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Faith and food in rural Malawi: an investigation into the sociocultural determinants of household food security

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ABSTRACT
This study demonstrates that religion and culture play a substantial role in shaping the dietary preferences of rural Malawians. Therefore, it is imperative that cultural and specifically religious factors are given due consideration when devising strategies aimed at alleviating household food insecurity and promoting food security. Despite years of substantial agricultural output, household food insecurity remains a persistent problem, primarily due to sociocultural factors that influence how food is consumed within households. It has been proven that social activities such as weddings, initiation ceremonies, and funerals can significantly impact a household's food status. The study underscores the need for policymakers to incorporate cultural factors into food security interventions to produce more effective and equitable policies.

1. Introduction

Ensuring food security is of paramount concern in many developing nations, including Malawi. Food security refers to the availability of sufficient, safe, and nutritious food that meets the dietary needs and preferences of individuals, allowing for an active and healthy lifestyle (Connolly-Boutin and Smit 2016a; Southern Africa Development Community 2014). The concept of food security is based on four interrelated/hierarchical dimensions, namely availability, accessibility, utilization and stability. The first dimension concerns the availability of food in a country or household in any way, e.g., production and yield, imports or food aid. The second aspect, access, refers to prices and the possibility of obtaining food through purchases on the market, from own stocks or production, through gifts or loans. The third area concerns biological use (food preparation, consumption and nutrition) (Demeke, Keil, and Zeller 2011; Misselhorn et al. 2012; Poppy et al. 2014; Reincke et al. 2018). The utilization dimension of food security is fundamental to attainment of nutritional security. Utilization refers to the way in which the body optimally uses the various nutrients in food. It includes health aspects such as the safe

and proper preparation of food and the nutritional quality of household diet (Richardson 2010). Compromised utilization can lead to nutritional deficiencies, which manifest themselves in severe malnutrition. The fourth dimension concerns the stability of food supplies seasonally and from year to year. Food insecurity also occurs when one dimension is not met. For example, households that lack the financial or material resources to provide themselves with sufficient food or that lack food diversity are considered food insecure. Many studies show that poverty is a rural phenomenon in most developing countries and the rural poor are the most food insecure (Harrigan 2008; Oluoko-Odingo 2011). Furthermore, FAO et al. (2018) have reported higher prevalence of severe food insecurity among women than men in Sub-Saharan Africa (World Health Organization 2018).

Malawi is among the poorest countries globally, with over half of the population living in poverty and experiencing chronic food insecurity (Harrigan 2008; National Statistics Office of 2020). A study by Yunhee Kang et al. (2019) on food and nutrition security in Malawi revealed that the Malawian diet lacks diversity, leading to high rates of malnutrition among women and children. According to Ailish Craig et. al., in Malawi, women experience higher levels of food insecurity and struggle to access food for extended periods compared to men (Craig et al. 2023, 8–11). Their limited mobility hinders their ability to access food due to a decrease in social connections. Therefore, it is important to understand the causes of food insecurity and its impact on vulnerable groups including the rural poor, women and children.

Food insecurity has far-reaching effects on the health, wellbeing, and development of families and communities. Its negative impact can manifest in various ways, including poor maternal and child health, reduced quality of education, and decreased productivity. Research indicates that nearly 50% of children under the age of five in Malawi are affected by malnutrition due to insufficient access to basic sustenance (Noora-Lisa, Janice, and Todd 2015, 1). As a result, addressing the problem of food insecurity is of utmost importance if we are going to achieve Sustainable Development Goal 2 (SDG2), which is connected to the alleviation of poverty, the transformation of rural areas, and the promotion of sustainable agriculture.

Food insecurity is a complex and multifaceted issue, with numerous interconnected factors that contribute to its prevalence. This issue stems from a range of economic, physical, political, and social aspects that can have significant implications for individuals, communities, and entire nations. Economic factors play a pivotal role in shaping food security. Household incomes can limit access to food production inputs or food sales, resulting in reduced production and availability. This can have a severe impact on people's ability to access sufficient food and nutrition, particularly in low-income communities. Physical factors, such as rainfall patterns, water resource management, and soil quality, also have a significant impact on food security through the production/availability dimension. For example, poor water resource management and soil degradation can significantly reduce crop output, which can have severe implications for food and nutrition security. Similarly, heavy floods caused by rainfall patterns can affect food security-related infrastructure, such as roads, bridges, and storage facilities, leading to limited food supply and distribution. The destruction of road infrastructure after heavy floods can also limit food flows from source to demand areas, exacerbating the food insecurity crisis (Kalanda-Joshua et al. 2016).

Food security is significantly impacted by various government policies and interventions, such as those related to agriculture, the trade of food products, and food security. In the case of Malawi, the government has implemented various policies and undertaken actions to address the problem. One of the earlier significant actions taken was the distribution of starter packs to smallholder farmers in 1998, which was prompted by the prevailing conditions of low maize production and high levels of food insecurity (Harrigan 2008). Research indicates that the majority of Malawians determine their level of food security based on the accessibility of maize (Fisher and Lewin 2013; Nkhoma 2020). Therefore, each pack, which was given for free to smallholder/subsistence farmers, included 15 kilograms of fertilizer, 2 kilograms of high-quality maize seed, and 1 kilogram of legume seed. The starter pack had a positive impact by helping households avoid hunger and food shortages (Harrigan 2008).

Recently, since around 2004, the Farm Input Subsidy Program (FISP) and its succeeding Affordable Inputs Program (AIP) have been adopted to improve food security in Malawi by providing smallholder farmers with access to essential agricultural inputs at reduced prices. During the 2008–2009 season, eligible households received two vouchers, allowing them to purchase 100 kilograms of maize fertilizer and either free hybrid maize seed or open-pollinated maize seed. In the implementation, there were challenges such as unfair resource distribution. Young female-headed households received fewer input subsidy packets compared to older male-headed households, and poorer households received fewer vouchers than wealthier ones. It was observed that higher educated households received more coupons, possibly due to better negotiation skills with village leaders. Longer residency in the village also increased the likelihood of receiving coupons (Chibwana et al. 2010). Nevertheless, the subsidy had direct impacts such as increased maize production and improved real incomes for recipients and poorer households benefited more proportionally from the subsidies. Indirect impacts were also observed, with the southern region experiencing greater gains due to differences in poverty incidence and land pressure (Dorward and Chirwa 2013).

In 2020, the Malawian government introduced the AIP to help subsistence farmers buy agricultural inputs at affordable prices (Kateta 2022). The aim was to improve food security by ensuring access to essential inputs for smallholder farmers. Both the FISP and the AIP have significantly improved food security in Malawi by increasing access to agricultural inputs and improving smallholder farmers' livelihoods (Sibande et al. 2015). However, addressing distribution inequities and ensuring effective implementation remain crucial for sustained impact.

Despite various interventions, food insecurity continues to be a persistent issue in developing countries. Several studies have shown that despite achieving high agricultural productivity and economic growth over the past 50 years, 98% of undernourished children (who are stunted, underweight, and have micronutrient deficiencies) reside in developing countries. Furthermore, 25% of this population resides in Sub-Saharan Africa, which includes Malawi (Food and Agriculture Organization 2014; Misselhorn et al. 2012; Richardson 2010; Ringler et al. 2010).

While many studies have focused on analyzing the effect of economic, physical and political factors on food security and associated interventions aimed at addressing household income inequalities, improving access to agricultural products and increasing agricultural productivity, there is a gap in our understanding of how traditional beliefs

and religion affect household food security, especially in developing countries. Studies on the sociocultural determinants of food security are few and far between. Nevertheless, the existing research indicates that social factors, such as land ownership, have a significant impact, particularly in rural areas, cultural and religious beliefs, and the level of education, can also have implications for food security (Connolly-Boutin and Smit 2016b; International Food Policy Research Institute 2018). According to the Mexico City Declaration on Cultural Policies, culture is defined as "the whole complex of distinctive spiritual, material, intellectual, and emotional features that characterize a society or social group. It includes not only the arts and letters, but also modes of life, the fundamental rights of the human being, value systems, traditions, and beliefs" (UNESCO, Declaration on Cultural Policies, World Conference on Cultural Policies, Mexico City, 26 July–6 Aug. 1982 cited in Lenzerini 2011, 104). Culture can be divided into material and non-material aspects. Material culture refers to the tangible elements of culture that are specific to particular societies, such as their livelihood and production activities and the goods they produce (Gaskell 2020; Lunn-Rockliffe, Derbyshire, and Hicks 2020). Non-material culture, on the other hand, encompasses the intangible aspects of culture, including beliefs and taboos (Lenzerini 2011). Both aspects of culture are interconnected and have implications for food security. For instance, if certain foods are subject to taboos that restrict their consumption, production, and utilization, it can lead to limited food availability within a given society. In the following section, we will consider ways in which beliefs and traditions can have a significant influence on food security.

1.1. The intersection of culture and religion and food security

In Malawi, over 90% of the population belongs to various religions, heavily influencing the country's social and political landscape. 77.3% of the population in Malawi are Christian, while 13.8% follow Islam. The Christian population is further broken down into various denominations, including Roman Catholics at 17.2%, Central Africa Presbyterians at 14.2%, Seventh-day Adventist/Seventh-day Baptists at 9.4%, Anglicans at 2.3%, and Pentecostals at 7.6%. The remaining 26.6% fall under the category of "other Christians"("Malawi," n.d.; National Statistics Office 2019a). People who claim no religious affiliation make up 2.1%, while 5.6% belong to other religious groups, such as Hindus, Baha'is, Rastafarians, Jews, and Sikhs ("Malawi," n.d.). Malawi is a highly religious country where most citizens attend religious services weekly (Trinitapoli 2015, 4–5). Religious leaders play a crucial role in the Malawi society. Recently, they have been at the forefront in the fight against pandemics, along with health workers, as well as promoting social harmony and creating unity at both national and grassroots levels. By getting involved in civil concerns, they can foster adherence to the moral norms and religious beliefs of the particular communities and merge their ideals with preventative activities (Trinitapoli 2015). Religion serves as a cultural tool that individuals use to address significant issues in their own lives, highlighting the importance of faiths in the daily routines of Malawians.

Malawi is home to over sixteen ethnic groups, with the largest ones being the Chewa, Lomwe, Yao, Ngoni, and Tumbuka (Kayira, Chiudza Banda, and Robinson 2019, 1). The Chewa, Lomwe and Yao follow matrilineal traditions while the Ngoni and Tumbuka follow patrilineal customs. However, the matrilineal culture in Malawi

did not develop into a matriarchy. In matrilineal society, maternal uncles have authority over children and their social lives, suggesting that men have influence and can influence family decisions in both matrilineal and patrilineal environments (Phiri 1997). Christian missionaries faced a significant challenge when attempting to establish nuclear families in Chewa communities, where maternal uncles possess considerable power and authority over children and decisions concerning them (Tembo 2022, 109). In matrilineal systems women inherit and own the land (Asfaw and Maggio 2018). However, it is men who makes final decisions in the family (Craig et al. 2023, 4).

The Chewa, Lomwe, Yao, Ngoni, and Tumbuka groups are also found in neighboring countries such as Tanzania, Zambia, and Mozambique(Posner 2004; 吉田憲司 and ヨシダケンジ 2022). The annual cultural festivals among the Chewa of Malawi and Zambia illustrate a shared culture and belief system (吉田憲司 and ヨシダケンジ 2022). However, this study did not delve into the ethnogenesis of these ethnic groups in southern Africa to identify their similarities and differences across the region and their potential impact on food security. The extent to which cultural differences, for instance, between the Ngoni of Malawi, Zambia, Mozambique, and Tanzania, influence their dietary habits is outside the scope of this paper. The study exclusively examined the Yao and Ngoni communities in the southern region of Malawi. Variations in belief systems among the different Ngoni or Yao groups across the country are to be expected, as culture is dynamic rather than static.

This study contends that each of these cultural aspects can individually or jointly affect food consumption and the effect cannot be uniform across space. Thus, people of a given tribe may be associated with consumption of certain foods, but differences can occur if they belong to different religious affiliations. Variations can also occur between regions. Hence, while some of these religions and tribes are found in other countries within Southern Africa, some beliefs and practices may be unique to each setting because culture is not static. It changes over time and space. This means the effects on food security are likely to be contextual. In this context, the cultural impact on food security in Malawi may differ from other countries. This requires more specific studies instead of generalizing people's experiences.

A growing amount of research has focused on the connection between sociocultural factors and food security (Noack and Pouw 2015). Research has shown that household food security can be significantly influenced by cultural factors, as well as the personal beliefs and values of the household head (Just, Heiman, and Zilberman 2007). According to Noack & Pouw, "food and nutrition security can only be achieved when 'sufficient culturally adapted food' is available and accessible to a household or community to meet physiological and social needs"(Noack and Pouw 2015, 172). Noack & Pouw argue that people's diets are heavily influenced by their traditions, religions, and cultures. Therefore, if we want to reduce food insecurity, we need to ensure that the food we serve is socially and culturally appropriate for the community. Other studies show that the food distribution in a household is significantly influenced by the religion and culture of the people residing in it (Just, Heiman, and Zilberman 2007). Research indicates that overlooking social and cultural factors can lead to detrimental impacts on communities (Enriquez and Carlos Archila-Godinez 2022; Higgs 2015; Robinson, Blissett, and Higgs 2013). To reiterate, achieving food security depends on offering food that is socially and culturally

acceptable within people's regions. As such, it is imperative to comprehend the intricacies of food politics within the framework of social and cultural issues.

While most Malawians belong to different tribes and also subscribe to some form of religion, there are not enough studies on the intersection of faith and food security. Even the Southern Africa Development Community (SADC) Food and Nutrition Strategy 2015–2025, developed in Lilongwe, Malawi, does not mention the importance of cultural and religious beliefs to food and nutrition security(Southern Africa Development Community 2014). At the country level, the Church and faith-based institutions (such as World Vision International, The Christian Health Association of Malawi, Christian Aid, Pamoza, Catholic Relief Services, and Islamic Relief) are recognized as key actors in the fight against hunger, famine, and poverty. However, their roles are only limited to emergency food provision in times of famine, drought, natural disasters, and provision of seeds and farm implements. Consequently, it is difficult to determine the impact of religion and cultural beliefs and practices on food and nutrition security beyond the current generalizations.

Nonetheless, religious beliefs and practices, particularly in Christianity and Islam, have a significant impact on food consumption and choices (Heiman, Gordon, and Zilberman 2017). These religions offer guidelines that regulate human behavior, encompassing the access, utilization, and consumption of food. African people commonly observe and engage in religious beliefs and practices alongside their cultural beliefs and values. This means that practices allowed in a religious context may be discarded if they conflict with cultural norms. In terms of food consumption, the majority of mainline churches allow the consumption of a wide range of food groups. It is worth noting that in Malawian villages, some appreciate local delicacies such as pork and mice, while others avoid consuming them due to religious beliefs. For instance, the Seventh-day Adventist group adheres to a modified kosher diet, and those who follow the Islamic faith are bound by Halal food regulations. It is hypothesized in this study that in regard to food, religious and traditional beliefs play a significant role in decision-making, consumption, and preparation. Cultural and religious values are passed down through socialization, which helps preserve them across generations. Therefore, relying solely on dietary practices that are in accordance with these beliefs might result in unequal levels of food security across households in a society where there are varying cultural and religious beliefs. Similar patterns have also been observed in rural villages of India, where belonging to low caste groups and religious minorities has adverse effects on food security (Mahadevan and Suardi 2012; Schanbacher and Gray 2021).

Despite these studies that have delved into the underlying causes of food insecurity in Malawi, there remains a paucity of research exploring the interplay between religion, culture, and food security. This study endeavors to bridge this gap by conducting a thorough investigation into the food security of rural households in Malawi. By doing so, the study seeks to augment the existing body of knowledge concerning the impact of sociocultural factors on food security. In addition, the study also recognizes gender implications for food security, which are largely understudied in Malawi. Many studies acknowledge that in traditional societies, women bear the responsibility of preparing and distributing food (Molnar 1999). Despite being major producers of household food, they continue to face cultural prohibitions that limit their food intake. According to Joseph Molnar, "the status of women and children within households

reflects the values and attitudes of a culture and their subsequent effect on the distribution of wealth and food in a household" (Molnar 1999, 490). It is therefore crucial to investigate how these values impact women's agency and food security. This study contributes to filling this gap. The research was carried out in rural areas of Malawi because over 80% of the population of Malawi lives in rural settings (National Statistics Office 2019b). Our study delves into the effects of traditional beliefs and religious observance on food security with respect to utilization, shedding light on this crucial aspect.

This paper is part of a larger study investigating the intersection of religion, culture, and food security in rural Malawi. The district of Machinga was selected for this research project because of its high proportion of rural areas, as well as the fact that previous studies have found that the district has a high incidence of food insecurity among households and has high cultural diversity(Government of Malawi 2017). The proportion of poor people in Machinga (62.3%) is significantly greater than the average for the country (50.7%) (National Statistics Office 2021). In addition, Machinga was selected because of the social and cultural makeup of the region. Machinga has a population that comprises both Muslims and Christians, and because it is predominantly rural, the people still adhere to beliefs and customs that can influence how food is utilized and consumed. The selection of the two villages was based on their contrasting cultural and religious backgrounds. Village A is mainly Ngoni and Christian, while village B is predominantly Yao and Muslim. One of the reasons we conducted this study was to investigate the traditional and religious beliefs and practices that have an impact on the dietary habits of households as well as the distribution of food within households. As a result, we collected data on food choices and diversity, who is given priority during family food distribution, who consumes the choicest food part in accordance with the food systems of communities, and cultural influence on women's access to food. Our study's primary contribution is in its use of unique empirical data to illuminate the ways in which cultural norms and religious beliefs affect people's access to adequate nutrition.

Our research was guided by the following questions:

(1) Are there any specific cultural prohibitions or restrictions around certain foods that could impact food access and utilization?
(2) What is the impact of following religious dietary regulations, such as halal, on food choices?
(3) How does gender influence the allocation and consumption of food within households?
(4) How do cultural festivals impact food security?
(5) What is the influence of religious beliefs and practices on food security outcomes?

2. Methodology

2.1. Study design and data

Our investigation into the relationship between food security and culture/religion employed a mixed methods approach. We collected both qualitative and quantitative data from approximately 230 respondents. We collected the qualitative data through four

focus group discussions (FGDs) and six key informant interviews (KIIs) (see FGD guidelines [Appendix D] and KII tools in [Appendices B and C]). We ensured that separate interviews were conducted between men and women to collect reliable data amidst existing gender differences. Additionally, we spoke with traditional leaders, members of the village development committee, and religious leaders in each community to obtain the necessary qualitative data. We transcribed and translated qualitative data into English and then analyzed them using thematic analysis. This method is commonly used to interpret a series of texts, such as interview transcripts. The data were thoroughly examined by the researchers to identify recurring themes, concepts, and meaning patterns. This method involves a five-step process; including familiarization, coding, theme generation, theme review, and theme naming, which enables the researcher to effectively analyze the data.

We collected quantitative data from a total of 190 households in Village A and Village B.[1] Our data collection technique consisted of randomly selecting a representative sample from the household listings provided by the village chiefs. Household interviews were conducted in study participants' homes. The study involved 50 households from village A, which has a total of 87 households, and 140 households from village B, which has 249 households. This denotes 56% coverage of all households in both villages. The data were collected by trained enumerators with close supervision of the researcher. We collected quantitative data pertaining to household characteristics, household income sources, food and non-food expenditure, food access, current efforts and interventions to mitigate/adapt to access and utilization issues, gender roles, poverty, and household assets (see household questionnaire used in Appendix A). During household interviews, respondents (who would be the household head, the head's spouse or parent – in that order) were asked about their religious affiliation and whether their cultural and religious beliefs had any impact on food security. FGDs and KIIs further elaborate on specific beliefs and values. This approach aimed to capture a comprehensive understanding of the influence of religious and cultural views on food security.

To accurately gauge food preferences, respondents were required to provide information on their typical daily diet, as well as their desired daily diet, including any food they preferred to eat when ill. Additionally, we inquired as to whether religious or cultural factors influenced their dietary choices. Our research also delved into the occurrence of religious and cultural festivals, noting the significant amounts of food consumed during these celebrations. This information proved valuable in understanding postharvest food usage and for determining whether there was community pressure to partake in such events, even in the context of food insecurity.

The study strictly adhered to ethical standards stipulated in the Declaration of Helsinki (Bošnjak 2001; Goodyear, Krleza-Jeric, and Lemmens 2007). Approval was obtained before the study commenced. Participants voluntarily opted to participate and were explicitly informed of their right to withdraw at any given time. Written consent was duly obtained from all participants aged 18 years and above.

2.2. Analytical modelling

Summary statistics (means, proportions), cross-tabulations, Wilcoxon-Mann-Whitney tests, Pearson chi-square and Fisher's exact tests were applied to household survey data to

investigate the distribution and associations between independent and dependent variables. This includes the association between household wealth and food security dimensions, adherence to cultural and religious beliefs and uptake of food in the areas under study. The Wilcoxon-Mann-Whitney test is a non-parametric analogue to the independent samples t-test adopted to avoid assuming that the dependent variable is a normally distributed interval variable, as is assumed in the parametric t-test. Knowing that the Pearson chi-square test assumes that the frequency of each cell in a cross-tabulation is at least 5, we adopted Fisher's exact test in the cross-tabulations which did not meet the chi-square specifications. To assess household wealth level, the study applied household wealth analysis using asset-based approaches. The asset-based wealth index in this study is applied as a relative/proxy measure for consumption expenditure(Howe et al. 2009; Howe, Hargreaves, and Huttly 2008; Wittenberg and Leibbrandt 2017.) because of its simplicity (Kabudula et al. 2017), wide application and reliability relative to direct measures such as income or consumption expenditure, especially in middle income and resource poor countries (Filmer and Pritchett 2001; Kabudula et al. 2017; Nkonki et al. 2011). In particular, the principal component analysis (PCA) was conducted, from which the 2-quantile and 5-quantile wealth indices were computed and used.

We adopted the following empirical model specification (equation 1) based on the theory and literature:

$$y_i = \lambda_0 + \beta\, Religion_i + \theta\, Ethnicity_i + \Gamma(Religion_i \times\ Ethnicity_i) + \sum_{i=1}^{n} \alpha_i X_i + \varepsilon_i \quad (1)$$

where y_i represents the various indicators of the outcome variable (food [in]security) for respondent i (i.e.), i) lack of funds for food, ii) food inadequacy and the iii) coping strategy index (CSI); Religion is a binary variable taking 1 if the respondent is Christian and 0 if the respondent is Islamic; Ethnicity is a binary variable taking 1 if the respondent is from the Yao tribe (the main ethnic group in the area) and 0 otherwise; X_i represents all demographic, socioeconomical and physical household factors serving as control variables, as guided by previous literature (including wealth [asset index], gender, age, education, household size, the average time taken to the main water source, water cost, size of land owned, assistance from outsiders, food assistance from the government and food assistance from a church (Dzanja et al. 2013; Zingwe, Petro Manja, and Wadonda Chirwa 2023)); and ε_i is the error term. In capturing age, we constructed a "youth" variable defined as a dummy, taking 1 if age is from 15 to 24 years, as per the United Nations definition[2]; and taking 0 for ages above 24. Worth noting from the list of measures of food insecurity is that CSI is the most inclusive – and hence most reliable – variable, and it has been widely applied in previous studies due to among others its ability to capture vulnerability while reducing recall errors that are observed in measures such as the food consumption scores (Zingwe, Petro Manja, and Wadonda Chirwa 2023). The CSI aggregates coping strategies employed by the survey unit to mitigate the food problem into an index ranging from 0 to 56 (with higher scores representing more coping strategies adopted and hence higher food insecurity). We adopted the strategies as reported by (Zingwe, Petro Manja, and Wadonda Chirwa 2023), including the frequency at which households relied on less preferred or less expensive foods. The other two indicators of food insecurity (lack of funds for food and food inadequacy are included to reveal possible channels of food insecurity). β, θ and Γ are the main coefficients of

interest, with β capturing the effect of religion; θ capturing the effect of traditional beliefs; and Γ capturing the effect of the interaction term on food insecurity.

Given that most of the proxies for the dependent variable are binary in nature (lack of funds for food and food inadequacy), we used the binary logistic regression model to examine the nexus between food insecurity, on the one hand, and religious beliefs, culture, and traditions, on the other hand. For the third proxy of food insecurity (CSI), we used the Tobit model (with censoring between 0 and 56). The logistic regression model is a type of multi-predictor regression model that establishes associations between a number of predictors and a binary outcome variable (Peng et al., 2002). Logistic analyses try to determine how likely an event is to happen and how one or more predictor (independent) variables affect what actually happens (O'Connell 2006). The logistic regression model, which can be fitted using the maximum likelihood estimation procedure, is specified as follows, in equation 2:

$$logit(y_i = 1|X_i) = log\frac{\pi_i}{1 - \pi_i} = \beta_0 + \beta_1 X_i \qquad (2)$$

where $\pi_i = prob(y_i = 1|X_i)$ is the conditional probability of $y_i = 1$ given X_i; β_0 is the overall intercept, and β_1 is the vector of regression coefficients.

The third proxy of food insecurity is the CSI, for which the more coping strategies used, the less food-secure a household is(Salima et al. 2023). The Tobit model censored from both sides (at c on the left side and d on the right side, $c, d \in \mathbb{R}$) can be presented in the form of an index function for y as in equation 3:

$$y_i = \begin{cases} c & if \ y_i^* \leq c \\ y_i^* & if \ c < y_i^* < d \\ d & if \ y_i^* \geq d \end{cases} \qquad (3)$$

where y^* is a latent dependent variable, given as in equation 4, for $\varepsilon(0, \sigma^2)$ an error term:

$$y_i^* = x_i^{'}\beta + \varepsilon_i. \qquad (4)$$

3. Results and discussion

3.1. Summary statistics

This section quantitatively analyses the data that were collected in Malawi, specifically in the southern region in Machinga district, traditional authority (TA) Nkula in two villages. With 90 respondents sourced from village B village, 42 respondents were from village A village, making a total of 132 respondents. Of the 132 respondents, 21.2% were male, and most of the respondents (47%) were aged at least 40 years, with less than 1% being at most 19 years of age. In terms of marital status, up to 58.3% of the respondents were married, and only approximately 3.8% were never married, with the rest being widowed (16.7%), divorced (13.6%) or separated (7.6%) (see Table 1). At the time of the interviews, most of the respondents (72%) reported having lived in their current residential places for at least 10 years prior to the interview, with only 3.8% having lived for less than a year. Demographically, the data also revealed that most respondents had only attained primary education or adult literacy (59.8%) and were of the Yao tribe (53%) – explained by the fact that Machinga is predominantly

Table 1. Summary statistics.

Variables	Count (N)	Mean	SD	Min	Max
CSI[a]	132	19.659	13.516	0	56
Lacked Funds for Food (1/0)	132	0.902	0.299	0	1
Insufficient Food Past Year (1/0)	132	0.894	0.309	0	1
Youth (1/0) (24 years and below = 1)	132	0.182	0.387	0	1
Age of Respondent (1/0)					
15–19 years	132	0.008	0.087	0	1
20–24 years	132	0.174	0.381	0	1
25–39 years	132	0.348	0.478	0	1
≥40 years	132	0.470	0.501	0	1
Asset Index (Binary)	132	1.500	0.502	1	2
Wealth Quintiles (1/0)					
Wealth Quintile 1	132	0.258	0.439	0	1
Wealth Quintile 2	132	0.144	0.352	0	1
Wealth Quintile 3	132	0.205	0.405	0	1
Wealth Quintile 4	132	0.197	0.399	0	1
Wealth Quintile 5	132	0.197	0.399	0	1
Ethnicity (1/0)					
Yao	132	0.530	0.501	0	1
Ngoni	132	0.288	0.454	0	1
Chewa	132	0.015	0.123	0	1
Lhomwe	132	0.121	0.328	0	1
Other	132	0.045	0.209	0	1
Gender (Male = 1, Female = 0)	132	0.212	0.410	0	1
Highest Level of Education (1/0)					
None	132	0.121	0.328	0	1
Primary and Adult Literacy	132	0.598	0.492	0	1
Secondary and Post-Secondary	132	0.280	0.451	0	1
Household Size	132	4.977	1.948	1	10
Religion (Christianity = 1, Islam = 0)	132	0.500	0.502	0	1
Marital Status (1/0)					
Single	132	0.038	0.192	0	1
Married	132	0.583	0.495	0	1
Separated	132	0.076	0.266	0	1
Divorced	132	0.136	0.344	0	1
Widowed	132	0.167	0.374	0	1
Average Time Water (Minutes)	132	21.398	18.663	1	124
Water Cost (MWK)	132	156.212	457.837	0	3,900
Access to Farm/Arable Land (1/0)	132	0.947	0.225	0	1
Size of Owned Land (Acres)	132	1.372	1.176	0	5
Finance Assistance from Anyone (1/0)	132	0.227	0.421	0	1
Food Assistance from a Church (1/0)	132	0.227	0.421	0	1
Government Food Aid Participation (1/0)	132	0.144	0.352	0	1
Religion affects Food Eaten (1/0)	132	0.417	0.495	0	1
Tradition affects Food Eaten (1/0)	132	0.341	0.476	0	1

[a]The CSI represents the coping strategy index (ranging from 0 to 56) – which aggregates the number of coping strategies used by households to reduce the food problem. (1/0) means the variable (or set of variables below it) is binary taking 1 for yes and 0 for no.

occupied by the Yao, following their relocation from northern Mozambique after attack by the Makua people around the 1830s. The Yao predominantly share Islamic faith due to the ties they had with Arab trading partners, and because Islam was more inclusive of the Yao's cultural requirements than Christianity (Kudo 2014). No wonder, up to 50% of the respondents reported belonging to Islam, much higher than the 13.8% national average reported by the National Statistics Office (National Statistics Office 2019b). The average household size was approximately 5 members, not too far from the 4.3-member average reported in the Malawi population and housing census of 2018 (National Statistics Office 2019b).

The data reveal that most of the respondents were relatively poor, as up to 25.8% were in the bottom wealth quintile, yet only 19.7% were in the top wealth quintile. Of course, in spite of this relative poverty status, most of the respondents (94.7%) mentioned owning or having access to family land, with the rest having to rent some arable land in the area. Another interesting aspect of the data pertains to how food taken by respondents is affected. The table shows that up to 41.7% of the respondents indicated having religion as a key factor affecting the food they take, with 34.1% of the respondents having traditional beliefs affecting food taken. This means that culture influences food choices for over 75% of the respondents. The results also show that food insecurity was highly prominent in the area, with 90.2% reporting having been hungry but unable to buy food due to lack of funds; and 89.4% reporting having been faced with a situation where they did not have enough food, all over the previous 12 months. These figures are much higher than the 63.5% reported by the Malawi National Statistical Office(National Statistics Office 2021) [NSO] in the fifth integrated household survey (IHS) report of 2020 but even worse than the 38.3% reported in 2010.[3] These food security indicators are supported by the coping strategy index (CSI) as a food security early warning indicator, which shows an average of 19.7 on the 0–56 range. Only 14.4% of the respondents received government food aid.

3.2. Food security, demographic and socioeconomic characteristics

Having appreciated the prevalence of food insecurity situation in the study area, we conducted a number of analyses to better understand food insecurity. First, we decomposed the measures of food insecurity by gender and wealth to observe possible differences. In particular, the Wilcoxon-Mann-Whitney test, a non-parametric analogue to the independent samples t-test, was used. This test does not assume that the dependent variable is a normally distributed interval variable. The wealth variable was constructed as a 2-quantile variable from a derived principal component analysis (PCA) variable. Table 2 shows that there are statistically significant differences in the underlying distributions of CSI scores of females and CSI scores of males ($z = 2.080$, $p = 0.0375$), as well as in underlying distributions of scores of availability of funds to restock food for poorer respondents and for wealthier respondents ($z = 2.619$, $p = 0.0088$). In particular, the results show that for CSI, females have a higher rank sum (7289.5) compared to males (1488.5). In terms of availability of funds to restock food, respondents in the lower quantile have a higher rank. This demonstrates some inequality in food security in favor of males, where female-headed households are more food insecure than their male counterparts. The results also show that the scarcity of funds for food is unequally born between poorer and richer households to the detriment of the poorer households. However, these differences are not observed for the other measures of food insecurity, signaling the need for an econometric analysis to effectively check the effects of gender and wealth on food insecurity.

We then conducted Pearson chi-square and Fisher's exact tests on the food insecurity variables against some key demographic and socioeconomic variables to observe if there are any significant relationships. In terms of the method, when one or more of the cells in a cross-tabulation has an expected frequency of five or less, the Pearson chi-square test was deemed suitable; otherwise Fisher's exact test was used. Displayed in Table 3, the

Table 2. Wilcoxon-Mann-Whitney tests of food security measures by gender and wealth.

Variable	Obs	Rank Sum	Expected	z	Prob > |z|	Exact Prob
Lacked Funds						
Female	104	6800	6916	−1.251	0.2109	0.3764
Male	28	1978	1862			
Insufficient Food						
Female	104	6918	6916	0.021	0.9833	1.0000
Male	28	1860	1862			
CSI						
Female	104	7289.5	6916	2.080**	0.0375	0.0371
Male	28	1488.5	1862			
Lacked Funds						
Asset Index = 1	66	4686	4389	2.619***	0.0088	0.0164
Asset Index = 2	66	4092	4389			
Insufficient Food						
Asset Index = 1	66	4521	4389	1.126	0.2600	0.3973
Asset Index = 2	66	4257	4389			
CSI						
Asset Index = 1	66	4560	4389	0.779	0.4361	0.4380
Asset Index = 2	66	4218	4389			

Null hypotheses are H_0: Dependent Variable (Gender = = Female) = Dependent Variable (Gender = = Male) and H_0: Dependent Variable (Asset Index = = 1) = Dependent Variable (Asset Index = = 2).
Asset index is a 2-quantile variable derived from the PCA. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

results show that the only statistically significant associations exist between the availability of funds for food and wealth, as well as between CSI and wealth, all at the 5% level of significance. We further explored the association between CSI and wealth to see if there exist any gender inequalities which would suggest differences in ability to cushion against food insecurity, and the result is shown in Figure 1. Interestingly, the figure shows that the association between CSI and wealth is negative, as expected and in line with previous research (Chen, Wu, and Jin 2023; Zingwe, Petro Manja, and Wadonda Chirwa 2023) and we find that this negative association persists regardless of household head gender, signaling the importance of wealth in dealing with food insecurity.

3.3. Beliefs and food taken

We also computed cross-tabulations to observe if different beliefs are related to the kind of food taken. These results are shown in Tables 4 and 5 for religious beliefs and traditional beliefs, respectively (where numbers are frequencies with column percentages in parentheses). Given that none of the cells in the cross-tabulations has a frequency that is at most 5, the requirements for chi-square tests were met for both tables. From Table 4, we observe that there is a statistically significant association between religious beliefs and food consumed at all levels of significance. The cross-tabulations reveal a particularly unique relationship for Muslims, more than for Christians, as up to 81.8% of respondents who indicated being influenced by religious beliefs in choosing food were from the Islamic faith. This is highly expected, as one of the fundamental practices in the Islamic faith involves abstaining from certain foods. In terms of the linkage between traditional beliefs and food choice, Table 5 shows that there is an association between a respondent's ethnicity and food. Particularly, the cross tabulation shows that up to 80% of the respondents who reported having food choice being affected by beliefs were from the Yao tribe. This may be driven by religion given that over 80% of the Yao revealed

Table 3. Number of respondents who expressed lack (cross-Tabulations/Chi-squares).

Variable	Gender			Married			Wealth			Religion		
	Male	Female	Chi2	No	Yes	Chi2	Poorer	Wealthier	Chi2	Muslim	Christian	Chi2
Lacked Funds for Food	27	92	0.298[†]	50	69	1.000[†]	64	55	0.016**[†]	62	57	0.242[†]
Insufficient Food Past 12 Months	25	93	1.000	52	66	0.152[†]	61	57	0.397[†]	62	56	0.156[†]
CSI[a]	28	104	0.883[†]	55	77	0.572[†]	66	66	0.021**[†]	66	66	0.524[†]
Total Respondents	**28**	**104**		**55**	**77**		**66**	**66**		**66**	**66**	

[†] means reported value is p-value from Fisher's exact test instead of chi-square statistic (the Fisher's exact test was used in place of the chi-square test when one of the cells in the cross-tabulation has expected frequency of five or less. Fisher's exact test has no "test statistic," rather computes the p-value directly).

[a]CSI has 0 to 56 categories and hence, for lack of space, here we just indicate the overall cross-tabulations by the respective binary variables. Wealth is defined by the asset index, derived at by computing 2 quantile categories from principal component analysis. CSI not included in table because it is a continuous variable.

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Figure 1. Coping strategy index (CSI) and asset index scores, by gender.

Table 4. Religious beliefs and food.

	Does your religious belief affect the kind of food you eat?		
Religious Group	No	Yes	Total
Christian	56 (72.73)	10 (18.18)	66 (50.00)
Islam	21 (27.27)	45 (81.82)	66 (50.00)
Total	77 (100.00)	55 (100.00)	132 (100.00)
Pearson Chi-Square = 38.1818* Probability = 0.000**			

Cell values are frequencies (with column percentages in parentheses).
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Table 5. Traditional beliefs and ethnicity.

	Does your traditional belief affect food eaten?		
Ethnicity	No	Yes	Total
Yao	34 (39.08)	36 (80.00)	70 (53.03)
Others	53 (60.92)	9 (20.00)	62 (46.97)
Total	87 (100.00)	45 (100.00)	132 (100.00)
Pearson Chi-Square = 19.9378* Probability = 0.000**			

Cell values are frequencies (with column percentages in parentheses). "Others" includes Ngoni, Chewa, Lhomwe and others.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

identifying with the Islamic faith. Overall, the results signal that both religion and ethnicity (traditional beliefs) are relevant in the choice of food by respondents in the study area.

3.4. Econometric results

After exploring the bivariate relationships as presented above, we then conducted a multivariate analysis to understand the relationships while holding other factors constant. To do this, logistic regression models were estimated for the two yes-no (dummy) food insecurity indicators (lack of funds for food and insufficient food in the past 12 months), and a Tobit regression model was estimated for the coping strategy index (CSI). The results, shown in Table 6, reveal a number of interesting insights. To begin with, all models show satisfactory overall statistical significance (as shown by the significant chi-square and F statistics for the logistic and Tobit models, respectively), enhancing some confidence in the findings.

Of particular interest from the table are odds ratios for Christianity and ethnicity, all of which are statistically significant at the standard level in all models. In interpreting these results, especially for the logistic models, care must be taken because we also have an interaction term for the variables of interest in the models. From the table, the odds of a Yao Islamic respondent facing inadequate food or lack of funds for food are much lower than those of an Islamic respondent of any other ethnicity, controlling for various factors. In fact, a Christian respondent of any non-Yao tribe has lower odds than an Islamic respondent of non-Yao ethnicity. This means that the risk of being food insecure (in terms of having inadequate food or lacking funds for

Table 6. Logistic and Tobit regression estimation results.

	Lack of Funds for Food	Inadequate Food	CSI
	(1)	(2)	(3)
Religion (Christianity = 1, Islam = 0)	0.000***	0.000***	7.103**
Ethnicity (Yao = 1, 0=Other)	0.000***	0.000***	6.265**
Christian × YAO	901,681.225***	794,742.295***	−8.638
Asset Index (Quantile 1 = 1)	0.188*	0.777	−1.610
Gender (Male = 1, Female = 0)	25.539***	1.964	−5.251*
Youth (1/0) (24 years and below = 1)	0.371	0.608	−4.650
Highest Education Level (Base Category =None)			
Primary/Adult Literacy	3.560	3.254	−0.148
Secondary	2.034	6.790*	−2.247
Household Size	0.946	1.215	−0.293
Average Time Water (Minutes)	1.018	1.003	0.179*
Water Cost (MWK)	1.001	1.004	0.001
Land Owned (Acres)	0.562**	0.511***	−0.476
Outside Financial Assistance (1\0)	0.317	0.572	−2.687
Government Food Aid (1\0)	0.077***	0.085**	−4.204
Church Food Assistance (1\0)	43.467**	20.356**	9.284**
_const	223,000,000***	5,738,242***	15.723**
chi2 (Logistic)/F (Tobit)	508.955***	770.495***	2.223***
p	0.000	0.000	0.009
N	132	132	132

Columns 1–2 show exponentiated coefficients (odds ratios) from the Logistic model. _const estimates baseline odds. Column 3 shows regular coefficients from the Tobit model censored both sides (CSI ranges between 0 and 56). All models employ robust standard errors.
(1/0) means the variable is binary taking 1 for yes and 0 for no – in which case the reference category is 0.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

food) is highest for Islamic respondents of non-Yao ethnicity. The odds for a Yao Christian respondent to face food inadequacy or lack of funds for food (found by multiplying the odds ratios for Christian, Yao and [Christian × YAO]) are much lower than the odds for an Islamic respondent of non-Yao ethnicity. Of course, when looked at separately (particularly in Column 3 – Tobit model – for the CSI results), being Christian and belonging to the Yao ethnicity are both highly associated with food insecurity. The observed positive association between Christianity and food insecurity could possibly be explained by some practices promoted within Christian circles such as "Farming God's Way" or broadly conservation agriculture which has not been found to be beneficial for food security in settings with small landholdings as is Malawi (Hassan et al. 2022; Mango, Siziba, and Makate 2017).

Besides religious beliefs and ethnicity (which represents traditional beliefs), the results also interestingly reveal a positive association between food inadequacy (or even lack of funds for food) and receipt of church food assistance, as shown by the strong odds ratio of 46.467 (or respectively 20.356), meaning that there is a higher chance of experiencing food insecurity for households which benefit from church food assistance. In other words, controlling for the other variables, the odds of facing food inadequacy or lack of funds for food are 43.467 and 20.356 times higher for church-food-assistance benefiting households than the odds of households that do not benefit from church food assistance. Church food assistance is also associated with higher food insecurity through the CSI. Of course, it is worth acknowledging possible existence of endogeneity for this estimate (from reverse causality), which is not further explored considering the study objectives. On the contrary, the odds of facing food inadequacy and lack of funds for food significantly shrink by respective factors of 0.085 and 0.077 with government food aid, suggesting that government food aid reduces the odds of a household facing food inadequacy and lacking funds for food by about 91.5% and 92.3%, respectively. While this result could be a signal of better targeting by the public system, compared to the church, it is worth further research. In addition, the results in Table 6 show that land ownership – ownership of a critical factor of production in smallholder agriculture – reduces chances of food insecurity (reducing odds of facing food inadequacy and lacking funds by 48.9% and 43.8%, respectively), in line with previous studies (Mota, Toma Lachore, and Halala Handiso 2019; Zingwe, Petro Manja, and Wadonda Chirwa 2023) which find that land ownership is associated with better food security; and Keovilignavong and Suhardiman (2020) who find that perceived and *de facto* land tenure security negatively affects food insecurity (Keovilignavong and Suhardiman 2020). Table 6 also shows that the odds for a male-headed household to face lack of funds for food are 25.539 times higher than the odds for female-headed households, meaning that there is a higher risk of lack of funds for the male-headed households. Higher risk of lack of funds in male-headed households could be because male-headed households tend to save more in financial and quasi-liquid assets, whereas female-headed households tend to hold more liquid family consumption assets, as was found by (Paxton 2009). Of course, in terms of overall food (in)security, mixed results have been found in the literature with finding that there are no significant differences in broad food (in)security between male- and female-headed households for Bangladesh (Mallick and Rafi 2010), and Dzanja et al. (2013) finding that food security status is positively associated with

having a male-household head (Dzanja et al. 2013). Table 6 shows that there are no significant differences in the food security status as measured by CSI.

3.5. Qualitative analysis

3.5.1. Cultural and religious prohibition against food

Through the FGDs and KIIs, it was discovered that traditional beliefs, religion, and food security are intricately linked. The villagers unanimously agreed that traditional beliefs have a significant impact on food choices through taboos; however, religious beliefs that prohibit certain foods have a much greater influence on people's food habits (FGD – village B). The FGDs conducted in both communities unveiled that traditional and religious beliefs play a vital role in determining what foods are eaten and avoided. This aligns with research showing that religio-cultural beliefs collectively influence dietary choices, traditional food acquisition methods, food combinations, processing, and preparation (Alonso 2015; Heiman, Gordon, and Zilberman 2017). For instance, in village A, where the majority of the Ngoni people live, the consumption of mice, monkeys, and pork is common. There is an abundance of pork and mice in the community, and the domestication of pigs is permitted. These foods are a significant source of animal protein for households that include them in their diet. In contrast, in village B, where the majority are Yao and Muslim, pork, monkeys and mice are strictly avoided for religious reasons. Additionally, Muslims abstain from consuming meat that has not been slaughtered according to *halaal* regulations, which includes animals that have died naturally. In Islam, "Halal" refers to anything that is permissible and lawful according to Islamic law (Sharia). On the other hand, "Haram" means something that is forbidden or prohibited in Islam. When it comes to food, "Halal" denotes foods that adhere to Islamic dietary requirements, while "Haram" refers to foods that are prohibited according to the Qur'an and prophetic tradition (Ahmed Osman 2023; Iner and Baghdadi 2021) A key informant at village B elaborated that religious teaching "stress[es] that if we eat animals that have died on their own, it is Haram" (FGD – village B). Protestant Christians in village A have complete freedom in regard to their dietary habits, as there are no religious restrictions imposed on them. In this context, it was observed that many community members indulge in food that brings them happiness, without any abstinence practices. These results are in line with the quantitative findings as reported in Tables 4 and 5. A KII in village A explained that "in [this] community, there is not much food abstinence. [I think that] in our community, many people eat things that make them happy."

Within both villages, a select few Christians adhere to the Seventh-day Adventist (SDA) religion, which prohibits them from consuming pork, rats, catfish, ducks, and *ngumbi* (flying insects that appear during the rainy season). These dietary restrictions can often lead to conflicts within households where individuals belong to differing religious groups. Despite not sharing the beliefs of the SDA religion, some family members still comply with these restrictions as a sign of respect toward those who do. These restrictions have an impact on household food choices. Religious constraints limit the consumption of locally available proteins like *ngumbi* and more affordable options such as pork. Moreover, households are unable to afford alternative animal proteins like chicken and goat meat due to their high cost.

During a men's focus group discussion, it was expressed that religious beliefs in households limit the food options of people within the villages. Participants shared their frustration with being unable to consume pork or *ngumbi* due to the presence of SDA or Muslim members. In a men's FDG (village A), participants lamented you want to eat *ngumbi* but then there is a member of Seventh Day Adventist in the household. Maybe you want to eat pork but there is a Muslim in the household. You fail to eat. This highlights the fact that religion can exert a significant impact on people's eating habits, thereby affecting families and communities. It was shared that religious regulations forced participants to avoid certain foods, even if they personally preferred them. Participants reported that "because of religion, it is not possible for a person to eat certain things no matter how much you suffer" (Women FGD Village B). The area strictly enforces Islamic dietary laws, making it impossible for people to consume food considered haram in their religion. Sometimes, these dietary differences cause conflicts and division between the two communities, as village B does not allow Christian influences from neighboring villages on their diet. While a few individuals chose to abstain from fish for personal reasons, the majority based their food choices on religious and cultural guidelines.

The residents of village B and village A adhere to cultural beliefs that significantly influence their food choices, in addition to religious restrictions. It is a widely accepted norm that children should not consume eggs, as it was once believed to cause illness, even though this belief is no longer prevalent. It was previously believed that 'Children should not eat eggs because they hurt the stomach (Women FDG, village B). This is a common practice in traditional societies across Malawi and many African countries (Dalaba et al. 2021; Reuters 2015). However, in village B, they hold additional beliefs that children should not eat goat liver and that "a pregnant woman should not eat the intestines of a goat because the child is born wearing a robe" (Women FGD, village B). It is believed that eating tripe would have negative effects on the unborn child. Cultural regulations that govern the eating habits of pregnant mothers are prevalent in many traditional societies in Malawi. However, such taboos limit food diversification and utilization of available nutritious foods which consequently can have negative implications on the nutritional status of children and pregnant women who are considered vulnerable to food insecurity (Ekwochi et al. 2016; Organization 2019). Many studies already show that sub-Saharan Africa has the highest prevalence of malnourished children in the world (Misselhorn et al. 2012; Richardson 2010; Ringler et al. 2010).

Notable cultural changes have occurred in the area, particularly in regard to food consumption. Eggs and tripe, which were previously prohibited, are now permitted for women and children to eat. These changes can be attributed to health talks provided by NGOs working in the area, as well as interactions between villages. Of course, this change has caused concern in village B, where they hold strong religious opinions toward the consumption of pork and rats. At a women's gathering in village B, concerns were expressed about children imitating the eating habits of their Christian friends in village A. They lamented that "the children of this village are playing with the children of [village A] who are Christians so they are imitating the behavior of their friends," now eating culturally and religiously forbidden food. Village A members also raised similar concerns about the influence of their Muslim in-laws on traditional food practices. These cultural

shifts have been observed in village B, as well as other communities in the region. A key informant explained:

> This community belongs to the Ngoni's from way back . . . now we are mixed with our Yao friends. Are they not married here? They have brought Islam. At home, they have stopped eating some things . . . to stop because the in-laws are home.

The recent changes in food options have expanded choices for some groups of people, but if they are not properly regulated and managed, they may lead to conflicts.

3.5.2. Choice portions

In the villages of village A and village B, men are given priority in household food distribution due to traditional values that are reinforced by their respective traditional, Islamic and Christian beliefs. It was widely reported that the men are heads of households hence should be prioritized. Within traditional family structures, men often take on the roles of "providers" and "advisors," particularly when it comes to managing the family's financial resources, ensuring the availability of food, and overseeing access to healthcare (Watson et al. 2023). As a result, they may receive preferential treatment when it comes to food, such as getting the best portion and larger quantities. Age also plays a significant role in determining food distribution, with men being the first to receive food. A key informant from village A confirmed that this is customary in their community. They explained that it is culturally expected that "father should be eating a larger portion." This tradition also applies to choice of food types and diversity.

In these communities, the drumstick holds the highest value in a meal and is exclusively reserved for husbands. In a focus group discussion conducted with men in village B, it was revealed that women prioritize giving the drumstick to their husbands over giving it to their children. The men elaborated that this is a widely accepted practice in the distribution of household food. When asked why the men are prioritized in household food distribution, the men (FDG Men, village B) explained that the "woman favours [the] husband [in] trying to take care of the family that is why she does that" FGD Men village B. Food distribution in traditional societies often prioritizes husbands over other household members, particularly in terms of access to the best and most desirable food. This cultural norm neglects the nutritional needs of those who are not male (Ekwochi et al. 2016; Reuters 2015). This means the male members in the households eat the best portions.

However, women indicated that lately the practice is changing following Malawi Government's awareness campaigns concerning children's right to food, when food is scarce, children receive priority in most households. According to a women's FDG conducted at Village A, the women explained that "in the past, it was the elders who used to eat the largest portion. Currently, it is children who get to eat the largest portion." While the quantity of food offered to children may have increased, it does not necessarily mean they are receiving the best portions of the chicken or any other food being served. On the other hand, men continue to receive the best portions of the food served.

3.5.3. Postharvest cultural practices that affect food availability at home.

Within many traditional communities, communal events such as weddings are highly valued because they bring the community together. While these events are crucial for the

sustenance of society and its cultural values, their impact on household food security is not well established. To gain further insight, we asked the communities to specify the traditional and/or religious ceremonies that occur postharvest and how they influence household food security. Members of the community identified several ceremonies and their contribution to household food insecurity. The ceremonies include weddings, initiation ceremonies, and funeral rites. Initiation ceremonies are rites of passage that indicate growth from childhood to adulthood (Werbner 2014). They explained that these social events contribute significantly to food wastage, ultimately affecting household food security. It was unanimously agreed upon in both villages that weddings, initiation ceremonies, and funeral rites contribute to household food insecurity. Traditionally, after a burial, friends and close relatives stay with the bereaved family for a few days to offer condolences. The family is responsible for providing food for those offering condolences during the funeral and for several days after. This may lead to an excess of prepared food and strain the food supply for the grieving family. It is also important to note that in both communities, initiation ceremonies and weddings occur after harvest between the months of August and September (Women FDG, village A). Similarly, *saddakah*, a ceremony where the bereaved family organizes a feast for the community in memory of a departed family member, is held after harvest. These ceremonies are conducted as rites of passage and to unite the community. Families are expected to invite the public to their initiation ceremonies, weddings, and funerals. Failing to do so is seen as improper and can lead to social scrutiny. This pressure ensures that even families with limited resources comply with the community's expectations for such events to occur throughout the year (Margolies, Aberman, and Gelli 2017).

The event dates are strategically chosen to align with the harvest season, as sustenance is a necessity. These rituals are important to the community because they provide opportunities for networking and celebration and closure for the family as they celebrate the life of the recently deceased family member. During these festivities, the community has observed a significant amount of food waste. This may be attributed to the challenge of estimating the number of attendees at these public gatherings, resulting in the preparation of surplus food and subsequent wastage. Mike Mtika offers an alternative explanation that the grieving family received food assistance from the community for several days after the funeral and may have benefited from this food assistance (Mtika 2000, 355). In practice, the community often contributes only small portions, leaving the bereaved families responsible for feeding everyone at the funeral. Traditional leaders have recently urged communities to cease holding these communal feasts during funerals. Senior Chief Lukwa has gone so far as to ban the feasts in his area, stating emphatically, "I don't want any chief to force bereaved family members to feed people who come to funerals. There is a serious problem in our midst, and we must allow families to preserve whatever little food they have"(Mkubwi, n.d..). Certain members have questioned the pertinence of adhering to traditional customs and rituals postharvest. The women FDG's (village B) response was sarcastic in nature. The women explained:

> Now the spirits have stopped eating wherever they are, it is waiting till we harvest. It's because of our ignorance. We sell food to buy a uniform for the initiation ceremony. Most people don't notice. Just because we don't have someone to warn us on the effects of food insecurity.

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Community members feel obligated to engage in certain practices that affect their food security, despite being aware of the negative impact. To make a change, there must be a negotiation at a societal level to determine the best way to preserve traditions and practices without disrupting communal structures. Additionally, best practices for food usage should be established.

A key informant at village B was firm in the belief that "these traditional practices bring about hunger in households." It is imperative that the community understands the gravity of the situation in regard to social events and food security. The devastating effects of household food insecurity on families and the community cannot be ignored.

The analysis is supported by the fact that many households reported experiencing hunger during the months of November to January. This resulted in people having to consume less desirable food or going without food for days due to a shortage of food. It can be argued that social events are not hosted by households every year, so their impact may be limited and not affect the household's food situation. However, it is essential to note that in traditional societies, social events are community activities involving everyone. Our survey respondents explained that they are expected to contribute food to these events, even if they are not held in their homes. During a men's FGD in Village B, participants explained that "during funerals, people contribute food so that those coming from far can eat even those who stayed long at the funeral they need food." Moreover, the community is expected to provide food to the bereaved family, but this does not extend to events such as weddings and initiation ceremonies. A KII in Village B explained that

> The difference is that during funerals, everyone contributes. However, if it is something that an individual wants, such as weddings or initiation ceremonies, it is the wish of the individual. Therefore, it is the responsibility of the one who wants to have a feast or party.

Likewise, in Village A village, both FGD and KII participants agreed that there is a social expectation for residents to contribute food during funerals.

However, some members compete to outdo each other, leading to people selling food to sponsor social events, especially weddings and initiations. During a men's FGD in Village B, it was mentioned that "people challenge how they prepared for the ceremony of their child" in reference to financial preparations for their child's initiation ceremony, leading to overspending on food. It was further stated that "sometimes people do the ceremony when they have only 3 bags, but because of pride, food is misused" (Men's FGD, Village B). On average, each person in Malawi consumes about 9.5 kg of maize per month (Landani and Roberts 2024). This means that every individual needs about 3 bags of 50 kg of maize for their sustenance throughout the year. A family that only harvests 3 bags of maize is not food secure, and hence the respondents argued that maize is being misused during initiation ceremonies. For households with higher poverty rates and low agricultural productivity, these activities increase their vulnerability to food shortages, impacting their food security status. Collectively, social practices and religious and cultural restrictions on food affect the food status of communities.

Respondents mentioned eating *nsima* made from maize husks for sustenance, even though it has poor taste. It was further explained that "in the month of December and January we usually rely on Mangoes but now problems will continue since its period is over" (Key Informant, Village B). During periods when the Mangoes are out of season, it was reported that people can go for a day without a meal. In a key informant interview at Village B, one member informed us that they "depend on those who are kind enough to give me food. Sometimes I go three days without eating."

> "Some will even go for a day without eating, no breakfast no lunch or supper. We live so close to each other that we can notice that there is no smoke coming from one's household, meaning that they didn't cook anything. Some of us go to the farm in the morning without taking any food, and when we come back home, we still don't have any food." Women FDG, Village A

Similar sentiments were echoed in Village B village, where people resort to tying to their empty stomachs due to hunger. At a women's FDG, they explained that "In hunger times, I take a handkerchief and tie it around the stomach so that there should be no movement in the stomach. Hunger is a beast. A hungry man cannot tie a tie around his neck."

It was suggested that there is a need to introduce irrigation farming "for people to have food between the months of December and January" Women FDG Village A. It is imperative to address the issue of excessive food usage during the social events mentioned earlier, as it may result in the waste of produce and cause food insecurity in households, despite irrigation activities. Therefore, there must be social action and intervention to regulate food consumption during such occasions. The cycle of initiations, weddings, and funeral festivals that follow the harvest season often leads to food wastage and must be curbed.

4. Conclusion

The study offers a valuable and insightful perspective on the intricate relationship between food security, traditional beliefs, and religion. Its primary objective was to evaluate the impact of these interrelated factors on the prevalence of food insecurity in rural areas of Malawi using two villages in Machinga district as case studies. The study's findings underscore the critical and often overlooked role of cultural practices, such as weddings, funerals, and initiations, in determining the availability of food in households. The research also highlights the strong association between food insecurity and cultural influences, with food consumption choices being significantly influenced by religious and traditional beliefs. Therefore, it is crucial to account for cultural factors when crafting food security policies and interventions.

The research findings indicate that indigenous and religious communities are influenced by beliefs that significantly impact household food security. The study reveals that food not only fulfills a biological need but also serves as a means of expressing ethnic and religious identity, leading to a sense of belonging within the community. It is important to note that these differences affect household food security, meaning that neighboring households in the same area may have varying levels of food security due to distinct ethnic and religious beliefs and practices. As a result, efforts to improve household food security will yield different results in

neighboring communities due to the contextual influence of cultural and religious factors. The research concludes that incorporating cultural factors into food security policies can lead to the development of more effective and efficient policies and interventions. This can create a more sustainable and equitable food system that ensures food security for all.

Notes

1. Here we do not use actually village names to ensure anonymity given that we surveyed a high proportion of households in each village.
2. Refer to the United Nations Fact Sheet at https://www.un.org/esa/socdev/documents/youth/fact-sheets/youth-definition.pdf.
3. (National Statistics Office 2012, National Statistics Office of 2020)

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