

COPING STRATEGIES AND RESILIENCE TO FOOD INSECURITY IN URBAN-RURAL CONTINUUM OF MOROGORO AND IRINGA, TANZANIA

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ABSTRACT

This study assessed whether food access insecurity strategies employed by households are similar along the urban-rural continuum. Equally, the study determined whether the above-mentioned strategies contribute to building households' resilience to food access insecurity. A cross-sectional research design was employed whereby a sample of 279 households was drawn using a Geographic Information System (GIS)-based simple random. Data were collected using a structured questionnaire and were analysed mainly descriptively. Results show that the surveyed households use a number of coping strategies most of which vary significantly from one spatial entity to another. Also, findings revealed that these strategies do not improve households' resilience to food access insecurity because they erode household's own resilience. It is concluded that food access insecurity coping strategies vary significantly among households located in urban, peri-urban and rural settings. Additionally, the surveyed households employ mainly reactive strategies, which may not be considered as proper in the realm of resilience building. It is recommended that poor households should be supported to diversify their income-generating activities so as to be able to employ resilient building strategies when they experience food shortages.

Keywords: Household food access insecurity, coping strategies, resilience, rural-urban continuum

INTRODUCTION

Before the early 1980s, global challenges of food insecurity were viewed almost exclusively as a rural phenomenon, and most of the international focus was directed on rural farming (Misselhorn, 2004; Hendriks, 2005; Aliber and Hart, 2009; Matshe, 2009; Altman *et al.*, 2010; Crush *et al.*, 2011). 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 at an unprecedented magnitude resulting in the gradual transfer of social threats closer to peri-urban and urban settings (Zezza and Tasciotti, 2010; Tawodzera *et al.*, 2012). The fact that population in and around African cities is growing faster than the provision of social services including food (UN-HABITAT, 2014), 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

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 (Radimer *et al.*, 1992; Coates *et al.*, 2007). Studies in several developing countries have documented that households employ a range of coping strategies during times of food insecurity (Liwenga, 2003; Verpoorten, 2009; Floro and Swain, 2013; Kuuire *et al.*, 2013; Agada and Igbokwe, 2014; Amendah *et al.*, 2014; Gebrehiwot and van Der Veen, 2014). These strategies vary from one location to another and also over time according to choices, objectives, opportunities and constraints (Siri *et al.*, 2005; Chagomoka *et al.*, 2016). 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 (URT, 2012). 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 (Hadley *et al.*, 2007). 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 shortage (Leyna *et al.*, 2007; Knueppel *et al.*, 2009). In the city of Dar es Salaam, borrowing money and taking less preferred foods were the most common food insecurity coping strategies among people living with HIV/AIDS (Semali *et al.*, 2011).

Despite the above-mentioned observations, little is known on how these strategies vary along the urban-rural continuum¹ in medium sized towns² in Tanzania. Moreover, there is insufficient literature about whether these strategies really contribute to building and improving households' resilience to food access insecurity. As Maxwell *et al.* (2008) assert, variation in the food access insecurity coping strategies from one spatial entity to another can serve as a useful indicator for predicting, understanding shortfalls in achieving adequate food and for allocating resources or tracking the impact of interventions. This study examined the variation of coping strategies to households' food access insecurity along the urban-rural continuum in medium-sized towns. Equally, the contribution of these strategies towards building and improving households' resilience to food access insecurity was sought.

The findings provide researchers and policy-makers with fresh insights into the debate on the extent to which food access insecurity coping strategies vary among households located in places categorised as urban, peri-urban and rural. In addition, an understanding of the implications of these strategies on households' resilience to food shortage facilitate formulation of more effective and appropriate interventions in strengthening the resilience of households in coping with food access insecurity.

Multi-layered social resilience framework in the context of this study

Based on the above section, it is evident that households employ different types of food coping strategies when they do not have enough to eat. Such strategies, though may temporarily solve the issue, are an indication that things are getting worse. As noted above, the most common food coping strategies include eating foods that are less preferred, limiting portion size, reducing number of meals, and skipping eating for a whole day. Others are borrowing money, selling household assets, and working for food or cash. Given the fact that the frequencies of strategies vary from one household to another and also from place to place, an important question is whether these strategies contribute to building household's resilience to food access insecurity.

The underlying theoretical framework of this assessment is the 'Multi-layered Social Resilience' as put forward by Obrist *et al.* (2010). This framework borrows heavily from ecological (Holling, 1973; Folke *et al.*, 2000; Carpenter *et al.*, 2001), psychological (Luthar, 2003; Masten, 2001) and socio-anthropological approaches (Bourdieu, 1984), as well as the sustainable livelihoods framework (DfID, 1999). Adapting the definition of Obrist *et al.* (2010) to the context of this study, resilience is defined as household's capacity to not only cope with and adjust to a threat ("reactive" capacities), but search for and create options ("proactive" capacities), and thus develop increased competence and thus create pathways for mitigating or even overcoming the threat. Whereas 'reactive capacities' refers to direct reactions towards a threat that is taking place or has just taken place, 'proactive capacities' are understood as abilities such as anticipating threats, changing rules and regulations, creating new options, planning ahead and recognising danger. Therefore, according to Obrist *et al.* (2010), the capacity of a household to access capitals so as to both cope with and actively avoid a threat (e.g. food access insecurity) is known as resilience.

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

² A medium-sized town refers to an urban area with less than 500,000 inhabitants.

Generally, resilience building is determined by the access to and ownership of capitals, notably human, physical, financial, social and natural capitals. According to DfID (1999), human capitals encompass skills, knowledge, ability to labour and good health. Physical capitals include basic infrastructure (livestock ownership, rental facilities such as motorbike and bicycle). Social capitals entail social resources such as membership in formal and informal groups, relationships of trust, and access to wider institutions of society that people draw upon in pursuit of livelihoods. Financial capitals include cash money, savings, supplies of credit or regular remittances and pensions. Natural capitals include aspects such as land, water, wildlife, biodiversity and other environmental resources.

In the context of this study, coping with food access insecurity by employing ‘reactive capacities’, notably eating less preferred quality food, limiting portion size, reducing number of meals, having a strict budget on food items, working for food or cash, making and selling charcoal, firewood, local beer, and livestock is not regarded as resilience building. On the other hand, the ability to anticipate household’s food access insecurity situation and thus employ ‘proactive capacities’ such as creating additional source of income, growing drought-resistant crops, and buying enough food in bulk when food prices are low is regarded as resilience building.

The Multi-layered Social Resilience Framework was considered appropriate for this study because of several factors. First, it recognizes capitals such as human, physical, social, financial and natural capitals as prerequisite for resilience building. Second, it recognizes that resilience must be examined with respect to a particular threat such as food access insecurity. It also recognizes that resilience building is a process involving social networks ranging from individual, household, community, national and international levels. Lastly, this framework provides researchers and policy-makers with a solution-oriented way of thinking about population at risk.

METHODOLOGY

A cross-sectional research design was used whereby data was collected once from sampled households.

Description of the study area

This study was carried out in Morogoro and Iringa Municipalities including two rural districts surrounding each Municipality. The Municipalities covered urban and peri-urban areas while the rural part extended to Morogoro and Mvomero districts in Morogoro; and Iringa and Kilolo districts in Iringa. Morogoro Municipality is a town with a population size of 315 866 (URT, 2014) located in the eastern part of Tanzania about 200 kilometers west of the city of Dar es Salaam, the country’s largest commercial center. Morogoro Municipality is bordered to the East and South by Morogoro District and to the North and West by Mvomero District. Iringa Municipality has population size of 256 348 (URT, 2014) and is situated about 492 kilometers south-west of Dar es Salaam City. It is bordered to the North, East and West by the Iringa District and to the South by the Kilolo District.

Morogoro and Iringa municipalities 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.

Target population and sampling approach

The targeted population was all households located along the urban-rural continuum in Morogoro and Iringa. Households were selected through a three-stage cluster sampling procedure. In stage one, a purposive sampling technique was employed to select two study sites namely Morogoro and Iringa Municipalities. In stage two, two districts in each site were purposively selected to form urban-rural continuum. These districts are Morogoro and Mvomero in Morogoro, and Iringa and Kilolo in Iringa. 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, out of a sample of 300 households, 279 households participated in data collection. Experience from previous similar studies by Schlesinger (2013) and Chagomoka *et al.* (2016) established that a sample of 150 households in each of the study sites was sufficient to allow for analysis.

Data collection and analysis

Primary data was the key source of information for this study and was collected through surveying technique using a structured questionnaire that included both quantitative and qualitative information. Quantitative questions inquired about access to food in the household during previous 30 days. The Household Food Insecurity Access Scale (HFIAS) tool was used to collect the access component of food security (Coates *et al.*, 2007; Becquey *et al.*, 2010). Qualitative questions investigated the ways in which households cope with food insecurity situations. Respondents, who were preferably the spouses in charge of food provisioning and cooking, were guided to recall all the coping strategies they employed during the times of food shortage. Data was collected between November and December 2015 in Iringa and between February and March 2016 in Morogoro. According to WFP (2013), the two time periods represent peak seasons of food shortage in the respective areas.

At the end of data collection, the information was checked for completeness and consistency before coding into computer using Statistical Package for Social Scientists (SPSS) software. Analysis took the form of descriptive statistics including frequencies, means, standard deviations and cross-tabulations to describe status of food access security, characteristics of sampled households, and the types of food insecurity coping strategies. Descriptive analysis was chosen because of its ability to organize and compare vast amount of data in a more manageable form. 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 $p \leq 0.05$. The status of food access security was determined by computing the HFIAS score for each sampled household. The minimum HFIAS score is 0 and the maximum score 27. The higher the score, the more food access insecurity the household experiences and vice versa (Coates *et al.*, 2007). Household was considered to have food access security if its total number of HFIAS score was less or equal to 11, and food access insecurity if its total score was more than 11 (FAO, 2010).

FINDINGS AND DISCUSSION

Aim/Objective 1: Assessment of food access insecurity coping strategies along the urban-rural continuum

Using Chi-square test (X^2), the surveyed households use a number of coping strategies most of which vary significantly from one spatial entity to another (Table 1). 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 ($p \leq 0.01$). 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 heavily on rain-fed subsistence farming, something which lowers their food security status especially when there is crop failure. Studies by Hadley *et al.* (2007), Regassa (2011), Gupta *et al.* (2015), and Chagomoka *et al.* (2016) have also reported similar results. Since these strategies have negative effects on the nutritional status of household members, it implies that rural households are less resilient to food shortage as compared to the urban and peri-urban households.

Table 1: Percentage of households undertaking various household food insecurity coping strategies along the urban-rural 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***
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 **, respectively, indicate significance at 1% and 5% levels.

It was noted that 63% of the surveyed households in rural areas work for food or money to buy food compared to respectively 21.7% and 15.2% in peri-urban or urban settings ($p \leq 0.01$). Whereas most rural household members sell their labour in the farms of their neighbours and relatives, their counterparts in urban and peri-urban areas engage mostly in construction work. These activities are highly labour-intensive with very little pay something which makes these labourers less resilient to food shortage among other necessities. These results are in conformity with those of the study by Liwenga (2003) which found that poor households sell their labour in order to get money to buy food. Also, Chagomoka *et al.* (2016) reported that poor women in poor rural households in the northern region of Ghana are sometimes involved in harvesting crops as labourers in order to get money to buy food for their households.

Greater proportions of the surveyed rural households reported to have engaged in income-generating as compared to urban and peri-urban households as a way of coping with food access insecurity ($p \leq 0.05$) (See Table 1). About half of the respondents in rural households confirmed being involved in making and selling charcoal, firewood and local beer from maize and millet to generate income to buy food and other necessities. One explanation is that the livelihoods of most poor rural households depend on natural resources for both their income and food. Thus, it is a common practice to resort to forest products such as firewood and charcoal making especially during times of hardship. Similarly, trading local beer is more practiced in rural areas simply because its main ingredients notably maize and millet are easily accessible especially during harvesting season. On the other hand, most of urban and peri-urban households, particularly women and youth, were reported to engage in small-scale gardening and food vending. The main reason is that urban and peri-urban households source much of their food through market purchase something which facilitate the growth of such businesses. The main implication of these findings is that rural households are likely to be less resilient to food shortage due to their engagement in such unsustainable activities. Likewise, the resilience of urban and peri-urban household members is at stake as foodstuffs grown and sold in open spaces and road reserves are likely to endanger their health. Studies by Liwenga (2003) and Khatri-Chhetri and Maharjan (2006) have also reported that rural households engage in selling charcoal, firewood and local beer as a way of coping with food shortages. Likewise, Floro and Swain (2013) noted that women were engaging in income generating activities such as selling food in order to get money to buy food in times of household food shortages. Similar results have also been reported by Hovorka *et al.* (2009) who assert that women from urban low-income households contribute to food security through activities such as urban farming among others during times of food insecurity.

Results in Table 1 show that more urban households cope with food shortage by having strict budget on food and non-food items through buying and consuming only necessities compared to peri-urban and rural households ($p \leq 0.01$). The kinds of foods reported as unnecessary and hence reduced or omitted from meals during the difficult moments include fruits, juice, soda, fish, meat and chicken. Unlike peri-urban and rural households, most poor urban households do not have access to wild edible plants and animals, selling of

firewood, and making charcoal or local beer. Therefore, they are forced to relying on strict food budgeting. These results compare well with the findings by several studies on food insecurity coping strategies in urban areas in developing countries (Kraak *et al.*, 1999; Hadley *et al.*, 2007; Maxwell *et al.*, 2008).

Peri-urban and rural households have been noted to be selling livestock mostly chicken during times of food shortage as compared to urban households ($p \leq 0.05$). Livestock keeping is mostly practiced in peri-urban and rural areas because such areas offer enough space to raise animals. Although households sustained their lives through buying food and other household necessities, livestock keeping could be regarded as resilience building only if it was practiced in such a way that it could sustain the household throughout the crisis. Consequently, households in peri-urban and rural settings are less resilient to food access insecurity as compared to their counterparts in urban settings. Selling livestock was cited as one of the coping strategies in Central Tanzania to buy food (Liwenga, 2003). Elsewhere, the works of Quaye (2008) in Ghana and Yaffa (2013) in Gambia have also reported use of livestock as fall-back asset during time of food shortages. The study by Verpoorten (2009) in Rwanda has also shown similar results although it did not explain the extent to which the sale of livestock varied among urban, peri-urban and rural households.

Aim/Objective 2: Assessment of employed strategies' contribution to building households' resilience to food access insecurity

Based on the Multi-layered social resilience framework, all the food coping strategies employed by the surveyed households are mainly reactive; they are direct reactions towards a threat (i.e. food shortage) taking place. First, eating less preferred quality food, limiting portion size, reducing number of meals and having a strict budget on food items have negative repercussion on nutritional status of household members notably children, the elderly and the sick by eroding their health. Second, working for food or cash denies most of the household members an opportunity to work on their own fields and hence perpetuating a food insecurity cycle (Ntwenya *et al.*, 2015). Third, making and selling charcoal, firewood, and local beer from maize and millet erode household resilience by destroying the environment, putting people's health at risk and depleting food reserves. Likewise, foodstuffs grown and sold in open spaces and on road reserves are likely to endanger consumer's health as they are constantly polluted by fumes and dust from vehicles and people. Selling livestock could have a positive resilience implication if livestock business was carried out in such a way that it could sustain the household throughout the crisis. However, this was not the case among the surveyed households.

A negative resilience implication of these strategies is the fact that households cope with food shortage by eroding their own resilience. Indeed the resilience of these households is at risk because resilience is more than just coping in the sense of minimizing the consequences of an adversity and managing vulnerability to ensure short-term survival (Obrist *et al.*, 2010). In this case coping with a threat by eroding own resilience notably eating less quality food, limiting portion size, reducing number of meals, working for food or cash, trading firewood, charcoal, local beer and food may not be considered as proper in the realm of resilience building process.

CONCLUSION AND RECOMMENDATIONS

This study examined the variation of coping strategies to households' food access insecurity along the urban-rural continuum in medium-sized towns. Equally, the contribution of these strategies towards building and improving households' resilience to food access insecurity was sought. Based on the two objectives and findings, it is concluded that food access insecurity coping strategies vary significantly from one spatial entity to another in terms of frequency. This knowledge on how households at different locations along the urban-rural continuum cope with food insecurity is useful for geographical targeting and resource allocation along the continuum. 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 of 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.

Also, based on the Multi-layered Social Resilience Framework, it can be concluded that households managed to utilize their capitals to develop mainly reactive strategies to cope with food access insecurity. The negative implication of these strategies is that the households coped with food shortages by eroding their own resilience. First, fewer and low quality foods coupled with strict budget on food and non-food items could have put households' health at risk. Second, spending much time selling labour for cash or food could further perpetuate food insecurity cycle as household members will not have sufficient time to work on their own fields. Third, making and selling charcoal, firewood, and local beer, as well as cultivating and selling foodstuffs in informal places are not resilience building because these activities destroy the environment, endanger household members' health and deplete food reserve base. Finally, the resilience of these households is at risk because resilience is more than just coping in the sense of minimizing the consequences of an adversity and managing vulnerability to ensure short-term survival.

It is recommended that, in order to strengthen household resilience and hence alleviate food access insecurity in poor households there is need for better livelihood support from the government at all levels 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 (Afrane, 2002). The microfinance innovations may take the form of loans and savings as discussed by Dary and Issahaku (2013). 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.

Limitations and Future Studies

Data collection on household food access security relied on specific indicators including measures of household food access insecurity access scale (HFIAS) and ownership of household assets, which depend on the respondent's ability to recall. Recall methods are prone to bias or response errors. Although the questionnaire was translated to Kiswahili at the time of interview, the communication errors brought about by differences in the level of understanding between the enumerator and respondents cannot be ruled out although, efforts were made to ensure that realistic information is collected by repeating the same question several times.

Since this study focused on Morogoro and Iringa regions whereby the main livelihoods of their inhabitants do include agriculture to a great extent, future studies are recommended to look at other regions with a different main livelihood strategy using the urban-rural continuum approach. Methods that do not address recall information may be applied to minimize response errors or bias.

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