

Household Food Insecurity and Associated Coping Strategies in Urban, Peri-Urban and Rural Settings: A Case of Morogoro and Iringa Towns, Tanzania

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Abstract—Food insecurity is a worrying challenge worldwide with sub-Saharan Africa including Tanzania being the most affected. Although factors that influence household food access security status and ways of coping with such factors have been examined, little has been reported on how these coping strategies vary along the urban-rural continuum especially in medium-sized towns. The purpose of this study was to identify food insecurity coping strategies employed by households and assess whether they are similar along the urban-rural continuum. The study was cross-sectional in design whereby a random sample of 279 households was interviewed using structured questionnaire. Data were analysed using Statistical Package for Social Sciences (SPSS) Version 20 software. It was revealed that the proportion of households relying on less preferred and quality foods, eating fewer meals per day, undertaking work for food or money, performing farm and off-farm activities, and selling fall back assets was higher in rural settings compared to urban and peri-urban areas. Similarly, more households in urban and peri-urban areas cope with food access insecurity by having strict food budgets compared to those in rural households ($p \leq 0.001$). The study concludes that food insecurity coping strategies vary significantly from one spatial entity to another. It is thereby recommended that poor, particularly rural households should be supported to diversify their income-generating activities not only for food security purposes during times of food shortage but also as businesses aimed at increasing their household incomes.

Keywords—Food coping strategies, household food insecurity, medium-sized towns, urban-rural continuum.

I. INTRODUCTION

HOUSEHOLD food insecurity exists when food is not available or cannot be accessed (either socially, physically or economically) with certainty in socially acceptable ways at the level of household [1]. Over the last decades, global challenges of food insecurity were seen nearly completely as a rural problem, and most of the international focus was directed on rural farming, and most of the international focus was directed on rural farming [2]–[7]. Nevertheless, the dramatic growth of cities in the developing world combined with steep increases in food prices that started in 2008 and climate change has endangered livelihoods and

food security to the extent that resulting in the transferring of social threats closer to urban settings [8], [9]. The fact that population in and around African cities is growing faster than the provision of social services including food [10], calls for a critical analysis of potential food insecurity challenges concerning not only urban but also peri-urban and rural dwellers and how these populations would cope with these challenges.

Literature reveals that food insecurity is largely a “managed process”, meaning that people are not passive victims but rather are active participants in responding to the risks they face [11]. Studies in developing countries have documented that households employ a range of coping strategies during times of food insecurity [12]–[18]. These strategies vary from one location to another and also over time according to choices, objectives, opportunities and constraints [19], [20]. For example, the poorest households in Kilindi, Muleba and Ngorongoro districts in Tanzania, have been reported to resort to severe coping strategies like stopping children from going to school and temporal migration [21]. In Rukwa region, households were reported to use reduction of food consumed, borrowing money from relatives, selling labour for food or money to buy food, and gathering wild edible plants [22]. Rural households in Iringa and Kilimanjaro regions are known to rely on less preferred and quality foods and eating fewer meals per day during periods of food insecurity [23], [24]. In Dar es Salaam city, borrowing money and taking less preferred foods were the most common food insecurity coping strategies among people living with HIV/AIDS [25].

Despite the above-mentioned discoveries, little is known on how these strategies vary across the urban-rural continuum¹ in medium sized towns like Morogoro and Iringa, Tanzania. As [26] asserts, variation in the food access insecurity coping strategies from one spatial entity to another can serve as useful indicator for predicting, understanding shortfalls in achieving adequate food and for allocating resources or tracking the impact of interventions [26]. This paper therefore seeks to identify food access insecurity coping strategies employed by households and determine their variation along the urban-rural continuum in medium-sized towns. The findings of this study aid in designing appropriate policies and interventions that can effectively alleviate food access insecurity in households.

¹ Urban-rural continuum, as it is conceptualized in this study, refers to a spatial location comprised of urban, peri-urban, and rural settings.

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II. METHODOLOGY

A. Description of the Study Area

This study was carried out in Morogoro and Iringa Municipalities and in two rural districts surrounding each town. The Municipalities covered urban and peri-urban areas while the rural part extended to Morogoro Rural and Mvomero districts in Morogoro; and Iringa Rural and Kilolo districts in Iringa. The Morogoro Municipality is a town with a population of 315,866 [27] in the Eastern part of Tanzania, about 190 kilometers West of Dar es Salaam, the country's largest population city and commercial center. It is situated on the lower slopes of the Uluguru Mountains and covers 260 square kilometers (100 miles). Morogoro Municipality is bordered to the East and South by Morogoro Rural District and to the North and West by Mvomero District. Iringa Municipality has a population of 151,345 [27], and it is situated on a plateau that ranges from 1,500 meters to 2,500 meters above sea level, about 492 kilometers South West of Dar es Salaam City. It is bordered to the North, East and West by the Iringa Rural District and to the South by the Kilolo District.

Both towns are facing rapid influx of new residents causing major challenges in managing social and economic conditions with growing poverty. Infrastructure and services such as roads and transportation network are less developed in many parts of the study sites something which prevents both producers and consumers from accessing markets easily. Food stores are high following maize harvest in June but often become depleted from December before the next season. The months before harvest, called the 'hungry' or 'lean' season, are often the time period when households experience devastating food insecurity.

B. Research Design and Sampling Approach

A cross-sectional research design was used whereby data were collected once from sampled households. The targeted population was all households located along the urban-rural continuum in Morogoro and Iringa towns. Households were selected through a three-stage cluster sampling procedures. In stage one, a purposive sampling technique was employed to select two study sites namely Morogoro and Iringa towns. In stage two, three districts in each site were purposively selected to form urban-rural continuum. These districts are Morogoro Urban, Morogoro Rural and Mvomero in Morogoro region, and Iringa Urban, Iringa Rural and Kilolo in Iringa region. Lastly, a sample of 150 households in each site (i.e. 50 households each, respectively, from urban, peri-urban and rural settings) were selected using Geographical Information System (GIS). Accordingly, the sample size from which data were collected consisted of 300 households. Experience from previous similar studies established that a sample of 150 households in each of the study sites was sufficient to allow for reasonable analysis [19], [28]. Details of the sampling procedures have been described elsewhere [29].

C. Data Collection and Analysis

Primary data were the key source of information for this paper and were collected through interviews using a structured questionnaire that included both quantitative and qualitative information. Whereas quantitative questions inquired primarily about the household's biographical information, qualitative question investigated the ways in which households cope with food insecurity situations. Respondent, who was preferably the spouse in charge of food provisioning and cooking, was guided to recall all the coping strategies he or she employed during the times of food shortage. Data were collected between November and December 2015 in Iringa and between February and March 2016 in Morogoro.

At the end of data collection, the information was checked for completeness and consistency before coding into computer using SPSS Version 20 software. Analysis took the form of descriptive statistics including frequencies, means, standard deviations and cross-tabulations to describe characteristics of sampled households and the types of food insecurity coping strategies. Chi-Square test was performed to determine whether there was any significant relationship between each employed coping strategy and the spatial location of the household at $p \leq 0.05$.

III. FINDINGS AND DISCUSSION

A. Characteristics of Sampled Households

Out of the 279 surveyed households, 32% were situated in urban areas, and 32.3% and 35.8% were, respectively, located in peri-urban and rural settings. Overall, the mean age of the household's heads in urban areas was 40.51 (± 12.18) years as compared to 42.12 (± 12.31) and 42.50 (± 12.76) years in peri-urban and rural areas respectively (Table I). This implies that most of the household heads fall within the productive age; hence, they are capable of engaging in economic activities [27]. The majority of household heads in rural areas have not completed seven years of primary school education as compared to their counterparts in urban and peri-urban areas who have gone to post-primary school education ($p \leq 0.001$)². A literate household head often tends to adopt easily new skills and ideas which in turn can have positive effects on household food security [30]. The mean household size of the surveyed households at the time of the survey was 4.72 (± 2.215 individuals per household in urban setting compared to 5.09 (± 2.12) and 5.13 (± 2.19) individuals in peri-urban and rural areas respectively. Household size is an important variable in determining the state of household food security whereby, an increase in household size implies having more dependents and more mouths to feed from the limited resources, and therefore negative effect [31].

² According to the education system of Tanzania, the first seven years of education are considered as primary school while the next four years are termed as ordinary level secondary education, and additional two years of advanced level secondary school (also known as high school). Thereafter, a person goes to university or other tertiary level education.

TABLE I
 DISTRIBUTION OF STUDY POPULATION BY MEAN AGE, EDUCATION AND
 HOUSEHOLD SIZE ALONG THE CONTINUUM

Variable	Mean (and Standard Deviation)			P-Value
	Urban (n=89)	Peri-urban (n=93)	Rural (n=97)	
Age (Years)	40.42 (± 12.18)	42.01 (± 12.31)	42.5 (± 12.76)	0.517
Years of schooling	9.26 (± 3.58)	8.84 (± 4.16)	5.79 (± 3.33)	0.000***
Household size	4.72 (± 2.15)	5.09 (± 2.12)	5.13 (± 2.19)	0.365

*** indicate level of significance at less than 1%

B. Food Access Insecurity Coping Strategies

Overall, the surveyed households use a number of coping strategies most of which vary significantly along the urban-rural continuum (Table II). The proportion of households consuming foods which they did not prefer due to lack of resources was relatively higher in rural settings compared to urban and peri-urban areas ($p \leq 0.000$). Data on number of meals revealed that more rural households eat fewer meals per day compared to urban and peri-urban households ($p \leq 0.05$). One explanation is that on average the surveyed rural households rely entirely on rain-fed subsistence farming, something which lowers their food security status especially when agricultural yield drops. Studies [22], [32], [33], and [19] have also reported similar results. Relying on less preferred quality foods and reducing number of meals per day have repercussions on nutritional status of household members, especially on children, elderly and the sick [34].

It was noted that 63% of the surveyed households in rural areas sell labour for food or money to buy food compared to less than 20% in peri-urban or urban settings ($p \leq 0.000$). Work-for-food or money activities included working as casual labourers in agriculture during the agriculture season and non-agricultural activities such as in construction sites. However, relying on casual labour is not a reliable coping strategy because once the person is not healthy enough to engage in such activities, the household becomes highly devastated. Greater proportion of the surveyed households in rural areas indicated to undertake various income-generating activities during times of food shortage ($p \leq 0.05$). Such activities included mostly making and selling charcoal and firewood, and selling local beer from maize and millet ($p \leq 0.05$). On the other hand, small-scale gardening and food vending, particularly by women and youth, were the main strategies adopted by the urban and peri-urban households. Such findings correspond very strongly with the Household Economy Approach (HEA) framework [35] which declares a household cope with food insecurity based on the options it has and the level of wealth of that household. Also, these results are similar to studies [12], [36] and [19], which also noted that cutting of trees for firewood and charcoal making and selling of local beer are quite detrimental because they adversely affect the environment and food reserve base.

The results also show that more households in urban and peri-urban households cope with food access insecurity by having strict budget on food compared to the households in rural settings ($p \leq 0.001$). In this context, having a strict

budget for food implies buying and consuming only necessities. Based on HEA framework, because most of poor urban and peri-urban households have inadequate income resulting from limited formal and informal employment opportunities, these households are likely to resort to having strict food budget than their counterparts in rural households. These findings are in line with findings of [37]. Also, it was reported that more rural households sold their livestock, mostly chicken, as a means of coping with food access insecurity compared to urban and peri-urban households ($p \leq 0.05$). Several studies conducted in rural settings [12], [22], [36], [38], [39] have also affirmed that the majority of rural households keep livestock as a fall-back asset during times of needy.

TABLE II
 PERCENTAGE OF HOUSEHOLDS UNDERTAKING VARIOUS FOOD INSECURITY
 COPING STRATEGIES ALONG THE CONTINUUM

Food insecurity coping strategy	N	Urban	Peri-urban	Rural	P – Value
Relying on less preferred foods	181	23.2	32.0	44.8	0.000***
Eating a limited variety of foods	95	31.6	26.3	48.5	0.113
Eating fewer meals in a day	68	20.6	30.9	48.5	0.003**
Work for food or money	46	15.2	21.7	63.0	0.000***
Undertaking various income-generating activities	81	27.2	27.2	45.7	0.049**
Buying food in bulky	6	66.7	33.3	0.0	0.108
Having a strict budget for food	41	41.5	48.8	9.8	0.001***
Selling livestock	8	0.0	25.0	75.0	0.036**

*** and ** indicate levels of significance at 1% and 5% respectively.

IV. CONCLUSION AND RECOMMENDATIONS

This study assessed the extent to which food insecurity coping strategies in households vary along the urban-rural continuum in medium-sized towns of Morogoro and Iringa and their surrounding rural areas. The study concludes that food insecurity coping strategies vary significantly from one spatial entity to another. The proportion of households relying on less preferred and quality foods, eating fewer meals per day, undertaking work for food or money, performing farm and off-farm activities, and selling fall back assets was higher in rural settings compared to urban and peri-urban areas. Similarly, more households in urban and peri-urban areas cope with food access insecurity by having strict food budgets compared to those in rural households.

In order to alleviate food access insecurity in poor households there is need for better livelihood support such as access to credit and training on small businesses and establishment of trading cooperatives in the study sites. Success has been reported in Ghana and South Africa following microfinance interventions in terms of increased business incomes and empowerment of people [40]. The microfinance innovations may take the form of loans and savings as discussed by [41]. In addition, poor rural households should be supported to, among other things, diversify farming activities with other sustainable and viable non-farming activities, not only for food security purposes during times of food shortages, but also as businesses aimed at increasing household incomes.

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