

Food Vendor's Coping Strategies and Nutritional Security of Customers Within Major Bus Stations in Dar Es Salaam Tanzania

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Abstract

Keywords:

Coping Strategies;
Nutritional Security;

This paper examines how food vendors around major bus stands in Dar es Salaam cope with socio-economic stress and the impact on their customers' nutritional security. The findings are essential for developing programs to improve food and nutritional security, contributing to sustainable development. The study identifies challenges vendors face and the coping strategies they use, while also assessing the implications for customer nutrition. Data were collected from 160 respondents through a cross-sectional study, supplemented by 20 in-depth interviews with local government officials. The analysis was conducted using SPSS with both descriptive and inferential statistics. Results show that most vendors manage economic stress by reducing portion sizes (90%) or using lower-quality raw materials (89%), posing health risks to consumers. Additionally, a lack of organizational skills and non-compliance with regulations limit their access to local government support. Inferential statistics revealed that "possession of legal business premises" and "number of dependents" significantly influenced coping strategies, with more dependents negatively affecting them. In conclusion, food vendors face significant socio-economic challenges that affect both their operations and customers' health. Addressing these issues is essential to promote sustainable business practices and safeguard consumer health. It is recommended that local governments provide training in organizational and hygiene skills while integrating vendors into urban planning, enabling access to financial services and stable workspaces.

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1. Introduction

Food vending provides a vital source of income for vendors and offers affordable meals to urban low- and middle-income workers, school children, and university students. The demand for vended food is driven by several factors, including the limited availability of home-cooked meals due to the high percentage of women (88% in Tanzania) working in the formal sector, rapid urbanization, which increases the distance between home and workplace Dar es Salaam being the third-fastest growing city in Africa and the fast pace of urban life. Additionally, vended food is cheaper than eating at formal restaurants or cooking at home, as it saves time and fuel. The absence of canteens in schools and the limited number of cafeterias in higher education institutions also contribute to the demand for vended food [1]. It is estimated that 90% of food vendors are women aged 20 to 45 [2], many of whom support families and employ 3 to 6 people [3]. This highlights food vending's significant role in family economies and well-being.

Despite their importance to the economy and nutrition, food vendors operate informally without social protection or support mechanisms, relying on daily income [1]. Average profits range from 5,000 to 20,000 Tanzanian shillings, depending on location [2]. Most food vendors cannot afford basic hygiene facilities, such as running water and soap, and work in crowded spaces [3]. They face challenges such as unfavourable regulations, lack of access to credit, limited skills, and marketing difficulties.

The strategies food vendors use to address these socioeconomic challenges and the implications for customers' food and nutritional security remain unclear due to a lack of available literature. Many vendors operate in unhygienic environments, raising concerns about their resilience and the safety and quality of the food they sell. In Dar es Salaam, many low- and middle-income workers, as well as commuters, rely on vended food to meet their daily nutritional needs due to long working hours. Proper nutrition is essential for the health of these workers, school children, and university students, as it contributes to national development. Particularly in middle and old age, good nutrition helps prevent disease, and according to the World Health Organization [4], almost every country face malnutrition, which poses a serious public health risk. Poor nutrition can lead to significant economic losses, with undernutrition potentially reducing GDP by up to 12% in low-income countries due to impaired intellectual development. Malnutrition leads to serious health issues, including cognitive impairment, illness, and death [4].

The causes of undernutrition are complex and interconnected, as outlined in WHO's Food and Nutritional Security Framework. The immediate causes include poor dietary habits and inadequate intake of nutrients, often worsened by infections that prevent proper nutrient absorption. For example, unhygienic food can cause foodborne infections like cholera, which can further exacerbate malnutrition [5]. In Tanzania, it is common to see food vendors selling in unsanitary bus stand environments, where either home-prepared or on-site-cooked food is sold, despite the lack of proper infrastructure for food safety.

This study examined the strategies food vendors use to manage daily risks and their implications for customers' nutritional security and health. Specifically, it identified coping strategies, analysed the factors influencing these choices, and evaluated the impact on customers' food and nutritional security. The study ultimately sought to answer the key question: How do food vendors cope with socioeconomic challenges, and what are the implications for consumers' health and nutrition?

2. Research Method

Study's Area

The study was carried out in Dar es Salaam due to its dense and bustling local bus stations, which attract large crowds from within the city, other regions, and neighbouring countries, many of whom rely on vended food. As the largest and fastest-growing city in Africa [2], Dar es Salaam had the highest population in Tanzania in 2020, with 5,401,801 residents, according to projections from the National Bureau of Statistics (NBS) [6]. The study included four bus stations, one from each council: Ferry Kigamboni, Gongo la Mboti, Makumbusho, and Mbezi.

Study's Design

The study utilized a cross-sectional research design, collecting both qualitative and quantitative data at a single point in time. This design enables estimation of the prevalence of the outcome of interest in this case, the implications for customers' nutritional security by sampling from the entire population [7]. Additionally, the design is cost-efficient, time-saving, and ensures the collection of high-quality data.

Sampling Procedure

A multistage sampling procedure was used in the study, which involved: (i) the deliberate selection of Kigamboni Ferry, Kinondoni Makumbusho, Ubungo Mbezi, and Gongolamboto bus stands, as they are the most crowded areas with numerous food vendors in the city; (ii) the purposeful inclusion of public officials

such as district health officers, community development officers, trade officers, and planning and social welfare officers to answer questions related to governance and opportunities available for food vendors within the local government authorities (LGA); and (iii) the random selection of 40 food vendors from each bus station, totalling 160 participants. This sample size was sufficient to minimize sampling error at a 0.05 confidence interval, as argued by [8]-[9], who state that a minimum sample of 30 cases is adequate for research involving statistical analysis, regardless of the population size. Additionally, [7], [10] note that increasing sample size reduces sampling error. Therefore, the sample was considered representative of all food vendors around Dar es Salaam's bus stations.

Data Collection Methods

The study employed both qualitative and quantitative data collection methods to balance the strengths and weaknesses of each approach [11]. Quantitative data, including information on income, demographic characteristics, and capital size, were gathered using structured questionnaires. Meanwhile, qualitative data, focusing on challenges faced by vendors, coping strategies, and opportunities available at the local government level, were collected through in-depth interviews.

Measurement of Variables

The dependent variable in this study, "coping strategies," was measured using three indicators: raising prices (1 = Yes, 0 = No), reducing portion sizes (1 = Yes, 0 = No), and borrowing (1 = Yes, 0 = No). The predictor variables included a mix of socio-demographic and economic factors, such as age, gender, number of dependents, capital size, food prices, and ownership of formal business premises.

Data analysis

Descriptive statistics from the quantitative data, which included the demographic characteristics of food vendors, types of vended foods, and coping strategies, were generated using SPSS and presented in a table. Inferential statistics from multinomial logistic regression were applied to assess the influence of socio-economic and demographic variables on the choice of coping strategies. As noted by Pallant [12], [10], multinomial logistic regression is the most suitable model for predicting categorical outcomes with two or more categories, using a mix of continuous and nominal predictors, as is the case with the variables in this study. The model is shown below:

$$P(y) = \frac{e^{\alpha + \beta_1 x_1 + \dots + \beta_k x_k}}{1 + e^{\alpha + \beta_1 x_1 + \dots + \beta_k x_k}} \quad [13].$$

In this equation, $P(y)$ represents the food vendors' coping strategies, e denotes the natural log, α is the intercept, β_1 to β_k are the coefficients of the predictor variables, and $x_1 \dots x_k$ refer to the predictor variables listed in the section on variable measurement. Before performing the logistic regression, the data were examined for outliers and multicollinearity, and two predictors with fewer than 10 observations were excluded from the model.

3. Results and Analysis (10pt)

Characteristics of Respondents

Table 1 presents the socio-demographic characteristics of the study's respondents.

Table 1: Socio-Demographic Profile of the Study Respondents

S/N	Character	Count n = 160	Percent
1.	Respondents' District		25
	Dar es Salaam City Council	40	25
	Ubungo Municipal Council	40	25
	Kinondoni Municipal Council	40	25
	Kigamboni Municipal Council	40	
2.	Respondents' Sex		
	Female	114	71.2
	Male	46	28.8
3.	Respondents' age-groups		
	33 years and below	59	36.9
	34 – 38	49	30.6
	39 and above	52	32.5
4.	Number of schooling years		
	7 years or younger	151	94.4
	8 years or older	9	5.6
5.	Condition of Business Premise		
	Stationed	10	6
	Temporary/Mobile/ Standby	150	94

Source: Field Data computation

The survey successfully interviewed 160 food vendors, with 40 vendors from each bus station. Most of the respondents (71%) were women, and over half (68%) were under the age of 39, indicating they were economically active. According to [14], a high proportion of economically active individuals supports economic growth, and policies that expand this workforce help counteract the negative effects of an aging population on national growth. The findings in Table 1 show that the majority (94%) of the food vendors did not have permanent business premises but preferred to operate within bus stations for easier access to customers. However, key informants noted that vending inside bus stations is illegal, as district authorities had designated separate areas for food vendors to operate. While following customers is a key business strategy, as emphasized by [15], who define marketing as identifying customers and ensuring their convenience, food vendors' actions violate urban planning regulations by not adhering to the designated areas. Informants also mentioned that only vendors in official business areas are provided with necessary infrastructure, such as handwashing facilities. Interviews revealed that food vendors had been allocated business plots, but most could not meet the construction requirements tied to specific designs. Additionally, the designated plots were far from potential customers. The required designs and materials were too expensive for most vendors, leading many to sell their plots to those who could afford them. The study suggests that a public-private lease model could address this issue. As [16] describe, leasing involves transferring state-owned property to a private partner for temporary use under a fee-based contract. This model could allow vendors to afford renting business premises rather than constructing them, with local government authorities better positioned to gather resources to build premises that meet required standards.

Types of the Traded Food Products

The study revealed that a variety of food items were sold by the interviewed food vendors, as illustrated in Figure 1. As previously mentioned, most vendors (94%) were mobile rather than operating from fixed locations (Table 1). Around 49% of them sold a combination of solid and liquid foods, such as rice with beans or meat stew. It was noted that many vendors cooked at home, transported the food in buckets, and sold it at designated spots, which exposed the food to contamination. These vending areas were unsanitary, with flies, litter, and a lack of handwashing and dishwashing facilities. [17] emphasized that vendors operating in unhygienic environments, within Nairobi County, Kenya, often experience high levels of food contamination by microorganisms. [19], along with [19], recommended that good hygiene practices should be implemented throughout the entire food supply chain to prevent contamination. According to [20], good hygienic practices include the cleaning and sterilization of food preparation areas and equipment; these practices were largely absent in the study area.

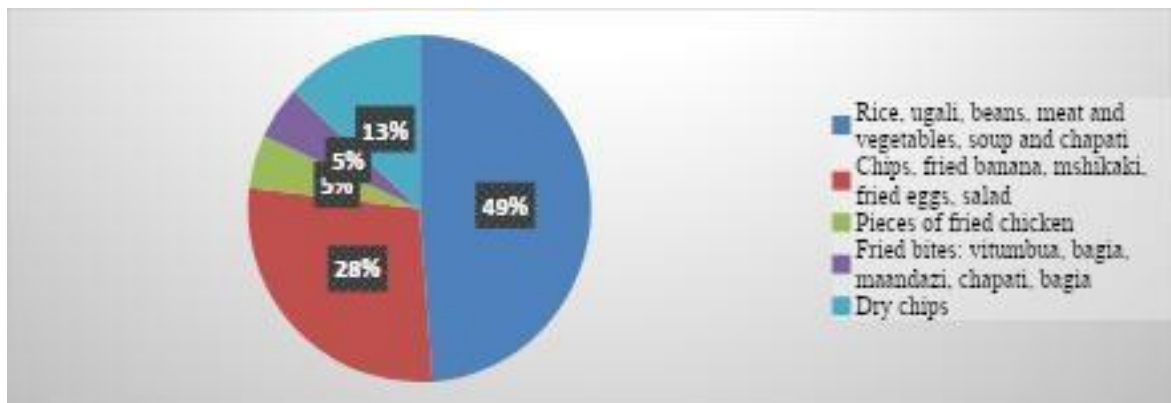


Figure 1: Types of Food Products Traded by Respondents

It is crucial to recognize that contaminated food can lead to foodborne illnesses such as food poisoning and infections [20], which impair nutrient absorption and contribute to undernutrition. The health implications of these issues include increased healthcare costs, incapacity, and even death. Therefore, it is essential to prevent such public health risks through the proper management of food systems, including the food vending chain.

The Identified Coping Strategies

The food vendors' coping strategies are detailed in Table 2. As presented by the Table, the main coping strategies employed by food vendors included reducing portion sizes, using cheaper raw materials, and borrowing. The specific raw materials chosen varied by the type of business. For example, vendors selling fried items like chips and chicken reported reusing cooking oil multiple times, while those selling rice or

ugali with accompaniments opted for cheaper rice and tomatoes, known locally as "masalo" in Swahili. However, these practices pose health risks to consumers, increasing their vulnerability to illness. This behaviour is likely to raise national healthcare costs and negatively impact productivity. As WHO highlighted [21] unsafe food can contain harmful bacteria, viruses, parasites, or chemicals, potentially leading to diseases such as diarrhoea and cancer. Additionally, rancid oil contains toxins [4]. Apart from compromising food quality, these practices can contribute to a cycle of both communicable and non-communicable diseases, including malnutrition, particularly affecting vulnerable groups like infants, young children, the elderly, and the sick. This situation calls for intervention to improve the work conditions, knowledge, and capital of food vendors, who serve a vital segment of the population, including students, middle- and low-income earners, and travellers' groups essential for sustaining national economic growth [22]. Many food vendors who reported borrowing raw materials admitted that they often could not repay their debts. One woman at the Gongolamboto bus station expressed her struggle:

"I don't have capital; I borrow raw materials and often fail to make enough money to repay my debts. But I must continue working for my survival and my family, as I have no other option."

Table 2: Types of Chosen Coping Strategies - Multiple Responses

S /N	Strategy	YES		NO	
		Count	Percent	Count	Percent
1	Borrowing ingredients	66	41.2	94	58.8
2	Over dilution of detergents	48	30	112	70
3	Raising food prices	00	00	160	100
4	Opting cheap ingredients	143	89.4	17	10.6
5	Reducing food rations	144	90	16	10

Source: Analysis of field data

It was noted with deep concern that 90% of food vendors were managing financial hardships by reducing portion sizes, which ultimately lowers consumers' nutrient intake, leading to undernutrition. Prolonged undernutrition results in weight loss, loss of body fat and muscle, stunted growth in children, reduced mental function, and heightened susceptibility to disease due to chronic hunger [22].

Influence of Socio-economic Variables on Coping Strategies

Multinomial logistic regression was used to test the hypothesis that individual socio-economic and demographic factors influenced food vendors' choice of coping strategies. The hypothesis was:

H₀: The odds of choosing specific coping strategies are the same among food vendors with different socio-economic and demographic characteristics.

The data were examined to ensure independence of observations, no multicollinearity, and no outliers, following guidelines from [23]. Two predictors, "selling online" and "raising food prices," were excluded from the model due to very low occurrences in certain categories, which could have caused issues such as failure of the model to converge [12]. The outcome variable had three categories: (1) Use of cheap raw materials, (2) Reduced portions, and (3) Borrowing. The results of the multinomial logistic regression analysis are shown in Tables 3 and 4.

Table 3: Results of Logistic Regression on the Ability of the Model to Fit the Data

Model	Model Fitting Criteria	Likelihood Ratio Tests				
	-2Log Likelihood	Chi-Square	df			Sig.
Intercept Only	194.813					
Final	163.210	31.602	14			.005
Goodness-of-Fit						
	Chi-Square		df			Sig.
Pearson	146.574		142			.365
Deviance	155.808		142			.202

Source: Analysis of field data

The "Final statistics" in Table 3 show that the model successfully identified the factors influencing the choice between borrowing, reducing portion sizes, and using cheap raw materials ($p = .005$). Additionally, the Pearson Chi-square statistic was not statistically significant ($p = .365$), indicating a good model fit. As noted by [23], a significant Pearson Chi-square result ($p = .05$) suggests the model does not fit well, but in this case, the model fits the data properly. The model as a whole accounted for 42% (Nagelkerke R squared) of the variance in the probability of opting for borrowing over compromising food quality or quantity. Contrary to the hypothesis, the results in Table 4 reveal that two variables, "permanent premises" and "number of dependents," had a statistically significant effect ($p < .05$) on the likelihood of food vendors choosing borrowing rather than reducing portion sizes or using cheap raw materials. The specific effects of each variable are explained in the following sections.

Table 4: Logistic Regression Results on the Influence of Socioeconomic Variables on Coping Strategy Choices.

Coping strategies		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Cheap raw materials Vs Borrowing	Intercept	19.287	2.843	46.038	1	.000			
	Age	.001	.004	.078	1	.780	1.001	.993	1.009
	Years in school	-.189	.271	.489	1	.484	.828	.487	1.406
	Premise dependents	.000	.000	3.056	1	.010	1.000	1.000	1.000
	Sex	-17.32	.907	364.79	1	.000	-2.997E8	5.067E-9	1.773E-7
	Sex	-1.459	.804	3.289	1	.070	.233	.048	1.125
	Organised	-.125	1.237	.010	1	.919	.882	.078	9.960
	Training	1.654	1.201	1.897	1	.168	5.230	.497	55.079
Reduce ration Vs Borrowing	Intercept	18.956	3.612	27.546	1	.000			
	Age	.001	.004	.071	1	.790	1.001	.993	1.009
	Years in school	-.240	.383	.392	1	.531	.787	.372	1.666
	Premise dependents	.000	.000	2.451	1	.117	1.000	1.000	1.000
	Sex	-17.116	.000		1	.001	-1.356E-8	1.356E-8	1.356E-8
	Sex	-1.327	.881	2.266	1	.132	.265	.047	1.493
	Organised	2.319	1.762	1.734	1	.188	10.169	.322	321.174
	Training	.175	1.054	.028	1	.868	1.192	.151	9.403
Organised	2.319	1.762		1	.188	10.169	.322	321.174	
Training	.175	1.054		1	.868	1.192	.151	9.403	

Source: Analysis of field data

The variable "permanent business premises" was statistically significant ($p = .000$) in predicting the likelihood that food vendors (FVs) would choose borrowing over using cheap raw materials. The positive B coefficient indicates that having a permanent business premise increased the likelihood of opting for borrowing instead of reducing portion sizes or using lower-quality raw materials. This suggests that efforts to settle mobile food vendors in permanent locations are more likely to encourage sustainable business practices than improving other predictors in the model. This finding is not surprising, as many respondents noted that those with stable business premises could access credit and secure significant capital, typically amounts of TZS 500,000 or more. As a result, having access to stable capital and business premises provided vendors with the confidence to borrow. Respondents also highlighted that lacking permanent premises left vendors vulnerable to losses due to frequent evictions from unofficial sites. The variable "number of dependents" also showed statistical significance ($p = .000$) in predicting the likelihood of choosing borrowing over reducing portions or using cheap raw materials. The negative B coefficient suggests that as the number of dependents increases, food vendors are less likely to choose borrowing over using cheaper raw materials or reducing portion sizes.

Challenges Encountered

Government officials were interviewed to explore the relationship between the government and food vendors, as well as the opportunities and challenges faced by vendors. A summary of the challenges identified by respondents is presented in Table 5.

Table 5: Multiple Response: Challenges Encountered by Respondents

Challenges	Count	Percent
Lack of business premises	57	35.6
Lack of running water	57	35.6
Inconsistent Market	15	9.4
lack of water and premises	114	71.2
Reasons for not organising		
Do not belong to group	87	54.4
Do not have time	23	14.4
Income is uncertain	70	43

Source: Analysis of field data

Noncompliance: A Cause and Consequence of Exclusion from Public Support

Community Development and Health officers explained that the government provides loans exclusively to organized women and youth groups. Additionally, the government, in partnership with private health stakeholders, supplied handwashing facilities, sanitizers, and masks, but only to vendors operating within official business premises. District master plans also allocate marketplaces, including spaces for food vendors. However, these premises do not guarantee a consistent customer base, according to food vendors, and the construction requirements were beyond what most vendors could afford. As a result, many food vendors remain unorganized and ineligible for the loans offered. Among vendors with permanent business premises, 30% provided handwashing facilities, but used excessively diluted detergents instead of proper hand soap. The main challenges associated with governance, as outlined in Table 3, include lack of

permanent business premises and access to water, with 71% of respondents identifying these as major issues. As discussed earlier, vendors at bus stations are operating in areas prohibited by the government, leading to frequent conflicts with authorities and repeated evictions. These evictions result in loss of goods, tools, and sometimes injury. By working in unofficial locations, food vendors disqualify themselves from government support, leaving them vulnerable to continuous losses.

Generally, the paper explored the coping strategies adopted by food vendors to address socio-economic challenges, along with the implications for consumers' food and nutritional security. Specifically, it identified the strategies used, the factors influencing those choices, and the effects on customers' nutrition. The results showed that food vendors typically chose to borrow capital, use lower-quality raw materials, or reduce portion sizes in response to economic pressures practices that pose a threat to consumer health and nutrition. Multinomial logistic regression analysis revealed that having permanent business premises had a positive effect ($p = .000$) on the likelihood of borrowing, while the number of dependents had a negative effect ($p = .000$). The study also highlighted ongoing conflicts between food vendors and local government authorities (LGAs), as vendors often operate in restricted areas, making them ineligible for public support services like loans, infrastructure, and training. Moreover, urban planning failed to account for the economic realities of food vendors when allocating plots and setting regulations. These services and considerations are essential for enabling food vendors to cope effectively with the challenges they face.

4. Conclusion

The paper underscores the need for more supportive measures to help food vendors in Dar es Salaam navigate socio-economic pressures, ensuring both their sustainability and the health of consumers. Improving access to public support services, integrating vendors into urban planning, and addressing the gap between regulations and the realities of vendors' operations are essential steps to safeguard public health and promote economic resilience among this vital group of entrepreneurs.

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