



Gender Roles in Improved Cowpea Varieties Production and Selection Among Farmers in Kano State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author AAI designed the study, wrote the protocol, and first draft of the manuscript. Authors IT and DIJ performed the statistical analysis, managed the analyses and literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Gender plays a vital role in agricultural production, especially for cowpea, which is an important crop in Nigeria. The selection of good preferred varieties results in optimum output. The study assessed the gender roles in improved cowpea variety production and its selection among farmers in Kano State, Nigeria. A multi-stage sampling technique was used to select six (6) Local Government Areas (LGAs) from the three (3) Agricultural Development Programme (ADP) zones in the state. 204 farmers were selected across the six LGAs. The Harvard Analytical Framework and questionnaire were used to collect the data, and descriptive statistics were also used to analyse it. The results from the study revealed that the majority (63%) of adult males are the key actors in all

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cowpea farm activities, with the exception of the processing of farm products, which is being carried out mainly by the majority (76.6%) of adult females with the assistance of the female youth in the household. Females handled the majority of the income-generating tasks, such as petty trading and the sale of processed cowpea products. Adult males in the study area had more access to and control over the available production resources than adult females, and almost all the respondents benefited from the resources, such as food items, clothing, education, etc. The result further indicated that the constraints faced by both male and female farmers were inadequate training on improved agronomic practices and no proper information on the cowpea varieties. Conclusively, adult males performed most of the cowpea production and selection activities, and females were responsible for the income-generating activities. Therefore, farmers should be adequately trained on the improved cowpea production practices and females be encourage to participate actively in cowpea production activities.

Keywords: Control of resources; cowpea production; improved varieties; gender; selection.

1. INTRODUCTION

Gender is concerned with the socio-cultural construction of males and females' roles in society and how such construction brings about changes in each sex's socioeconomic and political conditions. Its studies attempt to explain the differences between men and women, as well as the implications of such differences in society. It elucidates the production and reproduction of inequality in human societies, as well as how gender functions as a discriminatory instrument in the allocation of labour, care, property, income, education, and the political process overall [1]. Gender roles and relationships have an impact on food security and household welfare, which are important for human development [2]. It also asserted that the gender dimension is critical for economic and efficiency reasons. This is because gender helps to differentiate both the roles, responsibilities, resources, constraints, and opportunities of women and men in agriculture and rural development [3]. Building gender into agricultural development could lead to the inherent strength of males and females to mutually learn and overcome gender-based prejudices for improved food production [4].

Women have a substantial role in the production and processing of food in developing countries such as Nigeria. We cannot ignore their efforts to tackling Nigeria's agricultural development concerns [5]. They grow and process food, and they employ a range of coping methods to secure their families' food security [6]. Despite their economic and active role in agriculture. However, the barriers vary from socioeconomic to cultural. Women are typically in charge of both farm production and home chores, which has a detrimental impact on their labour productivity in

farm output. Gender inequalities and prejudice against women and girls threaten their health and well-being. Women and girls may encounter larger challenges than men and boys in getting health information and services [7]. These barriers include limited mobility, a lack of access to decision-making power, lower literacy rates, discriminatory attitudes among communities and healthcare providers, and a lack of training and awareness among healthcare providers and health systems about the specific health needs and challenges of women and girls [8]. Women are crucial to agricultural production, processing, and marketing, which affects food security. Women make up 20–50% of developing country agricultural workers [9]. Women assist with hoeing, weeding, harvesting, land preparation, threshing, transport, and use. Asymmetries in land, water, energy, credit, knowledge, and labour ownership and access limit women's food production [10,11]. One major reason for this is the gender gap, which restricts women's access to land, financial services, and social capital, as well as access to technology, making them vulnerable to food insecurity [11,12]. The World Bank [10] asserts that effective gender-responsive policies, programmes, and projects must address gender disparities throughout the whole food production process, from production to consumption' that impede the attainment of food and nutritional security It has provided evidence of poor resource allocation and low productivity across gender lines, which disadvantages women. As a result, for enhanced food production in rural regions, gender has emerged as the most significant factor influencing the division of rights, resources, and duties among people, families, and communities [13]. Women participate in planting, thinning, weeding, fertiliser application, harvesting, storage, marketing, and processing [14]. Farm

work often seems gendered. Women face many gender-specific barriers to accessing productive inputs, assets, and services in agriculture. These include asset ownership, fertiliser access, loans, and extension services [9,10]. Even when women have access to land, they often lack control over productive resources. Lack of ownership discourages them from investing time and resources in sustainable farming, lowering production and household income [15]. Along with women, men are vital to food production in agriculture. They have fewer restrictions than women. Men have greater access to land, credit, and extension services. Cultural traditions often encourage men to leave their farms for work when crops fail due to poor weather, leaving women to struggle to feed their families. Women often lack resources to prepare for and avoid future crises [16].

Cowpea is an affordable and easily accessible plant protein alternative that may be conveniently used in place of more expensive animal protein sources. The fodder functions as an excellent source of sustenance for livestock. The growing population has resulted in a surge in the demand for cowpeas, but supply levels have not kept pace. Small-scale farmers have been responsible for local production, achieving a yield of 200-350 kg/ha. However, in certain instances, they have experienced negative yield due to their failure to utilise available better technology [17]. Globally, farmers cultivate it over an area of about 12.5 million hectares, producing over 3 million metric tonnes annually. Over the past five decades, there has been an increasing trend in the global cowpea cultivation region, from 2.41 to 10.68 million ha. Nigeria is the world's largest producer, contributing about 61% and 58% of production in Africa and worldwide, respectively, with a yearly production of over 2 million metric tonnes on 5 million ha of land [18]. The arid savannahs of the Sahel, on the outskirts of the Sahara Desert, are mostly used for agricultural, with annual rainfall of 300 mm or less. Cowpea is a cover crop that fixes atmospheric nitrogen while both providing shelter and increasing soil fertility. People enjoy its grain because of its rich protein, energy, and micro- and macronutrient content [19,20,21,22].

However, cowpea varietal selection enables identified farmers to prefer cowpea varieties for large-scale production or targeted breeding. Farmers' knowledge, preference, and acceptance of newly developed cowpea varieties are important for their ultimate use [23]. Farmers

rated high yield potential, early maturity, a white-coloured seed coat, and good taste as the most important selection criteria in choosing cowpea varieties. Although insects, *Striga*, and drought were the three major constraints to cowpea production identified, farmers considered resistance and/or tolerance to these stresses as secondary selection criteria [24]. The International Institute of Tropical Agriculture's (IITA) cowpea breeding programme has released several improved cowpea varieties. The TLII project, in collaboration with the Institutes of Agricultural Research (IAR) and Agricultural Development Projects (ADPs), then distributed these varieties to small-scale farmers in specific communities within specific local government areas (LGAs) in the north-west of Nigeria. Farmers were selecting cowpea varieties based on simple criteria such as high grain yield and fodder yield, but there are some other desirable criteria to be considered when selecting a cowpea variety to cultivate. In line with this, the study examined the gender roles in cowpea variety selection and the production of improved cowpea varieties in Kano State, Nigeria.

1.1 Objectives of the Study

1. To describe the socio-economics characteristics of farmers in the study area
2. To describe the gender roles involved in the selection of improved cowpea varieties among the cowpea farmers;
3. To describe the constraints associated with gender-based selection of improved cowpea varieties among the cowpea farmers.

2. METHODOLOGY

2.1 Description of the Study Area

The research was carried out in Kano State, Nigeria. Kano was established on July 27th, 1967, at a time when the country had only twelve state structures. Katsina State shares borders with the states to the northwest and west, Jigawa State to the east and northeast, Bauchi State to the south, and Kaduna State to the southwest [25]. The state is located in the Sudan savannah, straddling latitudes 13°N in the north and 11°N in the south, as well as longitudes 8°E in the west and 10°E in the east. The area's climate is tropical, with wet and dry seasons from May to October and an average rainfall of 600mm–

1000mm annually. The dry season is from October to April. The mean temperature ranges from 21 to 39°C [26].

The National Bureau of Statistics estimated Kano State's population at 15,462,200. The state has 44 local government areas with a land area of 42,582.8 km², out of which agricultural land is 30,684.8 km², and forest and grazing land is 11,898 km² [25]. Greater proportions of the population of the area are full-time farmers, who are predominantly Hausa/Fulani. They engaged in the production of crops such as millet, sorghum, maize, cowpea, groundnut, and vegetables. Cowpeas is one of the important crop in the state and produced in large quantity. They also rear animals like cattle, sheep, goats, and poultry [27].

2.2 Sampling Procedure

The study employed a multi-stage sampling technique. The first stage involved the purposive selection of six (6) Local Government Areas (LGAs) from the Agricultural Development Programme (ADP) zones (I, II, and III) in the study area. The high concentration of cowpea farmers engaged in the production of improved cowpea varieties introduced by IITA in collaboration with IAR and ADPs led to their selection. Bebeji and Gwarzo Local Government Areas (LGAs) were selected from Zone I, Bichi and Minjibir LGAs from Zone II, and Garko and Gezawa LGAs from Zone III. The second stage involved the purposeful selection of three communities from each of the selected LGAs due to their active involvement in the production and selection of the improved cowpea varieties. The following communities were selected: Wak, Bagauda, and Gargai in Bebeji LGA; Katsira, Katsinawa, and Kutama in Gwarzo LGA; Yakasai, Muntsira, and Badumi in Bichi LGA; Kazawa, Farawa, and Wasai in Minjibir LGA;

Garko, Hurumi, and Maida in Garko LGA; and Danja, Wangara, and Ketawa in Gezawa LGA. The study selected a total of eighteen (18) communities (Fig. 1).

The final stage involved selecting farmers from each of the selected LGAs. The sampling frame was the preliminary survey that IITA, ADP, and LGAs conducted in 2019 on a total of 1,162 farmers, both males and females. A simple proportional formula by Miller and Brewer (2003) was used to calculate the number of farmers interviewed. Estimated the sampling size from the sampling frame in the study area, using a 7% margin of error. Therefore, a total of two hundred and four (204) farmers were derived for the study (Table 1).

Miller and Brewer [28] provided a mathematical formula to determine the sample size.

as:

$$n = \frac{N}{1+N(a)^2}$$

Where:

- n= required sample size,
- 1= constant,
- N= sample frame,
- α= level of significance or margin of error.

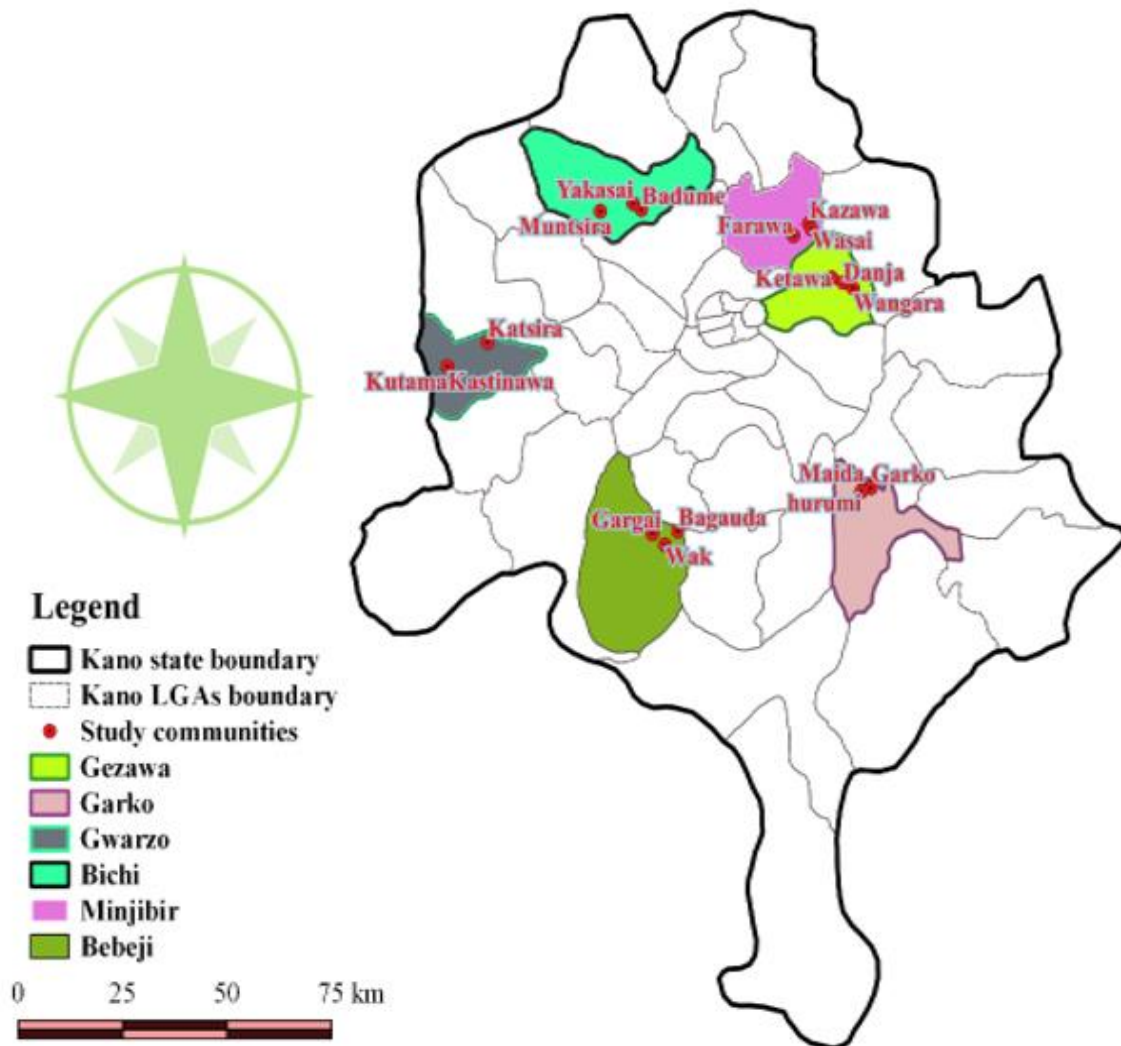
2.3 Data Collection and Analytical Technique

The Harvard analytical framework (HAF), which was developed at Harvard University and accepted by numerous scientists worldwide, is one of the tools used in gender studies to observe the various activities engaged by different adult males, adult females, male youth, and female youth within the family. Therefore, we used HAF to analyse the gender roles in cowpea variety selection and production. HAF has four

Table 1. Summary of the Sampling

S/N	Zone	LGAs	Male Farmers' Population	Female Farmers' Population	Sample size (Male)	Sample size (Female)	Sample size per community
1	Zone 1	Bebeji	115	62	20	11	31
2		Gwarzo	175	42	31	8	39
3	Zone 2	Bichi	84	67	14	11	25
4		Minjibir	175	55	33	10	43
5	Zone 3	Garko	64	118	5	21	26
6		Gezawa	166	39	32	8	40
Total		6	779	383	135	69	204

Source: Preliminary survey, 2022



Source: Preliminary survey, 2022

Fig. 1. Map of Kano State showing study Local Government Areas and Communities

components that are relevant to this particular research project. The study was divided into two parts: activity and access/control of resource profiles. This showed that the cowpea farmers in the study area chose different types of cowpeas based on how men and women divided up work and who had access to and control over resources. The study also used structured questionnaires with the assistance of well-trained enumerators. Data collected were on the gender-based activity profile, access and control of resources, the influential factors that led to improved cowpea variety selection and production, and the constraints associated with gender-based selection of improved cowpea varieties in Kano State, Nigeria. The study used descriptive statistics and the Harvard Analytical Framework to achieve its objectives.

3.RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of Cowpea Farmers

Socioeconomic characteristics assist in getting true thoughtful behaviour from these farmers, which may give evidence towards clarifying their character and could bring about a better perception of their selection attitude. Tables 2, 3, and 4 present the results derived from socioeconomic characteristics. According to Table 2, almost one-third (30.8%) of male cowpea farmers are between 48 and 55 years old, with a mean age of 41 years old, which was considered to be their active working age. Similarly, one third (33.4%) of the female cowpea farmers are in the age bracket of 48–55 years

old, with a mean age of 42 years old. This implied that the cowpea farmers in the study areas were in their prime age group with good active working conditions, and that could influence the positive selection of improved cowpea varieties. The findings aligned with those of Ishikawa *et.al.* [29], who conducted a study on the characteristics of farmers' selection criteria for cowpea (*Vigna unguiculata*) varieties in the north and south regions of Burkina Faso. They reported an average age of 34 years among participants, with the oldest and youngest being 82 and 15 years, respectively. The majority (84%) of male cowpea farmers were married, while less than one-third (16%) were single. Likewise, most (80.6%) of the female cowpea farmers were married, and less than one-third (19.4%) were widows. The implication here is that almost all the cowpea farmers were married and had responsibilities that led to good choices of cowpea varieties that increased their yield, thereby increasing their income, which will benefit the whole community. This study was in agreement with the findings of Oluwatusin and Shitu [30], who reported that the majority (84.2%) of the respondents in Nigeria were married.

Furthermore, the result shows that 32.0% of the male cowpea farmers had a household size of 10–12 with an average of 8 persons per household, whereas 33.4% of the female cowpea farmers had a household size of 7-8 with an average of 9 persons per household. The cowpea farmers in the study area had less family labour available to them than their female colleagues, giving the female colleagues an edge in production over the male cowpea farmers. They show that the cowpea farmers in the study area had less available family labour, which reduced the cost of production; they relied on both family and hired labour for their farm activities. This implies that most cowpea farmers trusted members of their immediate and extended families as sources of free labor. This agreed with the findings of Ojo *et al.* [31], who stated that household size affects output in that the larger the household, the more labour is available for production, resulting in an increase in output. As presented in Table 2, 37.2% of the male farmers had secondary school education, and 30.8% had qur'anic education; likewise, 19.4% of the female cowpea farmers had secondary school education, and 38.9% had qur'anic education. While none of the female cowpea farmers had tertiary education, educational status is paramount in the lives of cowpea farmers and is expected to have a

positive influence on the selection of cowpea varieties. It will aid in the selection of cowpea varieties that are high-yielding and adaptable to their ecological environments, resulting in increased production productivity. Oluwatusin and Shitu [30] reported that more than half (55.8%) of respondents had Qur'anic education.

Table 3 shows the socio-economic characteristics of the respondents, revealing that farming was the primary occupation for the majority (80.1% and 75.0%) of both male and female cowpea farmers, with only a small number working as civil servants in the study area. This implies that a significant portion of cowpea farmers work full-time, and it's possible that some still rely on other sources of income to supplement their income. This will encourage and motivate them to select cowpea varieties that are high-yielding and tolerant to some diseases for adoption. According to Wordofa *et al.* [32], farmers who have farming as their main occupation tend to be more interested in adopting improved agricultural technologies in order to boost their productivity since their livelihood depends on incomes from the farm. People often assume that experience is the best teacher, providing a deeper understanding of improved farm practices and selection techniques for better decision-making. Table 3 indicates that 24.9% of the male cowpea farmers were within the farming experience ranges of 15–18 years old, with an average years of farming experience of 16 years; similarly, 27.7% of the female cowpea farmers were within the years of farming experience ranges of 11–14 years old, with an average years of farming experience of 14 years. This implies that cowpea farmers have more experience in agricultural production and can make decisions about selecting cowpea varieties that increase their output. The findings agreed with those of Ojo *et al.* [31], who reported that the majority of the male respondents (63%) had over 10 years of farming experience, while fewer female respondents (46%) had over 10 years of farming experience. The male respondents had longer years of farming experience than women, probably because men were usually more aware of and involved with cash crops than women, and cowpea is a cash crop in the study area.

Farm size is one of the major factors determining labour requirements, and it's important for agricultural production. More so, the results (Table 3) show that more than half (59.0%) of the male cowpea farmers had a farm size distribution

of 0.5–1 hectares of land, with a mean of 1.63 hectares. Conversely, the majority (80.6%) of female cowpea farmers also had a farm size distribution of 0.5–1 hectares, with a mean of 1.19 hectares. This implies that the majority of the cowpea farmers were smallholder and subsistence cowpea farmers, and there is no significant difference in the size of land between the male and female cowpea farmers. This could lead to the selection of cowpea varieties with higher yields, increasing their incomes and food security in the study area. The finding was similar to that of Owolabi *et al.* [33], who found that 65% of the respondents have between 0.1 and 1.0 ha of land. Only 25% of the respondents have land above one hectare, which does not allow for expansion or mechanisation.

3.2 Activity Profile of Cowpea Farmers Involved in the Selection of Cowpea Varieties

Farm activities carried out by the farmers were analysed using the Harvard Analytical Framework, as indicated in Table 4. The cowpea production activities involve the participation of adult males, adult females, male youth, and female youth. All cowpea farm activities primarily involve the majority (63%) of adult males, except for the processing of farm produce, which primarily involves the majority (76.6%) of adult females, with the assistance of female youth (24.4%) in the household. Table 4 clearly shows that adult females and female youth were not involved in land preparation (making ridges),

Table 2. Socio-economic Characteristics of the cowpea farmers

Variable	Male		Female	
	Frequency	Percent (%)	Frequency	Percent (%)
Age (years)				
24-31	38	24.5	3	8.3
32-39	25	16.1	11	30.7
40-47	44	28.0	10	27.6
48-55	48	30.8	12	33.4
56-63	1	0.6	-	0
Min	24			30
Max	57			35
Mean	41			42
S.D	9.596			8.123
Marital Status:				
Married	131	84.0	29	80.6
Single	25	16.0	-	-
Widow	-	-	7	19.4
Household size (Number):				
1-3	25	16.0	1	2.8
4-6	26	16.7	10	27.7
7-9	44	28.3	12	33.4
10-12	50	32.0	7	19.4
13-15	11	7.0	6	16.7
Min	3			3
Max	14			15
Mean	8			9
SD	4.231			3.612
Educational level:				
Qur'anic education	48	30.8	14	38.9
Primary School	40	25.6	15	14.7
Secondary school	58	37.2	7	19.4
Tertiary education	10	6.4	-	-

Source: Field survey 2019

weeding, or pesticide application (herbicides and insecticides). The majority (70.3%) of adult males, often assisted by less experienced individuals, primarily use an oxy-drawn plough to make ridges. Youth, males and females, were not involved in civil services; this was simply because they were still in school, learning to become the future leaders of tomorrow, and also helping their parents with farming activities. The result from Table 4 shows that 61.5% of adult males, 4.7% of adult females, 31.3% of youth

males, and 2.6% of female youth were involved in farm labour as a source of employment to generate income for the farming family. The majority (68.8%) of adult females are handcraft artisans, 14.6% of adult males, and 16.7% of female youth. The adult female was into knitting caps and child clothing, making soaps, and other things like pomades for local consumption in and outside the community. Few adult males are interested in blacksmithing and knitting mats.

Table 3. Socio-economic Characteristics of the cowpea farmers (Cont.)

Variable	Male		Female	
	Frequency	Percent (%)	Frequency	Percent (%)
Main occupation				
Farmer	125	80.1	27	75.0
Civil servant	18	11.5	1	2.8
Tailoring	5	3.2	2	5.6
Trader	8	5.1	6	16.7
Farming exp. (Years)				
7-10	34	21.7	9	25.0
11-14	31	19.9	10	27.7
15-18	39	24.9	9	25.0
19-22	34	22.0	5	13.9
23-26	18	11.5	3	8.4
Min	7		Min	10
Max	25		Max	24
Mean	16		Mean	14
SD	5.179		SD	4.266
Farm size (ha)				
0.5-1.0ha	92	59.0	29	80.6
1.5-2.0ha	29	18.6	7	19.4
2.5-3.0ha	35	22.4	-	0
Min	1ha		Min	1ha
Max	3ha		Max	2ha
Mean	1.63		Mean	1.19
SD	0.828		SD	0.401

Source: Field survey 2019

Table 4. Cowpea Farmers Activities Profile

Farm activities	Adult male		Adult female		Male youth		Female youth	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Land clearing	121	63.0	49	25.5	22	11.5	-	-
Preparation of ridges	135	70.3	-	-	57	29.7	-	-
Planting	75	39.1	67	34.9	37	19.3	13	6.8
Weeding	131	68.2	-	-	61	31.8	-	-
Fertilizer application	110	57.3	-	-	61	31.8	21	10.9
Pesticide application	159	82.8	-	-	33	17.2	-	-
Field visit	123	64.1	62	32.2	7	3.6	-	-
Decision on selection	127	66.1	65	33.9	-	-	-	-
Harvesting	13	6.8	23	12.0	65	33.9	91	47.4

Farm activities	Adult male	Adult female	Male youth	Female youth
Transporting produce home from farm	119	62.0	60	31.3
Threshing/Winnowing	87	45.3	90	46.9
Storage	122	63.5	70	36.5
Processing of farm produce	-	-	151	78.6
Marketing	157	81.8	35	18.2
Farm labour	118	61.5	9	4.7
Civil service	169	88.0	23	12.0
Hand craft artisan	28	14.6	132	68.8

Source: Field survey 2022

3.3 Income Generation Activity Profile among Cowpea Farmers involved in the Selection of Cowpea Varieties

Table 5 presents the analysis of the income-generation activities carried out by the cowpea farmers using the Harvard Analytical Framework. The majority (64.6%, 61.5%) of female youth, adult females, and 7.3% of male youth were involved in the sale of processed cowpea products and petty trading, respectively. The involvement of the adult female and female youth could be due to the entrepreneurial spirit of the women in the rural areas, who preferred their female children to sell processed products to generate income for family advancement. According to Table 5, most adult females (63.0%) and 37.0% of adult males were also involved in tailoring businesses to generate income for the family. The majority of adult males (95.8%) and adult females (82.6%) were into hair barbing and hair plaiting, respectively, for extra income generation. All adult males (100%) were involved in transport services to generate income that would help pay for their families' home expenses.

3.4 Access to and Control over Farm Resources among the cowpea farmers involved in the Selection of Cowpea Varieties

Although access was critical in selecting improved cowpea varieties, the activities should not proceed without resource ownership. Control over resources, given the nature of rural families, may not be a challenge that impacts the use of resources among the members of the farming families. Table 6 reveals that the majority of adult males and less than one-third of adult females

had access to land, farm implements, fertilizer, seeds, and pesticides, respectively. However, male and female youth do not have access to all these resources, as they are still under their parents' care, receiving instructions, feeding, clothing, and housing within the household. Furthermore, Table 6 shows that most adult males and less than one-third of adult females have control over land, farm implements, fertiliser, seeds, and pesticides, whereas male and female youth do not have control over all of these resources because they are still under the nourishment of their parents. Meanwhile, adult males have more access to all farm resources than adult females. The results further stated that the majority of adult males and one-third of adult females had access to farm produce, farm labour, and cash income, which, of course, the youth males and females do not have access to because they are teenagers under the control of their parents. The findings further stated that the majority of adult males and 31.3% of adult females had control over farm produce, farm labour, and cash income. The youth, both male and female, lack control over these resources due to their status as teenagers under parental care. In the fight against rural poverty, hunger, and malnutrition, the lack of access to farm resources, services, and opportunities for women can be a key factor. This finding aligns with the FAO [11] approach to prioritising gender equality and rural women's empowerment.

3.5 Benefits of the Available Resources among the Cowpea Farmers Involved in the Selection of Cowpea Varieties

The benefits of the available resources that the cowpea farmers' families derived assisted in improving their farming activities. The result from Table 7 shows that 26.6% of adult males and

females and 23.4% of male and female youth benefited from food items; all the respondents benefited from water, shelter, and clothing in their households. Furthermore, Table 5 indicated that the majority (64.1%) of adult males and 35.1% of adult females benefited from having access to income assets generated outside of the household; almost half (47.9%) of youth males and 35.4% of female youth benefited from education activities. This implies that the study area considers girls' education important, enrolls them in school, and also acquires the necessary educational activities. Lastly, 67.2% of adult males and adult females (32.8%) benefited from having access to extension training and services that helped them improve cowpea production and productivity, their attitude towards the adoption of new technology, and their agronomic practices.

3.6 Constraints Militating against Selection and production of Cowpea Varieties among Male and Female Farmers

Among the keys to achieving a successful and good selection of cowpea varieties is having access to vital, proper information and adequate, improved agronomic training on the varieties. Both male and female farmers faced limitations in cowpea variety selection and ranking. According to Table 8, 26.1% of male farmers in the study areas had problems with the varieties. Some of them didn't have traits like resistance to insect pests and diseases, which slowed down

the process of choosing better cowpea varieties. Male farmers (30.8%) had inadequate training on improved agronomic practices and had no proper information on the cowpea varieties; perhaps this is due to their level of education or not paying attention or concentration when the cowpea varieties were introduced to the community. Male farmers, accounting for 12.8%, did not participate adequately in the varietal demonstration plot exercise, a requirement for all farmers to visit and learn about new technologies in their community. And lastly, 6.0% had inadequate practical knowledge of cowpea varieties because they were busy combining many activities at once, which did not allow them to concentrate very well on cowpea production.

The results also reveal that nearly half (48.1%) of the female cowpea farmers lacked sufficient knowledge about the new cowpea varieties grown in their area. Another 15.6% and 11.5% did not have enough practical knowledge and training on how to grow cowpea varieties more effectively. The results further show that female cowpea farmers had limited field visits and participation, which made them indecisive when making their selection. Inadequate practical knowledge of cowpea varieties constrained both male and female farmers, with less than one-third (19.7%) facing deficiencies in cowpea varietal traits like resistance to insect pests. The implication was that a small number of farmers lacked the necessary knowledge and training to quickly make decisions, saving time in selecting and ranking cowpea varieties in the study area.

Table 5. Cowpea farmers income generation activities profile

Income generation	Adult male		Adult female		Male youth		Female Youth	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Sale of cowpea grain	149	77.6	43	22.4	-	-	-	-
Sale of processed product	-	-	68	35.4	-	-	124	64.6
Petty trading	14	7.3	118	61.5	-	-	60	31.3
Tailoring	71	37.0	121	63.0	-	-	-	-
Hair plaiting	-	-	159	82.8	-	-	33	17.2
Hair barbing	184	95.8	-	-	8	4.2	-	-
Transport services	192	100	-	-	-	-	-	-

Source: Field survey 2022

Table 6. Cowpea farmers access and control over farm resources

Resources	Access				Control			
	Adult male		Adult female		Adult male		Adult female	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Land	143	74.5	49	25.5	171	89.1	21	10.9
Farm implement	135	70.3	57	29.7	191	91.7	16	8.3
Fertilizer	133	69.3	59	30.7	148	77.1	44	22.9
Seeds	138	71.9	54	28.1	153	79.7	39	20.3
Pesticide	177	92.2	15	7.8	178	92.7	14	7.2
Farm produce	120	62.5	72	37.5	127	66.1	65	33.9
Farm labour	131	68.2	61	31.8	132	68.8	60	31.3
Cash income	118	61.5	74	38.5	119	62.0	73	31.3

Source: Field survey,2022

Table 7. Analysis of Benefits of Available Resources among the Cowpea Farmers

Benefit of Resources	Adult male		Adult female		Male youth		Female Youth	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Food items	51	26.6	51	26.6	45	23.4	45	23.4
Water	53	27.6	57	29.7	41	21.4	41	21.4
Shelter	47	24.5	57	29.7	44	22.9	44	22.9
Clothing	67	34.9	72	37.5	23	12.0	30	15.6
Income assets from within the Household	123	64.1	69	35.1	-	-	-	-
Education	23	12.0	9	4.7	92	47.9	68	35.4
Extension training	129	67.2	63	32.8	-	-	-	-

Source: Field survey 2022

Table 8. Constraints of Cowpea varieties Selection and production among Male and Female Cowpea Farmers

Variables	Male		Female	
	Frequency	Percent (%)	Frequency	Percent (%)
No proper information on the cowpea varieties	57	24.4	25	48.1
Inadequate practical knowledge of cowpea varieties	14	6.0	6	11.5
Inadequate training on agronomic practices	72	30.8	6	11.5
Inadequate participation of farmers in varietal demonstration plot	30	12.8	2	3.8
Limited field visit and participation of female farmers	-	-	5	9.6
Some varieties lack numerous traits e.g., Resistant to insect pest and diseases	61	26.1	8	15.6

*Source: Field survey, 2022. *Multiple responses*

4. CONCLUSION

The cowpea farmers in the study area were in their prime age group with good active working conditions, and that could influence the positive selection of improved cowpea varieties. Both males and females were involved in cowpea variety production and selection, with the majority of the females performing the most processing activities. The farmers had access to most of the resources in the area, but adult males controlled most of them, and young males and females did not have access to all of them. Also, the farmers had issues getting proper information about the new improved varieties. It is recommended to encourage young males and females to access resources that will enhance their productivity and organise training on new agronomic practices, particularly those related to the production of new improved cowpea varieties.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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