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## Sex of Household Heads and Attitude Towards Home Gardening in Southwest, Nigeria

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DAK and ASA: Data analysis, interpretation of data and revised manuscript (30%)

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### Abstract

*This study investigated the attitude of household-heads towards home gardening in southwest Nigeria using a cross-sectional survey with sex-disaggregated data. A randomly selected sample of 480 households was used for the study. Data were analyzed using frequencies, percentages, charts, mean, standard deviations and t-tests. The findings revealed that male-headed households had a more favourable attitude towards home gardening when compared to female-headed households. The results also indicated a significant difference in home gardening knowledge, with female-headed households demonstrating higher levels of knowledge than their male counterparts. Major constraints reported by households in home gardening were damage from pests, diseases, animals, and theft (male:  $1.98 \pm 0.63$ ; female:  $1.96 \pm 0.61$ ) and limited access to agricultural inputs like capital, tools, and seeds (male:  $1.94 \pm 0.77$ ; female:  $2.00 \pm 0.75$ ). Tackling these identified constraints could contribute to improving household perceptions of home gardening, reducing gender disparities in attitudes, and enhancing food security outcomes. Regular training sessions be organized by relevant government and non-governmental agencies to encourage and equip households with new agricultural skills, thereby addressing challenges related to global food insecurity.*

## Introduction

Home gardening has been identified as a vital strategy for enhancing household food security, nutrition, and economic resilience. However, its adoption and effectiveness are influenced by socio-cultural and gender dynamics. In Southwest Nigeria, gender differentials in roles and access to resources create disparities in participation and attitudes towards home gardening (Olanrewaju et al., 2021). Women, often the primary caregivers, face significant barriers such as restricted availability of capital, land, and extension services compared to their male counterparts (Zafar et al., 2024), thereby affecting their ability to contribute to household food systems effectively (Salami et al., 2024). Despite these challenges, home gardening holds immense potential for mitigating food insecurity and fostering socio-economic stability. Yet, household attitudes, shaped by cultural norms and gendered perceptions of agricultural roles, can either enable or constrain its adoption.

Research in the region indicates that men and women perceive the benefits and constraints of home gardening differently, further impacting participation rates and outcomes (Tehinloju & Fasina, 2024). Moreover, limited access to tailored agricultural extension services exacerbates these disparities, as women often receive less support due to socio-economic barriers and systemic biases in service delivery (Hidrobo et al., 2024). Extension programs that fail to address gender-specific needs may inadvertently reinforce inequalities and hinder the broader adoption of home gardening practices (Opayinka et al., 2024). Engaging in home gardening offers numerous benefits, including the sustainable production of certain food crops for healthy feeding, availability of fresh organic nutrition, and the capability to raise farm animals under high welfare standards. It also enables households to save money and contribute to the preservation of the environment (Odebode et al., 2023). Additional advantages include exposure to fresh air and vitamin D, closer interaction with nature as plants and animals grow, opportunities for physical exercise, and the capacity to address food insecurity by providing food for the household using minimal resources (Oladele et al., 2020; Crow, 2021; Rick, 2022). These practices ultimately enhance income and improve household well-being among farmers.

Research has further shown the negative and positive effects of gardening on the tenants. A survey explored the attitudes of gardeners and non-gardeners towards home gardening and its perceived health benefits. It found that frequent gardening impacts on well-being and perceived stress of the gardeners (Chalmin-pui et al., 2021). Another study also showed that home gardening influences the health of gardeners while improving community connections for the elderly (Wiles et al., 2021). Their findings demonstrated a strong link between regular gardening and improvements in well-being, reduced stress levels, and increased physical activity. According to Grebitus (2021), trust, attitude, and knowledge are key factors influencing home gardening efforts, while communal participation and individual behaviours are the fundamental determinants of community-based gardening initiatives. Additionally, household size, gender, and income have been found to influence home gardening (Grebitus, 2021). Other studies further revealed notable gender differences as perceived in gardening. Males tend to garden for reasons related to nutrition, strength, and nostalgia, while females are more focused on personal productivity (Alaimo et al., 2019). However, this study found no significant differences in the motivations of gardeners across age groups, suggesting that gardeners from different generations may share similar goals and benefits in comparable ways.

There is anecdotal evidence of gender differences and household attitudes towards home gardening in Southwest Nigeria. The few existing research either generalized the findings across regions or overlooked the nuanced gendered factors that shaped gardening practices. This lack in context-specific research portrayed a significant gap in understanding how gender dynamics affect the implementation of home gardening initiatives. Furthermore, the dearth of literature on this subject also hindered the development of relevant effective policies and interventions aimed at advancing gender equality, food security, and economic empowerment through gardening practices. Therefore, this study investigated the sex of household heads and attitude towards home gardening in southwest, Nigeria. Specifically, it sought to answer the following key research questions: First was to find out if a gender gap existed in household attitudes towards home gardening. The Second was to analyze whether male and female-headed household members have adequate knowledge of home gardening.

### **Methodology**

The research was undertaken in the southwestern area of Nigeria comprising six states (Ogun, Lagos, Ekiti, Ondo, Oyo, and Osun). Geographically, the region is located between latitudes 6° N, and 4° S, and longitudes 4° W, and 6° E: covering about 114, 271-kilometer square. The study population comprises all farming households who engage in home gardening within the region. A multi-stage sampling technique was employed to determine the sample size. In the first stage, three out of the six states in Southwest Nigeria were randomly selected while two agricultural zones per state were purposively chosen in the second stage based on the prominence of home gardening. In the third stage, four peri-urban or urban centres known for home gardening were purposively selected from each agricultural zone, resulting in 24 urban centres. Finally, 20 households (10 male-headed and 10 female-headed) were randomly sampled from each centre, yielding a total of 480 respondents for the study. Data were collected using a structured questionnaire administered via an Android-based software platform (KoboToolbox). Variables on the household socio-economic characteristics were measured as follows; age (actual age in years), marital status (single = 1, married = 2, divorced = 3, widowed =4), educational level (no formal = 1; primary = 2, secondary = 3, and tertiary = 4), household size (total number of people under a roof who cook and eat together), farm plot size (total number under cultivation in (ha)), home gardening experience (exact number in years) and access to institutional variable (credit, extension services were measured as yes=1, otherwise 0).

A list of nine (9) attitudinal statements on the importance and benefit of home gardening activities were itemized for the respondents' reaction to measure household attitude towards home gardening. The statements were evaluated using a 5-point Likert scale with options ranging from *strongly agree to strongly disagree* with assigned scores of 5, 4, 3, 2, and 1, respectively. To establish a decision-making threshold, the sum of the possible scores (5+4+3+2+1) was divided by 5, resulting in a threshold value of 3.0. A score of 3.0 or higher was classified as a favourable attitude while means below 3.0 reflected an unfavourable attitude towards home gardening among respondents.

The knowledge level of households on home gardening activities was measured using the test with a list of items (1 for correct answer and 0 otherwise). The households were further categorized into different knowledge levels using the knowledge index.

$$Knowledge\ Index\ (KI) = \left(\frac{n}{N}\right) 100 \dots \dots \dots (1)$$

n = Total score of respondents for correct answers

N = Maximum obtainable score (23)

After calculating the Knowledge Index, a further classification into 3 was done:

- Class 1: KI scores 0 – 33 = *low*.
- Class 2: KI scores 34 - 67 = *moderate*.
- Class 3: KI scores 68 – 100= *high*.

A 3-point scale was used to evaluate the severity of constraints. very Severe- 2, severe- 1, and not Severe- 0. The decision-making threshold was calculated (2+1+0) and divided by 3 to give an average value of 1.0. A mean score of 1.0 or higher is significant and is interpreted as a major constraint while values below 1.0 were considered as minor constraints.

The data were analysed using charts, frequencies, means, and standard deviations while a t-test was employed for the hypothesis.

## Results and Discussion

### Sources of Information on Home Gardening among Households

Figure 1 shows that a significant proportion of male (72.7%) and female (68.5%) households primarily relied on informal sources, such as friends and relatives, for information. This finding is consistent with Lin et al. (2021), that the role of communal associations in sharing knowledge among rural and peri-urban farmers. The finding is not surprising as informal networks are often the most accessible and trusted sources in communities where formal extension services are limited. Further, 37.1% of the males and 41.8% of female-headed households relied on radio or TV for such information, while 31.1% of males and 24.9% of females received guidance from extension agents. Additionally, 11.2% of male and 7.5% of female households gathered information through cooperative societies, and 15.7% of males and 18.8% of females consulted various research institutes for home gardening knowledge. Approximately 37.8% of male and 16.4% of female-headed households acquired information from fellow home gardeners, with print media being a source for 18.7% of males and 16.9% of females. The data highlighted that the primary source of information for all households was from family and friends, illustrating strong social networks.

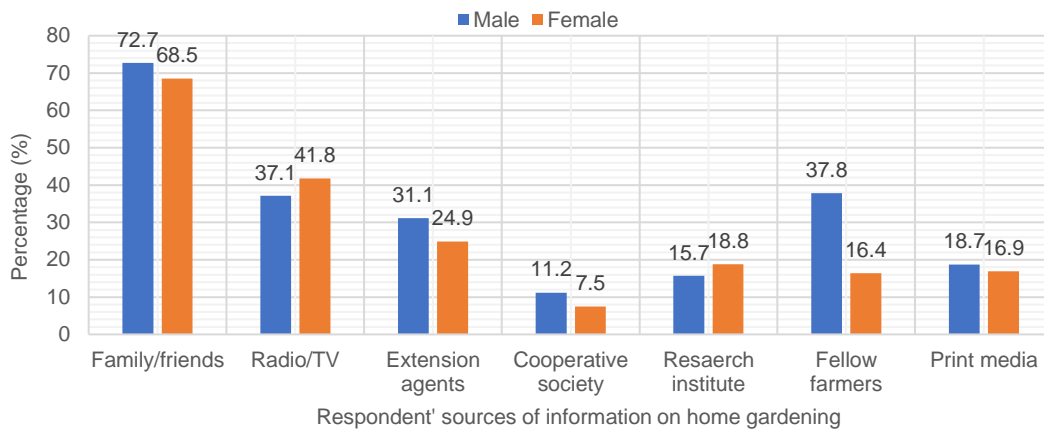


Figure 1: Sources of information on home gardening.  
Source: Field survey (2024)

### Cropping Systems Used

Figure 2 shows that about half of the sampled households (male- 52%; female- 50%) practised mixed cropping. This underscores the importance of mixed cropping in managing risks, improving soil fertility, and maximizing land productivity. Daudu et al. (2019) noted that mixed cropping is a common practice among smallholder farmers in Nigeria, particularly in food-insecure households, as it ensures crop diversification and resilience against climate variability. Aderinoye-Abdulwahab et al., (2024) also opined that women diversify family incomes to cushion livelihood vulnerability by combining the growing of crops and rearing of livestock along with other income-generating activities. Sole cropping, practised by 40.1% of male and 44.6% of female-headed households, is likely influenced by the focus on cultivating specific staple crops. It has been previously reported that farmers with access to extension services and market opportunities often preferred sole cropping because of its economic benefits (Daudu et al., 2019). The lower adoption of intercropping (7.9% male and 5.6% female households) as seen in Figure 2 may reflect the challenges in managing the complexity of this system or a limited knowledge of its potential benefits.

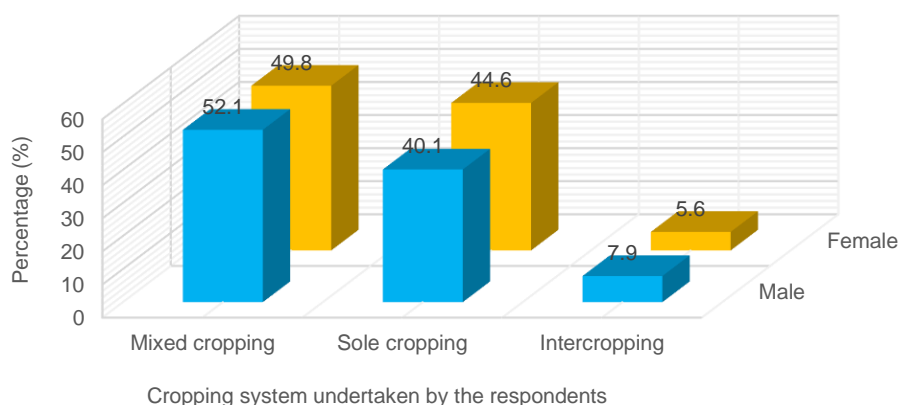
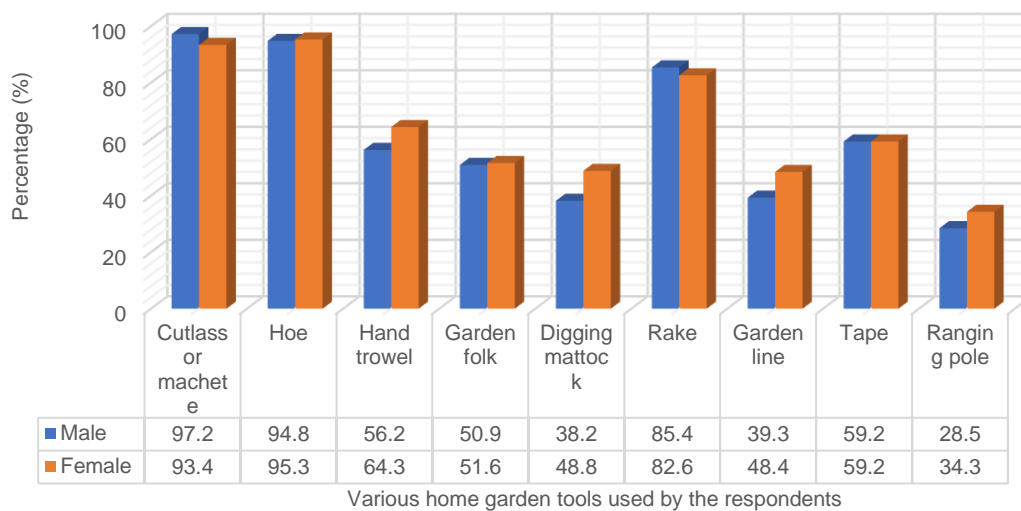


Figure 2: Cropping systems being practised in home gardening  
Source: Field survey (2024)

### Farm and Garden Tools Used in Home Gardening

The results in Figure 3 show that the majority (97.2% and 93.4%) of both male and female households utilized cutlasses or machetes. Hoes were also widely used, with

94% of male and 95% of female households employing them. Studies have shown that these tools are essential for manual farming in regions where mechanization remains limited due to cost and accessibility barriers (Daum, 2023). Hand trowels were employed by 56.2% of male-headed households and 64.3% of female-headed households. Garden forks were similarly used by approximately half of the male (50.9%) and female (51.6%) households for agricultural tasks. Digging mattocks saw usage among 38.2% of male-headed and 48.8% of female-headed households, while rakes were widely utilized by 85% of male-headed and 82.6% of female-headed households. Garden lines were available and used by male (39.3%) and female (48.4%) headed households. Furthermore, measuring tools such as tape measures were employed by 59.2% of households overall, while ranging poles were utilized by 28.5% of male and 34.3% of female-headed households.



**Figure. 3: Farm tools used in home gardening**  
Source: Field survey (2024)

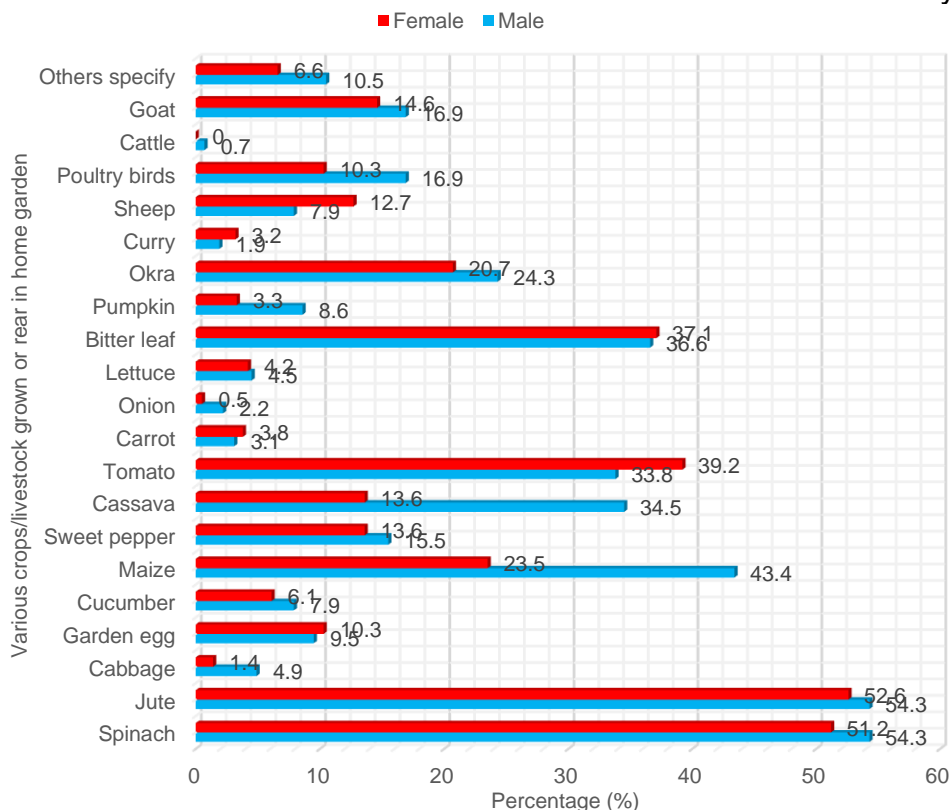
### Crops and Livestock Raised

Figure 4 shows that the majority of the sampled gardeners maintained productive gardens that included fruits, vegetables, and livestock. Specifically, 54.3% and 51.2% of both male and female-headed households respectively cultivated spinach, while 54.3% and 52.6% correspondingly grew jute. The high cultivation rates of spinach and jute highlighted their prominence as staple leafy vegetables in the region. These crops are known for their nutritional value, rapid growth cycles, and adaptability to small-scale farming, making them ideal for household food security. In contrast, only a small percentage, 4.9% of male and 1.4% of female-headed households cultivated cabbage. The low percentages for cabbage suggest its limited suitability or cultural preference. Similar findings indicated that less locally adapted crops face barriers in adoption due to higher resource needs or lower perceived utility (Taruvinga et al., 2021).

Furthermore, findings indicated that 9.5% and 10.3% of male and female-headed households correspondingly grew garden eggs, while 7.9% and 6.1% grew cucumbers. Maize is cultivated by a significant portion of the households headed by males (43.4%) and females (23.5%) incorporated it into their gardens. Sweet peppers were grown by male (15.5%) and female (13.6%) headed households while cassava was cultivated by a corresponding male (34.5%) and female (13.6%) headed

households. In addition, tomatoes were grown by 33.8% of male and 39.2% of female households. The higher percentages as seen in female-headed households cultivating tomatoes while higher percentages of males cultivated cassava and maize indicated gendered preferences driven by traditional roles. It has been reported that women often grow crops for immediate household consumption or income generation, such as tomatoes, while men prioritize staple crops like maize, which have larger land and labour requirements (Njuki et al., 2020). Results in Figure 4 showed that the less commonly grown crops included carrots (3.1% male, 3.8% female), onions (2.2% male, 0.5% female), and lettuce (4.5% male, 4.2% female). Other crops cultivated by male-headed households were bitter leaf (36.6%), pumpkin (8.6%), okra (24.3%), and curry (1.4%). In contrast, female-headed households cultivated bitter leaf (37.1%), pumpkin (3.3%), okra (3.2%), and curry (3.2%).

In terms of livestock, a higher percentage of female-headed households rearing sheep (12.7%) compared to males (7.9%) may reflect women's involvement in managing small ruminants, which require minimal investment while providing steady income or nutritional benefits (Wodajo et al., 2020). Findings showed that poultry keeping was more common among male-headed households (16.9%) than female-headed households (10.3%). This may be due to men's greater access to inputs and markets necessary for larger-scale poultry operations, compared to women, who often manage backyard flocks (Heckert et al., 2023). The minimal engagement in cattle rearing (0.7% by males) pointed at resource constraints, as cattle farming requires huge expanse of land while also being capital intensive. It also suggested a focus on smaller livestock suitable for households with limited resources (Wodajo et al., 2020). Goats are kept by 16.9% of male and 14.6% of female households. This finding showed that goat keeping is more evenly distributed, reflecting its importance across genders as a source of milk, meat, and income. There are other crops and livestock being managed by 10.5% of male and 6.6% of female headed households in the study area.



## Figure 4: Crops/livestock grown or reared in home gardens

Source: Field survey (2024)

### Household Attitude Towards Home Gardening

Table 1 illustrates that both sexes of gardeners displayed a favourable attitude towards home gardening benefits as all corresponding mean scores exceeded the threshold of 3.0. However, male respondents generally had slightly higher mean values across most categories, reflecting the gendered perceptions of home gardening benefits. Findings show that both male ( $4.53\pm 0.80$ ) and female ( $4.48\pm 0.74$ ) respondents strongly agreed that home gardening helps to improve household food security. Home gardening is critical and essential for low-income families to attain adequate food and its nutrients as it offers a sustainable source of fresh produce (Basarir, et al., 2022). The slight gendered difference may stem from men's perception of associating food security with land and economics, whereas women focus on household food availability. In terms of nutrition and food diversity, male respondents ( $4.32\pm 0.75$ ) rated the nutritional benefits of home gardening higher than females ( $4.01\pm 0.81$ ), reflecting possible differences in priorities. This is rather surprising and could mean that women, who are typically the primary caregivers might have already associated nutrition with other activities beyond gardening (Abokyi et al., 2022). Home gardening is widely recognized for their contribution to dietary diversity, enabling households to grow fruits, vegetables, and medicinal plants that provide essential nutrients (Wodajo et al., 2020). Table 1 further displays the contribution of home gardening to income and employment through off-season or additional production is rated more favourably by males ( $4.09\pm 0.90$ ) when compared to females ( $3.82\pm 0.89$ ).

The attitudes of males ( $3.93\pm 0.86$ ) were more favourable to mitigating risks through diversification than the females ( $3.59\pm 0.98$ ). This trend suggests men's greater concern for financial and agricultural risk management. Diversification through home gardening can provide households with a buffer against economic and climate-related shocks (Basarir, et al., 2022). Also, findings showed that male respondents rated environmental benefits such as recycling water and waste nutrients ( $3.85\pm 0.92$ ) and controlling shade, dust, and erosion ( $4.04\pm 0.87$ ) more highly than females. Women's lower ratings may stem from limited involvement in activities directly related to soil or resource management. Home gardening contributes to environmental sustainability by improving soil fertility and reducing pollution (Santos et al., 2022). The benefits of maintaining biodiversity (male:  $3.90\pm 0.84$ ; female:  $3.57\pm 0.94$ ) and preserving Indigenous knowledge (male:  $3.94\pm 0.87$ ; female:  $3.83\pm 0.86$ ) demonstrate favourable attitudes, albeit with gender differences. Men may have a higher awareness of biodiversity due to greater participation in extension programs, while women tend to preserve indigenous knowledge through traditional farming practices (Picot et al., 2023). Lastly, both genders showed strong agreement regarding the health benefits of home gardening (male:  $4.19\pm 0.90$ ; female:  $4.12\pm 0.90$ ), highlighting their perceived role in improving physical and mental well-being. These findings confirm that home gardening improves health outcomes through better nutrition and serve as stress relief (Hume et al., 2022).



**Table 1: Perceived benefits of home gardening**

Perceived benefit of home garden	Male Mean ( $\pm$ StD)	Female Mean ( $\pm$ StD)
Home gardening improves food security	4.53 $\pm$ 0.80*	4.48 $\pm$ 0.74*
Home gardening augments food availability and improves nutrition by promoting a diverse range of foods.	4.32 $\pm$ 0.75*	4.01 $\pm$ 0.81*
Income generation and enhanced employment through supplementary or off-season production.	4.09 $\pm$ 0.90*	3.82 $\pm$ 0.89*
Decreased risk through diversification	3.93 $\pm$ 0.86*	3.59 $\pm$ 0.98*
Environmental advantages from reusing water and recycling waste nutrients.	3.85 $\pm$ 0.92*	3.59 $\pm$ 0.99*
Controlling shade, dust and erosion	4.04 $\pm$ 0.87*	3.83 $\pm$ 0.94*
Maintaining or increasing local biodiversity	3.90 $\pm$ 0.84*	3.57 $\pm$ 0.94*
Preserving indigenous knowledge and building integrated societies	3.94 $\pm$ 0.87*	3.83 $\pm$ 0.86*
Improving health	4.19 $\pm$ 0.90*	4.12 $\pm$ 0.90*

Source: Field survey (2024); Significant: Mean=3.0 and above; \*Favourable attitude

### Knowledge of Home Gardening Production Practices

Table 2 highlights the knowledge and application of critical practices in home gardening among male and female households. While both groups exhibit substantial understanding of the principles of home gardening, male households consistently reported higher levels of knowledge across various domains. These gendered differences reflect disparities in access to information, training opportunities, and traditional gender roles in agricultural practices.

In terms of soil requirements and land preparation, Table 2 points out that most of the households headed by males (83.5%) and females (72.8%) understood the importance of loose, fertile, moist, and sandy loam soils for home gardening. The knowledge of land preparation including ploughing, digging, and levelling, was also relatively high with the male households (73.8%) demonstrating a better grasp than female-headed households (63.4%). Similar trends were observed in clearing (male: 95.5%; female: 90.6%) and land tillage (male: 91%; female: 81.2%). These findings are consistent with another research that emphasized that land preparation techniques improve soil structure, reduce weed growth, and enhance water and nutrient retention (Al-Shammary et al., 2024). Women's lower levels of knowledge may have resulted from reduced access to extension services and agricultural training programmes (Adebayo and Worth, 2024, Zafar et al., 2024, Aderinoye-Abdulwahab et al., 2024). The knowledge of ridging as an erosion control was known to households headed by males (62.9%) and females (50.7%). Similarly, terracing is better understood by males (67.8%) than females (58.2%).

Results in Table 2 show that cover cropping was widely practised by 94.8% of male and 89.2% of female-headed households. Other practices, such as broadcasting (male: 91%; female: 85.4%) and transplanting (male: 87.3%; female: 78.9%) were generally popular, though men exhibited a consistently better grasp. However, a larger gender gap was observed within seed drilling (male: 62.2%; female: 42.7%) and thinning (male: 54.3%; female: 42.3%). This disparity might have arisen due to the physical demands and technical complexity of these practices as gender discrimination is already at play against women (Ketchiwou and Dzansi, 2020). Mulching was widely understood by 89.9% of males and 86.4% of females. This is

reflective of its importance in reducing evapotranspiration, runoff, and weed growth, as emphasized in contemporary studies on sustainable agriculture (Al-Shammary et al., 2024). Findings from fertilizer application and pest control showed that most respondents are knowledgeable about fertilizer application, with males (90.6%) slightly outperforming females (83.1%). Similarly, pest and disease control practices such as planting disease-resistant varieties (male: 85%; female: 82.2%) and proper disposal of crop remnants (male: 78.3%; female: 68.5%) were widely known, though with notable gender differences. These findings align with previous research which suggested that men's higher access to agricultural inputs and extension services enhances their technical knowledge (Daudu et al., 2019).

Harvesting techniques such as picking and digging were equally well understood (male: 94%; female: 87.8%), while post-harvest handling, including storage, processing, and marketing showed a gap (male: 68.9%; female: 54.9%). Women's lower knowledge of post-harvest practices may stem from their limited participation in market-oriented activities, as noted in studies on gender roles in agricultural value chains (Snider et al., 2023). However, women excelled in harvesting during optimal conditions (female: 73.7%; male: 14.2%) while this is likely reflective of their traditional responsibility for ensuring food quality for household consumption. Lastly, careful transportation and handling of home gardening products were better understood by males (64%) than females (55.9%).

### **Knowledge of Home Gardening Practices**

The findings in Table 3 reveal sex variations in knowledge levels related to home gardening practices. While nearly half of male households (48%) and slightly more than half of female households (52%) demonstrated a high level of knowledge, the females outperformed males in this category. The higher proportion of female households with high levels of home gardening knowledge aligns with studies emphasizing the conventional responsibility of women as caretakers of home gardens. Women often have a stronger connection to household food production while focusing on nutrition security, increasing and diversifying incomes, protection against financial crises, guarding against environmental shocks and engaging in crop diversity (Lufuke et al., 2022). Lufuke et al. (2022) reported that women are more likely to integrate indigenous knowledge and sustainable practices into their gardening activities. This will equally enhance their expertise in managing home gardens in the same manner that they feed the family by diversifying incomes and nutrients when a variety of nutritious food is no longer affordable or available (Aderinoye-Abdulwahab, et al., 2024).

**Table 2: Knowledge of home gardening practices**

Home garden production practices		Male (% (n=267))	Female (% (n=213))
<i>Soil</i>	Loose, fertile, moist, sandy loam soils are the best	83.5	72.8
	Prepare the land by ploughing or digging and follow this by levelling	73.8	63.4
	Clearing: prior clearing of remnant crops and vegetation, pruning the woody shrubs and trees, and setting them on fire.	95.5	90.6
	Levelling: supports the tasks of ploughing, harrowing, ridging, and site preparation.	70.0	65.7
<i>Land preparation</i>	Tillage: is the creation of an optimal seedbed for optimum productivity, elimination of weed competition during early growth, improvement of soil structure, and conservation of water and nutrient levels in the soil.	91.0	81.2
	Erosion control: stubble can be mixed into the soil. Ridges can also be built to prevent erosion	62.9	50.7
	Terracing: this is achieved by creating level areas along the primary contours of the land.	67.8	58.2
	Cover crop: this protects an uncultivated portion of the farmland from direct sunlight and rainfall.	94.8	89.2
<i>Planting</i>	Broadcasting: is the subtle scattering of seeds into the soil surface by throwing them onto the soil for possible germination.	91.0	85.4
	Seed drilling: involves sowing small-seeded vegetables into the soil in rows.	62.2	42.7
	Transplanting: should be done early morning or late evening so that seedlings experience less transplanting shock.	87.3	78.9
<i>Thinning</i>	Thinning is done if vegetables are planted directly to reduce competition for nutrients by removing excess seedlings per spot.	54.3	42.3
<i>Mulching</i>	Extra crop residues or other materials to serve as cover on soil surface to reduce rate of evaporation, runoff, and to restrict weed growth.	89.9	86.4
<i>Watering</i>	It is best to water the plants early in the morning or late evening.	67.4	51.6
<i>Fertilizer application</i>	It is safe to apply fertilizer when crops are established both as pre-planting basal treatment and as a post-planting application	90.6	83.1
<i>Weeding</i>	Weeding activities should be performed early in the growth stages. Examples are hoeing, weeding, and roguing.	69.3	52.6
<i>Pest and disease control</i>	Sowing high-quality, disease-free seeds.	73.0	55.9
	Ensure disease-resistant varieties that are appropriate to the climate and soil conditions are used.	85.0	82.2
<i>Harvesting</i>	Ensure remnant crops are removed after harvest to prevent pests from resurfacing.	78.3	68.5
	It is necessary to harvest fruit and vegetables on dry, clear days.	14.2	73.7
<i>Post-harvest</i>	Harvesting of fruits and vegetables is better done by picking, topping, digging, or lifting.	94.0	87.8
	Preservation, Processing; Storage and Marketing	68.9	54.9
	Transportation and handling	64.0	55.9

Source: Field survey (2024)

Results in Table 3 show that 43.5 % of males exhibited moderate knowledge of home gardening production practices compared to 30.4% of females. The prevalence of moderate knowledge among male households suggested that while men may engage in home gardening, they often focus on specific technical tasks, such as land preparation and pest management, rather than the comprehensive management of gardens. Nonetheless, 47.8% of the male-headed households still demonstrated high knowledge of home gardening. This finding is consistent with the research indicating

that men prioritize cash crop production or large-scale farming, which may limit their focus on home gardening (Daudu et al., 2019). The lower proportion of males with high knowledge levels when compared to females (52.2%) emphasized a potential gap in their access to resources and training tailored for home gardening. Conversely, the higher percentage of women with low knowledge (17.4%) may be reflective of systemic barriers such as limited access to extension services or formal education, which disproportionately affect rural women (Buehren et al., 2019, Aderinoye-Abdulwahab, et al., 2024). These findings underscored the significance of gender-sensitive training programmes that cater to the unique needs of both men and women in agriculture. The gendered differences in knowledge levels may also be influenced by socio-cultural norms that assign gardening responsibilities to women as part of their household duties. These norms enable women to develop deeper practical knowledge of home gardening, even in contexts where formal training is limited (Shah et al., 2023).

**Table 3: Knowledge levels of home gardening**

Level of knowledge	Knowledge Index	Male	Female
		Percentage (%)	Percentage (%)
High	68 – 100	47.8	52.2
Medium	34 – 67	43.5	30.4
Low	0 – 33	8.7	17.4
Total		100	100

Source: Field survey (2024)

### Constraints to Gardening among Households

Table 4 highlights significant constraints that impeded home gardening production, revealing both shared and sex-specific challenges between both household types. These constraints span the right to resources, environmental factors, and technical limitations. Damage due to pests, diseases, and theft was ranked the topmost constraint ( $1.98 \pm 0.63$ ) for male-headed households while it was the second-most critical issue for female-headed households ( $1.96 \pm 0.61$ ). Damage caused by pests, diseases, and theft is a well-documented barrier in small-scale gardening, particularly in areas with limited access to pest control measures and secure fencing (Ofuya et al., 2023). These challenges are exacerbated by insufficient agricultural extension services to guide households on integrated pest management practices. Female-headed households identified limited access to seeds, planting materials, tools, and capital as their primary constraint ( $2.00 \pm 0.75$ ). It was also a significant constraint ( $1.94 \pm 0.77$ ) for male-headed households, thus reflecting broader issues of affordability and distribution inefficiencies in rural areas. Evidence has shown that women in agriculture often face greater difficulties in accessing inputs due to systemic gender disparities in resource allocation (Quisumbing et al., 2021).

Furthermore, findings in Table 4 show that there was shortage of family or hired labour for households headed by males ( $1.92 \pm 0.62$ ) and females ( $1.95 \pm 0.65$ ). Labour scarcity is a critical challenge in rural agriculture, often compounded by seasonal migration, household responsibilities, and the competing demands of off-farm work. For women, additional caregiving duties may further limit their ability to mobilize sufficient labour for gardening (Pierotti et al., 2022). Also, both male ( $1.89 \pm 0.62$ ) and female

(1.81±0.69) households identified limited access to credit as a significant barrier. This aligns with studies showing that small-scale farmers, especially women, are often excluded from formal credit systems due to lack of collateral or credit history (Khan et al., 2024). Access to affordable credit is critical for scaling up garden productivity, purchasing inputs, and improving post-harvest handling. Environmental challenges such as poor soil fertility, erosion, and inadequate water access were prominent for both male and female respondents. Female-headed households reported inadequate water access (1.94±0.77) as a more significant challenge compared to males (1.68±0.78). The scarcity of land and absence of tenure security were significant constraints, particularly for female-headed households (1.88±0.71). Male-headed households also reported this issue (1.65±0.67) albeit on a lower scale, suggesting that overall, land scarcity affects both.

Limited marketing opportunities and excessive post-harvest losses were common concerns among both groups. Male headed households reported lower post-harvest losses (1.59±0.73) compared to females (1.69±0.72). The disparity could be attributed to men having better access to markets and storage facilities, while women often rely on informal channels with limited infrastructure (Bryan et al., 2024). Findings showed that a paucity of information, knowledge, and advisory services was ranked higher by female-headed households (1.78±0.75) compared to males (1.61±0.68). However, the findings highlighted critical barriers to home gardening, with notable gender differences in the perceived constraints. The findings align with global and regional studies, emphasizing how systemic gendered issues limit the potential of home gardening for revenue generation and attaining food security.

**Table 4: Constraints faced in home gardening practices**

Constraints to home garden	Male	Female
	Mean (±SD) *	Mean (±SD) *
Limited access to agricultural assets such as seedlings and capital	1.94±0.77	2.00±0.75
Limited availability of land and the absence of secure land tenure	1.65±0.67	1.88±0.71
Inadequate access to water	1.68±0.78	1.94±0.77
Damage due to pests, diseases, animals, and theft	1.98±0.63	1.96±0.61
Poor environmental conditions	1.73±0.69	1.85±0.69
Insufficient knowledge, information, and access to advisory services	1.61±0.68	1.78±0.75
Shortage of family or hired labour	1.92±0.62	1.95±0.65
Poor soil fertility and soil erosion	1.63±0.71	1.77±0.68
Lack of credit facilities	1.89±0.62	1.81±0.69
Limited marketing opportunities	1.62±0.74	1.75±0.75
Excessive post-harvest losses	1.59±0.73	1.69±0.72
Insufficient studies/research focused on home gardening	1.69±0.81	1.77±0.68
Absence of information regarding the nutritional advantages of home gardening.	1.55±0.77	1.77±0.78

Source: Field survey (2024)

## Differences between Sex of Households' Head and Attitude Towards Home Gardening

The results from Table 5 highlight a statistically significant difference in the attitude of male and female heads towards home gardening. Male respondents exhibited a higher mean attitude score ( $4.3184 \pm 0.7407$ ) compared to females ( $4.0094 \pm 0.8068$ ), with a mean difference of 0.3089. The t-test ( $t = 4.364$ ) confirmed that the observed difference is not due to chance. The higher mean attitude score among male respondents suggested a more favourable perception of home gardening. Men may associate home gardening with its economic benefits, such as source of revenue, reduced food costs, and household food security. Atapattu et al. (2024), underscored that male-headed households often prioritized agricultural activities that align with financial goals and long-term sustainability. This finding also reflects men's greater access and control over resources enabling them to view home gardening as a feasible and rewarding activity (Chalmin-Pui et al., 2021).

The lower mean attitude score for female respondents could stem from the structural barriers they face, such as limited access to land, credit, and agricultural inputs (FAO, 2023, Zafar et al., 2024). Additionally, the dual burden of household and caregiving responsibilities may constrain women's ability to fully engage in and benefit from home gardening. Despite these challenges, women often prioritize home gardening for its immediate contribution to household nutrition rather than as a source of income, which may influence their perception of its overall value (Saaka et al., 2024). The significant mean difference underscores the influence of gender-specific roles and resource access on attitudes towards agricultural practices. Gender disparities in knowledge, training, and input access shape perceptions and participation in agricultural activities (Buehren et al., 2019).

**Table 5: Difference in attitude towards home gardening between male and female gardeners**

Variable	Category	Number	Mean	Standard Deviation	Mean Difference	t-value
Households' attitude towards home gardening	Male	267	4.3184	0.7407	0.3089	4.364*
	Female	213	4.0094	0.8068		4.322

Source: Field survey (2024), \* $P \leq 0.05$

## Conclusion and Recommendations

Male-headed households exhibited a more positive attitude, often linking home gardening to economic and land use efficiency while female-headed households demonstrated higher knowledge levels emphasizing subsistence and nutritional benefits. Despite these differences, both groups face common challenges, including limited access to agricultural inputs, pests, labour shortages, and environmental constraints. Addressing these issues is highly necessary to ensure home gardening delivers on sustainable livelihoods. The study therefore recommended an enhanced access to extension services for female-headed households. This can be achieved by recruiting female extension officers to complement the male extension agents and

designing gender-focused training programmes. This will help to reduce knowledge disparities and empower women to overcome systemic barriers. There is a need to conduct campaigns highlighting the nutritional and economic advantages of home gardening to ensure a positive shift in attitude and encourage participation across gender lines.

## References

- Abokyi, E., Asante, B. O., & Wongnaa, C. A. (2022). Women's role of caregiving for under five children: Implications for dietary diversity and food security in Ghana. *Cogent Food & Agriculture*, 9(1).  
<https://doi.org/10.1080/23311932.2022.2153415>
- Adebayo, J.A.; Worth, S.H. (2024). Profile of women in African agriculture and access to extension services, *Social Sciences & Humanities Open*.  
<https://doi.org/10.1016/j.ssaho.2023.100790>.
- Adeosun K. P., Nnaji, A. P. and Onyekigwe, C. M. (2020). Socio-economic determinants of home gardening practices among households in University of Nigeria community: Heckman double stage selection approach. *Agro-Science Journal of Tropical Agriculture, Food, Environment and Extension* 19 (3), 19-24. ISSN 1119-7455. DOI: <https://doi.org/10.4314/as.v19i3.4>
- Aderinoye-Abdulwahab, S., Rabi Ganiyu, A., & Egbewole, H. (2024). Changing Paradigms in Addressing Climate Shocks among Pastoralists and Women Farmers in Northern Nigeria. IntechOpen.  
<https://doi/10.5772/intechopen.1006532>.
- Agwu, A.E., Suvedi, M., Chanza, C., Davis, K., Oywaya- Nkukumwa, A., Najjingo Mangheni, M., and Sasidhar, P.V.K. (2023). Agricultural Extension and Advisory Services in Nigeria, Malawi, South Africa, Uganda, and Kenya. Partnerships for Innovative Research in Africa (PIRA) Research Report. East Lansing, Michigan, USA: Alliance for African Partnership, Michigan State University.
- Alaimo, K., et al. (2019). Gender differences in motivations for gardening. *Landscape and Urban Planning*, 189, (102-111).  
<https://doi.org/10.1016/j.landurbplan.2019.04.009>.
- Al-Shammary, A.A.G. et al., (2024). Optimizing sustainable agriculture: a comprehensive review of agronomic practices and their impacts on soil attributes, *J. Environ. Manag.* 364 (2024) 121487.
- Atapattu, A. J., Ranasinghe, C. S., Nuwarapaksha, T. D., Udumann, S. S., and Dissanayaka, N. S. (2024). "Sustainable agriculture and sustainable development goals (SDGs)" in Emerging technologies and marketing strategies for sustainable agriculture (IGI Global), 1–27. doi: 10.4018/979-8-3693-4864-2.ch001
- Basarir, A.; Al Mansouri, N.M.N.; Ahmed, Z.F.R. (2022). Householders Attitude, Preferences, and Willingness to Have Home Garden at Time of Pandemics. *Horticulturae*, 8, 56. <https://doi.org/10.3390/horticulturae8010056>
- Buehren, N., Goldstein, M., Molina, E., & Vaillant, J. (2019). The impact of strengthening agricultural extension services on women farmers: Evidence from Ethiopia. *Agricultural Economics*, 50(4), 407-419.
- Bryan, E., Muzna, A., Sophia, H., Claudia, R. (2024). Addressing gender inequalities

- and strengthening women's agency to create more climate-resilient and sustainable food systems. *Global Food Secur.* <https://doi.org/10.1016/j.gfs.2023.100731>.
- Chalmin-Pui, L.S.; Griffiths, A.; Roe, J.; Heaton, T.; Cameron, R. (2021). Why garden? Attitudes and the perceived health benefits of home gardening. *Cities*, 112, 103118. <https://doi.org/10.1016/j.cities.2021.103118>
- Crow, R. (2021). Backyard farming – a guide to homesteading for beginners. <https://www.homesandgardens.com/advice/backyard-farming-homesteading>; Accessed December 4th, 2024.
- Daudu, A.K., Oladipo, F.O., Olatinwo, L.K., Kareem, O.W., & Dolapo, T.A. (2019): Differences in Food Crop Diversification between Male and Female Smallholder Farmers in Kwara State, Nigeria. *Journal of Agricultural Extension*, Vol. 23 (4), 1-9. Published by Agricultural Extension Society of Nigeria. Available online at <https://www.ajol.info/index.php/jae/issue/view/18432>
- Daum, T. (2023). Mechanization and sustainable agri-food system transformation in the Global South. A review. *Agron. Sustain. Dev.* 43, 16. <https://doi.org/10.1007/s13593-023-00868-x>
- Dhillon, R.; Moncur, Q. (2023). Small-Scale Farming: A Review of Challenges and Potential Opportunities Offered by Technological Advancements. *Sustainability*, 15, 15478. <https://doi.org/10.3390/su152115478>
- Food and Agricultural Organisation (FAO). (2023). The status of women in agrifood systems. Rome. <https://doi.org/10.4060/cc5343en>
- Grebitus, C. (2021). Small-Scale Urban Agriculture: Drivers of Growing Produce at Home and in Community Gardens in Detroit. *PLoS ONE*, 16, e0256913. <https://doi.org/10.1371/journal.pone.0256913>
- Heckert, J., Martinez, E.M., Sanou, A., Pedehombga, A., Ganaba, R. and Gelli, A. (2023). Can a gender-sensitive integrated poultry value chain and nutrition intervention increase women's empowerment among the rural poor in Burkina Faso? *J. Rural Stud.*; 100: 103026.
- Hidrobo, M., Kosec, Gartaula, H.N., Campenhout, B.V., & Carrillo, L. (2024). Making complementary agricultural resources, technologies, and services more gender-responsive, *Global Food Security*, 42, 100778. <https://doi.org/10.1016/j.gfs.2024.100778>.
- Hume, C., Grieger, J.A., Kalamkarian, A., D'Onise, K., Smithers, L.G. (2022). Community gardens and their effects on diet, health, psychosocial and community outcomes: a systematic review. *BMC Public Health* 23;22(1):1247. doi: 10.1186/s12889-022-13591-1. PMID: 35739494; PMCID: PMC9229094.
- Issoufou, M., Amadou, O., Lawali, D., Saidou, O. M., Habibou, I., & Boubacar, Y. (2020). Constraints and strategies for women's access to land in the regions of Maradi and Zinder (Niger). *Cogent Social Sciences*, 6(1). <https://doi.org/10.1080/23311886.2020.1712156>
- Ketchiwou, G.F.; Dzansi, L.W. (2023). Examining the Impact of Gender Discriminatory Practices on Women's Development and Progression at Work. *Businesses*, 3, 347–367. <https://doi.org/10.3390/businesses3020022>
- Khan, F. U., Nouman, M., Negrut, L., Abban, J., Cismas, L. M., & Siddiqi, M. F. (2024). Constraints to agricultural finance in underdeveloped and developing countries: a systematic literature review. *International Journal of Agricultural Sustainability*. <https://doi.org/10.1080/14735903.2024.2329388>



- Lin, T.; Ko, AP.; Than, M.M.; Catacutan, D.C.; Finlayson, R.F.; Isaac, M.E. (2021) Farmer social networks: The role of advice ties and organizational leadership in agroforestry adoption. *PLoS ONE* 16(8): e0255987. <https://doi.org/10.1371/journal.pone.0255987>
- Lufuke, M., Bai, Y., Fan, S., Tian, X. (2022). Women's Empowerment, Food Security, and Nutrition Transition in Africa. *Int J Environ Res Public Health*. 24;20(1):254. doi: 10.3390/ijerph20010254. PMID: 36612576; PMCID: PMC9819006.
- Odebode, S. O.; Adeniyi, R. T.; Adetunji, T. A. (2023). Assessment of home gardening on the welfare of rural households in Egbeda Local Government, Oyo State, Nigeria. *Nigerian Journal of Rural Sociology* Vol. 23, No. 1, 2023
- Ofuya, T.I.; Okunlola, A.I.; Mbata, G.N. (2023). A Review of Insect Pest Management in Vegetable Crop Production in Nigeria. *Insects*, 14, 111. <https://doi.org/10.3390/insects14020111>
- Oladele, O. N., Emeghara, U. U., Ayodele, J. T., Ishola, B. F., Awobona, T. A. and Olukotun, O. I. (2020). Contribution of Home Gardening to Household Food Security: A Case Study of Home Gardeners in Igabi Local Government Area of Kaduna State, Nigeria. *Asian Journal of Agricultural and Horticultural Research*. 6(3): 13-23, 2020; Article no. AJAHR.59002ISSN: 2581-4478, DOI: 10.9734/ajahr/2020/v6i330073.
- Olanrewaju, K.O., Akintunde, O.K., Adeoye, I.B. and Bamiwuye, O.A. (2021). Gender differential in leafy vegetable production in Lagelu Local Government Area of Oyo State, Nigeria. *Journal of Agriculture and Food Sciences*, Volume 19 Number 1, April 2021 pp 120-133.
- Picot, L., Sisto, I. & Furst, M. (2023). Engaging women and men equally in managing biodiversity. Guidelines to address gender equality in policies and projects related to biodiversity. Rome, FAO. <https://doi.org/10.4060/cc4257en>
- Pierotti, S., Friedson, S., Olayiwola, O. (2022). Women farm what they can manage: how time constraints affect the quantity and quality of labor for married women's agricultural production in southwestern Nigeria, *World Dev.* 152 (2022) 105800, <https://doi.org/10.1016/j.worlddev.2021.105800>.
- Quisumbing, A., Heckert, J., Faas, S., Ramani, G., Raghunathan, K., Malapit, H. (2021). Pro WEAI for Market Inclusion Study Team. Women's empowerment and gender equality in agricultural value chains: evidence from four countries in Asia and Africa. *Food Secur.*, 3(5):1101-1124. doi: 10.1007/s12571-021-01193-5. Epub 2021 Sep 3. PMID: 34790280; PMCID: PMC8557149.
- Rick, W. (2022). Backyard Farming for Everyone: Get Started Easily Today. <https://worstroom.com/backyard-farming/>; Accessed December 4<sup>th</sup> 2024
- Saaka, M., Awini, S., Kizito, F., Nang, E. (2024). Relationship between home garden ownership and the consumption of fruits and vegetables. *Public Health Nutr.* 23;27(1): e46. doi: 10.1017/S1368980024000272. PMID: 38253554; PMCID: PMC10882533.
- Salami, A., Deji, O. F., & Opayinka, A. (2024). Gender-Based Violence and Agricultural Productivity in Osun State, Nigeria. *Journal of Agricultural Extension*, 28(4), 20-27.
- Santos, M., Moreira, H., Cabral, J.A., Gabriel, R., Teixeira, A., Bastos, R., Aires, A. (2022). Contribution of Home Gardens to Sustainable Development: Perspectives from A Supported Opinion Essay. *Int J Environ Res Public Health*. 21;19(20):13715. <https://doi.org/10.3390/ijerph192013715>. PMID: 36294295; PMCID: PMC9603381.

- Shah, N., Zaheer, S., Safdar, N.F., Turk, T., Hashmi, S. (2023). Women's awareness, knowledge, attitudes, and behaviours towards nutrition and health in Pakistan: Evaluation of kitchen gardens nutrition program. *PLoS One*, 14;18(9):e0291245. doi: 10.1371/journal.pone.0291245. PMID: 37708133; PMCID: PMC10501633.
- Snider, A., Adraki, P. K., Lolig, V., & McNamara, P. E. (2023). Assessing gendered impacts of post-harvest technologies in Northern Ghana: gender equity and food security. *Gender, Technology and Development*, 28(1), 99–122. <https://doi.org/10.1080/09718524.2023.2273153>.
- Taruvunga, A., Singatha, W., Mukarumbwa, P. (2021). Factors influencing commercialisation among smallholder cabbage farmers of the Buffalo City Metropolitan Municipality of South Africa: A Cragg Double-Hurdle model approach. *J. Agribus. Rural Dev.*, 4(62), 353–362. <http://dx.doi.org/10.17306/J.JARD.2021.01440>.
- Tehinloju, O. A., & Fasina, O. O. (2024). Perception of Cassava and Maize Farmers on the Effectiveness of Agricultural Information Channels in Southwest, Nigeria. *Journal of Agricultural Extension*, 28(4), 13-19.
- Turnšek, M.; Gangenes Skar, S.-L.; Piirman, M.; Thorarinsdottir, R.I.; Bavec, M.; Junge, R. (2022). Home Gardening and Food Security Concerns during the COVID-19 Pandemic. *Horticulturae* 2022, 8, 778. <https://doi.org/10.3390/horticulturae8090778>
- Wiles, J.; Miskelly, P.; Stewart, O.; Rolleston, A.; Gott, M.; Kerse, N. (2021). Gardens as Resources in Advanced Age in Aotearoa NZ: More than Therapeutic. *Soc. Sci. Med.*, 288, 113232. <https://doi.org/10.1016/j.socscimed.2020.113232>
- Wodajo, H. D., Gameda, B. A., Kinati, W., Mulem, A. A., van Eerdewijk, A., & Wieland, B. (2020). Contribution of small ruminants to food security for Ethiopian smallholder farmers. *Small Ruminant Research*, 184, 106064. <https://doi.org/10.1016/j.smallrumres.2020.106064>.
- Zafar, M., Amir, R. M., Raza, H. A., Aderinoye-Abdulwahab, S., Irshad, I., & Dolapo, T. A. (2024). Factors Affecting Livelihood Diversification of Women of Farm Families Working in Textile Industries in Faisalabad District, Pakistan. *Pertanika Journal of Social Sciences & Humanities*, 32(3). <https://doi.org/10.47836/pjssh.32.3.14>.