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Caught in Transition: A Study of Food Security Dynamics in Kismayo's Displaced and Non-Displaced Contexts

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ABSTRACT

The convergence of prolonged conflict, climate change, and population displacement has exacerbated food insecurity in Somalia. In Kismayo, a major trade hub and destination for internally displaced persons (IDPs), limited access to resources, disrupted livelihoods, and inadequate application of standardized tools, such as the Food Consumption Score (FCS), hinder effective risk evaluation and response. This study addresses critical literature gaps by employing a mixed-methods approach, integrating quantitative surveys (n = 369 households), FCS metrics, and early warning system assessments with qualitative interviews and focus group discussions. The research highlights the role of access to early warning systems, perceived safety, education, residency, and household income in influencing food security outcomes. Findings indicate that 54% of households achieved an acceptable FCS, 31% a borderline level, and 15% a poor level, with an average monthly income of US$101.50. Logistic regression analysis identifies education, residency status, and safety perceptions as significant predictors of higher FCS, while gender showed no statistical significance. The study also reveals inequalities in food security between displaced and non-displaced populations. To enhance resilience, recommendations include expanding income-generating activities, improving community safety mechanisms, broadening protective services, supporting host communities, and enhancing educational opportunities. Addressing food insecurity in urban, displacement-affected settings, such as Kismayo, requires integrated qualitative and quantitative analyses tailored to local contexts.

Keywords: Food Security; Displacement; Food Consumption Score; Early Warning Systems; Kismayo; Somalia

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1. Introduction

Prolonged conflict, chronic drought, and sudden flooding have fused in Somalia, compressing the humanitarian emergency into a single swollen knot. By late 2022, food-security experts had counted at least 6.6 million people in acute distress; nearly 4.3 million of them were already in formal crisis or emergency phases [1,2]. Relief agencies warn that the brief opening for a rapid, scaled-up response will close as the lean season deepens. Internally displaced families feel the pressure most intensely; their restricted access to water, cooking fuel, and informal markets multiplies every ounce of hardship. The social safety net plays a vital role in reducing food insecurity among marginalized populations, especially in situations where formal support systems are limited or inaccessible due to security or climate change issues.

In the Horn of Africa, especially in Somalia, the decline of social safety nets is worsening food insecurity among communities affected by displacement. Recent studies indicate that prolonged displacement and migration have weakened traditional support systems, such as clan-based redistribution, communal food-sharing, and informal credit networks, which once served as vital coping mechanisms during crises [3,4]. In urban displacement settings like Kismayo, social fragmentation, overcrowding, and insecurity have led to a breakdown in mutual aid, particularly among non-kin and mixed-ethnic settlements. This social fragmentation limits access to community-level food support and deepens reliance on humanitarian assistance, which is often insufficient to meet the rising social demand [5,6]. Studies have further revealed that women-headed households, lacking strong social capital, are more likely to adopt coping mechanisms for climatic and insecurity shocks, such as reducing meal frequency or withdrawing children from school to seek income [7]. These studies underscore that food insecurity in Somalia is not only a function of socioeconomic shocks and climate-induced factors but also of the fraying social cohesion that once underpinned resilience in the face of adversity.

Kismayo is a coastal geography that introduces distinctive pressures on local food supply and trade. The port city serves as a critical redistribution hub, handling cargo from larger centers while also accommodating thousands of internally displaced persons (IDPs) who arrive from camps across the border in Kenya. Those dual roles stretch market infrastructure and inflate transport costs. This study examines Kismayo's food security profile through the lens of the Food Consumption Score (FCS) and probes whether an early warning system is perceptibly reaching vulnerable households. Previous studies within the Somali context have highlighted the link between displacement and food security, but few have examined other influencing factors, such as violence, safety, and the impact of displacement on food security, within the quantitative framework of the FCS. This study aims to address these gaps by situating vulnerability within the context of food insecurity faced by the displaced population in Kismayo.

Given the diversity dynamics of Kismayo, the study employed a combination of qualitative and quantitative research methods, including measuring FCS, conducting surveys, and interviewing key informants, as well as utilizing an early warning system. This is a particular case in which actions must be taken that are not only appropriate but are also subtle. This digest offers a snapshot of the complexity of displacement, food insecurity, and Kismayo alike.

1.1. Contextual Background

A recent assessment by the humanitarian and relief agencies in the region reports that at least 6.6 million Somalis now confront acute food shortages; close to 4.3 million of them are classified as living at the emergency threshold. The displaced populations offer a stark indicator of desperation. Most of the households exactly understand what the concept of food security means [3,4]. This crisis has stemmed from a different set of issues, most importantly, decades of conflict that have destroyed livelihoods and access to food sustainment mechanisms. Frequent and severe droughts, exacerbated by climate change, further devastate crops and livestock, contributing to worsening food insecurity (https://www.unhcr.org/countries/somalia). According to Boeyink [3], most of the internally displaced persons (IDPs) are displaced from rural areas to big cities, where the majority of them lack the prerequisite skills

necessary to integrate into the urban economy. These challenges are particularly acute for IDPs, who face significant poverty compared to host communities [5]. Furthermore, the Federal Government of Somalia faces limited capacity and funding issues in providing services to a population of around 7.7 million people who require urgent humanitarian intervention [6].

Consequently, malnutrition is widespread, particularly among women and children, hindering development and increasing vulnerability. Displacement disrupts traditional coping mechanisms and access to income, making affected populations heavily reliant on humanitarian aid [7]. Limited healthcare access exacerbates health issues for IDPs and other vulnerable groups. Key figures highlight the severity of the situation, with over 2.6 million Somalis internally displaced and more than 1.3 million children under five acutely malnourished. A significant funding gap of US$378 million in humanitarian funding is reported from November 2023 to April 2024 (WFP. (2023, November 28). Anticipatory action & integrated climate risk management. *WFP Publications*. Retrieved October 29, 2023).

These challenges call for immediate and multitiered strategic approaches. Actions aimed at mitigating the challenges should concentrate on the long-term systematic issues, prioritizing the development of appropriate strategies while simultaneously meeting the fundamental humanitarian funding necessities [8,9]. It is essential to enhance the resilience of all Somalis, particularly the vulnerable internally displaced persons (IDPs), through sustained and comprehensive efforts aimed at improving food security while fostering more sustainable development processes.

Kismayo's strategic location as a port city in Somalia makes it critically important to the region's food security system. Its central role as a major port of the region has implications for food imports, their access within the region, as well as their market value, which determines the general status of food in the region. Kismayo's port facilitates the import of various goods, thereby positively impacting the selection and availability of food in local markets. These factors consolidate Kismayo's significant stature in the food trade, determining the control of distribution and price for basic goods (FEWS NET. (2023). Flood-affected riverine areas face Emergency (IPC Phase 4) outcomes. *Food Secuirty Outlook UpdateDecember 2023*. Retrieved January 6, 2024, from https://fews.net/east-africa/somalia/food-security-outlook-update/december-2023).

In addition, the strategic importance of Kismayo has drawn many people to the city, which includes a large influx of Internally Displaced Persons (IDPs) from the Kenyan refugee camps. As reported by CCCM Cluster Somalia [10], Kismayo is home to over 145,000 people living in 170 IDP settlements within and around the city. The sustainability factors include the persistent and extreme droughts that have been plaguing the area, as well as the fierce Al-Shabab strongholds that surround the port city of Kismayo [11]. This peculiar context of displacement patterns creates a city inflow focused on individual needs and vulnerabilities. The increasing diversity within the displaced population in terms of ethnicity, culture, and region only complicates the food security situation. For these intervention strategies to work, addressing the specific needs of these displaced populations is crucial (FSNAU. (2021). Somalia 2021 Post DeyrFood Security and Nutrition Outcomes and Projections. Retrieved December 28, 2023, from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://fsnau.org/downloads/Somalia-2021-Post-Deyr-Seasonal-Food-Security-and-Nutrition-Assessment-Findings.pdf).

The proximity of Kismayo to Kenya and the potential presence of refugee populations may lead to unique nuances in displacement patterns compared to other areas. Moreover, as the city grapples with local conflicts or even competition over resources, internal displacement is likely to be exacerbated, necessitating tailored solutions to alleviate displacement concerns sustainably (FSNAU. (2021). Somalia 2021 Post DeyrFood Security and Nutrition Outcomes and Projections. Retrieved December 28, 2023, from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://fsnau.org/downloads/Somalia-2021-Post-Deyr-Seasonal-Food-Security-and-Nutrition-Assessment-Findings.pdf).

Kismayo has an economic center and extends beyond common agricultural practices. Certain types of lo-

cal business activities, such as fishing and trading, are vital. Fishing communities may not be able to give up eating fish as easily as agricultural ones could. To assist the economy of Kismayo, it is important to understand these different approaches and devise effective actions and policies (FSNAU. (2021). Somalia 2021 Post DeyrFood Security and Nutrition Outcomes and Projections. Retrieved December 28, 2023, from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://fsnau.org/downloads/Somalia-2021-Post-Deyr-Seasonal-Food-Security-and-Nutrition-Assessment-Findings.pdf).

Kismayo's uniqueness stems from its being an important port city and receiving a large influx of IDPs from Kenyan refugee camps. The IDPs have very different sociocultural practices, together with their lifestyles as port-city workers, which makes the food security situation unusual. Solutions formulated to cater to these peculiar aspects must be tailored and carefully designed to fully meet the population's needs in Kismayo.

1.2. Problem Statement

Somalia's food security and displacement conundrums are intricately interwoven and deeply troubling, especially given that over 6.6 million people are affected, including 4.3 million in acute or crises of food insecurity. Internally Displaced Persons (IDPs) face critical hurdles as some of the most disadvantaged groups, experiencing land, market, and resource access barriers. The disruption of livelihoods and access to food is rooted in a decade-long conflict that is exacerbated by recurrent droughts stemming from climate change. Despite the growing regional and global recognition of displacement-driven food insecurity, particularly in fragile contexts such as South Sudan, Yemen, Congo, Sahel, and others, localized studies in urban settings like Kismayo, Somalia, remain extremely limited. This study addresses a critical gap by applying the sustainable livelihoods framework to interpret the intersection of displacement, food security, and vulnerability dynamics.

The situation is dire because malnutrition, especially ominous in women and children, remains one of the most persistent issues that impedes prospect development and increases susceptibility. Displacement also disrupts coping strategies and income streams, resulting in complete dependence on humanitarian assistance, while already limited healthcare services exacerbate existing health issues. Food security is affected because of the inflow of IDPs from Kenyan refugee camps, which, therefore, facilitates access to food commodities through heavy port activities. Kismayo, as a port city, holds strategic relevance due to its position as one of the major ports. However, current literature lacks spatially disaggregated food security assessments that differentiate between displaced and host communities in such settings, limiting policy responsiveness and targeting. Suddenly, significant gaps in the literature emerge because the lack of a food consumption score prevents the accurate appreciation of the severity of food insecurity and comparison among groups. Moreover, safety concerns as well as information about violence are little dealt with, which is an important lack of knowledge. To devise appropriate interventions tailored to alleviate the multifaceted problems of the people in Somalia, specifically in Kismayo, addressing these matters is crucial.

This investigation resolves the problem by employing FCS as a quantitative measure, which adds depth to the understanding of food security relationships. It also factors in access to early warning systems as a vital component of food security, which helps to understand the underlying factors that strengthen the vulnerability of displaced people. These ideas are relevant for formulating the best response to the complex population issues in Somalia, especially in Kismayo.

1.3. Literature Review

FAO [12] has provided us with useful qualitative accounts of the hurdles that displaced women and girls face regarding food security in conflict-affected Somalia. While the examination of issues such as resource inequities, caregiving hyper-capacity, and gender violence is commendable, the study does not address the food consumption score (FCS) or dietary diversity. The lack of such data collection adds to the study's difficulties in demonstrating the range of food insecurity among displaced populations and in measuring the difference in FCS among displaced groups or in comparison with

other populations. It is commendable that the study attempts to document the gendered aspects of the issue. However, the lack of FCS data is a major shortcoming; the possibility of addressing this gap through future research, which combines qualitative and quantitative methods, is focused more strongly on the needs of displaced women and girls to respond to their food insecurity needs.

Ahmed et al.[7] used a qualitative case study to explore the drivers of food insecurity in Somalia, focusing on the gender dimensions that particularly affect women and children. The study examined 36 in-depth interviews and 20 FGDs conducted across three conflict-affected regions in Somalia (Kismayo, Mogadishu, and Baidoa), targeting DACs, the host community, government stakeholders, and humanitarian actors. Through thematic analysis, the study identified conflict, displacement, climate-related shocks, and weakened social protection mechanisms. The study emphasized that women, particularly female-headed households, faced disproportionate burdens due to limited access to livelihood opportunities, systematic exclusion from the decision-making process, and insecurity in displacement sites. Furthermore, the breakdown of clan-based support networks and poor access to health and nutrition services further deepened food vulnerability among women, the elderly, and children. Finally, the paper points out the urgent need for gender-sensitive, context-specific interventions that strengthen safety nets and effective service delivery mechanisms.

Mugera and Yoshimura[13] utilize high-frequency phone-based surveys to assess the repercussions of the 2021–2022 drought on displaced populations and host communities in Somalia, making a notable contribution to empirical research. The report captures well the increased risk of food insecurity among IDPs, detailing their vulnerability beyond mere exposure. There are, however, some unspoken limitations: sampling bias due to phone access, a short-term focus on immediate impacts, and a superficial exploration of underlying issues. Although the report stands out for its reliance on data, it would be even more satisfying if these gaps were addressed in future efforts.

Samatar[14] provides an extensive quantitative evaluation of the impact of social safety nets on poverty alleviation in the Banadir region of Somalia. The analysis utilizes a dataset of 342 households to evaluate the impact of program perception, design, and implementation on household income and poverty levels. Most strikingly, the study reveals a paradox: well-managed social safety net programs can increase household income by 33%, but without effective exit strategies, dependency can lead to a 26% increase in poverty. These findings are applicable to the Kismayo context, specifically in examining the food security gap between displaced and non-displaced populations, many of whom are aid beneficiaries, and both groups were exposed to similar interventions. Nonetheless, the research is geographically limited to Banadir and thus less applicable to Kismayo's unique socio-political and displacement dynamics. Moreover, the multi-faceted issue of food security is only tangentially addressed, omitting essential dimensions such as dietary diversity and food utilization. Regardless, the study contributes to the discourse on the unintended consequences of aid dependency while integrating social protection with sustainable livelihood opportunities, which is critical to food security strategies in Kismayo's urban transitional setting.

FSNAU[15] displays remarkable strengths, particularly in its thoroughness regarding the relationships between indicators and its attention to internally displaced persons (IDPs). The assessment also has some weaknesses, too, including insufficient qualitative evidence, which could enrich the report through interviews or focus group discussions about the experiences of vulnerable people. Accompanying these positives is the publication's date of October 2023, alongside the robust methodology of household surveys, which further cements the report's reliability. Besides, although some regional differences are explored, the analysis would benefit from a more enhanced spatial understanding of certain hotspots or IDP concentration areas. Finally, the focus of the report could shift from the current situation to anticipating future scenarios, while providing a deeper analysis of the situation's underlying factors that are required for effective long-term strategies.

Ahmed et al.[7] provide an overarching longitudinal account of healthcare and nutrition interventions in the

context of conflict in Somalia. It highlights the peculiar evolving issues and contextual dynamics pertaining to women and children. Along with these valuable insights, the study has certain limitations, including a restricted scope of generalizability, a lack of discussion on the dynamics of food insecurity, reliance on qualitative data, and a limited focus on practical recommendations. Nevertheless, the research profoundly enriches our understanding of the intricacies of humanitarian action. Other researchers could build upon these findings to provide more effective healthcare and nutrition interventions in such settings. In evaluating the study, one must acknowledge its intended objectives and target audiences to appreciate the strengths and weaknesses presented.

The diverse livelihoods that incorporate agriculture, such as farming, pastoralism, and fishing, as well as wage labor and petty trade, are effectively captured in FAO[12], Mugera and Yoshimura[13], Karnik and Peterson[16], and Samatar[17]. The report examines these livelihoods in relation to food security, linking vulnerabilities and coping strategies for each group, especially IDPs. The report also provides useful policy frameworks designed to support livelihoods and food security, but acknowledges gaps in data and variations between regions. It calls for more attention to the gender dimension of the livelihoods studied as well as the sustainability of the proposed solutions. Notwithstanding these concerns, the report contributes to the design of specific and practical actions to address food security in Somalia, especially for vulnerable populations such as IDPs.

Samatar[18] presents an extensive empirical analysis of the impacts of climate change on crop production in Somalia for the period 1990–2022. Using ARDL, FMOLS, and DOLS econometric models, the study demonstrates that rainfall and rising temperatures have an insignificant or even negative effect on crop production, while foreign direct investment and the labor force significantly enhance productivity. Furthermore, the research reveals that climate change, particularly chronic droughts and irregular rainfall, undermines food production by disrupting agricultural cycles and exacerbating the challenges of farming in Somalia's rain-fed agricultural regions. These findings are particularly important in relation to food security concerns in Kismayo, as floods and droughts, alongside displacement pressures, exacerbate the food availability crisis for both displaced and host populations. However, while the insights into the macro-level climate and agriculture relations in the study are important, the lack of analysis on displaced versus non-displaced populations is critical to understanding Kismayo's urban food insecurity dynamics, which constitutes a significant concern gap. Nonetheless, the study's gaps do not diminish its empirical depth and policy relevance in highlighting the need for immediate agricultural policy shifts towards Somalia's vulnerable regions, which are most susceptible to famine.

The literature review encompasses various studies addressing food security and displacement in Somalia, each contributing valuable insights. Osman and Abebe[19] shed light on the link between rural displacement and food insecurity in Inter-Riverine communities, emphasizing the disruption of traditional livelihoods. FAO[12] highlights the challenges faced by displaced women and girls, noting the lack of quantitative metrics, such as the Food Consumption Score (FCS). Mugera and Yoshimura[13] analyze the impact of the 2021–2022 drought on displaced and host communities, providing data-driven insights but acknowledging potential limitations. FSNAU[1,20] offers a comprehensive assessment of food security, particularly for IDPs, with strengths in methodology but a need for deeper spatial insights and a more in-depth exploration of root causes. Ahmed[7] offers a longitudinal perspective on healthcare and nutrition interventions in conflict-affected Somalia, with a focus on women and children, emphasizing sociocultural dynamics. WFP[21] delves into diverse livelihoods and their connection to food security, targeting vulnerable populations like IDPs. A knowledge gap identified is the absence of a food consumption score in studies, which limits the quantification of food insecurity severity, group comparisons, and broader contextual understanding. Introducing safety concerns and violence information can enhance the understanding of the challenges faced by displaced populations, bridging a critical gap in the current literature.

2. Methodology

In Somalia, the study design adopts an overarching approach, particularly in Kismayo, to understand the complex interplay between displacement and food security. It also attempts to measure the seriousness of food insecurity through a quantitative metric, the Food Consumption Score (FCS), to ensure that the understanding articulated goes beyond nuances. To collect valid and comparable data, robust evidence was employed, along with household surveys and expert surveys, ensuring that meticulous survey methods were logistically matched to the study's context. Furthermore, the study not only relies on FCS but also utilizes access to early warning systems (novel) as a quantitative measure, illuminating factors that contribute to vulnerabilities in food security. Given the port city of Kismayo's dualistic identity, which is not only a major port but also a host to large numbers of internally displaced persons (IDPs) in 2015, the research design captures this complexity as well. The contextual comprehension of displacement trends, livelihood sustenance activities, and the peculiar business environment of Kismayo will be obtained through quantitative surveys, qualitative interviews, and focus group discussions. Focused on addressing the emerging realities of Kismayo and Somalia's multifaceted challenges, this sophisticated study design intends to provide actionable recommendations informed by thorough research and contextual engagement.

All participants provided verbal consent to participate in the study and were informed about its details. The aim of the study, the expected nature of participation, and the rights of the participants, which included the right to withdraw at any given point without facing any consequences, were clearly outlined by the researchers. These procedures ensure that the subjects understand the consequences of their participation and have a genuine intention to participate in the study. Participants were assured of confidentiality, which also led to an environment during the study in which participants respected trust. The study employed a robust sampling method in which 369 households from different neighborhoods in Kismayo were randomly sourced. Goobweyn had 81 respondents, Luglow, 77, and Madina and Midnimo provided 87 and 124 respondents, respectively. Data were collected face-to-face using the Kobo Enketo platform from September to November 2023.

The Food Consumption Score (FCS) plays a pivotal role in assessing food security within the context of vulnerability analysis and mapping (VAM) [9,22,23]. FCS was designed by the FAO together with the Food and Nutrition Technical Assistance (FANTA) project, which aims to improve nutrition and food security in developing countries. The project aims to promote dietary diversification and increase the frequency of food consumption at the household level. In this case, households are interviewed, and enumerators record their food consumption for a one-week period. The results are then converted into a score based on set thresholds for food groups, frequencies, and quantities to be consumed. The FCS metric captures the developmental level of diet diversity and quality in a household, thus mirroring food security.

After calculating the FCS based on the FAO-FANTA VAM methodology, three FCS profiles were estimated (Poor, Borderline, and Acceptable) using a defined threshold. These profiles were further categorized into two groups: the Borderline and Acceptable, grouped as the success category, and the Poor, labeled as the non-success category. The odds ratio was calculated through logistic regression analysis. The outcome variable was the dichotomized FCS profiles, which were assigned the values of 1 and 0, respectively. The independent or explanatory variables included the type of residency household (IDP or host), household monthly income in dollars, the head of household's gender, and access to community safety mechanisms. The logistic regression model estimated is given as **Equation (1)**:

$$logit\big(P(Y=1)\big) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k \quad (1)$$

where:

- $logit(P(Y = 1))$ is the log-odds of a household falling in a non-poor FCS profile
- β_0 is the logistic regression constant
- $\beta_1, \beta_2, \cdots, \beta_k$ are the coefficients of the predictor variables $X_1, X_2, \cdots, X_k$

As noted earlier, separate checks were required to validate the logistic regression model. The Hosmer-Lemeshow test, a form of the goodness-of-fit statistic for

logistic regression, was used to evaluate whether the linearity of the logit could be maintained Hosmer [24]. This test analyzes a specific null hypothesis: that there is homogeneity in the population of dependent variable values in relation to the dues of predicted probabilities. If this test yields a small *p*-value, the null hypothesis can be rejected, indicating a statistically significant difference.

Wald Test was employed to assess the significance of each coefficient in the model. Therefore, the Individual Coefficient Significance Test in logistic regression was performed. In logistic regression, for each predictor variable, the null hypothesis is that the coefficient associated with that variable is equal to zero. We reject the null hypothesis because of a small *p*-value. In addition, a correlation was calculated for each pair of explanatory variables to assess multicollinearity, which refers to a situation where several regressors in multiple regression analysis are highly correlated with one another. This study helps ascertain variable independence and affirms the reliability of the logistic regression model.

Additionally, a goodness-of-fit assessment was conducted to evaluate the model's fit. The test assessed the null hypothesis that there is no significant difference between the actual and predicted outcomes based on the model's predictions. This evaluation, in particular, strengthens confidence in the results produced by the logistic regression analysis.

Ethical Considerations

Both the Maasai Mara University Ethics Committee and the Tropical Consult Research Ethics Review Board approved the research protocol. Before any participant provided their feedback, informed consent was acquired. All contributions were anonymous, and participants were fully informed about the study's goals.

3. Results

3.1. Descriptive Statistics

The surveyed households demonstrated demographic variation, with 74% being female-headed and 26% male-headed. The respondents, who were household heads aged 18 to 89 years, had household sizes ranging from 2 to 16 members. Their level of education also varied, with 82.1% reporting no formal education, 7.9% having primary education, secondary education accounting for 1%, tertiary or higher education at 0.3%, and vocational training at 8.7%. The study included both Internally Displaced Persons (IDPs) and host communities, shedding light on the population dynamics of Kismayo.

The research provided specific clarifications on the economic well-being of households within the sampled communities. The household's mean monthly income was reported at $101.50, with a minimum of $0 and a maximum of $350. The income distribution is indicative of the economic diversity or stratification resulting from the population's economic activities. Apart from income, the study assessed food security with the Food Consumption Score (FCS) as one of the primary indicators. The calculated FCS had a mean value of 44.7, with minimum and maximum values of 8 and 106, respectively. The numbers help capture the level of spending and earnings as well as the consumption of food at the household level, which in turn helps understand their security situation.

An integral part of the research was classifying households according to their FCS profiles. The analysis showed that about 54% of the households were categorized under the Acceptable FCS profile. This indicates that a significant number of households were able to maintain a relatively stable and varied diet. On the other hand, about 31% of the households were classified under the Borderline FCS profile, which suggests they are moderately vulnerable to food security. The remaining 15% were categorized as Poor FCS, which indicates households under greater difficulty with food security.

The obtained results contribute to the complexities of understanding of the economy and food security in the studied communities. The distribution across FCS profiles is an important tool for recognizing at-risk populations and directing aid to address the multifaceted problems encountered by households with varying levels of food security.

Figure 1 illustrates the FCS distributions based on residency status and considerable intra-group variation within the aggregate, host, and IDP populations. Although IDPs have the highest proportion of acceptable FCS at 56.8%, they also have the steepest poor FCS rate at 21.1%. This pattern suggests a bipartite distribu-

tion, which is typically indicative of unequal access to resources or interventions. The host population has the highest borderline FCS at 33.9%, indicating a vulnerability that may worsen with minor stressors. These gaps highlight the need for tailored policy interventions and targeted statistical frameworks that are responsive to specific residency demographics, enabling the efficient addressing of food insecurity challenges.

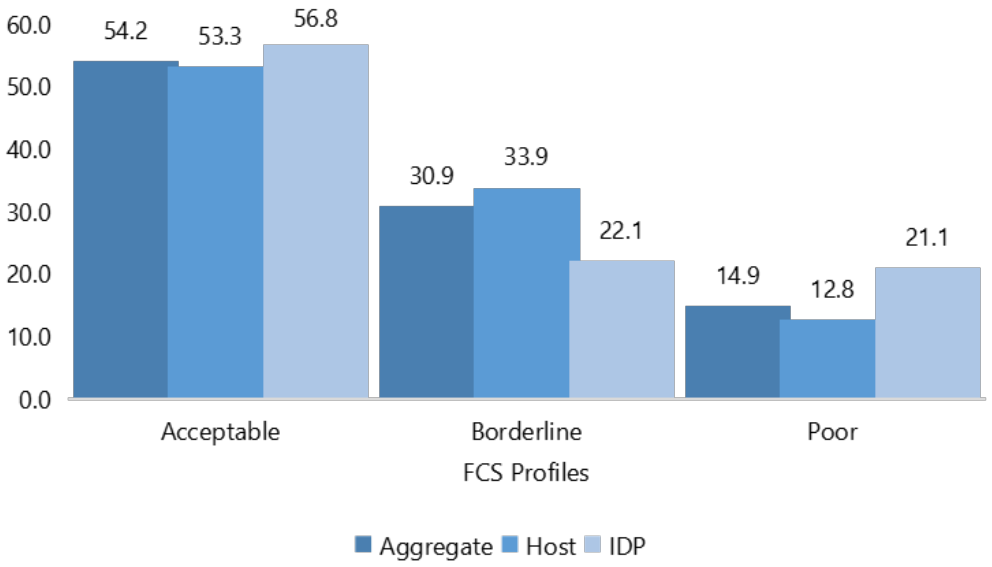

Figure 1. Residency status-disaggregated FCS profile distributions (%).

Source: Author compilation from survey data.

3.2. Logistic Regression Results

3.2.1. Discussions of Regression Results

Table 1 summarizes the results of the logistic regression analysis, revealing a significant model fit with a chi-square of 30.72 ($p < 0.001$) and an R-squared value of 0.0989. Education emerged as the most powerful positive predictor, associating strongly with FCS at a coefficient value of 7.27. The education variable emerged as the strongest positive predictor, with a coefficient value of 7.27, and was significantly associated with FCS. Other significant predictors included safety (3.24), residency (2.76), household size (1.15), and household income (1.01), in that order, all showing significant but lower-than-expected positive associations with FCS. Gender's influence was measured at 1.42, although it was not statistically significant, as a weak association is supported by its confidence interval, which includes 1, suggesting no reliable effect. The results suggest that improving education, safety, and socio-economic factors has a significant impact on food consumption, highlighting the need to consider social and environmental factors in food security programs.

The logistic regression analysis indicates that the coefficient for the residency variable is 2.75, which means that the odds of being in the food non-poor profile of the food security categorization are 2.75 times higher for households in the host community than for their IDP counterparts. This finding is consistent with the wider literature, as studies such as Mugera and Yoshimura[13] and FSNAU[15] have noted the resource and livelihood constraints faced by IDPs. The disproportionately greater odds for host community households highlight the distinct resource scarcity issues that IDPs face in Kismayo. This reiterates the need for always displaced people-focused responses. The literature on food security in displacement settings has often highlighted the need to understand the multidimensional issues that IDPs face in developing effective responses to them. This adds to the concern regarding the gap in food security between IDPs and host communities, and calls for more responsive actions from policymakers and humanitarian bodies on tailored aid for such configurations.

In the logistic regression analysis of this study, the

income variable has an odds ratio of 1.007, indicating that a $1 increase in monthly income corresponds to a 0.7% increase in the odds of being in a non-poor food security profile. This suggests a positive correlation between household income and food security status. This relationship is also reflected in the literature, as evidenced by WFP [21] and Mugera and Yoshimura [13], who acknowledge the impact of household income and livelihoods on food security. A greater household income facilitates access to a wider variety of nutritious food, thereby elevating food security. This provides additional evidence for the theoretical framework presented in prior research, which focuses on the need for aid programs to incorporate economic dimensions into food security strategies in conflict-affected regions. The importance of this finding is directed to the policymakers and practitioners of humanitarian aid and development programs, emphasizing the need for activities that improve income opportunities for households in the region.

Table 1. Odds ratios for the logistic regression of FCS on other variables.

Logistic regression **Log likelihood = −140.00877**				**Number of obs = 369** **LR chi2(6) = 30.72** **Prob > chi2 = 0.0000** **Pseudo R2 = 0.0989**		
FCS	**Odds Ratio**	**Std. Err.**	**z**	***p* >|z|**	**[95% Conf. Interval]**	
Residency	2.759716	1.178493	2.38	0.017	1.195012	6.373183
HH Size	1.149962	0.0777533	2.07	0.039	1.007234	1.312915
HH Income	1.006813	0.0028426	2.40	0.016	1.001257	1.0124
Education	7.269498	4.608164	3.13	0.002	2.098574	25.18167
Gender	1.416061	0.5761724	0.85	0.393	0.6378843	3.143563
Safety	3.235522	1.801736	2.11	0.035	1.086284	9.637077
Constant	0.2929967	0.2220406	−1.62	0.105	0.0663437	1.293975

Logistic regression analysis indicates the access to safety mechanisms variable has a coefficient of 1.802, meaning that the odds of being classified as a non-poor food security profile are approximately 1.8 times higher for households with access to safety mechanisms compared to those without. This resonates with FAO [12] and Mugera and Yoshimura [13], who focus on food insecurity and the community support mechanisms and safety nets employed to alleviate such conditions, particularly in conflict-affected regions. These findings strongly demonstrate the importance of safety mechanisms in relation to food security levels. The results also align with the theoretical proposition that increased access to safety nets is associated with enhanced food security. This highlights the need for more focused funding that goes beyond economic resources and actively develops and reinforces safety mechanisms to improve food security outcomes. This analysis strengthens the literature regarding safety mechanisms and food security by offering evidence that directly relates to the provision of such interventions in comparable frameworks.

The logistic regression output shows that the coefficient for the education level of the household head is 7.27, indicating that the odds of being in a non-poor food security profile are approximately 7.27 times greater for a household headed by a formally educated person compared to one with an uneducated head. This aligns with the literature, including WFP [21] and Ahmed [7], which recognize the role of education in enhancing a household's adaptability and resilience to external shocks. Education provides skills and knowledge that can enhance livelihoods and well-being at the household level [17]. The vast disparity in food security odds for households led by educated versus non-educated heads highlights the significant influence of educators on fundamental food security outcomes. This information should be factored into strategy development, underscoring the need for increased access to educational resources as a strategy to bolster food security and resilience for the population, which has been significantly worsened in this research.

3.2.2. Diagnostic Tests

The Hosmer-Lemeshow test was conducted to assess the goodness of fit in the logistic regression model. The null hypothesis tested was that there is no difference

between the observed and expected values of the dependent variable across different levels of predicted probabilities. The resulting *p*-value [0.5459] was compared to the predetermined significance level of 0.05. Upon analysis, the *p*-value was found to be greater than the significance level. Therefore, the null hypothesis was not rejected, and the conclusion was made that the logistic regression model fits the observed data.

The Wald test was employed to evaluate the significance of individual coefficients in the logistic regression model. The null hypothesis for each variable is that the coefficient associated with it is not significantly different from zero. The resulting *p*-values for all variables, including Household Income, Gender of Head, Safety Mechanisms, and Residency, were 0.003. These *p*-values were compared against the predetermined significance level of 0.05. Since the *p*-value is less than the threshold value, we reject the null hypothesis and conclude that each variable included in the model is statistically significant in explaining the variation in the outcome variable, contributing meaningful information to the logistic regression model.

The pairwise correlation analysis of the coefficients in the logistic regression model was conducted to assess the presence of multicollinearity. Multicollinearity can affect the stability and reliability of the logistic regression model, potentially leading to inflated standard errors and challenges in interpreting individual variable contributions. The analysis in **Table 2** revealed that the coefficients of the variables (Household Income, Gender of Head, Safety Mechanisms, and Residency) exhibited low (below 0.5) levels of correlation with each other.

Table 2. Correlation matrix for selected explanatory variables.

	Residency	HH Size	HH Income	Education	Gender	Safety
Residency	1.0000					
HH Size	0.0004	1.0000				
HH Income	0.0129	− 0.1265	1.0000			
Education	− 0.2266	0.0154	− 0.0972	1.0000		
Gender	− 0.4479	0.1136	− 0.1397	0.2146	1.0000	
Safety	0.0763	− 0.0001	− 0.1115	− 0.1974	0.1207	1.0000

4. Discussion

The results from this research emphasize the crucial aspects of food security in Kismayo, highlighting the significant inequalities between displaced and non-displaced groups. By considering the Kismayo region's FCS as a vital component of the assessment, the study addresses gaps in food security evaluation noted in other research. This section clarifies the accomplishments, analyzes existing information, and discusses potential areas for further research.

4.1. Key Findings and Interpretation

The research indicates that residency status impacts food security to a remarkable extent, revealing that host community households had 2.75 times greater odds of belonging to a non-poor FCS profile compared to IDPs. This result corroborates previously conducted studies asserting that IDPs undergo systematic discrimination resulting from broken livelihoods, lack of resource availability, and social isolation [13]. To address these derived differences, active policy measures are essential to meet the needs of IDPs, including assistance with sustainable livelihoods and enabling access to resources.

The household is the principal unit of income and serves as a basic determinant of food security, whereby higher income corresponds with an improved Food Consumption Security (FCS) profile. This underscores the importance of economic stability in accessing food, reaffirming the WFP's [21] findings on the significance of multidimensional sources of income. Such training, along with micro-business development, could improve economic stability for vulnerable families.

Education level was another pivotal factor, with households led by formally educated heads exhibiting markedly better food security outcomes. This finding aligns with broader research highlighting the role of education in enhancing adaptive capacities [7]. Incorporating educational support into food security programs could empower households by fostering skill develop-

ment and enhancing livelihood prospects.

Access to community safety mechanisms significantly improved food security odds, reinforcing the protective role of safety nets. This observation aligns with [12] and highlights the importance of strengthening community-based security and conflict resolution frameworks, thereby fostering a stable environment that promotes food security.

4.2. Comparison with Existing Literature

This study extends the existing literature by quantifying food security dynamics using the FCS metric, thereby addressing the methodological gap identified in prior studies [19,25]. It also highlights the role of community safety mechanisms, a relatively underexplored variable in prior research on Somali food security. These findings emphasize the importance of integrating both economic and social protective factors into food security interventions.

4.3. Policy Implications and Recommendations

The study's findings call for a multifaceted policy response, including income generation, educational empowerment, and the strengthening of community safety mechanisms. Humanitarian organizations should focus on tailored interventions that address both immediate needs and long-term resilience building. The integration of food security assessments into broader development policies could foster sustainable improvements.

4.4. Limitations and Future Research Directions

While this research provides critical insights, some limitations merit attention. The reliance on cross-sectional data constrains causal interpretations. Future longitudinal studies could offer a more dynamic perspective on how food security evolves. Additionally, exploring gender-specific dynamics of food security could reveal important insights into the intersection of gender, education, and economic stability. Expanding the study to other regions in Somalia would enhance the generalizability of the findings.

In conclusion, this study makes a meaningful contribution to understanding the dynamics of food security in Kismayo, highlighting the interconnected roles of income, education, safety mechanisms, and displacement status. Addressing these dimensions through integrated policy interventions could pave the way for sustainable food security solutions in similar conflict-affected regions.

5. Conclusion

As noted, the objective of this study was to explore the multifaceted link between food security and the displacement of people in Kismayo, Somalia. This requires a multi-method approach, such as quantitative surveys alongside qualitative interviews and focus group discussions, which this study aimed to capture all the dynamics of this unique case. The application of the Food Consumption Score (FCS) as a measuring unit and access to early warning systems, integrated as a new driver of food security, were significant contributions to the literature. The results highlighted the critical level of the food security and displacement problem in Somalia, especially in Kismayo, which suffers from acute food insecurity with more than 6.6 million people affected. Internally Displaced Persons (IDPs), who make up an already vulnerable group, struggle significantly due to insufficient resources. As a result of years of conflict, violence, and climate change, this problem disrupts people's livelihoods and makes food difficult to access.

Kismayo's primary port city and IDP destination function simultaneously to create unique dynamics of food security. The added mix of different ethnicities, cultures, and backgrounds within the displaced population further complicates the food security situation. The investigation highlighted the lack of food consumption scores as quantitative measures in the literature and the limited exploration of topics related to safety and violence. The contributions of the household income, availability of safety net mechanisms, residency status, and the educational attainment of the household head emerged as crucial determinants of food security outcomes. Increased household income, access to safety net

mechanisms, inclusion in the host community, and the presence of a formally educated household head were linked to improved odds of better food security.

Gaps in the literature were addressed, and informed policymaking, as well as actions by humanitarian organizations and researchers, were substantiated by these results. The recommendations from this study focus on providing tailored solutions to address income inequality, access to protection frameworks, and the entrenched attitudes of host communities. Subsequent studies on this topic should further investigate the nexus between food security and displacement within the socio-economic and broader environmental frameworks of comparable contexts.

Ultimately, this study represents a crucial step toward developing effective strategies to address the multifaceted challenges faced by the population in Somalia, particularly in Kismayo, thereby fostering sustainable development and enhancing overall food security outcomes.

6. Recommendations

The research highlights some recommendations tailored to the specific challenges of displacement in Kismayo's context in Somalia. Focused interventions should be directed towards improving the income-earning potential of displaced households. The implementation of economic empowerment activities and appropriate vocational training for the displaced population is of utmost importance. These interventions should prioritize context-relevant skills and target both male and female-headed households to maximize impact. These programs are designed to alleviate financial burdens and enhance the well-being of displaced households.

Community-based Safety net programs are emerging as a highly recommended approach. Safety net community watch programs should be implemented precisely to address safety and security issues within some displaced communities. They not only enhance an area's safety but also directly improve food security and the quality of community life. These mechanisms not only promote physical security but also enhance trust, mobility, and access to services—key enablers of household food security.

More specifically designed actions are required to assist the host communities. Employment opportunities for the construction of social services should be prioritized to meet the needs of both displaced individuals and host populations. Addressing these specific aspects of community concerns makes the intervention more impactful and durable. The integration of host communities into assistance frameworks can reduce tensions and ensure that interventions do not unintentionally exacerbate local inequalities.

Advancing education, especially for female heads of households in displaced contexts, is a primary recommendation. Support programs for displaced households should include elements of sustainable agriculture capacity-building interventions. Knowledge and skills are crucial in enhancing personal and household resilience and food security during challenging situations. These interventions should be tailored to the urban and pre-urban realities of displacement-affected communities to ensure practicality and long-term impact.

This research highlights the importance of comprehensive strategies that incorporate partnerships with governmental and local community stakeholders, as well as humanitarian organizations. These partnerships can respond to the complex and multidirectional drivers of food insecurity during displacement. Such collaboration should also ensure that interventions are inclusive of both displaced and host populations, promoting equity and social cohesion. Coordination and collaboration are essential to achieve effective, sustainable, and holistic outcomes.

Finally, donor funding is important and must prioritize the long-term socio-economic development of displaced populations. Contextually driven, community-based approaches to food security can enhance acceptance and effectiveness in Kismayo and other regions affected by displacement. Comprehensive policy frameworks that extend beyond immediate issues and actively engage in conflict transformation, climate change adaptation, and the adoption of social protection policies are needed to enable sustainable changes that improve food security during protracted displacement.

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Institutional Review Board Statement

The research protocol received approval from both the Maasai Mara University Ethics Committee and the Tropical Consult Research Ethics Review Board. Informed consent was obtained from all participants prior to their responses. All contributions were anonymous, and participants were provided with a thorough explanation of the study's objectives.

Informed Consent Statement

Informed consent was obtained from all participants prior to their responses.

Data Availability Statement

The datasets used and/or analyzed during the current study are available from the author on reasonable request.

Conflicts of Interest

The authors declare that there is no conflict of interest.

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