, bought, and received freely. It is also determined by assessing food production at the community, district, and national levels by comparing the amounts of harvests expected with the amounts of food required so that if the former are less than the latter, early warning can be given in advance about looming food shortage (Kayunze and Mwageni, 2013). Food is said to be enough on the basis of dietary energy consumed, which is the actual indicator of food security. With regard to dietary energy intake, a household is food insecure if it consumes fewer than 2,280 kcal per adult equivalent per day (Kayunze and Mwageni, 2013; FAO, 2012). Dietary energy consumed in terms of kilocalories is normally expressed per capita per day. When dietary energy consumed is expressed per capita per day, a household is said to be food insecure if it consumes less than 2,100 kcal per capita per day, which is the global average dietary energy consumption (Silke and Hand-Peter, 2005).

According to Kayunze and Mwageni, (2013), access to food is measured in terms of possession of resources like land to produce food, agricultural inputs, enough rainfall, labour supply, good infrastructure, political stability and cash to buy food. It is also measured by having valued assets like livestock, farms and others which can easily be sold to get cash to buy food (WFP, 2012). Therefore, households with access to the mentioned resources and assets are more likely to be food secure than their counterparts who either do not have such access or have poorer access to them. According to Kayunze and Mwageni, (2013), if no time in a year should the household have food shortage be it

chronic or transitory it becomes food secure. When a household runs a continually high risk of inability to meet the food needs of the household it becomes chronic food insecure and when it faces a temporary decline in the security of the entitlement for a short duration it is called transitory food insecurity (Kayunze and Mwageni,2013; WFP, 2012)

Generally, households faced with food shortages, be it chronic or temporary tend to adopt to a number of food insecurity coping strategies among which includes reduction in food intakes, dietary change, escaping of meals, distribution of family members to relatives, use of famine food, loans of grain from kin, sale of labour, and later, the sale of animals (Mequanent, Birara, Tesfalem, 2014; Afrol News, 2013; Liwenga, 2003).

Tanzania reports to have adequate food at the national level as it produces about 95% of her food requirements (André, Ton, Wijnand, Blandina, and Dick, 2013; National Bureau of Statistics, 2009). However, the country does not provide assurance to food security at the household level. Household food insecurity in Tanzania is both transitory and chronic in some regions. In regions such as Dodoma, Singida and Tabora, 45-55% of the households are food insecure. In Mwanza, Manyara and Kagera regions food insecurity affects between 20 to 30% of the households (WFP, 2012). In some areas traditionally considered food secure, a large proportion of the population is food insecure, specifically in Ruvuma and Iringa where 15% of households are classified as food insecure (WFP, 2012). There is also a high rate (between 21 to 27%) of households vulnerable to food insecurity in the regions of Lindi, Singida, Tabora, Dodoma and Mwanza (WFP, 2012, URT, 2006).

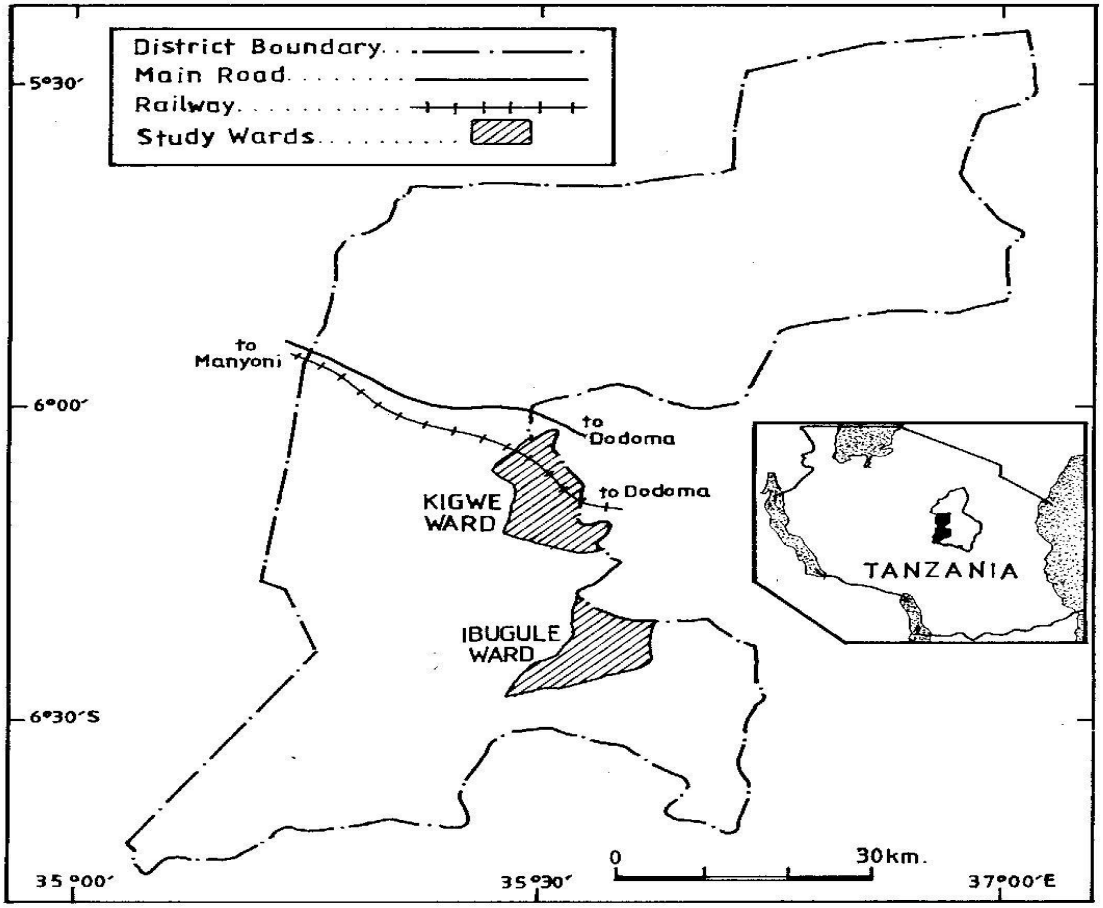
Bahi District in Dodoma Region is one among the districts with high incidences of transitory household food insecurity. The district experiences famines in almost every fourth year and a transitory food shortage occurs almost every year caused by natural calamities such as droughts and pests (URT, 2006). Despite high frequency of food insecurity in the district, little is known on the rate of food deficit based on statistical quantification of the problem. Previous studies (Afrol News, 2013; Liwenga, 2003) focused on peoples' perceptions on the occurrence of frequent food shortage in semiarid areas of central Tanzania. Moreover, though the area suffers from food shortage, it is still possible to find some households with food surplus side by side with food insecure households in some years, especially during seasons of adequate rainfall. This study therefore, aim at assessing the state of household food security in the study area, examining the variations on the state of household food security in Bahi district and explores how the households in the district cope with food insecurity.

2. Materials and Methods

2.1. Description of the Study Area

Bahi district is one of the seven districts of Dodoma region. The district is found in the central

plateau of Tanzania, west of Dar es Salaam city. The District extends between latitudes 6° 00' and 6° 30' south and between longitudes 35° 00' and 37° 00' east. It has a total land area of 6,100 square kilometers. Administratively, it is divided into four divisions namely Mwitikira, Chipanga, Bahi and Mundemu. These are further sub-divided into 21 wards and 56 villages. The studied wards are shown in Map 1. They are Ibugule and Kigwe from Mwitikira and Bahi divisions respectively.



Map 1. Location of Bahi District showing Ibugule and Kigwe wards

2.2. Research Design and Sampling Procedures

The study employed a cross sectional research design. The design was used on the grounds that, it allows the collection of data from different groups of respondents at a time. Both purposive and simple random sampling techniques were employed to select the study area and sample households. A total of 130 households were selected, approximately 5.6% of the total households. According to Boyd et al, (1981) five percent of the study population can suffice a sample under a certain circumstances. To get proportional sample of each village, 5.6% of the total households were taken. The exercise resulted to a sample of 50 households in Ibugule and 80 households in Kigwe, thus making a total of 130 households.

Thereafter Key Informants (KI) were purposively selected. These comprised two village

agricultural extension officers, the District Agricultural Officer (DAO), two Village Executive Officers (VEOs) and ten villagers constituting males and females. The ten villagers (five from each village) formed the Focus Group Discussion (FGD). The selection of these respondents was done with the help of the VEOs who provided to the researcher the names of people whom were thought could provide the required information.

2.3. Data Collection Methods, Analysis and Presentation

The study involved both quantitative and qualitative data collection methods including interviews, focus group discussions, documentary review and field observations. Semi-structured questionnaires were administered to household heads with age 20 and above. The age 20 was chosen as a starting point because many people in that age especially in villages have families. In-depth interviews were conducted between the researcher and village leaders who provided information on transitory food insecurity in their villages and documentary review was used to supplement the missing information.

Conversely, focus group discussions and field observations were used to collect qualitative data. Focus Group Discussions were conducted to ten selected elders both males and females. The purpose was to get general information on the causes of transitory food insecurity in the area. Field observation was used to cross check the physical availability of food and other behaviours related to the use of grains.

Furthermore, descriptive statistics including frequencies, percentages and mean were carried out with the help of Statistical Package for Social Sciences (SPSS version 16.0) and Microsoft Excel 2007). Content analysis was employed in analyzing qualitative data collected through key informants interviews and FGD. Thematic analysis was employed in coding and analyzing qualitative data obtained from the field based on themes.

3. Results and Discussion

3.1. Socio-economic Characteristics of the Respondents

Socio-economic characteristics of the respondents particularly sex, age, marital status and household sizes are good determinants of household food status. As indicated in Table 1, a majority of the respondents were in the age group of 25 - 44 years and 45 - 64 years; accounting for approximately 44% and 30% of the sample population respectively. With these ages of (above 18 years) respondents were mature to analyze issues related to food security in their area as they have experience over the social and farming activities. Mequanent, Birara and Tesfalem, (2014) in Ethiopia observed the same that older people have relatively richer experiences of the social and physical environments and greater

experience of farming activities. The above authors also affirm that, older household heads are expected to have better access to land than younger heads, because younger men either have to wait for land redistribution, or have to share land with their families.

Like the age, respondent's sex has an influence on household food security issues as it is associated with property ownerships. As shown in Table 1, out of 130 heads of households, 76.9 were males and the remaining 23.1% were females. As the study dealt with household heads, men seem to dominate the study. Similar findings was noted by Mequanent, Birara, Tesfalem, (2014) in Ethiopia were men dominated the study and had better access to land and labour resources among other factors of production than females thus, in most cases they were food secure than their counterparts females.

Table 1. Socio-economic characteristics of the respondents (N=130)

Characteristics	Categories	Ibugule (n= 50) (%)	Kigwe (n=80) (%)	Percentage (N=130) (%)
Sex	Males	82.0	73.8	76.9
	Females	18.0	26.2	23.1
Age groups:	>25	16.0	22.5	20.0
	25-44	46.0	42.5	43.8
	45-64	32.0	28.8	30.0
	< 65	6.0	6.2	6.2
Marital status:	Single	12.0	20.0	16.9
	Married	78.0	65.0	70.0
	Widowed &Divorced	10.0	15.0	13.1
Household size:	1–4	50.0	55.0	53.1
	5–8	34.0	33.7	33.8
	< 9	16.0	11.3	13.1

Moreover, many respondents (70%) in the current study were married while 30% of them were single, widowed or divorced. Also, a larger number of household surveyed (53.1%) had 1-4 household members, 33.8% of them had 5-8 household members and 13.1% of the household had household sizes of 9 members and above. The study by Ngongi, (2013), Obayelu, (2010) and Amaza et al, 2009) indicate that households with larger sizes are associated with being food insecure than those with smaller sizes.

3.2. Food Requirements and Food Status in the Study Area

3.2.1. Ideal and actual food available in the study area

The total amount of food available in a household in a year determines whether the household is food secure or insecure (FAO, 2014; FAO, 2012). If the amount is greater than or equal to the ideal food requirements, then the household is regarded as food secure. If the amount is less than the ideal requirements the household is regarded as food insecure (FAO, 2014; FAO, 2012). In this regard, the total amount of food available in the study area was established by adding up all grains obtained in the year of this study 2007/2008. This included grains harvested in the household, grains purchased from sales of other cash crops or livestock, grains obtained as gifts as well as grains from the balance of the previous harvest. This resulted to a total of 912500 calories per Reference Adult (RA) per year. The amount obtained (912500 calories) was converted to Reference Adults (RA) with an average food requirement of 2500 calories per day. In this study, calculations on calorific requirements were based on sorghum and bulrush millet, the major staple foods in the study area. Literature shows a calorific value of 3350 cal/kg for both sorghum and bulrush millet (Banyikwa, 1990). The calorific requirement per household per year was converted to kilograms and later to bags of approximately 100kg each.

Therefore, the general situation of food security in the study area was examined by comparing the available grains and the ideal food requirements in relation to the number of RA in the household. On the bases of calorific requirements obtained of 912500 calories per RA per year and having converted it to kilograms and later to bags of approximately 100kg each, calculations showed that one RA required a total of 2.7 bags of grain per year. Less than that one is considered to be food insecure.

The findings in Table 2 indicate that, the total grain available in the study area was 740 bags meeting only 61.1% of the total requirements of 1210 bags. The overall grain deficit of 38.9% shows that food insecurity was a real problem in the study area. However, the magnitude of the problem was slightly different between the two villages. The deficit was 40.9% and 37.4% for Ibugule and Kigwe villages respectively.

The major reason on the observed variations among the studied villages was variations on sources of income where in Kigwe many households reported to be involved in petty trading rather than depending on crop cultivation only. Those who depended on crop cultivation were more vulnerable to food insecurity particularly in years with inadequate rainfall as they could not afford to buy grain due to low income levels. Similar results were noted by Michael et al, (2012) in South Africa.

Due to high dependence on crop cultivation among households in Ibugule, it was possible to encounter food shortage frequently because the harvested crops were reported to be sold in order to pay for medications, buy clothes, pay school fees for their children and remain with little cash for day to day expenditures. High dependence on the harvested crops for other uses resulted to transitory household food insecurity even in good years. The situation was reported to be worse during critical

crop failure where some of the household members were forced to migrate in search of food or employment outside the study area.

Table 2. Ideal and actual food requirements in the study area (N=130)

Available food	Ibugule		Kigwe		Overall	
	Total	(%)	Total	(%)	Total	(%)
Ideal food requirements (bags)	512	100	698	100	1210	100
Actual grain available (bags)	303	59.1	437	62.6	740	61.1*
Deficit (ideal- actual)	209	40.9	261	37.4	470	38.9*

* Percent of actual and deficit food requirements

3.2.2. Intensity of food insecurity in the study area

The study results in Table 3 indicate 36.9% of the respondents reported to have experienced transitory food insecurity for two or three years within the past three years, 27.6% of the target population experienced transitory food insecurity for the past three years consecutively and, about 20% reported transitory food insecurity in one out of three years.

The current results affirm with that by FAO, (2013) in Tanzania, WFP, (2012) and United Republic of Tanzania, (2006) that despite the country being not drought prone, food insecurity in the country is both a transitory and chronic in nature

Table 3. Intensity of food insecurity in the study area (N=130)

Intensity of transitory Household food insecurity	Ibugule (n=50) (%)	Kigwe (n=80) (%)	Total(N=130) (%)
Three years consecutively	28.0	27.5	27.6
Two out of three years	38.0	36.2	36.9
One out of three years	20.0	20.0	20.0
Did not experience	14.0	16.3	15.5

Only 15.5% of the respondents said they did not experience transitory food insecurity in the past three years. These observations suggest that the prevalence of transitory hunger in Bahi district is a continuous phenomenon with over two thirds of the people suffering from moderate to severe food insecurity each year.

3.2.3. Food consumption patterns

Analysis of the number of meals eaten per day during the time of this study (Table 4) further affirmed the existence of transitory household food insecurity in the study area where, 40.8% of the respondents consumed two meals a day ignoring the morning meal, while 38.4% of the respondents reported to afford only one meal either lunch or dinner. Similar observation was noted by Michael, et al, (2012) in South Africa, Abayelu, (2010) in Nigeria and Quaye, (2008) in Ghana where some respondents were unable to afford all the three meals. The study findings also resembles with what was observed by Ngongi, (2013) in Kahama, who noted higher food insecurity among households. The remaining 20.8% of the sampled households in Bahi district, reported to afford the normal three meals a day. This group comprised petty business men/women and government employees particularly primary teachers, dispensary workers and administrative leaders who had reasonable income sources.

Table 4. Number of meals taken by households in the study area (N=130)

Number of meals	**Ibugule (n=50) (%)**	**Kigwe (n=80) (%)**	**Total(N=130) (%)**
Three meals	14.0	25.0	20.8
Two meals	40.0	41.2	40.8
One meal	46.0	34.8	38.4

Based on the study results in Table 4, when quantities of food in a household fell short, some households have been seen to reduce the number of meals per day as a coping strategy to household food insecurity. Not only this was seen to be the coping strategy, rather, a number of measures were presented during the FGD as seen in the below quotations where respondents reported to practice various strategies aiming at coping with transitory household food insecurity which persist almost each year.

> *"….food borrowing locally known as "songoleda" is frequently being done in our village particularly in times of critical food shortage. A food insecure household head visits the food secure household to request for a loan. The person is given the requested food expecting to return back the amount given with half more (50%) as an interest after harvest. The longer the food unsecured household stay with the borrowed food, the higher the interest…."* (A male, 48 years old at Ibugule village during the FGD).

Another respondent added that;

> "….. *we practice various measures in coping with the food deficit situation. Currently, my household is facing food shortage thus, escaping meals is commonly practiced. We normally consume two meals and, when we are not sure of tomorrow's diet, we eat once so as to reserve the remaining portion for the following day…..* (A female, 45 years old at Ibugule village during the FGD).

Apart from food borrowing and escaping meals, sell of household asserts was also reported among the coping strategies as reported by two respondents from Kigwe in the following quotations;

> *"….during food shortage, household heads decide to sell what is considered to be the household assert. This includes livestock, farms, houses and other valued asserts. The sold assert can be exchanged with grains or sold by cash.....*" (A male, 37 years old at Kigwe village during the FGD).
>
> *"…….in addition to what my fellow farmer has said, I have a good experience on it…. four years ago, I owned three cows as a payment dowry (Marriage fee) for my daughter. However the critical crop failure of last year (2007) forced me to sell two cows in order to buy grains to rescue my family from food shortage....." (*A male, 63 years old at Kigwe village during the FGD).

From the above quotations, one can reasonably argue that no single strategy is perfect on coping with household food insecurity. Selection of the coping strategy is determined by the severity of the problem. Under normal circumstances, households uses various measures including reducing the number of meals, escaping meals and consuming less preferred foods. However in critical times food borrowing and sell of household asserts becomes inevitable. Similar observations were made by Mequanent, Birara, Tesfalem (2014), Afrol News (2013), Ssewanyana, and Kasirye, (2010) and Liwenga, (2003).

4. Conclusion and Recommendations

The study results indicate that, transitory household food insecurity persists in the study area. This is evident from the total actual grain available during the time of survey which was less than the total grain required by 38.9%. Moreover, the number of meals eaten per day during the time of this study affirmed the existence of transitory household food insecurity where few of the sampled households (20.8%) could afford the normal three meals a day. It is concluded that, to reduce transitory household food insecurity in the study area and Tanzania in general, improvement of food production, availability and proper storage of the harvested crops should be given high priority. This can be done through provision of soft credits, distribution of agricultural inputs, provision of education on good farming and storage strategies as well as improvement of infrastructure particularly roads to ensure timely supply and distribution of food in times of critical food shortage.

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References

Afrol News. (2013). Food Insecurity Apparent in Central Tanzania*: Tanzania Agriculture Nutrition*[www.afrol.com/agriculture_nutrition/archive] visited on 5th, January, 2013.

Altman, M, Hart, T, and Jacobs, P. (2009). Household Food Security Status in South Africa.

Amaza, P. S., Abdoulaye, T., Kwaghe, P., and Tegbaru, A. (2009). Changes in Household Food Security and Poverty Status in PROSAB Area of Southern Borno State of Nigeria*; International Institute of Tropical Agriculture*, Ibadan, Nigeria.

André L, Ton D, Wijnand K, Blandina, K, and Dick, F. (2013). *Agricultural Dynamics and Food Security Trends in Tanzania*.

Banyikwa, W. (1990). *Environmental Degradation and its Relationship to Food Security in Tanzania: A Case Study of Dodoma Rural District*, Dodoma, Tanzania.

Boyd, H. K., Weslfall, P., and Stasch, S. F. (1981). *Marketing Research, Text and Cases*, Illinois. Richard D. Irwin, Inc.

Coleman, J, Alisha, C, G, and Anita S. (2014). Household Food Security in the United States in 2013, *Statistical Supplement*, AP-066, U.S. Department of Agriculture, Economic Research Service, America.

Conway, G. (2012). One Billion Hungry: Can We Feed the World? Cornell University Press, America.

Economist Intelligence Units. (2015). *The Global Food Security Index, National Food System Infrastructure Improvements Drive Food Security Progress Worldwide*, Hong Kong, China.

Food and Agricultural Organization. (2015). Regional Overview of Food Insecurity in Africa: *African Food Security Prospects Brighter Than Ever,* Accra, Ghana.

Food and Agricultural Organization and World Food Program. (2014). The State of Food Insecurity in the World 2012-2014: *Economic Growth is Necessary but not Sufficient to Accelerate Reduction of Hunger and Malnutrition*, Rome, Italy.

Food and Agricultural Organization, International Food and Agricultural Development and World Food Program. (2013). The State of Food Insecurity in the World 2013. *The Multiple Dimensions of Food Security.* Rome, FAO.

Food and Agricultural Organization. (2012). The State of Food Insecurity in the World: *The Multiple Dimensions of Food Security*, Rome, Italy.

Ikeno, J. (2010). Food Security and Livelihood in Rural Africa: Basic Conditions and Current Trends. Kyoto: Center for African Area Studies, Kyoto University, *African Study Monographs*, Supplementary Issue, 42.

Kayunze, K, E. and Mwageni, E, A. (2013). *Illness and Food Security in Rufiji District, Tanzania*.

Liwenga, E.T. (2003). Food Insecurity and Coping Strategies in Semiarid Areas: The Case of Mvumi in Central Tanzania. [Stockholm]: Department of Human Geography, Stockholm University. *Stockholm studies in human geography*, 11.

Mequanent, M., Birara E., Tesfalem K. (2014). *Determinants of Household Food Security among Southwest Ethiopia Rural Households*, Jimma University, Ethiopia.

Michael R, Florian K, Shaun, R, and Tebogo, D. (2012). The State of Food Insecurity in Johannesburg, *Urban Food Security Series No 12*, Bronwen Müller, Cape Town, South Africa.

National Bureau of Statistics. (2009). *Household Budget Survey 2007*, Ministry of Finance and Economic Affairs, Dar es Salaam, Tanzania.

Ngongi, A, M. (2013). *Food Insecurity and Coping Strategies of Farm Households in Kahama District*, Masters Dissertation, Sokoine University of Agriculture, Morogoro, Tanzania.

Obayelu, A. E. (2010). Classification of Households into Food Security Status in the North-Central Nigeria: An Application of Rasch Measurement Model, *Journal of Agricultural and Biological Science*, 5(3): 26 - 41.

Quaye, W. (2008). Food Security Situation in Northern Ghana, Coping Strategies and Related Constrains, *African Journal of Agricultural Research*, 3: 334-342

Robert A, James O, M, and Thomas T. (2013)**.** *Determinants of Household Food Security in the Sekyere-Afram Pains District of Ghana*.

Ssewanyana, S, Kasirye, I. (2010). Food Insecurity in Uganda: *A Dilemma to Achieving the Hunger Millennium Development Goal*, Economic Policy Research Centre, Uganda.

Silke, G. and W. Hand-Peter (2005), The Link between Poverty and Undernourishment: Uncovering a methodological Flaw, *Review of Agricultural Economics*, 27(1): 55-185.

United Republic of Tanzania. (2006). *Follow-up of the Implementation of the World Food Summit Plan of Action*: Ministry of Agriculture Food Security and Cooperatives, Dar es Salaam, Tanzania.

World Food Program and World Bank, (2013). *Comprehensive Food Security and Vulnerability Analysis (CFSVA) in Tanzania*, 2012 Report.