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**Women Group Garden Activities and Household Food Security in
Kwania District, Mid-North Uganda**



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Women Group Garden Activities and Household Food Security in Kwania District, Mid-North Uganda

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ABSTRACT

Purpose: This study examined the contribution of Women Group Gardens to household food security in Kwania District; specifically, the study determined the effect of women group gardens on food availability, food accessibility, food stability and food utilisation.

Methodology: The study adopted a cross-sectional study design, which employed a mixed methods approach of both quantitative and qualitative methods. The study population consisted of 122 respondents, which included District Commercial Officer, District Agricultural Officer, Sub county Development Officer, Executive and members of the women group gardens in Inomo Sub-county. Both the Simple random sampling technique and purposive sampling technique were used to select a sample of 122 participants. The researcher adopted Self-Administered Questionnaires to collect quantitative data and an interview guide to collect qualitative data. Both descriptive statistics and inferential statistics were used to analyse numerical data. Content analysis was used to analyse qualitative data.

Findings: The findings revealed a statistically significant positive relationship between women group garden activities and household food security. Further, it was revealed that women group garden activities had a significant effect on food availability, food accessibility, food stability and food utilisation.

Unique Contributions to Theory, Policy and Practice: It was concluded that women group garden activities significantly affects household food security in Inomo sub-county. The study recommended that, for improved food security in households in Inomo Sub-county, the Sub-county authorities should sensitise the local community to strengthen garden groups so that they can gain support from the government as well as enhance food security. The results of this study are valuable to local leaders given that the government of Uganda is currently implementing a number of poverty reduction interventions.

Keywords: *Women group garden, food availability, food accessibility, food stability and food utilisation.*

1. INTRODUCTION

The history of food security can be traced back to the Old Stone Age era about 11,000 years ago, a period in human history when foraging, hunting, and fishing were the primary means of survival and their diet was dependent on the natural ecosystems (Liu et al., 2013). In terms of gender roles, men had the responsibility of hunting and fishing while women would go for foraging. The period of Old Stone Age was followed by Neolithic era which started after a prolonged period of hunting and gathering and in this period, there were introduction of things like agriculture using rudimentary tools made out of stones and wild movement in search for food reduced. Crops were introduced at first to provide a stable food source for the group which ensured food security (Bar-Yosef, 2002).

The concept of household food security came into administrative acknowledgment when The United Nations Conference on Food and Agriculture, assembled by President Franklin Roosevelt at Hot Springs, Virginia, USA in 1943, during the Second World War which led to the creation of the Food and Agriculture Organization, (FAO) of the United Nations Organisation (Akram-Lodhi, 2009). The founding conference of FAO was organized to consider the goal of freedom from want in relation to food and agriculture and it was recognized that freedom from need means a secure, an adequate, and a suitable supply of food at every household level (Adhikari, 2009). Its main objective was to ensure abundant supply of the right kinds of food for all mankind at household level. The primary responsibility was to ensure that people had the food needed for life and health with each nation (Akram-Lodhi, 2009).

Globally, “The State of Food Security and Nutrition in the World”, was jointly launched in September 2017, marking the beginning of a new era in monitoring progress towards achieving a world without hunger and malnutrition, within the framework of the Sustainable Development Goals (SDGs). This report monitors progress towards the target of ending hunger (SDG Target 2.1) and provides an analysis of the underlying causes and drivers of observed trends (Smith & Archer, 2020). The great concern is the finding of 2015, after a prolonged decline, the most recent estimates showed that global food insecurity is still increasing in a number of countries around the world (Davidson & Morrell, 2020). The number of people globally who are experiencing acute food insecurity and will need urgent assistance is likely to climb to 222 million people in 53 countries and territories, according to a (FAO, 2022). The report further indicated that, the global prevalence of severe food insecurity rose from 9.3 to 10.9 percent between 2019 and 2020 to 11.7 percent in 2021. An estimated 923.7 million people faced severe food insecurity in 2021 (73.6 million more than in 2020 and 207 million more people compared to 2019). In 2021, an estimated 29.3 percent of the global population equivalent to 2.3 billion people were moderately or severely food insecure.

In Sub-Saharan Africa, household food insecurity has been on the increase and it is a rising concern to many state institutions in Africa (Sall & Blaney, 2020). The largest increase in food insecurity in Africa was witnessed between 2020 while moderate or severe food insecurity increased from 1.9% in one year to 57.9%, affecting nearly one in four people in the region in 2021 (FAO, 2022). An estimated 322 million Africans were facing severe food insecurity.

More than one-third of the total number of people facing severe food insecurity in 2021 lives in Africa according to World Economic forum (2022), 78 million people in Africa suffers from chronic hunger. This corresponds to 20 percent of the continent's population. It is estimated by the Food and Agriculture Organization that the number of malnourished people in Sub Saharan Africa indicates a rise from 165.5 million in 1990-92 to 198.4 million in 1999-2001 indicating 84% rise in food insecurity. This statistic relates to a recent study regarding the food insecurity situation in South Africa and Senegal (Akpaki et al., 2020).

In Eastern Africa, food insecurity is most severe in South Sudan where six in every ten people (63% of the population) face acute food insecurity; followed by Somalia (45%), Sudan (34%) and Rwanda (23%). In absolute terms, Ethiopia has the highest number of food insecure people in the region (20.3 million) followed by Sudan (15.6 million) (WFP, 2022). The report further indicated that number of children facing the impact of drought and rising food prices including acute hunger, malnutrition, and thirst has increased from 7.25 million in March 2022 to at least 10 million in July 2022 in Kenya, Somalia, and Ethiopia; Maternal malnutrition is also at a critical level with over 1.5 million requiring nutrition assistance. There is an increasing risk of unprecedented levels of mortality particularly in the worst drought affected areas. Recent studies indicate a similar trend in the Eastern African region (Mayanja et al., 2020). Women groups like women group gardens have been recognised to play a leading role in enhancing food security by increasing on the level of food production in the household, low level of productivity which results to food insecurity is still a challenge in most parts of East Africa (Masiga, 2014).

The theory of access put forward by Ribot and Peluso (2003) states that people may hold the right to access a certain resource, but may not necessarily have the ability to use the resource in a productive way to benefit from it due to a lack of structural and relational mechanisms such as capital, technology, labour, knowledge, authority, market mechanisms, social relations, and identity. The theory of access is related to this study in that if members of the women group garden get access to necessary resources, they will be in position to increase on the level of production. This will in turn lead to availability, accessibility and stability of food in the household. However the weakness of this theory is that a person will only benefit from certain resources only if he/she has structural and relational mechanisms like knowledge. This therefore implies that there is need for enhancement of capacity if all people are to benefit from resources effectively.

Women Group Gardens (WGGA) refers to a group of people always ranging from 20-30 members from within the same locality who farm together and have a garden for the group where they plant a selected crop variety, harvest, sells and save the money for the group (Commercial Officer Kwania, 2023). The groups also work on the garden of the members according the number that a group member has picked starting with the person who picked number one (Commercial Officer Kwania, 2023). The mandate of the leaders in relation to Bank account is that the Chairperson, the Secretary and the Treasurer must sign for any transaction to take place in the Bank. The concept of food security refers to the condition of sufficient food availability, access, stability and utilization or consumption (Peng & Berry,

2019). According to FAO (2018), household food security requires that food has to be available in its physical form in enough quantity and good quality in every household so as to safeguard against food insecurity.

Agricultural supply chain management has a significant effect on the availability, accessibility and stability of food in the household of people (FAO, 2019). According to United Nations' Committee on World Food Security, food security implies that all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life. The definition of household food security adapted in this study is that it is a situation when a household has access to the food needed for a healthy life for all its members in terms of quality, quantity, safety, and culturally acceptable at all times. In this study variable, food security will be characterised by Availability of food, Accessibility of food, food Stability and utilisation at all times at the household level.

The availability of sufficient quantities of food in acceptable quality and this could be from domestic production or imports, including food aid (FAO, 2016). Food availability refers to the physical availability and presence of food stocks in desired quantities given by domestic production or bought from any available source within a nation (Swaminathan & Bhavani, 2013). In this study, it refers to the degree to which food is consistently physically obtainable in desired quantities, shaped by the production, distribution, and exchange patterns of food goods. Food access essentially refers to a neighbourhood and a home having enough food and true food security requires that individuals have access to a sufficient amount and quality of nutritious food (Adhikari, 2018). In this study, it refers to the ability to obtain food free from barriers posed by travel time, physical features of the area and store, neighbourhood safety, and transportation costs.

Food accessibility is influenced by a number of geographical, social, and policy factors. Pricing, household proximity to suppliers and transportation all have an influence on food access (Adhikari, 2018). Food Stability as a situation when the food supply in household level remains constant during the year and in the long-term that includes food, income and economic resources (Peng & Berry, 2018). Food Stability requires that food must be present at all times in terms of availability, access and utilization without any fluctuation (Coleman-Jensen et al., 2020). In this study, it refers to the ability to purchase enough safe and nutritious food given demands on household income outside of food. Food utilisation represents an individual's food consumption and the ability to absorb nutrients contained in the food that is eaten (Bukenya, 2017). Food utilisation considers both the quantity and quality of food, the good health practices, food safety, food storage, food preparation, diet diversification, food preferences, proper feeding practices, proper hygiene, sanitation and clean water supply, which all indicate the importance of non-food input for meeting all physiological needs and achieving the physical and mental development of an individual (Arena, Olivia & Salerno, 2020). Thus, women groups have been recognised for the leading role they play in enhancing household food security. In a study by Kurniawan (2016), it is indicated that that women group has got a

direct bearing on household food stability because to ensure stability of food at all times there has got to be economic capacity to acquire food at the time it is needed throughout the year.

Uganda under the Ministry of Agriculture, Animal Industry and Fisheries came up many interventions aimed at enhancing food security (MAAIF, 2018). However, a report by Famine Early Warning System Network (FEWS NET, 2022) indicated that food insecurity worsens nationwide as prices rise during poor production year. Further assessment on household food security conducted in Uganda from December 2016 to January 2017 and it resulted into production of the Uganda Emergency Food Security Assessment report which was done by a number of government Ministries, departments, agencies, as well as international agencies such as World Bank, World Food Programme, United Nations Development Programme, FAO, United Nations Children Emergency Fund (Hamanna, 2020). The main objective of the exercise was to establish the food security situation using the integrated food security Phase Classification (IPC) for Uganda for the period from January to March 2017.

In Lango Sub- region, the government of Uganda has rolled out a number of projects to improve agricultural productivity and to enhance household food security. Projects like the Agriculture Cluster Development Project (ACDP) that was effective from January, 2017 focusing on improvement in productivity of crops like rice, beans, cassava, and coffee in Oyam, Lira, Apac, and Dokolo. Under ACDP project, Government of Uganda prioritized the supply of quality agricultural inputs to the region with the view of improving agricultural output (MAAIF, 2020). Government has also implemented the Vegetable Oil Development Project Phase 11 in the districts of Lira, Apac, Oyam, Amolatar, Alebtong, Otuke, Kole, Kwania and Dokolo, and many other projects under the Operation Wealth Creation. Despite massive government investments in agricultural inputs and other agricultural extension services in the region, productivity remains low (UBOS, 2019). It was against the background that the study examined the contribution of women group garden on food security.

1.1 Statement of the Problem

Whereas many initiative such as such Plan for Modernisation of Agriculture (PMA), National Agricultural Advisory Services (NAADS), Community Agriculture Infrastructure Improvement Programme (CAIIP), Operation Wealth Creation (OWC) have been made by the Government of Uganda, to improve household food security through the increase of the presence in different households, there is still widespread household food insecurity in many regions of Uganda with northern, north-eastern and eastern parts of Uganda experiencing more food insecurity (Yikii, Turyahabwe, & Bashaasha, 2017). The Global Hunger Index (2019) has ranked Uganda in position number 104 out of 117 countries which were assessed. The assessment qualified Uganda as one of the countries with a serious level of hunger. Similarly, Food and Agricultural Organization (2018) reported that undernourishment affects 41.4% of the population. According to National Planning Authority (2017), 25 percent of the population is food insecure, while the remaining 75 percent gets at least one meal a day. Regionally, Northern Uganda where Lango sub region is; accounts for most households in the country with chronic food insecurity at 40 percent (National Planning Authority, 2017) after Karamoja sub-

region in the north east (UBOS statistical abstract 2021/2022). FAO (2019) indicates that the percentage of population in Lango sub-region suffering from acute malnourishment increased from 3.4% in 2015 to 5% in 2016 and this was attributed to low agricultural productivity in the region. Perhaps, this dilemma can be linked to the absence of social group. It was against this background that the researcher examined how women group garden activities can enhance household food availability, access, stability and utilisation in Inomo sub county, Kwania District.

1.2 Purpose of the Study

The purpose of this study was to examine the contribution of women group garden activities on household food security in Kwania District. Specifically, four objectives were targeted; (i) To assess the effect of women group garden activities on household food Availability in Inomo Sub-county (ii) To examine the contribution of women group garden activities on household food Accessibility in Inomo Sub-county (iii) To assess the effects of women group garden activities on household food Stability in Inomo Sub-county (iv) To examine the contribution of women group garden activities on household food utilisation in Inomo Sub-county.

2. METHODS AND MATERIALS

The design of the study was cross-sectional study design using a mixed method research in data collection and management. A study population of 10 groups was considered generating 122 in the categories of District Commercial Officer, Sub-county Development Officer, WGGAs Leaders and group members. Due to the fact that the number of each WGGAs group which was between 10-30 members, the above population was representative enough. The population consisted of selected District leaders, selected Sub-county Leaders, selected Local Council leaders and leaders and members from different WGGAs from within Inomo Sub-county. From the study population of 122, the researcher used Krejcie & Morgan Table (1970) to draw the sample size to draw a sample of 92 using both purposive sampling and simple random sampling methods.

2.1 Quality Control

Quality control is the process of ensuring the validity and reliability of the instruments for data collection (Creswell, 2014). Test validity is widely understood as the degree to which a test measures what it should measure (Creswell, 2014). The researcher used face and content validity to assess the validity of the instruments. Face validity considers how suitable the content of a test seems to be on the surface (Creswell, 2014). Content validity was as well established and here, all of the questionnaire items were reviewed for readability, clarity and comprehensiveness and some level of agreement were reached so as to determine those items to be included in the final questionnaire (Kothari, 2014). It was established by calculating the content validity index (CVI). As a rule of thumb, CVI at 0.70 and above is acceptable and if the test for CVI for the items is found to be above 0.7, then the instrument is considered to have passed content validity. Consistency of the instruments was measured using the inter-rater reliability test where short-answer tests involving more than one word response, rating scales and observation instruments which is concerned with inter scorer reliability and or intra judge

reliability which is the reliability of two or more independent scorers or the reliability of the scoring of the same judge on more than one occasion individual scores. The stability of the instrument was established using a test-retest reliability method which is the degree to which scores on the same individuals are consistent over time.

Table 1: Reliability test

Variables	Cronbach alpha	No. of items
Women Group Garden	0.842	05
Food availability	0.822	05
Food accessibility	0.786	05
Food stability	0.760	05
Food utilisation	0.702	15
Overall	0.782	35

Source: Primary Data, 2023

2.2 Ethical Considerations

Ethical considerations are those considerations that relates to the integrity and safety of the respondent and the information got from them (Kothari, 2014)

- a) The major ethical issues in this study were informed consent and confidentiality of the respondents. Obtaining a valid sample entailed gaining access to specific lists and files where certain information are only supposed to be given by specific people within the structure of WGGGA management and in such events, the respondents were told the reason for the study and asked to take consent or else the researcher would find the information from the next person in the hierarchy with such authority.
- b) **Confidentiality:** Information obtained from the group was treated as confidential for the consumption of the group members only.

3. PRESENTATION AND DISCUSSION OF FINDINGS

3.1 Response rate

Out of the 80 questionnaires administered to the respondents, 80 (100%) were returned while out of 12 respondents interviewed, 12 participants took part. Given that any response rate above 50% is considered appropriate to accomplish the study objectives (Mugenda & Mugenda, 2003), this indicated that the data collected was adequate for carry out analysis. The 100% response rate was achieved because the researcher utilised the services of a trained researcher assistants in data collection.

3.2 Demographic Characteristics of the Respondents

The demographic characteristics of the study participants were studied in terms of gender, age, marital status, level of education, and level of production before and after joining the group. 78.9% of the respondents that form the majority were female while the remaining 21.1% were male. This was because these groups were mainly formed by women although some men also joined. The finding also indicated that majority of the study participants were married (67.5%). This indicates that most of the group members are people having families and they have the responsibility of feeding their families. This is probably the reason why they decided to form the group so as to enhance their capacities of producing more food for the families. Concerning the age brackets, majority of the respondents were in the age group of 41-50 years (42.5%) and was closely followed by those in the age bracket of 31-40 (41.3%). The age racket of 31-40 years mostly comprise of people having families (Children) to take care of. In the village where agriculture is the main economic activities, farmers tend to join group to improve their capacity to provide for the family.

On the level of education, most of the people who took part in the study had primary level of education (75%). However, they were in position to make sense of the study tool since the researcher used interviewee questionnaire administration (the researcher read and translated the questions on the data collection instrument. The result also revealed that most of the people who took in the study were between 1-3 and 4-6 cycles. Lastly, the finding revealed that there was increase in the level of production after the members had joined the group. For example 91.3% of the members were farming between 1-3 acres of land and only 8.8% were farming between 4-6 acres with none farming 7 acres and above. After joining the group, those farming 1-3 acres reduced from 91.3% to 10%. This implies that about 81.3% had increased their level of production. Also, those farming 4-6 acres increased from 8.8% to 68.8% while 18.8% of the members were now farming 7-10 acres of land. The contribution of women group garden was assessed in terms of their level of farming and the level of saving.

Farming Activities

In order to assess the level of farming activities among members of women group garden, respondents were assessed on the five (5) items.

Table 1: Descriptive Statistics for Farming Activities

Items	N	Mean	Std. Dev
I am currently producing varieties of food crops as a result of the help from the group	80	3.90	.805
I have been in position to get capital for my farming from sales of produce of group garden	80	3.93	.671
Joining women group gardens helped me to improve on the level of household income through increased level of food production	80	3.96	.702

As a member of the group, my living condition has improved due to increased production	80	3.94	.785
Women group gardens have helped me to increase on the availability of food at home	80	4.02	.636
Valid N	80	3.95	.720

Source: Researcher's Contribution using Primary data (2023)

The output in table 1 reveals that all the items used to assess the farming activities among the women group garden revealed above average performance on a Likert scale of 1-5 used by the researcher. The items of farming activities increasing food availability registered the highest mean score of 4.02. However, the entire mean were above the average mean scores of 3.0. This suggests that farming activities being carried out by women group garden are help in improving food security at their households. The overall mean score of approximately 3.95 suggested a positive impact of farming activities towards food security in Inomo Sub-county. The Standard Deviation of 0.720 indicated slight deviation in the views of the respondents regarding the contribution of farming activities towards food security.

Saving Activities

In an attempt to assess the level of saving activities among members of women group gardens, respondents were asked questions.

Table 2: Descriptive Statistics for Saving Activities

Items	N	Mean	Std. Dev
I have been in position to acquire more land for production from the savings I make in the group	80	3.89	.693
Joining the group has made me to be in position to feed the family properly	80	3.85	.695
I have been in position to acquire business skill after joining the group	80	3.77	.842
The quality of food for my family have improved as a result of savings I make in the group	80	3.88	.753
I have been in position to save money from group activities to increase my production for the family	80	3.94	.663
Valid N (listwise)	80	3.87	.729

Source: Researcher's Contribution using Primary data (2023)

The result reveals that all the items used to assess the saving activities among the women group gardens revealed above average performance on a Likert scale of 1-5 used by the researcher. The items of saving help to increase food production registered the highest mean score of 3.94. However, the entire mean were above the average mean scores of 3.0. This suggests that saving activities being carried out by women group garden are help in improving food security at their households. The overall mean score of approximately 3.87 suggested that saving by group members help to improve food security in Inomo Sub-county. The Standard Deviation of .729 indicated slight deviation in the views of the respondents regarding the contribution of saving activities towards food security.

Descriptive Statistics on the Dependent Variable

Food security was assessed in terms of food availability, food accessibility, food stability and food utilisation.

Food Availability

In order to assess the level of food availability in the households of members of women group garden in Inomo Sub County, respondents were assessed on the five (5) items.

Table 3: Descriptive Statistics for Food Availability

Items	N	Mean	Std. Dev
My family is position to afford three meals in a day	80	3.27	1.158
Right quantity of food is always present at home all the time	80	3.19	1.032
My family is able to get enough food at all times	80	3.41	1.002
The family is sure of the availability of food throughout the year	80	3.48	.981
My family is currently able to afford any type of food	80	3.33	.978
Valid N (listwise)	80	3.34	1.030

The findings indicated that all the items used to assess the level of food availability in the household of members of women group garden revealed above average performance on a Likert scale of 1-5 used by the researcher. According to the result, it suggests that if members of the women group garden carry out faming and saving activities, it can help to improve on the level of food availability in their household. Faiez Ahmed Mohamed Hamed El NEEL (2020) noted that group creates farm income opportunities for women and make them to be in position to feed their families, especially in rural areas where most of population live. The overall mean score of approximately 3.34 indicates that women group garden has a positive contribution towards food security in Bala Sub County. The Standard Deviation of 1.030

indicated deviation in the views of the respondents regarding the contribution of women group garden towards food security.

Food Accessibility

In order to assess the level of food accessibility in the households of members of women group garden in Inomo Sub County, respondents were assessed on the five (5) items.

Table 4: Descriptive Statistics for Food Accessibility

Items	N	Mean	Std. Dev
My family is in position to get food at all times	80	3.40	1.038
The family is able to get the diet it needs	80	3.36	1.009
My family is always in position to get the right quantity of food it needs	80	3.28	.954
My family always get the right quality of food	80	3.28	.981
All my family members are currently in position the type of food they need	80	3.31	1.063
Valid N (listwise)	80	3.326	1.009

The findings indicated that all the items used to assess the level of food access in the household of members of women group garden revealed above average performance on a Likert scale of 1-5 used by the researcher. According to the result, the mean scores of all the items above 3.0 suggests that the respondents expressed that if members of the women group garden carry out faming and saving activities, it can help to improve on the level of food access in their household. According to Nondumiso Thabisile Mpanza and Mfaniseni Wiseman Mbatha (2021), women's involvement in farm activities helps to generate income for the purchase of food for the family. The overall mean score of approximately 3.326 indicates that women group garden has a positive contribution towards food security in Bala Sub County. The Standard Deviation of 1.009 indicated deviation in the views of the respondents regarding the contribution of women group garden towards food security.

Food Stability

In order to assess the level of food stability in the households of members of women group garden in Inomo Sub County, respondents were assessed on the four (4) items.

Table 5: Descriptive Statistics for Food Stability

Items	N	Mean	Std. Dev
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My family is not scared of experiencing food shortage in future	80	3.57	.978
My family is sure of having three meals in a day	80	3.50	1.043
My family has secured enough food stock that can reach the next harvest	80	3.29	1.171
My family is sure having diet throughout	80	3.11	1.114
My family members are sure of the right quantity and quality of food at all times	80	3.10	1.098
Valid N (listwise)	80	3.31	1.081

The findings indicated that all the items used to assess the level of food stability in the household of members of women group garden revealed above average performance on a Likert scale of 1-5 used by the researcher. This suggests that if members of the women group garden carry out farming and saving activities, it can help to make to be in position to have food at home all the time. According to Obademi and Samson (2018), women's involvement in income generating activities help to ensure that food is always present at all times. The overall mean score of approximately 3.31 indicates that women group garden has a positive contribution towards food security in food security in Inomo Sub-county. The Standard Deviation of 1.030 indicated deviation in the views of the respondents regarding the contribution of women group garden towards food security.

Food Utilisation

In order to assess the level of food utilisation in the households of members of women group garden in Inomo Sub County, respondents were assessed on the four (4) items.

Table 6: Descriptive Statistics for Food Utilisation

Items	N	Mea	
		n	Std. Dev
The type of food that my family members eats is good for the body	80	3.75	1.013
My family eats diet frequently	80	3.23	1.043
All my family members are healthy due to the food they eat	80	3.63	.986
My family members do not suffer from illness related to poor feeding	80	3.65	.961
My family members do not have growth problem related to poor feeding	80	3.65	.943

Valid N (listwise)

80 3.58 .989

The findings indicated that all the items used to assess the level of food utilisation in the household of members of women group garden revealed above average performance on a Likert scale of 1-5 used by the researcher. According to the result, involvement of members of the women group garden carry out farming and saving activities help them to generate income which can make them to be in position to afford better meals (diet) for their families. According to Essilfie et al. (2020), women's empowerment through participation in group activities is positively associated with food security and improved nutritional outcomes of family members, especially children's nutrition and growth. Relatedly, Ghosh et al (2021) also noted that women participation in group make them self-dependent in decision making within their households, and this help to improve their roles in household food security and nutritional management The overall mean score of approximately 3.34 indicates that women group garden activities has a positive contribution towards food security in food security in Inomo Sub-county. The Standard Deviation of 1.030 indicated deviation in the views of the respondents regarding the contribution of women group garden towards food security.

3.3 Correlation between Women Group Garden activities and Food Security

In order to test the relationship between women group garden activities and food security, correlation analysis was carried out.

Table 7: Pearson's Correlation Results

			WGGA	FA	FC	FS	FU
Women group garden activities (WGGA)	Pearson Correlation		1				
	Sig. (2-tailed)						
	N		80				
Food availability (FA)	Pearson Correlation		.476**	1			
	Sig. (2-tailed)		.000				
	N		80	80			
Food accessibility (FA)	Pearson Correlation		.407**	.733	1		
	Sig. (2-tailed)		.000	.000			

	N	80	80	80		
Food stability (FS)	Pearson Correlation	.506**	.712**	.642**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	80	80	80	80	
Food utilisation (FU)	Pearson Correlation	.511**	.651**	.755**	.493**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	80	80	80	80	80

** . Correlation is significant at the 0.01 level (2-tailed).

The outcome of Pearson's correlation analysis reveals that women group garden activities is positively and significantly correlated with food availability ($r=0.476$, $P<0.01$), food accessibility ($r=0.407$, $P<0.01$), food stability ($r=0.506$, $P<0.01$) and food utilisation ($r=0.511$, $P<0.01$) at 99% confidence level. The finding therefore suggests that get involves in activities such as farming and saving in their group, it will increase on the level of food security in terms of the availability, accessibility, stability and utilisation of food in their households. According to the study women group garden activities has a positive impact on household food security among members of the group. The model summary of the regression test produced an Adjusted R Square of .217, which meant that women group garden contributed about 21.7% to food availability in the household of members of women group garden activities in Inomo Sub County. The remaining 57.5% was contributed by other factors outside the scope of this study.

It was revealed that the independent variables statistically and significantly predict the dependent variable, $F(1, 115) = 54.220$, $p < .05$. Therefore, the regression model is a good fit of the data. The significance level of 0.000 is less than the significance level for 95% confidence and this implies that women group garden activities significantly contribute to food availability in the households of members of women group garden. This therefore implies that the null hypothesis that 'women group garden activities have no significant effect on food availability' is rejected in favour of alternative hypothesis.

The finding indicated that data collection had a regression coefficient of 0.647 which is significant at 1% level of confidence. This suggests that that women group garden activities help in help in improving the level of food availability in households. From the finding, it suggest that if members of the women group garden get involved in activities like farming and savings, it will increase on the level of household food availability. This result answers the first research question which was asking the contribution of women group garden on household food availability among members of women group garden in Inomo Sub County. This result

is in support of the qualitative of the key informants in the interview held. The interview held with the key informants indicated that;

'Members always jointly participate in food production in the group garden and in the individual gardens of the members. This helps them to always produce a lot of food crops for their families'. (KI010)

The finding is consistent with that of Faiez Ahmed Mohamed Hamed El NEEL (2020) who assessed the role of women in household food security among small scale farmers group in Gedarif and Rahad localities of high agriculture production area in eastern Sudan. The result of the study has demonstrated that, there was significant positive effect on food availability in household who have a woman contributing in food processing and a household who live in Gedarif locality, a household who have a women contributing in farm activities. The study also indicated that household with woman engaging in income generation activities had a significant potential importance for increasing household food security in the study area in terms of availability. The finding also concurs with that of Semazzi and Kakungulu (2020) who examined the effect of women saving group on the availability of food in the household of its members. The study indicated that women group activities had a significant effect on food availability in the household of its members; the study was conducted in the part of the world where people who are in groups are properly trained.

The finding agrees with O'Brien, Leavens, Ndiaye, and Traoré (2022) who studied the impacts of implementing a gender-sensitive value chain development (VCD) initiative on food security. The finding of the study indicated that participation of women in the project had a significant effect on the availability of food in the households. In order to achieve the second research objective of this study which was to examine the contribution of women group garden to food accessibility, answer the first research question, and thereafter test the second research hypothesis, a simple linear regression analysis carried out.

The model summary of the regression test produced an Adjusted R Square of .155, which meant that women group garden activities contributed about 15.5% to food accessibility in the household of members of women group garden in Inomo Sub County. The remaining 57.5% was contributed by other factors outside the scope of this study. The F-ratio of ANOVA tests whether the overall regression model is a good fit for the data.

Table 8: ANOVA for Women Group Garden activities on Food Accessibility

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.157	1	9.157	15.448	.000 ^b
	Residual	46.233	78	.593		
	Total	55.390	79			

a. Dependent Variable: Food accessibility

b. Predictors: (Constant), Women group garden

The results suggested that the independent variables statistically and significantly predict the dependent variable, $F(1, 115) = 54.220$, $p < .05$. Therefore, the regression model is a good fit of the data. The significance level of 0.000 is less than the significance level for 95% confidence and this implies that women group garden significantly contributes to food accessibility in the households of members of women group garden. This therefore implies that the null hypothesis that ‘women group garden has no significant effect on food accessibility’ is rejected in favour of alternative hypothesis. A t-test for women group garden activities and food accessibility was also performed.

The finding indicated that data collection had a regression coefficient of 0.597 which is significant at 1% level of confidence. This suggests that that women group garden activities help in help in improving the level of food accessibility in households. From the finding, it suggest that if members of the women group garden get involved in activities like farming and savings, it will increase on the level of household food access. This result answers the first research question which was asking the contribution of women group garden activities on household food accessibility among members of women group garden in Inomo Sub County.

This result is in support of the qualitative of the key informants in the interview held. The interview held with the key informants indicated that; *‘As group members, for the period that we have been together, we have seen a lot of changes in our homes on the issues of access to food. Most of the members are now able to get access to the type of food they want for the family. (KI03)*

The finding agrees with that of Nondumiso Thabisile Mpanza and Mfaniseni Wiseman Mbatha (2021) who assessed the role of women in improving access to food at the household level in Mandeni Local Municipality, KwaZulu-Natal, South Africa. The study revealed that women depended on the off-farm sources of income because their household’s livelihood depends on purchasing food from retail vents. The finding is also in line with that of Faiez Ahmed Mohamed Hamed El NEEL (2020) who assessed the role of women in household food security among small scale farmers group in Gedarif and Rahad localities of high agriculture production area in eastern Sudan. The result of the study has demonstrated that, there was significant positive effect on food availability in household who have a woman contributing in food processing and a household who live in Gedarif locality, a household who have a women contributing in farm activities. The finding also concurs with Adhikari (2018) who examined the role of women saving group activities on household food security in Nepal. The result of the study indicated that women involvement in group activities had a significant effect on the level of accessibility of food in the household of its members. However, the result disagrees with that of Galiè, et al. (2018) who studied women’s empowerment, household food security, and maternal and child diet diversity as one indicator of nutrition security in two regions of Tanzania. The finding revealed significantly associated with women’s dietary diversity, but not with household food security.

Empirical results of Women Group Garden activities on Food Stability

In order to achieve the third research objective of this study which was to examine the contribution of women group garden activities to food stability, answer the first research question, and thereafter test the research hypothesis, a simple linear regression analysis carried out. The model summary of the regression test produced an Adjusted R Square of .425, which meant that women group garden activities contributed about 42.5% to food stability in the household of members of women group garden in Inomo Sub County. The remaining 57.5% was contributed by other factors outside the scope of this study. The F-ratio in the ANOVA in table 4.18 tests whether the overall regression model is a good fit for the data. The table 4.18 shows that the independent variables statistically and significantly predict the dependent variable, $F(1, 115) = 54.220, p < .05$. Therefore, the regression model is a good fit of the data. The significance level of 0.000 is less than the significance level for 95% confidence and this implies that women group garden activities significantly contributes to food stability in the households of members of women group garden. This therefore implies that the null hypothesis that ‘women group garden activities has no significant effect on food stability’ is rejected in favour of alternative hypothesis. A t-test was carried to draw out the statistical significance between women group garden activities and food stability.

Table 9: Coefficients for Women Group Garden activities on Food Stability

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
1 (Constant)	.116	.624		.186	.048
Women group garden	.819	.158	.506	5.179	.000

a. Dependent Variable: Food stability

The finding indicated that data collection had a regression coefficient of 0.819 which is significant at 1% level of confidence. This suggests that that women group garden activities help in help in improving the level of food stability in households. From the finding, it suggest that if members of the women group garden get involved in activities like farming and savings, they will be in position to have food in the house at all times. This result answers the third research question which was asking the contribution of women group garden activities on household food stability among members of women group garden in Inomo Sub County. This result is in support of the qualitative of the key informants in the interview held. The interview held with the key informants indicated that; ‘Participation is group activities had made most of our members to stabilise at their homestead in terms of the presence of food. Also the saving that we have is also lent out and so, encase a member has a problem, he/she can borrow’.

(KI12)

The finding is consistent with those of Obademi and Samson (2018) who assessed the contribution of women through their involvement in group activities on household food security. The finding of the study indicated that women involvement in group income generating activities had a significant effect on the level of food stability of its members. The finding also agrees with Faiez Ahmed Mohamed Hamed El NEEL (2020) who assessed the role of women in household food security among small scale farmers group in Gedarif and Rahad localities of high agriculture production area in eastern Sudan. The study indicated that household with woman engaging in income generation activities had a significant potential importance for increasing household food security in the study area in terms of stability of food. The finding is also in support of According to a study by Badarau and Turcu (2019) on the role of microfinance women group in ensuring all the four pillars of food security being availability, access, utilization and stability, the study indicated that women play a very instrumental roles in enhancing that all the pillars of food security is realised in the household. The finding also concurs with Mustapha (2017) who assessed the effect of women group activities of food stability in the household in Babati District, Tanzania. The finding of the study indicated that women group activities had a significant effect on the level of food stability in the household of its members.

Empirical results of Women Group Garden activities on Food Utilisation

In order to achieve the fourth and last objective of the study which was to examine the contribution of women group garden to food utilisation, answer the first research question, and thereafter test the last research hypothesis, a simple linear regression analysis carried out. The model summary of the regression test produced an Adjusted R Square of 251, which meant that women group garden activities contributed about 25.1% to food utilisation in the household of members of women group garden in Inomo Sub County. The remaining 57.5% was contributed by other factors outside the scope of this study. The F-ratio in the ANOVA in table 4.21 tests whether the overall regression model is a good fit for the data. From the findings, it was revealed that the independent variables statistically and significantly predict the dependent variable, $F(1, 79) = 64.407, p < .05$. Therefore, the regression model is a good fit of the data. The significance level of 0.000 is less than the significance level for 95% confidence and this implies that women group garden activities significantly contribute to food utilisation among the households of members of women group garden. This therefore implies that the null hypothesis that 'women group garden activities has no significant effect on food utilisation' is rejected in favour of alternative hypothesis. A t-test was carried to draw out the statistical significance between women group garden activities and food utilisation.

The finding indicated that data collection had a regression coefficient of 0.647 which is significant at 1% level of confidence. This suggests that that women group garden activities help in help in improving the level of food availability in households. From the finding, it suggest that if members of the women group garden get involved in activities like farming and savings, it will increase on the level of household food utilisation. This result answers the first research question which was asking the contribution of women group garden activities on household food utilisation among members of women group garden in Inomo Sub County.

This result is in support of the qualitative of the key informants in the interview held. The interview held with the key informants indicated that;

'Our group have the saving scheme and we also have a component called round cash where members collect money and give to each one starting with the one who has picked number one. This is helping group members to feed their families well'. (KI011).

The finding is consistent with those of Ghosh et al (2021) who examined the role of rural women group in household food security and nutrition management in Bangladesh. The finding of the study indicated that women's participation in various income-generating activities through their participation in groups made them self-dependent in decision making within their households, which in turn improved their roles in household food security and nutritional management. The finding also agrees with Essilfie et al. (2020) who studied the role of women participation in group on food security in Ghana. The finding of the study indicated that women's empowerment through participation in group activities is positively associated with food security and improved nutritional outcomes of family members, in particular, children's nutrition and growth.

The finding is also in support of Galiè et al. (2019) who assessed the contribution of women group on food security in Tanzania. The study particularly looked at the effect of women empowerment on children's nutrition and growth. The finding of the study indicated that Women's empowerment is positively associated improved children's nutrition and growth. The finding also concurs with Hossain et al. (2021) who studied the role of Women's group empowerment on household food security in in Bangladesh. The finding of the study indicated that women's participation in group activities is positively associated with food security and improved nutritional of the household members. Similarly, Wei et al., (2021) who assessed the role of women's group on household food security in rural Bangladesh. The finding of the study revealed that Women's participation enables them to be empowered and improves nutritional level of family members, particularly children's nutrition and growth.

Multiple Regressions of Women Group Garden activities on Food Security

To achieve the purpose of this study which was to examine the effect of women group garden activities in Inomo Sub County, the researcher carried out multivariate regression analysis. The results revealed that women group garden significantly contribute to the variance in food security by 28.3% (Adjusted $R^2=0.283$, $p<0.01$). This suggests that if member of the women group garden carries out farming and saving activities, their household food security will improve by a variance of 58%. The finding concurs with that of Kurniawan (2016), which also indicated that that women group has got a direct bearing on household food stability because to ensure stability of food at all times there has got to be economic capacity to acquire food at the time it is needed throughout the year.

4. Conclusion

Participation of women group garden members in activities like crop farming and making weekly savings help to improve on the level of their food production making food to always

available at home. Also, increased participation of women in group activities like doing crop farming and saving some money during every meeting days help to enhance their capacity making them to be in position to get access to food as and when needed. Additionally, women participation in income generating activities like agriculture and making weekly contribution inform of saving to a common pool help to empower them hence making them in position to afford food in their households at all times. And, women group activities like farming and savings help to improve on the income level of the family and this can make them positive to afford the right diet for the family. This leads to improved food utilisation.

Recommendations of the study

Based on the findings of this study, it is recommended that leaders at all levels should mobilise the community members to form group so that they can be in position to improve on the level of household food security.

- a) Government is encouraged to recognize that poor people need a range of financial services not just savings and credit, given that their incomes are low, unpredictable and irregular.
- b) Government should women's ability to access better markets.
- c) To maximize the positive impact that women group is having in empowering the low income earners economically by increasing their ability to generate and control income through training women on financial literacy.
- d) Government should improve women's access to resources, technology and information. More efforts should be put to safeguard women's right to land ownership.

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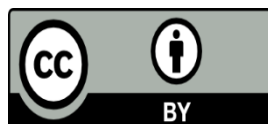
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