

Information Needs and Sources for Food and Nutrition Security among Smallholder Farmers in Mvomero District, Tanzania

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Abstract: This study focused on information needs and sources for food and nutrition security among smallholder farmers in Mvomero District, Tanzania, using the descriptive research design. The study employed the stratified random sampling method to select the sample of 84 respondents from the population of 2,389 smallholder farmers in the district. The data sources included a questionnaire, which provided the quantitative data and a Focus Group Discussion, which provided the qualitative data. The study used the STATA program for data analysis to perform descriptive statistics and the thematic approach in addressing the qualitative data. The study established a myriad of food and nutrition security needs. The identified needs include climate change adaptation strategies, nutritional value and dietary diversity, food crop processing techniques, land ownership and tenure, food preparation and dietary practices, market and trade insights and agricultural finance and investment opportunities. Furthermore, the study established a variety of sources of information including community meetings and workshops, extension services, traditional knowledge, mobile phones and SMS services, agricultural cooperatives and farmer groups, radio and television programs, online platforms and digital resources and research institutions and agricultural universities.

Keywords: Food security' food availability; food poverty; rural poverty; sustainable development.

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Introduction

Literature reveals that poor access to information and knowledge further limits the food security of vulnerable rural populations (Fumbwe et al., 2021; Kitole, 2023). Addressing this issue necessitates sustainable social protection programs aimed at providing targeted information on food crop production and nutritional practices. Despite recognition of the pivotal role of information in ensuring food and nutrition security, rural areas continue to grapple with limited access to these resources due to socioeconomic barriers and infrastructural deficiencies (Theodory & Kitole, 2024). While numerous studies (Matunga, 2008; Elly & Silayo, 2013; Mwalukasa, 2013) have explored information needs among rural farmers, there remains a gap in understanding information needs and sources specific to food and nutrition security in Tanzania (Bernard & Dulle, 2014). Information

needs and sources is relevant because knowing the kinds of information in each category of sources will help farmers choose the right kind of information to meet their required needs for enhancing food and nutrition security. Therefore, this study sought to establish information needs and sources for food and nutrition security among smallholder Farmers in Mvomero District, Tanzania.

Literature Review

This section presents the literature review and previous study findings to throw light on the problem under investigation.

Theoretical Underpinnings

The study used the Information Seeking Behavior (ISB) theoretical underpinning, a framework that explains how individuals seek information to satisfy their information needs (Wilson, 1997). One prominent ISB model is the Wilson Model of

Information Seeking Behavior, developed by T.D. Wilson in the year 1997. The model has it that information seeking is a dynamic and iterative process influenced by various factors. Furthermore, the model identifies several stages that individuals go through when seeking information. The initial stage begins when people become aware of a gap in their knowledge or recognize the need for information. In this study, farmers may initiate the information-seeking process when they identify a need for market data to inform decision-making, strategy development or other business activities. The selection stage is where the individual decides on the general area or topic of interest and selects the most relevant sources or channels to explore. In this study, the farmers chose relevant sources and channels for obtaining the information. In the exploration stage, individuals actively seek information, using chosen sources, and explore various avenues to gather relevant data. In this study, the farmers can actively seek information about their crops market trends, the consumer behavior and other relevant factors. At the formulation stage, the individuals refine the information and formulate their understanding of the topic. This may involve reassessing the initial information need. Here the farmers do refine and formulate a clear understanding of the market based on the gathered information.

At the collection stage, individuals collect specific information to meet their needs while utilizing the selected sources identified during the exploration stage. The farmers do collect specific data and insights of their agricultural crops that are crucial for making informed business decisions. At the presentation stage, when the information directs a broader audience, the individual may present the information in a suitable format, considering the context and purpose. When most of smallholder farmers acquire information, they tend to share the market information within their community to facilitate collaborative strategies on fixing crops prices. Finally, at the assimilation Stage individuals integrate the acquired information into their existing knowledge base, potentially leading to further information needs and initiation of a new cycle.

The Wilson Model of Information Seeking Behavior provides a framework that enables the understanding on how individuals or organizations go through systematic processes to seek, acquire, and use information. This model assists to explain

steps that farmers need to follow in obtaining and utilizing agricultural related data for strategic decision-making.

Empirical Literature Review

Access to relevant and timely information is crucial for effective decision-making and socio-economic development (Momodu, 2002; Shwe & Hlaing, 2011; Jonathan & Udo, 2015; Roel et al., 2013). Meeting the information needs of rural communities regarding food production, management, and preparation is essential for improving food and nutrition security (Breene, 2016; OECD, 2016; Kitole et al., 2024a; FAO et al., 2017). When rural community members' information needs are met, they can effectively make informed decisions and plan household dietary matters (Vakili et al., 2013; Kitole et al., 2024b). Knowledge influences household food and nutrition security food production, management, nutrient composition, and dietary habits (Tibesigwa et al., 2021; Mbwana et al., 2016).

Various sources provide rural communities with information, including radio, television, newspapers, extension workers, family members and neighbors (Momodu, 2002; Lwoga et al., 2011). People consider extension agents and community workers as potential sources of nutrition knowledge for rural communities due to their close interaction with farmers (Fanzo et al., 2013). Radio and television are cost-effective mediums for disseminating information to a wider rural population (Kitole & Sesabo, 2024). However, the effectiveness of these sources varies, with some studies highlighting their limitations in providing specific information needed by farmers (Elly & Silayo, 2013; Mwalukasa, 2013). Factors such as education and income levels influence access to food and nutrition information (Ochieng et al., 2018; Sarun & Mutayoba, 2018). Furthermore, higher education levels enable farmers to access and utilize various information sources, including printed media and agricultural institutions (Kitole & Utouh, 2023; Mittal & Mehar, 2013; Duhan & Singh, 2017). Conversely, low-income individuals may face challenges in accessing information due to affordability issues (Bernard & Dulle, 2014). Limited access to information sources may hinder the ability of rural community members to improve their understanding of food and nutrition security (Fanzo et al., 2013; Elly & Silayo, 2013). Efforts to address these disparities should consider the socio-economic context and accessibility of information sources to ensure

effective dissemination of food and nutrition information in rural communities.

Methodology

Design

The study employed the descriptive research design to establish information needs and sources for food and nutrition security among Smallholder Farmers in Mvomero District, Tanzania. The study utilized the mixed-methods approach that combines qualitative and quantitative data to provide a comprehensive understanding of the study problem.

Population and Sampling

The study employed the stratified random sampling method to select a sample of 84 respondents from the population of 2,389 farmers in the district.

Sources of Data

The data sources included a questionnaire, which provided the quantitative data and a Focus Group Discussion, which provided the qualitative data.

Statistical Treatment of Data

The study used the STATA program for data analysis to perform descriptive statistics. It also utilized the thematic approach in addressing the qualitative data.

Ethical Considerations

The researcher informed the participants about the study's subject matter and their intended roles. The researcher provided freedom for potential participants to in the study. Furthermore, the researcher treated the data confidentially in line with ethical requirements.

Table 1: Respondents Demographic Characteristics

Socio-Demographic (n = 84)	Attributes	Frequency	Percent
Sex	Male	36	42.86
	Female	48	57.14
	Total	84	100.00
Marital status	Single	26	30.95
	Married	41	48.81
	Separated	17	20.24
	Total	84	100.00
Age category	19 or below	4	4.76
	20-24	9	10.71
	25-29	21	25.00
	30-34	23	27.38
	35-39	18	21.43
	Above 40	9	10.71
	Total	84	100.00
Education level	Informal education	11	13.10
	Primary	41	48.81
	Secondary	19	22.62
	Certificate	6	7.14
	Diploma	7	8.33
	Total	84	100.00
Monthly income	less than 10000	16	19.05
	10000-49000	23	27.38
	50000-99000	24	28.57
	100000-149000	14	16.67
	above 150000	7	8.33
	Total	84	100.00

Results and Discussion

This section details the study findings, guided by research questions. The study used literature to enhance the discussion of the findings. The analysis begins with presentation of the demographics of respondents and then moves into the presentation of results according to research questions.

Demographics of Respondents

Table 1 presents the demographic characteristics of respondents. Regarding gender distribution, the majority of respondents were females, constituting 57.14% while males accounted for 42.86%. In terms of marital status, nearly half of the respondents were married (48.81%), followed by those who were singles (30.95%) and those who were separated (20.24%). Regarding age distribution, respondents spread across age categories. The highest proportion fell within the age range of 30-34 years, comprising 27.38% of the sample, followed by the age group of 25-29 with 25.00%. The lowest representation was that of the age category of 19 or below, with only 4.76% of respondents.

Education level varied among the respondents, with the majority having completed primary education (48.81%), followed by those with secondary education (22.62%). A smaller proportion had

informal education (13.10%) while others held certificates (7.14%) or diplomas (8.33%). Regarding monthly income, respondents exhibited a diverse range of earnings. The largest proportion earned between 10,000 and 49,000 units (Tanzanian Shillings), representing 27.38% of the sample, followed closely by those earning between 50,000 and 99,000 units at 28.57%. Fewer respondents reported incomes below 10,000 units (19.05%) while a smaller percentage earned above 150,000 units (8.33%).

Research Question 1: What are the information needs for food and nutrition security in Mvomero District?

The analysis in Table 2 reveals significant insights into the information needs of respondents regarding nutrition and food security. The table indicates a diverse array of information requirements related to agricultural production, climate resilience, financial management, market access, dietary practices and land tenure. Notably, food crop processing techniques emerged as a priority of 49 (58.33%), respondents, emphasizing the importance of understanding methods to preserve and enhance the quality of harvested crops.

Table 2: Information Needs for Nutrition and Food Security (n=84)

SN	Components of Information	Frequency	Percentage
1	Climate change adaptation strategies	52	61.90
2	Nutritional value and dietary diversity	52	61.90
3	Food crop processing techniques	49	58.33
4	Land ownership and tenure	49	58.33
5	Food preparation and dietary practices	42	50.00
6	Market and trade insights	41	48.81
7	Agricultural finance and investment opportunities	39	46.43

Moreover, climate change adaptation strategies were highlighted as a crucial area of interest, with 52 respondents (61.90%) expressing the need for information in this domain. This underscores the growing recognition among respondents of the impact of climate change on agricultural productivity and the importance of adopting adaptive measures to mitigate the adverse effects. The amount of 39 (46.43%) seeking information on agricultural finance and investment opportunities underscores the significance of access to financial resources in promoting sustainable agricultural development and enhancing farmers' livelihoods. Similarly, insights into market and trade dynamics were deemed essential with 41 respondents (48.81%) expressing a need for relevant

information. This underscores the importance of understanding market trends and demand-supply dynamics for effective marketing and commercialization of agricultural products. Additionally, a significant interest in food preparation and dietary practices by 42 respondents (50%) highlights the importance of promoting healthy eating habits and enhancing nutritional awareness among rural communities.

Furthermore, concerns regarding land ownership and tenure were evident, with 49 respondents (58.33%) seeking information in this area. This reflects the significance of secure land rights in fostering agricultural productivity and ensuring livelihood security among rural households. Lastly, the emphasis on nutritional value and dietary

diversity with 52 respondents (61.90%) underscores the importance of addressing malnutrition and promoting balanced diets to improve overall health outcomes.

The necessity for information on Food crop processing techniques stems from the importance of maintaining food quality in regions where scarcity is prevalent as indicated by Buzby and Hyman (2012), and Dimoso and Andrew (2021). Regarding Climate change adaptation strategies, the study supports the findings by Komba and Muchapondwa (2018), Tibesigwa et al. (2021) and Shwe and Hlaing (2011) who highlighted the critical role of climate information in crop planning and management to mitigate the impact of adverse weather conditions. Additionally, derisory market and trade insights contributes to farmers' challenges in determining market avenues and pricing strategies, echoing the observations of Fanzo et al. (2013). Furthermore, the need for Agricultural finance and investment opportunities underscores the financial constraints faced by farmers in accessing necessary resources for agricultural activities as noted by Fanzo et al. (2013), Komba and Muchapondwa (2018) and Tibesigwa et al. (2021).

During the focus group discussions (FGDs), it became evident that participants harbored a keen interest in acquiring information on various aspects related to food and nutrition security. Particularly, there was a consensus among respondents regarding the necessity of understanding proper methods for processing, storing, and preserving food crops. Participant No. 8 highlighted this need, expressing concerns over the prevalent spoilage of food due to reliance on traditional methods, which often prove ineffective. The respondent remarked, "Our food is usually spoiled due to lack of access to information on processing, storage and preservation mechanisms."

In addressing the challenges posed by climate change, participant No. 9 emphasized the urgency

of equipping farmers with information to cope with adverse weather conditions. The recurring droughts and subsequent land degradation had affected agricultural productivity, necessitating informed strategies for adaptation. Participant No. 10 further emphasized the importance of adopting new cultivation methods, such as irrigation schemes to mitigate the effects of erratic rainfall patterns and to ensure sustainable food production. One of respondents reported, "New ways of cultivation, for example using irrigation schemes are best solutions to overcome challenges of climate changes."

Regarding financial and investment information, participant No. 11 underscored the link between access to resources and agricultural profitability. Those well versed in financing and investing in the agricultural sector achieved higher profits through the adoption of modern farming practices. In contrast, participants lacking both information and capital resorted to traditional methods and were more vulnerable to the vagaries of weather patterns, highlighting the critical role of financial literacy in agricultural success. One of the respondents = commented, "Those who are well informed on financing and investing in agricultural sector normally get high profits than those who lack information and capital."

In terms of market and trade dynamics, participant No. 12 lamented on the limited knowledge among farmers regarding market trends and selling prices of crops. This lack of awareness often resulted in farmers selling their produce at lower prices to intermediaries, thereby compromising their purchasing power and overall economic viability. Addressing this information gap is crucial for empowering farmers to make informed decisions regarding the marketing of their products and optimizing returns on their agricultural endeavors. One of the respondents remarked, "Very few are familiar with where to sell their products."

Table 4: Sources of Nutrition and Food Security Information (n=84)

Sources of food and nutrition information	Frequency	Percentage
Community Meetings and Workshops	74	88.10
Extension Services	69	82.14
Traditional Knowledge	63	75.00
Mobile Phones and SMS Services	62	73.81
Agricultural Cooperatives and Farmer Groups	58	69.05
Radio and Television Programs	54	64.29
Online Platforms and Digital Resources	47	55.95
Research Institutions and Agricultural Universities	39	46.43

Research Question 3: What are the sources of food and nutrition security information in Mvomero District?

This research question sought to establish sources of food and nutrition security information. Table 4 shows diverse sources from which smallholder farmers sought information.

Among the 84 respondents surveyed, community meetings and workshops emerged as the most prevalent source with 74 (88.10%) respondents indicating the importance of communal gatherings for knowledge exchange and capacity-building initiatives within farming communities. Following closely, extension service was reported by 69 (82.14) respondents relying on the service for guidance and support in agricultural practices. Traditional knowledge also featured prominently with 63 respondents (75.00%) acknowledging its significance in informing farming practices. In addition, 62 (73.81%) respondents utilized mobile phones and SMS services, reflecting the increasing reliance on digital technology for accessing real-time information and advisory services. The table shows that 58 (69.05%) respondents identified agricultural cooperatives and farmer groups as valuable platforms for knowledge sharing and collaboration among peers. Next, 54 (64.29%) utilized radio and television programs as sources of information, underscoring the role of broadcast media in disseminating agricultural insights and updates to rural audiences. Moreover, 47 respondents (55.95%) utilized online platforms and digital resources in accessing the agricultural information, indicating the growing importance of digital tools in facilitating information dissemination and communication among farmers. Finally, 39 (46.43%) respondents cited research institutions and agricultural universities as sources of food and nutrition information, highlighting the contribution of academic institutions in advancing agricultural knowledge and best practices.

Concerning information sources, Extension Services emerge as prominent sources, aligning with findings by Elly and Silayo (2013), Bernard, and Dulle (2014), which emphasize the significance of extension service, and frequently farm visits in agricultural information dissemination among farmers. Additionally, mobile Phones and SMS Services, and Radio and Television Programs are identified as effective information sources, consistent with studies by Kitole et al. (2023), attributing the

widespread use of mobile phones to their accessibility and cost-effectiveness, especially in rural areas. Furthermore, Agricultural Cooperatives and Farmer Groups, are significant in enhancing information flow across rural communities, this in line with findings of Mbwana et al. (2016) which emphasizes the role of farming organization in information and education on food and agricultural practices.

The study reveals the strong influence of income and education levels on access to information, corroborating findings by Sarun and Mutayoba (2018), and Fanzo et al. (2013). Low-income levels restrict access to information sources, while higher education enhances understanding and utilization of available resources, consistent with observations by Ochieng et al. (2018); Duhan and Singh (2017). Moreover, socio-cultural factors, traditional Knowledge further impede information access, aligning with Souza et al. (2016); Aldosari et al. (2019) findings on the impact of education levels on dietary choices and social beliefs.

Conclusions and Recommendations

While access to information and knowledge stands as a cornerstone in addressing challenges of food and nutrition security, the study established a myriad of food and nutrition security needs. The identified needs include climate change adaptation strategies, nutritional value and dietary diversity, food crop processing techniques, land ownership and tenure, food preparation and dietary practices, market and trade insights and agricultural finance and investment opportunities. Therefore, there is a need to address the information challenges that face the farmers.

The study established a variety of sources of information including community meetings and workshops, extension services, traditional knowledge, mobile phones and SMS services, agricultural cooperatives and farmer groups, radio and television programs, online platforms and digital resources and research institutions and agricultural universities. This comprehensive understanding underlines the complex nature of information dissemination in the agricultural sector and highlights the importance of utilizing various channels to reach farmers. In this case, there should be efforts to integrate and coordinate different sources of information to ensure consistency and avoid duplication of efforts. Furthermore, training programs and capacity-building initiatives should be

implemented to enhance farmers' skills in accessing and utilizing information from various sources.

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