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Full Length Research

Gender Dynamics and Food and Nutrition Security in Sub-Saharan Africa – A systematic review

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Abstract: This systematic review examined the relationship between gender dynamics and food and nutrition security in sub-Saharan Africa. Synthesising findings from 34 articles published between 2014 and 2023 in 15 countries in sub-Saharan Africa, the review reveals a scarcity of research on this critical topic, with Kenya leading in publications. The findings highlight the vital role women play in ensuring food and nutrition security, despite facing significant constraints, including unequal access to resources, cultural norms, and power dynamics that perpetuate gender gaps. The studies demonstrate that women's empowerment is crucial for improving food and nutrition security outcomes, particularly in the context of smallholder farming systems. However, gender differences in access to and control over resources, decision-making power, and cultural norms hinder women's ability to fully contribute to food and nutrition security. Addressing these disparities is essential for achieving sustainable food and nutrition security in sub-Saharan Africa. The review's findings have implications for policy and practice, highlighting the need to prioritize gender-sensitive approaches to food security interventions and support women's empowerment in agriculture. By recognizing and addressing gender dynamics, we can unlock the potential for sustainable food security and improved nutritional outcomes in sub-Saharan Africa.

Keywords: Gender, Food Security, Nutrition Security, sub-Saharan Africa, Women.

1. INTRODUCTION

In sub-Saharan Africa, the intersection of gender dynamics and food and nutrition security presents a critical challenge that impacts the region's overall development. Gender roles, shaped by socio-cultural norms and economic factors, significantly influence food production, access, and consumption patterns. Women play a pivotal role in agricultural activities, yet they often face systemic barriers that limit their contributions to food security and nutrition (Sharma et al., 2022). Understanding these gender dynamics is essential for developing targeted interventions to enhance food security and nutritional outcomes, especially in a region characterized by high food insecurity and malnutrition (World Bank, 2023).

Food and nutrition security, according to the United Nations Standing Committee on Nutrition, is when all

people at all times have physical, social, and economic access to food that is consumed in sufficient quantity and quality to meet their dietary needs and food preferences and is supported by an environment of adequate sanitation, health services, and care, allowing for a healthy and active life. According to the Food and Agriculture Organization (FAO), food and nutrition security involves multiple dimensions, including food availability, access, utilization, stability, agency, and sustainability (FAO, 2020). However, gender inequalities deeply affect these dimensions. Women are typically responsible for food preparation and nutritional care within households but often lack access to crucial resources such as land, finance, and education (Doss et al., 2021). These disparities impede women's ability to secure adequate food for their families and restrict their

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decision-making power regarding food choices and dietary practices (Duncan et al., 2023). The resulting inequalities contribute to a persistent cycle of poverty and malnutrition, disproportionately affecting women and children (FAO, 2022).

Gender is defined as the perception of the roles, responsibilities, and capabilities of men and women in society (FAO, 2020). Gender norms in Sub-Saharan Africa vary from one community to another. Nonetheless, there are some common similarities. For example, women have limited control over family farms, play a limited role in decision-making, perform household chores, and are restricted from venturing into new activities without the approval of their spouses. These gender norms determine socially acceptable behaviors for men and women and, as a result, shape women's empowerment opportunities (Jayachandran, 2021; Bullough et al., 2022). These informal, unwritten social rules influence the gender gaps between men, women, and gender-diverse people because they determine key opportunities for women's empowerment in agriculture.

Despite women's critical role in food production and family nutrition, they encounter significant obstacles that prevent them from fully participating in food systems (Boserup et al., 2023). Additionally, agricultural policies often fail to consider the unique needs of women, leading to inefficient resource allocation and inadequate nutritional outcomes (UN Women, 2023). Addressing these challenges necessitates a comprehensive understanding of the multifaceted relationship between gender and food security. This review synthesised current literature on gender dynamics in sub-Saharan Africa, highlighting empirical studies and theoretical frameworks that elucidate how these dynamics influence food and nutrition security. The review noted that gender differences in access to and control over resources, decision-making power, and cultural norms hinder women's ability to fully contribute to food and nutrition security. By identifying gaps in knowledge and offering insights into effective interventions, this review aims to inform policymakers, practitioners, and researchers focused on improving food security and nutritional health in the region.

2. METHODOLOGY

To present a high-quality synthesis of literature on how gender dynamics affect food and nutrition security in sub-Saharan Africa, a systematic literature review approach was thought to be the most appropriate. This is because it can reveal current knowledge about gender dynamics and food and nutrition security in sub-Saharan Africa and identify gaps and opportunities for future research. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses

(PRISMA) guidelines to ensure transparency, rigour, and replicability in the review process (Moher et al., 2009). Hence, the data-gathering procedure used includes article identification, article screening, data coding and extraction, eligibility assessment, and document selection.

2.1. Literature Search Strategy

A comprehensive literature search was conducted using Google Scholar and Scopus electronic databases. The search strategy used a combination of keywords and phrases related to the topic: gender dynamics, food and nutrition security, and sub-Saharan Africa. Boolean operators (AND, OR) were used to refine the search results.

As the first step in article identification using Google Scholar, a preliminary search was conducted using the query string "Gender Dynamics" AND "Food and Nutrition Security" to broadly cover the subject to build a solid string of keywords for subsequent queries. Following this, titles, abstracts, and keywords of potentially relevant papers were scanned to capture alternative keywords that were included in subsequent searches to obtain relevant literature. This process identified a final set of pertinent keywords from the most frequently used terms. Using the Boolean operators, the following search strings were applied in the final search: "Gender Dynamics" OR "Gender Roles" OR "Gender Dimensions" AND "Food and Nutrition Security" AND "sub-Saharan Africa" (see Appendix II).

Similarly, the following keywords were used in Scopus to build the search string: "Gender Dynamics" OR "Gender Roles" OR "Gender Dimensions" AND "Food and Nutrition Security" AND "sub-Saharan Africa" (see Appendix). These search strings helped identify potentially relevant papers for achieving the study's objectives.

2.2. Study Selection Process

Initial screening was done to identify study titles and abstracts that are relevant based on the inclusion and exclusion criteria. Full-text articles of potentially relevant studies were retrieved and assessed for eligibility. Data was extracted from the selected studies into Excel. Extracted data included the author(s), year of publication, study location, research objectives, methodology, key findings, and implications for practice and policy.

2.3. Literature Inclusion and Exclusion Criteria

The review included studies published from January 01, 2014, to December 31, 2023. Peer-reviewed journal

articles, conference papers, policy briefs, and reports comprised this review. Studies focusing on gender dynamics and food and nutrition security in Sub-Saharan Africa, articles written in English, and studies that provided empirical data on the topic were included. Studies published before January 01, 2013, or after December 31, 2023; articles not available in full text; studies not focused on sub-Sahara Africa; articles not written in English; and opinion pieces, editorials, and commentaries without empirical evidence, as well as reviews, were excluded.

Database searches turned up 3499 records in total (3460 from Google Scholar and 39 from Scopus). The titles and abstracts of peer-reviewed articles, report titles and executive summaries (or a suitable portion of the texts), and the complete texts of websites and blogs were used to filter the first 3499 entries that were found. If an article was redundant, had no direct connection to the

subject matter, or contained no concrete instances of gender dynamics and food and nutrition security in the literature, it was disregarded. Also, duplicated studies from both searches in Google Scholar and Scopus were taken notice of and screened to keep only one source of those publications. Papers, reports, conference proceedings, primary research publications, and other websites and blogs were cited whenever gender and food and nutrition security were mentioned. Following screening, 3421 items were not included in the analysis.

An item's eligibility for inclusion was assessed after reading it through to the end. After evaluating 78 records for eligibility, 44 articles were deemed ineligible for further analysis based on a review of their complete texts. At this stage, we disqualified articles that did not explicitly or directly address gender dynamics and food and nutrition security in the literature. The eligibility evaluation led to the inclusion of 34 publications in the study.

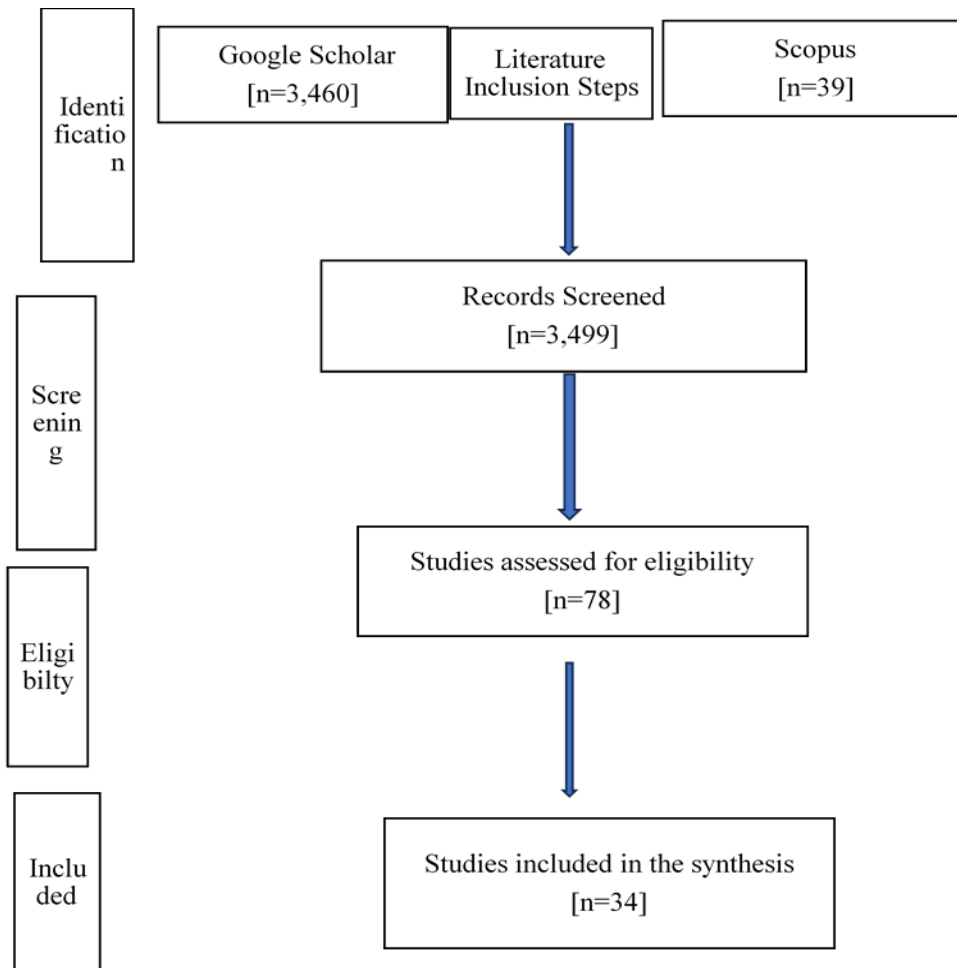


Figure 1: Article retrieval strategy adapted from PRISMA framework

2.4. Data coding and extraction

After selecting the articles, we read the complete text of each publication to extract pertinent data for further examination. A template for data extraction was developed in order to remove human error and streamline documentation. It collected and summarized pertinent information from the chosen articles. Additionally, every article's metadata was noted and categorised based on the author, the year it was published, the journal source, the country of the study, theme areas, methodology, and significant discoveries. Using the data extraction template in this step simplified the descriptive and thematic analyses carried out in the review. The geographic coverage for the systematic analysis, which utilized data from abstracts and keyword searches, was also included in this systematic review. Every piece of data that was obtained was assessed descriptively.

To organise the results into logical groups pertaining to the study's goals, thematic analysis was performed. The analysis was to give readers a thorough grasp of how gender dynamics impact food and nutrition security at the household level in sub-Saharan Africa.

2.5. Limitations

The systematic review acknowledged several limitations. First, the exclusion of non-English studies and the restricted access to full-text articles for some potentially relevant studies could lead to publication bias.

3. RESULTS

This systematic review aimed to synthesise the existing evidence on the intersection of gender dynamics and food and nutrition security in sub-Saharan Africa. After conducting a comprehensive search of multiple databases and screening a total of 3,499 articles, we identified 34 studies that met our inclusion criteria. These studies, published between 2014 and 2023, provide

valuable insights into the complex relationships between gender, food security, and nutrition outcomes in the region. The results of our review are presented below, organised thematically to highlight the key findings related to gender dynamics and food security, women's empowerment and nutrition outcomes, and the gendered impacts of food insecurity. Our findings have significant implications for policy and practice, highlighting the need to prioritize gender-sensitive approaches to addressing food and nutrition security in sub-Saharan Africa.

3.1. Analysis of yearly publication trends

According to the results of the systematic review, Scopus and Google Scholar published a total of 34 articles on gender dynamics and food and nutrition security in sub-Saharan Africa from 2014 to 2023 (see Fig. 2). The last decade has not seen much academic attention to gender dynamics and food and nutrition security in sub-Saharan Africa. For instance, in 2014 and 2015, the topic and the study area received only one publication each. Only two (2) publications each in 2016 and 2018 met the inclusion criteria. In 2019, Scopus and Google Scholar published three (3) articles. Since 2014, 2023 has seen the highest number of articles published, with nine (9), followed by four (4) in 2017, 2020, 2021, and 2022.

Analysis of the yearly trend indicates that even though the number of publications increased in 2023, the volume of publications on the topic has always been low. Numerous factors, such as limited research funding (FAO, 2017), lack of gender-disaggregated data (World Bank, 2020), limited attention to gender in food security policies (Gender in Agriculture, 2018), methodological challenges in studying gender dynamics (Peterman et al., 2014), and dominance of male-centric approaches in agriculture (Sachs et al., 2019), may contribute to the low volume of papers published on gender dynamics and food and nutrition security from 2014 to 2023.

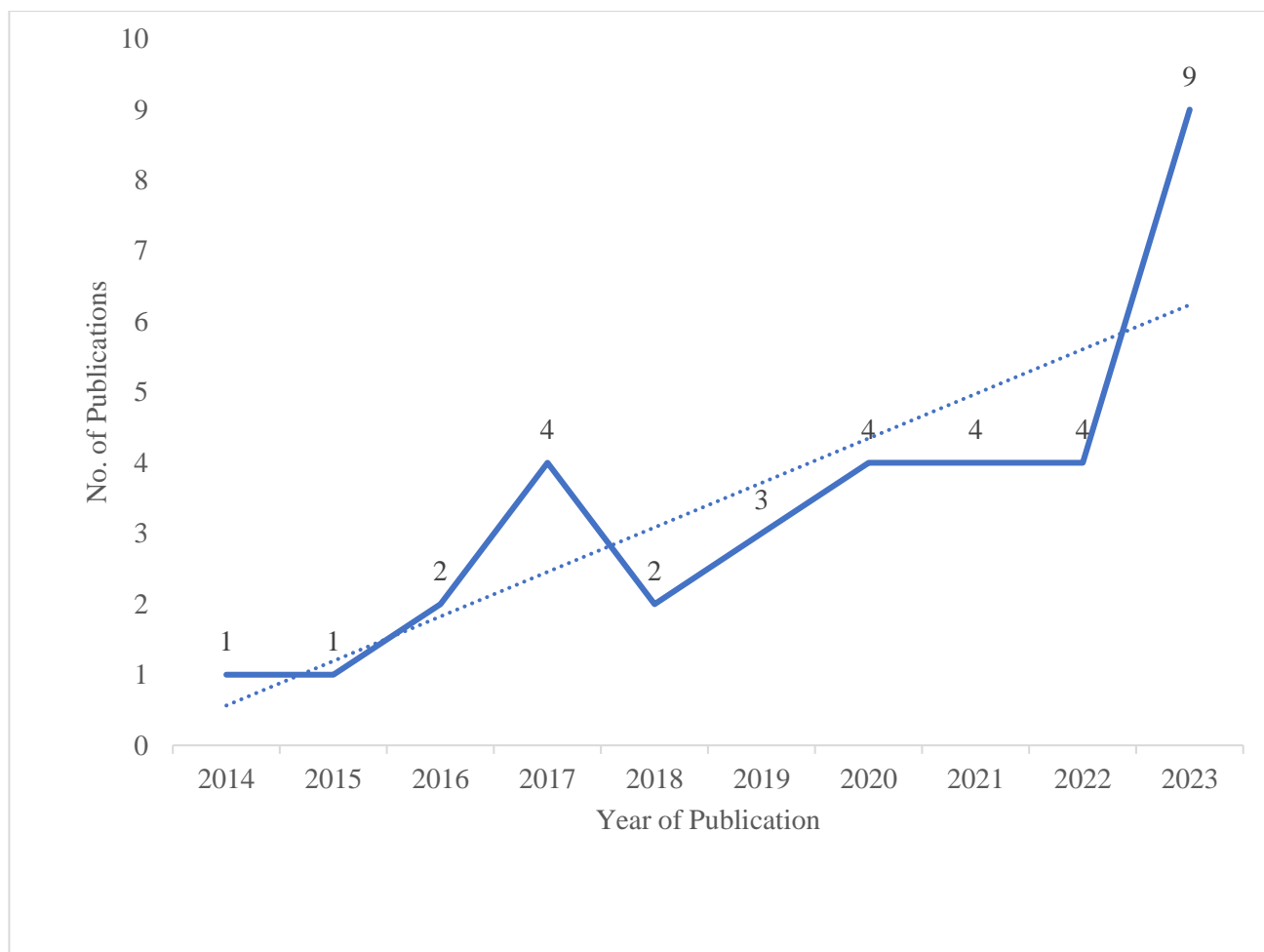


Figure 2: Yearly Publications Trend

3.2. Analysis of the publication's distribution across sub-Saharan Africa

The review uncovered 34 published studies on gender dynamics and food and nutrition security in 15 sub-Saharan African countries from 2014 to 2023. From Figure 3 below shows that Kenya conducted more studies (7) than any other country in sub-Saharan Africa in this review. the highest number of publications at seven (7), followed by Ghana and South Africa, each with four publications, and Malawi with three. Other countries had two (2) or fewer published articles, highlighting the varying levels of research output across the region within the period under review. The Kenyan government has implemented policies promoting gender equality in agriculture, such as the

National Gender and Equality Commission (NGEC), which can drive funding and research priorities (Wangari, 2014). Also, numerous NGOs, like CARE and Oxfam, engage in gender and nutrition projects, often collaborating with local researchers, which boosts publication rates (Ochieng et al., 2015). Limited funding may account for the limited number of publications (just one each) from Burundi, Tanzania, Zambia, and Niger on gender, food, and nutrition security between 2014 and 2023. Limited financial resources for research can hinder studies on gender and nutrition issues, affecting publication volume (Mwenda et al., 2022). Also, the focus on gender and nutrition may not be prioritised in the national policies of those countries, leading to fewer research initiatives in these areas (Chikowo et al., 2021).

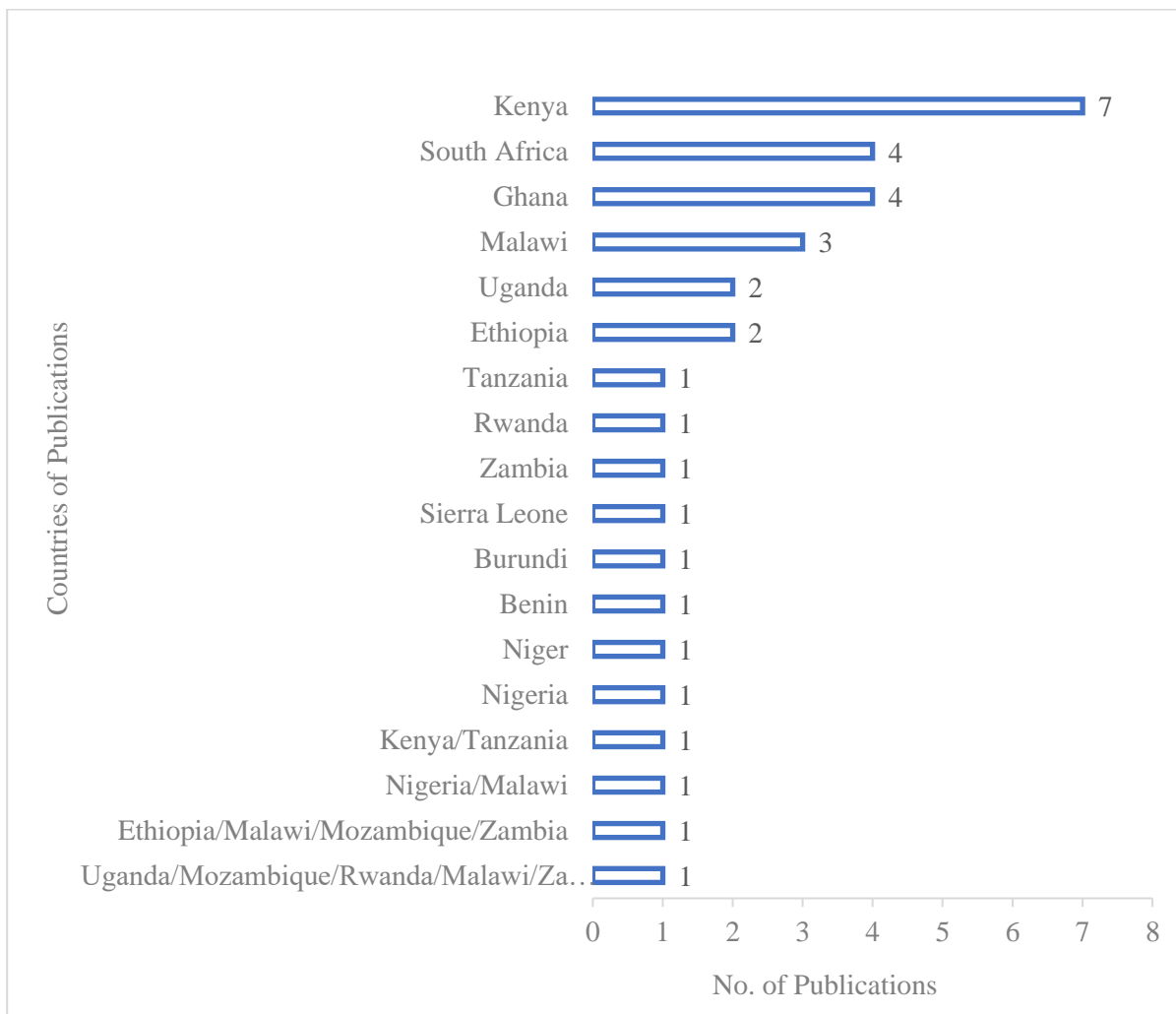


Figure 3: Publications Distributions across Countries

3.3. Gender indicators

This systematic review identified several key indicators reflecting the interplay between gender and nutrition in sub-Saharan Africa. As seen in the figure below, the most frequently cited factor was access to economic resources, mentioned in nineteen (19) publications, followed closely by access to land for agriculture (16) publications) and decision-making power (15 publications). Other important indicators included cultural norms (10 publications) and the division of labor

(9 publications). Conversely, only two (2) studies discussed power dynamics and food allocation, whereas eight publications discussed dietary practices. These findings highlight the critical roles economic access and access to agricultural resources play in shaping gender dynamics within food and nutrition security while also pointing to underexplored areas such as power relations and food distribution.

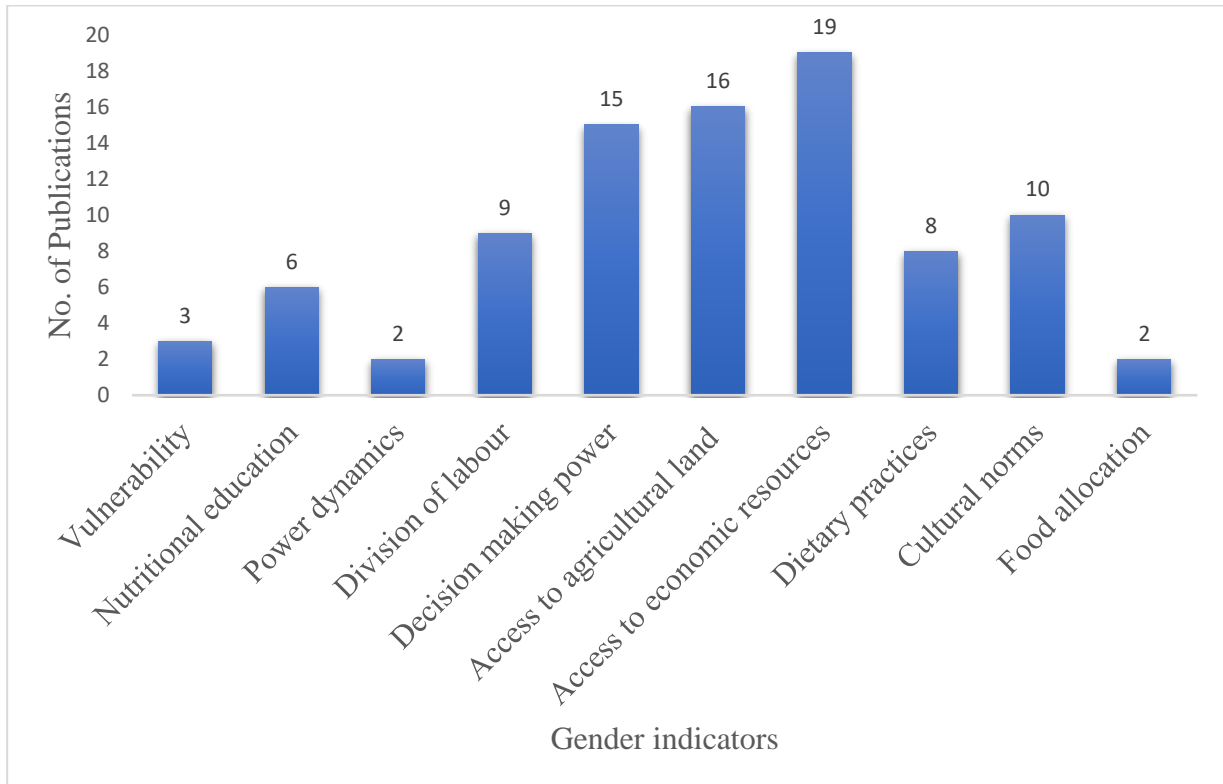


Figure 4: Gender indicators Cited in the Literature.

3.4. Summary of indicators of gender dynamics and food and nutrition security in the reviewed articles.

This systematic review synthesises findings from a range of studies, highlighting key indicators that shape gendered experiences within the context of food and nutrition security. The factors highlighted include access

to economic resources, access to land for agriculture, decision-making power, cultural norms, and dietary practices as being mentioned and discussed by various researchers. The table below summarises the key findings from the reviewed articles, providing a comprehensive overview of the most prominent themes and indicators identified in the literature.

Table 1: Summary of publications

Author (s)	Title of Publication	Country	Gender Indicators	Major Findings
Atere et al. (2023)	Gender contribution to rural household food security: An investigation of the role of women in smallholder farming systems in Osun State, Nigeria	Nigeria	Division of labour Decision making power dynamics.	Women's specific roles and responsibilities in smallholder farming systems positively contribute to food security in rural households
Ayamga et al. (2023)	Women empowerment and food-nutrition security in Sierra Leone: The Gender Model Family approach	Sierra Leone	Division of labour Decision making power Access to agricultural land Dietary practices Cultural norms	Women empowerment enhances outcomes in food and nutrition security, there has been a change in social rules about men taking part in domestic household work and women involvement in family decision-making.
Egyir et al. (2023)	Feeding the future in Ghana: Gender inequality, poverty, and food insecurity	Ghana	Division of labour Decision making power	Regarding gender roles, activities are not as rigidly divided between male and female only activities as in the past; today, girls may engage in work like construction and boys may engage in fetching water, cooking, and caring for babies
Nchanji et al. (2023)	Land tenure, food security, gender and urbanization in Northern Ghana	Ghana	Access to agricultural land Access to economic resources	In order to provide soup for the household while not having access to enough land, women often work on the farms of their husband or other male kin during harvesting.
Fanworth et al. (2023)	Gender roles and masculinities in leveraging milk for household nutrition: Evidence from two districts in Rwanda	Rwanda	Division of labour Decision making Access to economic resources Nutritional education Dietary practices Cultural norms Health services Vulnerabilities	A limited number of men accompany their wives to child growth monitoring sessions and other child health care training and check-ups. This boosts wives' morale and increases the likelihood of their attending all sessions and similar meetings.
Meclowitz et al. (2023)	Women's empowerment and child nutrition in a context of shifting livelihoods in Eastern Oromia, Ethiopia	Ethiopia	Access to economic resources Dietary practices Nutritional statuses	Women empowered in leadership were more likely to report having children who consumed animal source food compared to women who were not empowered.

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Ranucci et al. (2023)	Gendered effect of climate shocks on resilience to food insecurity: the role of kinship norms	Malawi	Vulnerability Adaptation Decision making Division of labour	We provide new evidence that gender gaps in food security and vulnerability to shocks are driven by sociocultural factors that contribute to determining different access to resources and decision-making power for men and women.
Gulema et al. (2023)	Influence of engaging female caregivers in households with adolescent girls on adopting equitable family eating practices: a quasi-experimental study	Ethiopia	Dietary practices Cultural norms Policies and program Food allocation	The involvement of influential adult community members significantly improves the family practice of eating together in households where adolescent girls are present in our study
Nchanji et al. (2023)	Gender norms and differences in access and use of climate-smart agricultural technology in Burundi	Burundi	Decision making Access to land and agriculture Access to economic resources Adaptative strategies	Joint decision-making, access to information, and collective action in groups reduced gender gaps in bean production and gender differences in access to and use of climate-smart technologies
Agyei-Mantey et al. (2022)	Unraveling the effect of gender dimensions and wood fuel usage on household food security: Evidence from Ghana	Ghana	Decision making Access to land and agriculture Access to economic resources Nutritional education	Among male headed households and female headed households, the results shows that the use of fuel wood predicts household food security status in Ghana.
Etim et al. (2022)	Gender Differentials in Income Inequality, Poverty and Food Insecurity Among Artisanal Crayfish Harvesting Households in the Niger Delta Area, Nigeria	Niger	Division of labour Decision making Cultural norms	Bias and discriminatory laws and norms; giving women restrictive access to productive resources, undermining their views in decision making, limiting their powers and authority accounts for gender differential gap in poverty and food insecurity in the study area
Mwaura et al. (2022)	An assessment of status and determinants of food security in female-headed households in Nairobi County, Kenya	Kenya	Access to economic resources	Household heads and household sizes are not significant factors that can influence the food insecurity in female-headed households in Nairobi.
Dzanku et al. (2021)	Gender, agricultural commercialization, and food security in Ghana	Ghana	Access to agricultural land Cultural norms	A combination of several factors, namely agroecology, gender, and choice of measurement indicators are implicated in the food security outcomes of agricultural commercialization.

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Tedoff and Pauley (2021)	Women's agency, nutrition, and food insecurity: A four-country field study on women and children in sub-Saharan Africa	Ethiopia Zambia Mozambique Malawi	Decision making power Dietary practices	There was evidence that special nutritional attention is given to vulnerable groups in the household that is pregnant women and children.
Kihiu (2021)	Gender, Access to Agricultural Resources and Food Security in Kenya	Kenya	Access to economic resources	the dimensions of women's empowerment that matter most in increasing household's food consumption cost are input in productive decisions, and control over use of income and group membership
Galie et al. (2021)	Intra-household handling and consumption dynamics of milk in peri-urban informal markets in Tanzania and Kenya: A gender lens	Kenya Tanzania	Decision making Access to economic resources Dietary practices Cultural norms Food allocation Power dynamics	Kenyan men and women respondents were particularly aware of the nutritional importance of milk, particularly for children.
Tsvuura et al. (2021)	Gender-Differentiated Contribution of Goat Farming to Household Income and Food Security in Semi-arid Areas of Msinga, South Africa	South Africa	Access to economic resources Access to agricultural land	Female-headed households were less food secure than male-headed households because they did not have reliable employment to provide adequate and nutritious food for their households.
Onah et al. (2020)	Approaches to understanding and measuring women's empowerment and its relationship with women's and children's dietary diversity in sub-Saharan Africa.	Rwanda Uganda Zambia Mozambique Malawi	Food allocation Power dynamics	Economic empowerment might be beneficial for the consumption of nutrient-dense food items including flesh proteins that are expensive for women to purchase, while autonomy, including in having input in production, might be beneficial for the consumption of nutrition-vital dairy and dairy products, fruits and vegetables for women and children
Estrada-Carmona et al. (2020)	A gendered ecosystem services approach to identify novel and locally-relevant strategies for jointly improving food security, nutrition, and conservation in the Barotse Floodplain	Zambia	Access to economic resources Access to agricultural land Nutritional education Dietary practices	Crops and fields cultivated by women potentially complement household diets with essential nutrients such as vitamin A.
Peters et al. (2020)	Understanding nutrition transition among internal rural-to-urban migrant women in Kenya.	Kenya	Dietary practices	Studies showed no clear differences between rural-to-urban migrant women's and urban non-migrants' diets

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Po et al. (2020)	Associations between maternal participation in agricultural decision-making and child nutrition in semiarid Kenya	Kenya	Decision making Access to agricultural land Access to economic resources Nutritional education Dietary practices	We find a statistically significant positive association between child growth and maternal participation in agricultural decision-making.
Ragasa et al. (2019)	Does providing agricultural and nutrition information to both men and women improve household food security? Evidence from Malawi	Malawi	Access to agricultural land Division of labour Education Dietary practices	women are frequently given the responsibility of attending training and meetings without their spouses.
Nyirenda et al. (2019)	Impact of land policies and women empowerment on dietary diversity and calorie intake in Malawi	Malawi	Access to economic resources Access to agricultural land Dietary practices	Our findings show that women's empowerment is a better determinant of household nutrition status.
Alaofè et al. (2019)	The impact of a solar market garden programme on dietary diversity, women's nutritional status and micronutrient levels in Kalalé district of northern Benin	Benin	Nutritional status Health services Cultural norms	Improving mothers' dietary intake and anaemia prevalence supports the need to integrate gender-based agriculture to improve nutritional status.
Dunga et al. (2018)	A gender analysis of household food insecurity in the South Eastern region of Malawi	Malawi	Power dynamics Vulnerability	Female-headed households employ more coping strategies as compared to their male counterparts, indicating vulnerability to food insecurity
Kassie et al. (2018)	The nutrition impacts of women's empowerment in Kenyan agriculture: Application of the multinomial endogenous switching treatment regression	Kenya	Decision making Access to economic resources	The analysis shows that women's empowerment has a positive and significant effect on women's and households' dietary diversity scores.
Mnimbo et al. (2017)	Gendered impact assessment on food securing upgrading strategies: Results from Three methodological approaches	Tanzania	Cultural norms	Men considered social relations in the community and in the household more important for food security than women did.
Forsythe and Lora (2017)	The impact of staple crop value chain participation on the livelihoods of smallholder farmers in Nigeria and Malawi: changes in poverty, gender relations, and food security	Malawi and Nigeria	Decision making Division of labour	Many women did not use high yielding cassava varieties because they were uncertain about their effectiveness or did not receive them from extension agents.

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Po et al. (2017)	Understanding the Relationships between Women's Access to Land Resources and Household Food Security in Eastern Kenya	Kenya	Access to agricultural land Access to economic resources Dietary practices	Children six to 16 months old are commonly breastfed and consume weaning food. In comparison, older children in our study likely required less attention from their mothers, enabling mothers to re-engage in agricultural production and increase their participation in farm decision-making.
Mothibi & Katlego (2017)	Strategies to enhance the recognition of Indigenous African Women in food security	South Africa	Decision making Access to agricultural land Access to economic resources Nutritional education Dietary practices	The study found that indigenous African women of Lokaleng, like any other women in South Africa and in most developing countries, are the mainstay of small-scale agriculture, farm labour, and day-to-day family subsistence, hence these women's efforts to ensure food security can only be realised if the full potential of women is acknowledged
Tibesigwa et al. (2016)	Assessing gender inequality in food security among small-holder farm households in urban and rural South Africa	South Africa	Access to land and agriculture Access to economic resources Vulnerability	We find that the contribution of agriculture to food security is higher in female headed households, especially those in rural areas.
Tibesigwa et al. (2016)	Small-holder farming, food security and climate change in South Africa: male-female and urban-rural differences	South Africa	Decision making Access to agricultural land Access to economic resources	We observe that the contribution of agriculture to food security is higher in female- than in male-headed households, especially those in rural areas and that the gender of the head of household determines the level of food security
Covarrubias et al. (2015)	The role of crop diversity in household production and food security in Uganda: A gender-differentiated analysis	Uganda	Access to agricultural land Access to economic resources	The production and productivity gap was estimated at approximately 30 per cent, with female-managed land generating less output overall and per acre than male or mixed managed land.
Simiyu & Foeken (2014)	Gendered divisions of labour in urban crop cultivation in a Kenyan town: Implications for livelihood outcomes; [Divisiones del trabajo generizadas en los cultivos urbanos en una ciudad de Kenia: Implicancias para los medios de vida]	Kenya	Economic resources Power dynamics Division labour	With regard to livelihood outcomes, women's labour contributed more directly to household food security, although men were increasingly getting involved in subsistence farming, which held prospects for improved productivity and therefore enhanced household food security

3.4. Gender Roles and Responsibilities

Gender roles and responsibilities refer to the societal expectations and norms that dictate how individuals should behave based on their gender (Buchmann & Charles, 2021). These roles often assign specific tasks, behaviours, and responsibilities to men and women, influencing their opportunities and experiences in various aspects of life, such as work, family, and community engagement (Koenig et al., 2021).

3.4.1. How gender affect roles in food production, preparation, and distribution.

A Nigerian study reveals a moderate positive impact of gender roles and responsibilities in smallholder farming systems on food security in rural households. The significant and positive coefficients suggest that women's specific roles and responsibilities in smallholder farming systems positively contribute to food security in rural households (Atere, 2023). Tedoff (2021) noted that women reported receiving assistance from both men and women in gathering and preparing food. In Sierra Leone also, evidence suggests that women's empowerment improves food and nutrition security, as societal norms regarding men's participation in domestic household work and women's involvement in family decision-making have changed. Ayamga et al. (2023) asserted that empowering women plays a crucial role in managing household food and nutrition security, fostering the consolidation of household food systems, enhancing nutrition intake, and combating food insecurity. In Kenya, Simiyu et al. (2014) opined that, with regard to livelihood outcomes, women's labor contributed more directly to household food security, although men were increasingly getting involved in subsistence farming, which held prospects for improved productivity and therefore enhanced household food security.

According to Ayamga et al. (2023), the gender division of labor traditionally drawn between men and women seems to be changing after the introduction of gender-model family principles. The target participants were content to participate in the division of labour for reproductive and productive tasks related to domestic chores, such as gathering food, cooking, fetching water, maintaining their sanitation facilities, and caring for their children. The men stated that they assist their wives by equally sharing the household activities. The women confirmed this by stating that their men support them in the daily house chores, especially when they are away. The husbands asserted that the family members collectively share the workload, thereby alleviating their wives' burden. Both participant groups argued that there is a more equal share of work in the household now than before.

However, Egyir et al. (2023) reported that in Ghana, despite an increased acceptance of males (particularly boys) assisting with housework and childcare, the majority of such work still falls on females in the study sites. Study participants perceive a shift in the strict gender division of activities. They perceive a greater flexibility in how roles are defined, with both males and females engaging in a wider range of activities. Participants asserted that in their communities today, girls may participate in tasks labeled as "difficult" (e.g., construction, repairs, and large animal rearing), while boys may engage in tasks considered "soft and for females" (e.g., fetching water, cooking, and caring for babies). The respondents perceived childcare as one of men's most common household tasks, with one caveat: when men are at home with children, they prefer to care for them by watching them play, playing with them, or putting them to sleep, rather than engaging in any other activity besides construction.

Ragasa et al. (2019) conducted research in Malawi, revealing complex patterns of gendered management and division of labour in farming. Ragasa et al. (2019) found no clear evidence of men's versus women's crops, and found that female and male household members jointly manage and attend to most farms in Malawi. Joint management by women and men is associated with greater household food security than separately managed plots. Joint ideas and efforts towards plot productivity may contribute to this. In their study in Rwanda, Farnworth et al. (2023) reported that in households that are female-headed, women are forced to look for a male neighbor or elder son to help with milking. Women explained that they shoulder the responsibility for milk in the kitchen: "Women boil raw milk before they give it to their children." On the rare occasion when the wife is not around, a man boils milk. (Farnworth et al., 2023)

3.4.2. Differences in who makes decisions about food resources and nutrition within households and communities.

In Rwanda, men dominate decision-making processes, including which livestock or livestock products to sell, where to sell, and how to allocate the income. When asked who makes decisions about buying animal-source foods, most men and women responded that husbands and wives jointly make these decisions, but men ultimately make the final decisions (Farnworth et al., 2023).

Additionally, reports indicate that both men and women purchase milk in Kenya, whereas in Tanzania, men are more likely to do so. In both countries, women generally purchase smaller quantities than men. According to Galiè et al. (2021), this may be due to women's generally limited financial resources and the belief that men are

responsible for ensuring a sufficient supply of milk in the home. house. Galiè et al. (2021) reported that women bear the responsibility of putting milk on the table and ensuring everyone's well-being, but they may not have the ability to determine the necessary quantity or source. Men's failure to provide women with sufficient decision-making space and financial resources can overshadow their ability to ensure everyone has enough milk. If women make decisions, the household would have more milk available, as they are more likely to prioritize ensuring everyone eats well and healthily.

Most women in Sierra Leone have the opportunity to participate and, in certain situations, make decisions for the family. Mostly, both husbands and wives make decisions about growing nutritious crops for the family. Rarely, families allow their children to participate in the decision-making process. Several participants noted that their wives take the lead in choosing which nutritious crops to cultivate. This may not reflect much of a change, as traditionally men oversee rice and cash crop production, whereas women oversee groundnuts, benni (sesame), beans, and vegetable production. However, decisions regarding the sales of cash crops were primarily made by both couples. There appears to be a general move towards more joint decision-making as many participants jointly decide before sales (Ayamga et al., 2023).

However, Dzanku et al. (2022) found that food insecurity could be attributed to subsistence production because of small land holdings, a lack of farm inputs, and the fact that women now solely handle food production labor because men have moved into off-farm activities. We found the strongest associations between women's decision-making and their nutrition status, with the relationship being positive in some instances and negative in others. Decision-making was associated with an increased risk of children's malnutrition in some countries and a decreased risk in others. While agency was consistently associated with increased dietary diversity in women and children, results for the association between women's agency and women's food insecurity experience were mixed (Tedoff et al., 2021).

3.5. Gender disparities in access to land, credit, and agricultural inputs.

In Kenya, an assessment of the effects of individual indicators on food consumption scores indicates that the dimensions of women's empowerment that matter most in increasing a household's food consumption cost are input in productive decisions, control over the use of income, and group membership. Unlike women, the dimension of men's empowerment that matters most in increasing a household's food consumption cost is access to and decisions on credit. (Kihui, 2021) Tibesigwa et al. (2016)

discovered that men in the rural setting in South Africa viewed land-owning women as untamable, with farm household income and the quantity of household assets serving as the main determinants of household food security. While the quantity of household assets appears to have an almost equal impact on the food security of male- and female-headed households, off-farm income is more significant in predicting the food security of male-headed households in South Africa. In Sierra Leone, men maintained that they took the lead in cash crop production while their wives served in supportive roles related to cooking, field clearing, transplanting, watering the nursery, etc. Other participants noted that they work jointly with their wives and husbands. (Ayamga et al., 2023).

Dzanku et al. (2022) found that men control the majority of land in Ghana and that women's commercialization capacity is significantly lower than men's in terms of production scale. In the more commercialized matrilineal forest zones of southern Ghana, no clear gender-based crop segmentation is evident. However, in the less commercialized patrilineal and drier northern zone, Dzanku et al. (2022) identified clear differences in commercialization pathways, revealing a lower representation of women in the relatively more lucrative pathways.

Also, Nchanji et al. (2023) confirmed that household heads ('landlords') and owners of land were almost always men in northern Ghana. During the main farming season, women typically received a small plot of land around their male relatives' fields to cultivate or produce vegetables. This plot of land was often considered less fertile and not suitable for the production of cereals or legumes, which are the main crops. The vegetables cultivated are usually jute mallow, roselle, pepper, and okra. This way of growing vegetables by women and sometimes preserving them for use in the dry season is a strategy for improving household food and nutritional security.

In Malawi, the proportion of plots managed solely by women is not very different from that of plots managed solely by men, with a slightly greater proportion of female-only managers for vegetables and a greater proportion of male-only managers for tobacco (Ragasa et al., 2019). A study by Nyirenda (2019) also found strong relationships between women's land tenure security, household diversity, and calorie intake in Malawi. Their findings show that women's empowerment is a better determinant of household nutrition status. This suggests that policies aimed at enhancing household nutrition should prioritize women's empowerment.

In their work in Ghana, Adjei-Mantey et al. (2022) discovered that there exist substantial differences between male-headed households' and female-headed households' food security status. Among headed households and female-headed households, their

findings also suggest that the use of fuel wood predicts household food security status in Ghana. In Burundi, researchers discovered that men generally owned and accessed more land than women and young farmers. For women, lack of land ownership was a considerable barrier to bean production, which contributes greatly to food and nutrition security. However, the use of certified seeds promoted women's involvement in bean production and contributed to joint decision-making within households. Most bean farmers, regardless of gender, participated in joint decision-making on bean production (Nchanji et al., 2023).

3.6. Differences in income, employment opportunities, and financial resources affecting food security.

Studies by Nchanji et al. (2023) in northern Ghana found that, in order to provide soup for the household while sometimes not having access to enough land, women often work on the farms of their husbands or other male kin during harvesting. The female harvesters receive a specific portion of the crop after harvesting. Depending on the number of harvesters, each woman receives a bowl of okra or more. Each woman receives a basin filled with pepper. The women typically use these vegetables to prepare soup in the household.

Onah (2020) underscores the importance of women's empowerment and access to economic resources in sub-Saharan Africa. The study findings suggest that the consumption of nutrient-rich food groups, especially certain legumes, nuts and seeds, flesh protein, and eggs, would benefit from improved women's economic empowerment, and the consumption of fruits and vegetables might benefit from improved agricultural practices in addition to economic empowerment. Economic empowerment improved women's autonomy in food purchase and consumption. However, limited income prevented women from exhibiting full autonomy in their consumption decisions and access. Onah (2020). In South Africa, a study revealed that households headed by women experienced less food security compared to those headed by men, primarily due to their lack of reliable employment that could supply adequate and nutritious food. Therefore, empowering women is crucial to ensuring food security, as unstable employment opportunities lead to households' inability to adequately cope with food insecurity (Tsvuura et al., 2021).

Additionally, Covarrubias et al. (2015) estimated that the production and productivity gap in Uganda was approximately 30 percent, with female-managed land generating less overall and per acre than male- or mixed-managed land. Given documented differences in access to assets and inputs, the potential negative impact of climatic changes and variability on female producers, and

their ability to adapt to parallel economic and domestic responsibilities, this gap raises the question of how much crop diversity can narrow gender differences in Ugandan agriculture.

3.7. How gender influences access to and utilization of nutritional education and information.

Ragasa et al. (2019) discovered that in Malawi, women often shoulder the responsibility of attending training and meetings without their spouses. Instead of viewing it as an empowering opportunity, women perceive their busy or disinterested husbands as a burden. Particularly for nutrition education, men's joint participation in trainings and meetings can play a crucial role in ensuring good household nutritional outcomes alongside women. Thus, targeting both women and men for nutrition extension is potentially empowering, as it not only works on changing behaviour but also starts to challenge gender norms of women's roles in domestic tasks and food preparation versus men's roles in productive and business activities.

3.8. Gender-based differences in dietary practices, food choices, and nutritional intake.

Evidence suggests that vulnerable groups in the household, such as pregnant women and children, receive special nutritional attention (Tedoff, 2021). This is crucial for promoting the growth of children, particularly those under five years old, and pregnant women, who require additional nutrients for the development of their unborn child.

In Sierra Leone, Ayamga et al. (2023) found that wives took the lead in deciding what food (and in what quantity) to prepare for their households' consumption. The study concluded that both husbands and wives observed their children consuming nutritious foods that promote their health. The women are especially pleased that their husbands now pay more attention to the health and welfare of their children. The males have agreed to take responsibility for providing nutritious food for their children by ensuring adequate and diverse food crop cultivation for their households. e. They possess a comprehensive understanding of food and nutrition, and the majority of husbands concur that they consume nutritious foods alongside their children. Also, in homes where there were livestock, husbands and wives made joint decisions about their consumption and sale (Ayamga et al., 2023).

In Ghana, a study showed that male-headed cocoa households had higher dietary diversity and were more food-secure than female-headed cocoa households. The themes promoting low dietary diversity and food insecurity among male- and female-headed households were

climate change/variability, unavailable lands, poverty, large household size, and gender stereotypes (Batame, 2024). In Malawi, a study across household types indicates that male-headed households consume fewer grains, cereals, legumes, nuts, and vegetables than other households on average. However, female-headed households consume less meat, milk products, fats and oils, and sugar than other households. These findings generally support the common understanding that female-headed households are typically less food secure. However, the findings also suggest that we shouldn't exclude male-headed households from nutrition-related knowledge campaigns because they are less food secure in other measures (Ragasa, 2019).

3.9. Gender differences in utilization of health services and nutritional outcomes, such as stunting, wasting, and micronutrient deficiencies.

A study by Mechlowitz et al. (2023) in Ethiopia found that the domains of women's empowerment in leadership and time were significantly associated with children's animal source food consumption and stunting, respectively. Empowerment in the leadership domain may correspond with a woman's self-efficacy in making health-related decisions and advocating for herself and her family. In Rwanda, a limited number of men accompany their wives to child growth monitoring sessions and other child health care training and check-ups. The men who participate in these activities said their presence boosts their wives' morale and increases the likelihood of their wives attending all sessions and similar meetings. However, respondents, both women and men, asserted that this practice is uncommon in the community, with only a few men who "love and care for their families" engaging in it. Women said that men should accompany them to growth monitoring sessions, as this will provide men with the opportunity to learn more about child and maternal nutrition (Farnworth et al., 2023).

3.10. How gendered cultural norms and practices affect food and nutrition security.

A study by Ayamga et al. (2023) in Sierra Leone observed that other domestic chores, such as fetching firewood and water for domestic consumption, which used to be predominantly championed by women, have been altered. Traditionally, the husband collects firewood from the bush and brings it to the farmhouse (from there, the woman will carry it to town). Also, children are typically involved in fetching firewood. According to the study, husbands are increasingly assisting in carrying the firewood to town, as well as fetching water.

Mnimbo et al. (2017) found that in Tanzania, men considered social relations in the community and in the household more important for food security than women did. Women scored several production-related aspects as more important than men. However, in Nigeria, cultural and social norms and beliefs about gender roles, which were representative of cultural and social norms and beliefs about gender roles, show a negative relationship with food security in rural households. A significant negative coefficient suggests that these cultural and social norms and beliefs have a slightly negative impact on food security in rural households (Atere, 2023).

3.11. Gender-specific vulnerabilities to climate change and environmental stressors impacting food security.

In Malawi, climate shocks affect disproportionately more women than men, further widening the existing gender gaps. Cultural practices prescribe different roles and powers in a society based on gender, contributing to such gaps and making women more vulnerable to shocks. The study provides additional evidence that resilience capacity concerning climate-induced food insecurity is not gender-neutral. Sociocultural factors drive gender gaps in food security and shock vulnerability, determining different access to resources and decision-making power for men and women. Gender disparities in resilience to climate shocks could potentially exacerbate these gaps (Ranucci et al., 2023).

3.12. Gender-based differences in the allocation of food within households.

Results from Uganda suggested a differential impact for boys and girls, with women's improved autonomy protecting a female child's dietary diversity. The findings suggest that women in poorer households who viewed violence as disempowering might practice improved dietary consumption for their children (Onah, 2020).

However, Kenyan men and women who responded were particularly aware of the nutritional importance of milk, especially for children. Despite acknowledging that high milk prices force them to reduce household consumption, they make great efforts to source milk and ensure children consume it in some form. In Tanzania, women and In Tanzania, both women and men recognize the importance of milk, but they often perceive it as expensive, with many considering it unaffordable during the dry season. Respondents also seemed to consider that they already consume a nutritionally adequate diet, particularly porridge (which includes legumes and grains, thus proteins), and hence, they may see less incentive to include milk in the household food basket (Galiè et al.,

2021). Also in Nigeria, coping strategies widely used by the crayfish harvesters when faced with poverty, food insecurity, and income inequality in the region were spending of saved income and children eating first (Etim, 2022).

3.13. How power dynamics between genders influence food distribution and consumption participation in community-based food security initiatives.

According to Tibesigwa et al. (2016), in South Africa, the study shows that male-headed households are more food secure compared to female-headed households. They found that the contribution of agriculture to food security is higher in female-headed households than in male-headed households, especially those in rural areas. In sub-Saharan Africa, economic empowerment could potentially increase the consumption of nutrient-dense food items, such as flesh proteins, which can be expensive for women to purchase. Conversely, autonomy, which includes having input in production, could potentially increase the consumption of nutrition-vital dairy products, fruits, and vegetables for women and children. (Onah, 2020). Dunga's (2018) study in Malawi found gender disparities in food insecurity at the household level, with female-headed households experiencing more food insecurity than their male counterparts. We found that female-headed households employ more coping strategies than their counterparts, indicating an increased vulnerability to food insecurity. In Ethiopia, a study indicated that the involvement of female caregivers, along with other influential adult community members, significantly improves the family practice of eating together in households, which is greatly beneficial in promoting equitable family allocation among adolescent girls. The intervention has great potential to minimize household food allocation inequalities and thus improve the nutritional status of young adolescents if it is implemented successfully at scale. (Gulema, 2023). According to Ayamga et al. (2023), everyone involved in Sierra Leone underwent the same training program. The women participated in theatre performances while the men were observers. Most of the participants alluded to having attended training on Village Savings and Loans Associations, nutrition, and agricultural practices.

CONCLUSION

This systematic review highlights the critical relationship between gender dynamics and food and nutrition security in sub-Saharan Africa and emphasizes the need for more focused research in this area. Despite the recognized importance of gender roles in agricultural

productivity and food security, the literature reveals significant gaps in understanding how these dynamics specifically affect different communities within the region. The findings indicate that while women play a crucial role in food production and household nutrition, existing studies often overlook the complexities of gender interactions and their implications for food systems. The limited research not only constrains our understanding of the challenges faced by women in securing food and nutrition but also hampers the development of targeted interventions that could enhance their contributions to food and nutrition security. Moreover, the review underscores the necessity for more comprehensive studies that explore the intersectionality of gender with other socio-economic factors such as poverty, education, and access to resources. These factors collectively influence women's empowerment in agricultural contexts and their ability to make critical decisions regarding food procurement and dietary practices.

To address these research gaps, future studies should prioritize localized approaches that account for cultural, economic, and environmental contexts unique to sub-Saharan Africa. Such research should aim to document women's experiences and the barriers they face, providing a clearer picture of the gendered aspects of food and nutrition security. Furthermore, interdisciplinary collaborations that incorporate perspectives from social sciences, nutrition, and agricultural development can lead to a more holistic understanding of the challenges at hand.

Finally, advancing gender equity in food and nutrition security is imperative not only for improving the well-being of women and their families but also for fostering sustainable development across sub-Saharan Africa. Addressing the identified gaps in research will be vital in informing policies and programs that empower women, enhance food and nutrition security, and ultimately contribute to the broader goal of eliminating hunger in the region. Emphasising gender considerations in food systems is not just a moral imperative but a strategic necessity for achieving lasting improvements in food security and nutrition.

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Appendix I

Scopus search string

"Gender Dynamics" AND "Food and Nutrition Security" AND (LIMIT-TO (SUBJAREA, "SOC") OR LIMIT-TO (SUBJAREA, "AGRI") OR LIMIT-TO (SUBJAREA, "ENVI") OR LIMIT-TO (SUBJAREA, "ECON")) AND (EXCLUDE (EXACTKEYWORD, "India") OR EXCLUDE (EXACTKEYWORD, "Systematic Review") OR EXCLUDE (EXACTKEYWORD, "EU Countries") OR EXCLUDE (EXACTKEYWORD, "Brazil"))

"Gender Dynamics" AND "Food and Nutrition Security" AND (LIMIT-TO (SUBJAREA, "SOC") OR LIMIT-TO (SUBJAREA, "AGRI") OR LIMIT-TO (SUBJAREA, "ENVI") OR LIMIT-TO (SUBJAREA, "ECON")) AND (EXCLUDE (EXACTKEYWORD, "India") OR EXCLUDE (EXACTKEYWORD, "Systematic Review") OR EXCLUDE (EXACTKEYWORD, "EU Countries") OR EXCLUDE (EXACTKEYWORD, "Brazil")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English"))

Appendix II

Google Scholar search string

"Gender Dynamics" AND "Food and Nutrition Security" AND "sub-Saharan Africa"

"Gender Dynamics" OR "Gender Roles" OR "Gender Dimensions" AND "Food and Nutrition Security" AND "sub-Saharan Africa"