

Gender Analysis on Decision-Making Roles among Maize Farming Households in Agricultural Zone C of Kogi State, Nigeria

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Abstract— This study analysed the decision-making role among maize farming households in Agricultural Zone of Kogi state, Nigeria. A multi-stage sampling technique was used to select 160 households from which the male and female heads were interviewed. Data collected were analysed using descriptive statistics and decision-making index. The mean age of male respondents was about 40 years while that of female respondents was about 33 years. Average income of male farmers was N147,321.90 while that of female farmers was ₦143,475.0. The average household size of the respondents was approximately 8 persons. The mean years of experience of male respondents was 16 years while that of the females was 10 years. It was observed that majority (95.9%) of the households depended on inherited land. Male respondents were more dominant in tertiary education than female respondents. The average DMI over all activities was 0.5 meaning that women on the overall were dominated by their men counterparts in terms of decision-making. It was recommended that the female gender must be more involved in households' decision-making as their insights and perspectives can lead to higher productivity. Most constraints identified bothers around institutional and infrastructural inadequacies in Nigeria's rurality therefore better extension service provision should be provided to the rural farmers, higher access to credits and provision of more access roads in rural areas.

Keywords— Gender, Gender analysis, Gender roles, Decision-making, Households.

I. INTRODUCTION

In Africa, 80% of the agricultural production comes from small-scale farmers, who are mostly rural women. Women comprise the largest percentage of the workforce in the agricultural sector (World Food Organization, 2013). Hence the bridging of the actual and potential productivity gap will promote agricultural productivity and enhance the overall economic development in developing countries like Nigeria. Farmers make decisions on a number of pre-harvest and post-harvest activities such as what to produce, input to use, harvest and post-harvest issues, which according to William (2003) affect production, processing, distribution, prices and costs. Farming decisions are made to maximize farm objectives subject to available materials and human resources. Despite the significant role played by women in agricultural production, processing and marketing in Nigeria (Barasa, 2006) men have continued to dominate farm decision-making, even in areas where women are the largest providers of farm labour (Amaechina, 2002).

Women are more or less relegated to playing second fiddle in farm decision-making. This could be counterproductive because there is bound to be conflict when women as key players, carry out farm tasks without being part of the decision process especially when the decisions fail to recognize their other peculiar household roles and responsibilities (Umeh, 2014). Maize (*Zea mays*) is also known as corn, and belongs to the family of *Gramineae*, which has many characteristics common to other grasses. It is a cereal crop that produces grain that can be used as food for human being as well as animals. Maize is high yielding, easy to produce, readily digested and cheaper than other cereals. It is also a versatile crop (Muhammed *et al.*, 2013). Despite the important roles women play in farm and household production, they have not been given due recognition in the agricultural sector (Ingawa, 1999). There has been a great disparity between women and men.

Women have been facing various socioeconomic obstacles such as difficulty in gaining access to land, credit facilities, productivity, enhancing inputs and other services which affect their productivity in agricultural sector compared to men who have more access to productive resources (Rahman, 2009). In most cases women are marginalized in the areas of decision-making as well as access to extension and these have implications to the poverty statuses of women in agrarian economies.

According to United Nation Gender-related Development Index (GDI), women are underprivileged and less empowered and this undeniably restricts women's ability to achieve full potentials in developing countries (United Nation Development Programme, 2006). This study therefore seeks to close the gap of the dearth of information available as to the accurate labour contribution as well as farm decision making roles of women especially in Kogi State. Therefore, the purpose of this study is gender analysis of decision-making roles among maize farming households in Agricultural zone area of Kogi State, Nigeria. The specific objectives of the study are to:

- i) Describe the socio-economic characteristics of male and female members of the maize farming households in the study area;
- ii) Estimate the level of involvement in farm decision-making by gender among farming households;
- iii) Identify the constraints to maize farming in the study area.

II. METHODS AND MATERIALS

The study was conducted in the Agricultural zone area of Kogi state, Nigeria. The zone covers seven (7) Local Government Areas (LGAs) which include Kogi, Lokoja, Adavi, Okene, Okehi, Ajakuta and Ogori Mangogo with its headquarters at Koton-karfe. The study area is located between latitude $6^{\circ}30'N$ and $8^{\circ}48'N$ and longitude $5^{\circ}23'E$ and $7^{\circ}48'E$. It has an average annual rain fall of approximately 1,288mm and annual mean temperature range rainfall from $22.7^{\circ}C$ – $36.8^{\circ}C$ (Agricultural Development Programme [KADP], 2017).

A multi-stage sampling technique was used to select the target respondents. The list of the household maize farmers was drawn from the sampled LGAs to serve as sampling frame for the study. In the first stage, four Local Government Areas (LGAs) were randomly selected from the seven (7) LGAs that make up the Agricultural Zone Area. In the second stage, two villages were purposively sampled from each of the four LGAs based on their level of maize production to give a total of eight (8) villages. Finally, 20 maize farming households were randomly selected from each of the eight (8) selected villages to give a total of 160 maize farming households. From the (160) maize farming households sampled male and female members of the household served as respondents for this study. Thus, a sample size of 160 maize farming households consisting of 160 female and 160 male members given a total of 320 respondents that were used to generate data for this study.

TABLE 1
SAMPLING FRAME FOR MAIZE FARMING HOUSEHOLDS IN THE STUDY AREA

Selected LGAs	Selected villages	Number of registered maize farming households in the villages where both the husband and wife were maize farmers	Number of maize farming households selected in each of villages
Kogi	Girnya	65	20
	Akpogu	60	20
Lokoja	Banda	55	20
	Abugui	53	20
Ajaokuta	Ajaokuta	57	20
	Adogo	63	20
Adavin	Oniyeka	50	20
	Idichegbede	62	20
Total	8	252	160

Source: Field Survey (2018)

Primary data were collected with the aid of a structured questionnaire that was administered to the respondents. Data were collected on socio-economic characteristics of maize farmers, level of gender involvement in farm decision and constraints to maize farming in the area. Simple descriptive statistics such as percentage, mean, frequency, and count were used to achieve objectives i and iii while Decision Making Index (DMI) was used to analyse objectives ii. Decision Making Index (DMI) and t-test was used to test the hypothesis at 5% level of significant of the study. Formula for t-test value given below as:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

2.1 Model specification

Decision Making Index (DMI) as implemented by Rahman *et al.* (2008) and Umar and Luka, (2011) was used. DMI is measured by 3-point scale such as decision taking by female alone (2), decision taking by male and female together (1) and decision taking by male alone (0).

$$DMI = \frac{(M \times 0) + (F \times 2) + (B \times 1)}{\text{Number of respondents}}$$

Where:

M= male member of household alone

F = female member of household alone,

B= both male & female members of household.

DMI >1 implies greater involvement in the decision-making process by female farmers.

DMI= 1 shows gender equality in the decision making.

DMI < 1 indicates greater involvement in the decision-making process by male farmers.

III. RESULTS AND DISCUSSION

3.1 Social-economic characteristics of respondents in the study area.

Figure 1 showed the age distributions of the respondents are presented according to their gender. Results show that most (58.8%) of the male respondents were within the age bracket of 33 – 43 years, followed by 21.3% who were within the age bracket 44-45 years. The mean age of male respondents was 40 years. Results also show that 44.8% of the female respondents were within the age bracket of 22 – 32 years, followed by 44.4% of the female respondents were within the age bracket of 33-43 years. The mean age of female respondents were 33 years. This result implies that respondents in the study area were in their productive ages. Individuals within this age limit are basically the labour force of any sector and are likely to supply labour at its disposition. This agrees with Ogunleye *et al.* (2013) who revealed that individuals within age limit of 21–50 years are basically the labour force of any sector and any side with a greater preponderance of them is more likely to have a greater supply of labour at its disposition.

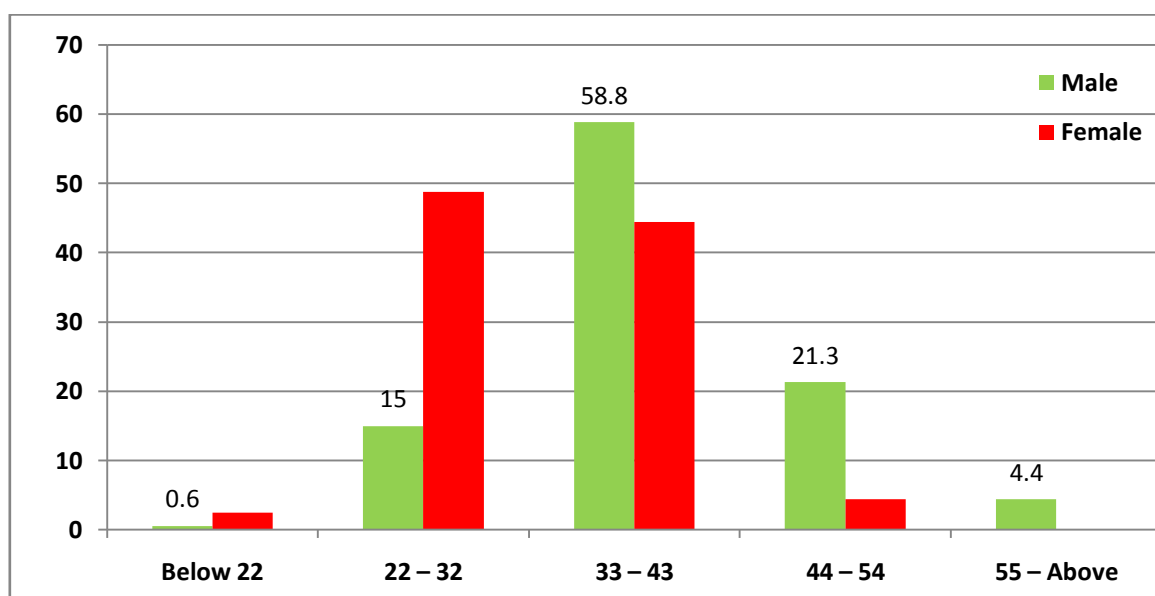


FIGURE 1: Age (years)
Source: field survey, 2018

The distribution of respondents according to their annual income is presented in Figure 2. From the result on the Figure, it is observed that majority (89.4%) of the male respondents earned between N1, 000 and N250, 000 annually. Also, majority (90%) of the female respondents earned N1,000 – 250,000 per annum. Only 10% of the male respondents and 9.4% of the female respondents respectively earned 251,000 – 500,000 per annum. At the highest earning category (Above N1million) only 0.6% of the male respondents earned here while no female respondent was recorded in this category. The mean annual income of male respondents was N147, 321.9 while that of female respondents was N143, 475.0. This implies that the male farmers earned more income than their female counterparts even though both categories were still low-income earners on the average. Analysing the overall income across the two categories it is observed that the mean annual income was N145, 398.40. This implies that the annual income level was generally low among men and women in the maize farming households in the study area. This may be due to their subsistent level of maize production by respondents in the study area. However, the average male income was greater than the average female income. Akpabio, (2005) revealed (74%) of men and women farmers are low income earner. He therefore opined that the poor income level of men and women farmers could be attributed to the subsistence level of farming prevalent in the rural areas.

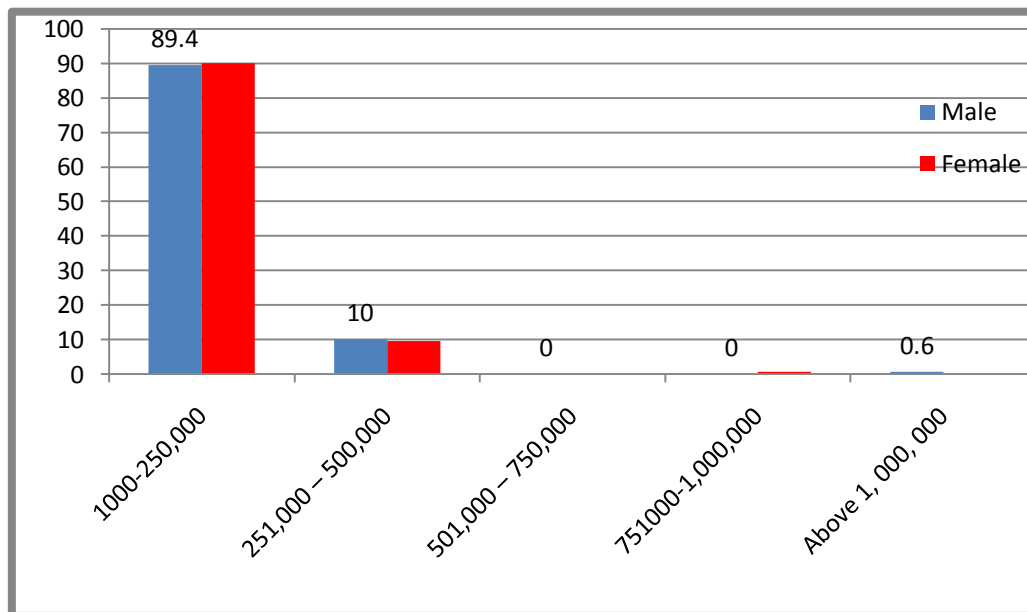


FIGURE 2: Annual income (naira)

Source: field survey, 2018

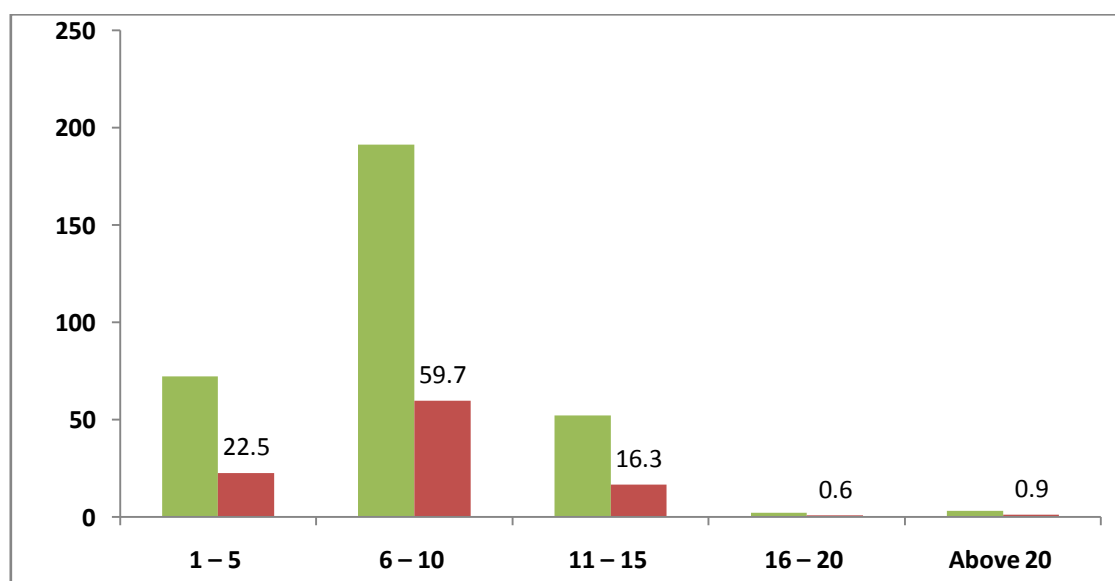


FIGURE 3: Household size (number of persons)

Source: Field survey, 2018

The household sizes of the respondents are presented in Figure 3. From the result on the Figure, most of the respondents (59.7%) had between 6 and 10 persons in their household. Only 22.5% of the respondents had 1 – 5 individuals in their household. Another 16.3% of the respondents had 11 – 15 persons in their household. The average household size of the respondents was approximately 8 persons. However, for the extreme high figures, 0.9% of the respondents had household sizes of over 20 persons. This means that most of the men and women maize farmers in the study area had a fairly large household size which might serve as an insurance against short fall in supply of farm labour. Household size has a great role to play in family labour provision in agricultural sector. Average household size in Nigeria was 5.9 and 4.9 persons in rural and urban areas, respectively as at the research of National Bureau for Statistic (NBS) and Federal Ministry of Agriculture and Rural Development (FMARD), (2016). By this report the average household size of the respondents was almost twice the national average. This results also agrees with Adejoh, *et al.*, (2017) who revealed that majority (60.9%) of male and (64.4%) of female rice farmers had household size between 1-5 members with an average household size of 7 and 5 person respectively implying that there is appreciable number of family labour supply to accomplish various farm operations.

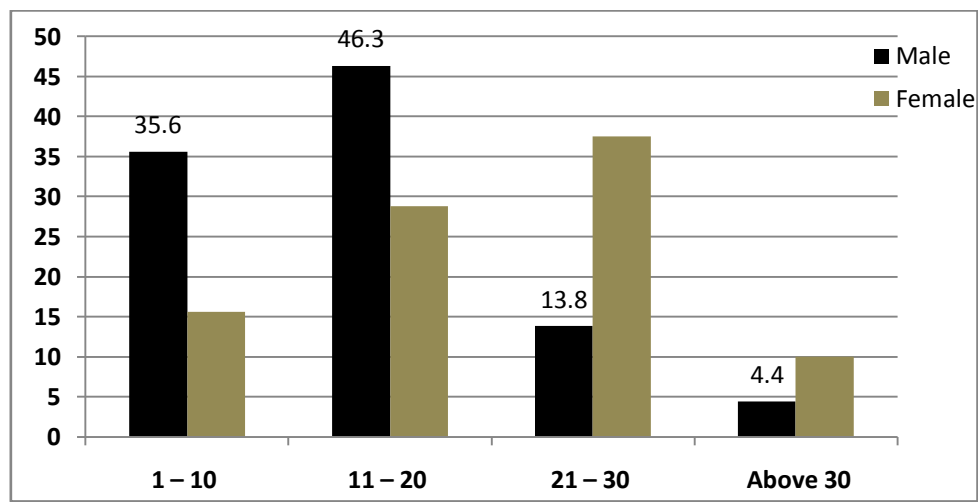


FIGURE 4: Years of Farming Experience

Source: field survey, 2018

The years of farming experience of respondents in the study are presented in Figure 4. A greater proportion (46.3%) of male respondents had between 11-20 years farming experience while majority (70.6%) of female respondents had between 1-10yrs of farming experience. Mean years of farming experience for males was 16years while that of females was 10 years. This implies that male farmers were more experienced in maize farming than their female counterparts. Farming experience is necessary for acquisition of relevant knowledge and skills in maize production. This also has some positive implications for increased production as experience helps to adapt better management decisions. Kagbu *et al.*, (2016) in their study on “Adoption of recommended rice production practices among women rice farmers” in Nasarawa State, Nigeria, revealed that rice farmers were widely experienced matured and could achieve a better understanding of adaptation strategies.

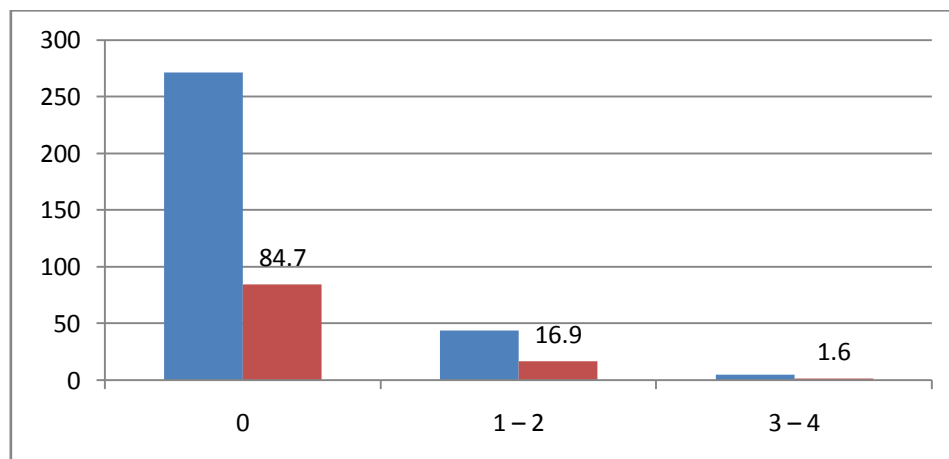


FIGURE 5: Extension Visits (number of times)

Source: field survey, 2018

Figure 5 shows the frequency of extension visits households receive per annum. From the Figure results show that majority (84.7%) of the households did not receive a single visit from extension agents all year round, (16.9%) of the households received between 1 – 2 visits per annum while (1.6%) of the respondents had between 3 – 4 visits per annum. The study revealed that the extension contact was very low in the area, as most of the respondent had never received an extension agent on their farms as a result of poor road network in most of the L.G.A and also most of the villages lacks basic amenities that will attracts any extension agents to wan to visit the place. This implies that extension contact which is supposed to be one of the main sources of agricultural information/ technologies for improved methods of agricultural activities was insufficient in the study area. This may affect the level of maize production as extension agents play critical role in increasing adoption of new farming ideas. According to Adejoh (2017), the provision of agricultural extension can lead to significant yield increases.

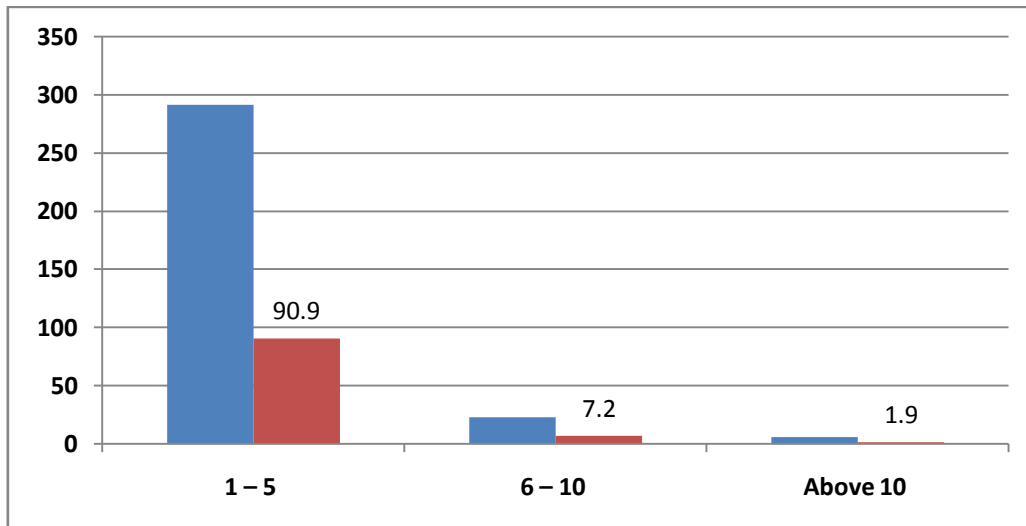


FIGURE 6: Farm size (ha)
Source: field survey, 2018

The sizes of farms are presented in Figure 6. Size of households’ fields can give an idea of the amount of labour and other inputs the household may require in carrying out their farm requirements. The result reveals that a resounding majority of the households (90.9%) had land holdings of between 1 – 5 hectares. Another 7.2% of the respondents had between 6 and 10 hectares. Farmers that had above 10 hectares of land were merely 1.9% of the study population. This means that respondents were small-scale farmers in the study area. This may be attributed to the land tenure system prevalent in the study area which encourages small holdings. The size of a farm is a strong determinant of the expected output/yield. This finding is in consonance with assertion of FAO (2010) that 80% of Nigeria’s farmers are smallholders.

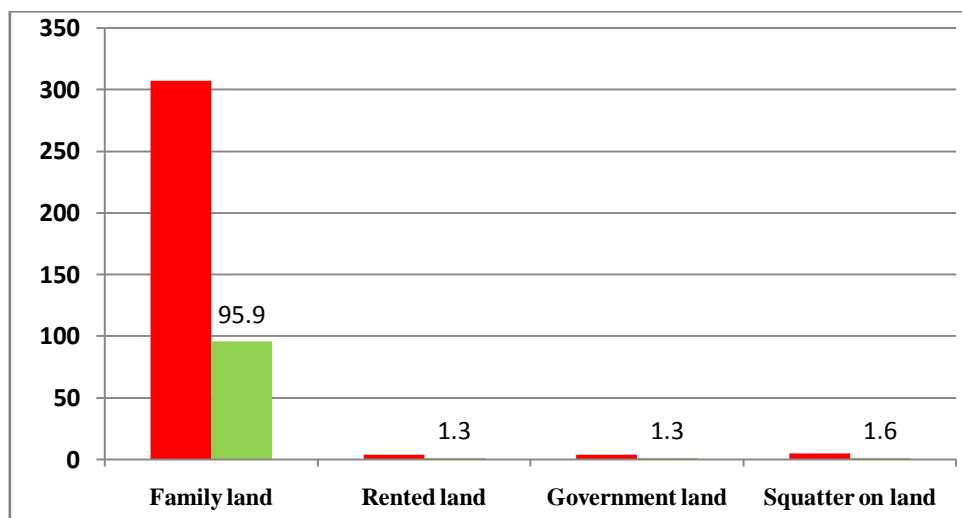


FIGURE 7: Land Acquisition
Source: field survey, 2018

The forms of tenure systems for land acquisition are presented in Figure 7 above. From the result it is observed that majority (95.9%) of the households depended on inherited land as family land for the practice of agricultural production. Squatter land as used by migrant farmers or the extremely impoverished landless people constituted 1.6% of the population. Furthermore, Government land and rented land both constitute 1.3% of land use respectively. This shows that land is acquired through cultural land tenure system in the study area. This may result in women having less access to land and other productive resources as heritage and control of land are given to men in most parts of Nigeria. This agrees with Ajani (2008) who reported that patriarchal structures and authorities give more resources to men in Nigeria, resulting in women having less access to productive resources, particularly land, which is perhaps the most economic constraint for most rural women.

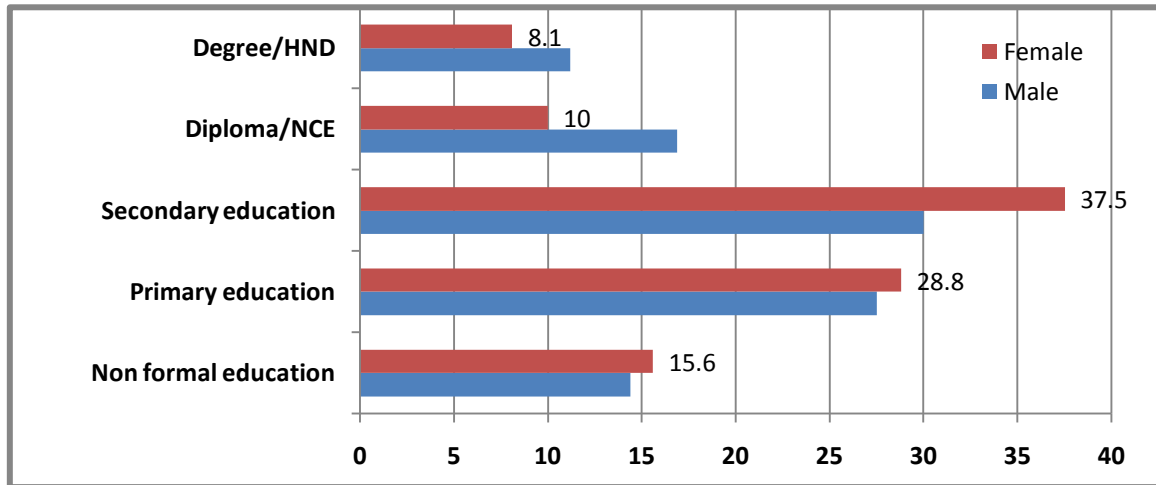


FIGURE 8: Level of Education
 Source: field survey, 2018

The different educational qualifications of respondents are presented in Figure 8. From the Table, it is observed that more female respondents (15.6%) had no formal education while 14.4% of male respondents had no formal education. Male and female respondents were close in terms of the percentage of male (27.5%) and female (28.8%) respondents who had acquired primary education although the female respondents were slightly higher. However, more male (30%) and female (37.5%) respondents had secondary education than any other form of education. Male respondents were more dominant in tertiary education than female respondents. For Diploma/NCE holders, 16.9% of male respondents were recorded against 10% of the female respondents while 11.2% of male respondents had acquired Degree/HND against 8.1% of the female respondents. The results implies that (85.6%) of the male respondents had one form of formal education while (84.4%) of the female respondents had one form of formal education. The level of farmers' education is believed to influence the use of improved technology in agriculture and hence, farm productivity. Formal education can influence decision making concerning maize production. This agrees with Kagbu *et al.*, (2016). The results of their findings revealed that about 98 % of the rice producers were literate. These results indicated that rice farmers might have good understanding of improved technologies about rice production, provided they are equally exposed to such technologies.

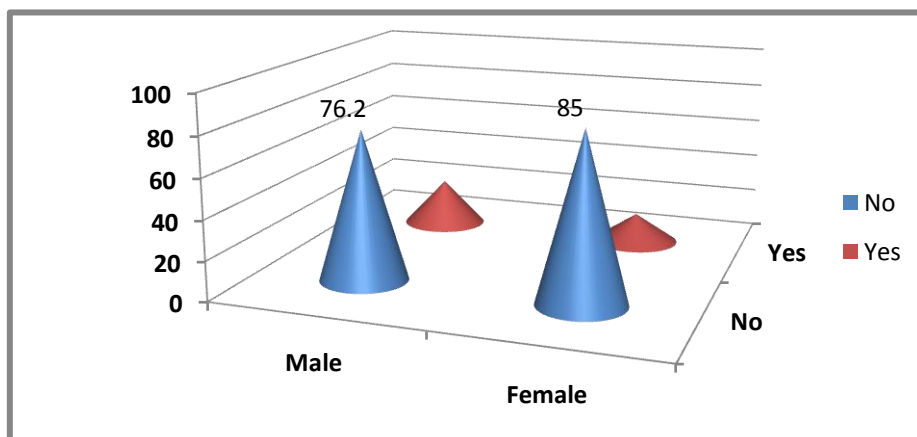


FIGURE 9: Access to credit
 Source: field survey, 2018

The results of respondents' accessibility to formal credits are presented in Figure 9. Overall access to agricultural credits was low across both genders. Results show that majority (76.2%) of male respondents had no access to formal credits while only (23.8%) had access to formal credits. Majority (85.0%) of the female respondents had no access to formal credits while only (15.0%) had access to formal credits. The result implies that male respondents had better access to formal credits than their female counterparts in the study area. Access to credit plays a significant role in agricultural production, hence it enable farmers procure inputs such as fertilizers, seeds and agrochemical as well as stimulates adoption of technology in farming and significantly increases farm incomes. This agrees with Ibrahim *et al.*, (2016) who carried out a study on Factors Influencing the Level of Adoption of Cowpea Production Technologies in Askira/Uba Local Government Area of Borno State, Nigeria. Result on access to credit revealed that only 16.9% of the respondents had access to credit. They opined that accessibility to credit warrants farmers procure adoption materials such as improved seeds, fertilizers and chemicals, which will ultimately encourage and enhance adoption of modern farming technology.

3.2 Level of Involvement in the Household Farming Decision

Respondents' level of involvement in maize household farming is shown on Figure 10. Decision-making index is used to analyse respondents' level of involvement in decisions. According to Rahman *et al.* (2008), decision Making Index (DMI) is an important indicator for assessing women empowerment since DMI and women empowerment is positively related. From the result, men were still dominant in decision-making. The observed indicators were selection of enterprise (0.16), input procurement (0.14), input allocation (0.28), selling of produce (0.68), processing of produce (0.94), storing of produce (0.75), consumption (0.78) and choice of innovation (0.25), with all indices less than 1, it means men dominated in decision for all activities. The average DMI over all activities was 0.5 meaning that women on the overall were dominated by their men counterparts in terms of decision-making. This shows that farming enterprise was a male-dominated sector as such the male solely made decisions as regards productive resources and other farm activities that they are dominant in. In most farming communities in Nigeria Women suffered marginalization in decision-making regarding agricultural activities in the household. This agrees with Ajewole *et al.* (2015). In their study, it was observed that the farming enterprise was a male-dominated sector. They also observed that 80.15% of the male had access and solely made decisions as regards productive resources compared to 19.85% of the females. Using the women empowerment index, results showed that women suffered marginalization in decision-making regarding agricultural activities in the households.

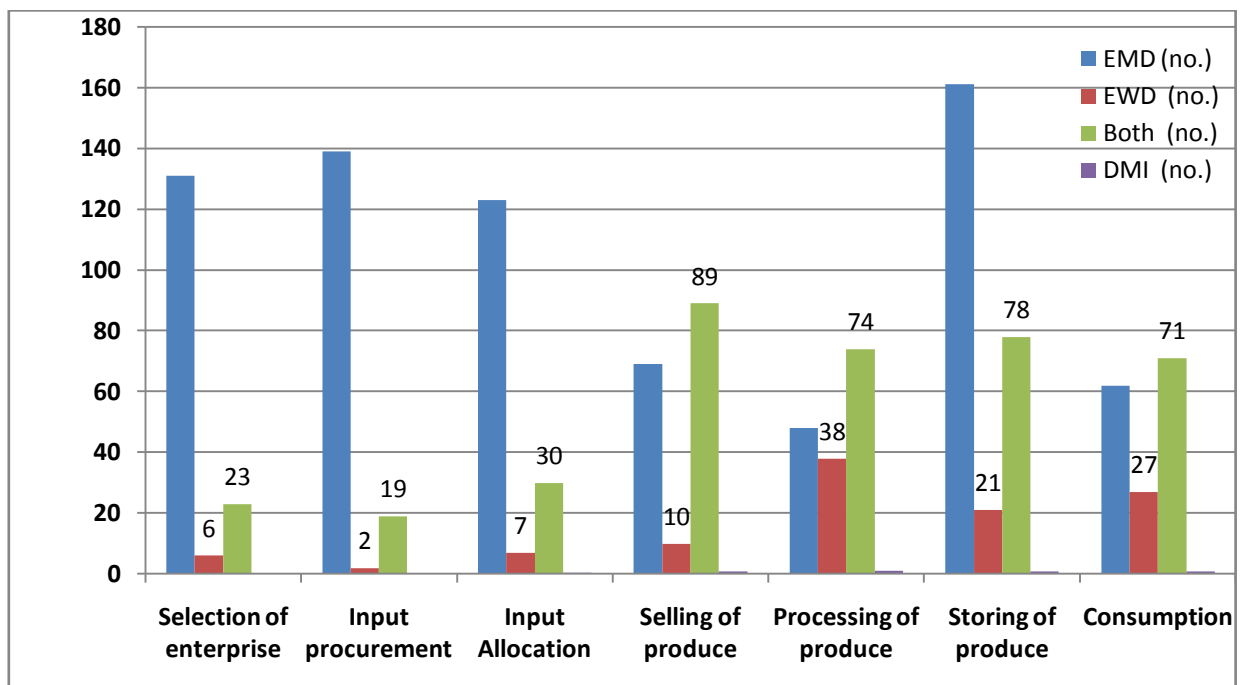


FIGURE 10: Decision Making Index in the Maize Farming Households

Source: Field Survey, 2018

DMA: Decision Making Activities

EMD: Exclusively Men Decision

EWD: Exclusively Women Decision

DMI: Decision Making Index

3.3 Constraints to Maize Production

Respondents' perceived constraints to their production of maize were presented on Figure 11. From the results on the Figure 11 majority (97.5%) of the male respondents perceived inadequacy of extension/advisory services as constraint to maize farming, 95.0% of the male respondents perceived poor access to credit as constraint to maize farming and 91.3% of the male respondents perceived poor access to farm inputs as constraint to maize farming. Also, 88.1% of the male respondents perceived Poor transport systems as constraint to maize farming, 86.3% of the male respondents perceived lack of storage/processing facilities as constraint to maize farming while 59.3% of the male respondents perceived pests and diseases as constraint to maize farming. The results in Figure 11 also show that majority (98.1%) of the female respondents perceived poor access to credit as constraint to maize farming, 97.5% of the female respondents perceived inadequacy of extension/advisory services as constraint to maize farming and 96.3% of the female respondents perceived poor access to farm inputs as constraint to maize farming. Also, 88.1% of the female respondents perceived poor transport systems as constraint to maize farming, 86.3% of the female respondent's perceived lack of storage/processing facilities as constraint to maize farming while 68.1% of the female respondents perceived pests and diseases as constraint to maize farming.

The results implied that male and female maize farmers were faced with multitude of constraints that could reduce their participation in maize production in the study area. Inadequate credit facilities to invest in maize production could reduce the level of participation of farmers in maize production. Poor transport systems imply that farmers in the study area could spend a lot spent a lot of money transporting farm produce to the store and markets. Poor access to farm inputs could constitute a significant constraint to their involvement in maize production. The implication of lack of extension services is that extension services which are supposed to be the main sources of agricultural information/ technologies for improved methods of maize production was lacking completely in the study area. Badmus *et al.* (2015) reported constraints encountered by female maize farmers to include pest infestation, which was the commonest constraint encountered by most women maize farmers, constraints of storage and weather were very common among women maize farmers as substantial number of respondents reported this, problem of glut in the market as well as transportation problem were common to sizeable number of the respondents, other familiar constraints reported were difficulty in getting hired labour (62.5% of the respondents), inadequate fund for production (54.8% of the respondents) and finally difficulty in acquiring land.

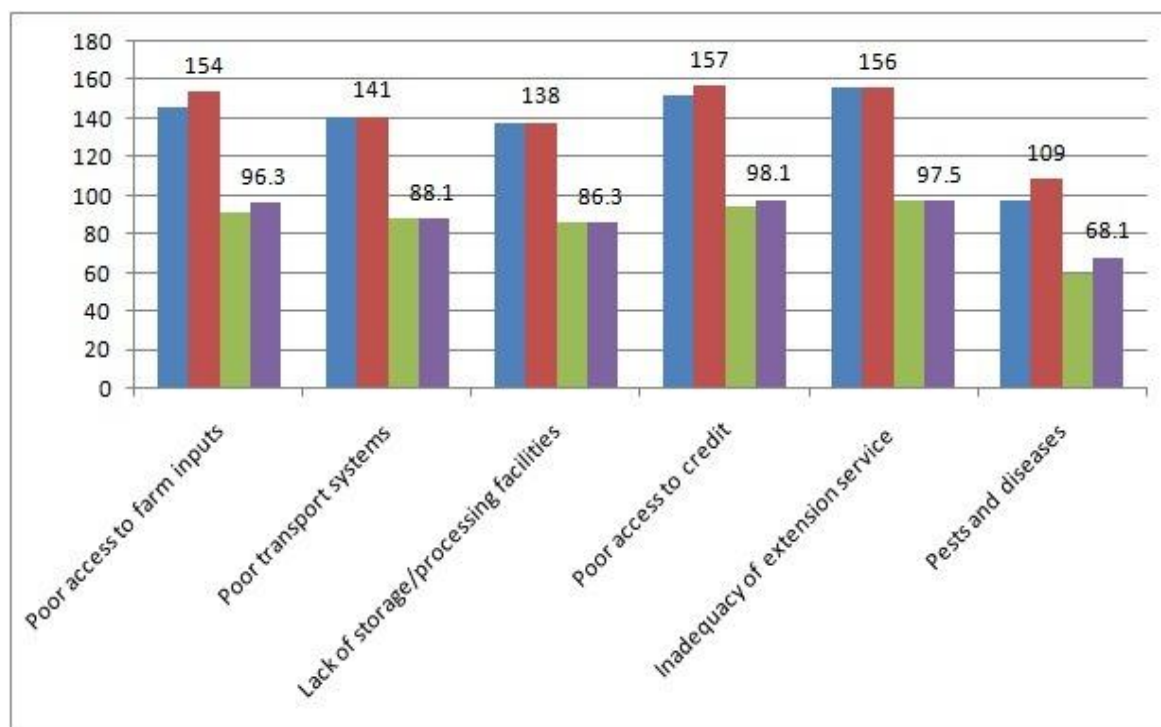


FIGURE 11: Constraints to Respondents' Maize Production

Source: Field Survey, 2018

Multiple responses allowed

3.4 Hypotheses testing

HO: There is no difference between decision making roles among male and female members of the maize farming households.

The null hypothesis stated that there is no difference between decision making roles among male and female members of the maize farming households. The results of the t-test analysis in table 2 below shows that the t-calculated (11.987) was greater than p-value (0.001) implying that there was significant difference between decision making roles among male and female members of the maize farming households. Based on the results the null hypothesis that stated that there is no difference between decision making roles among male and female members of the maize farming households is rejected and re-state that there is significant difference between decision making roles among male and female members of the maize farming households.

TABLE 2
SUMMARY OF THE RESULTS OF THE T-TEST ON DECISION MAKING ROLES AMONG MALE AND FEMALE MEMBERS OF THE MAIZE FARMING HOUSEHOLDS

Source of variance	N	X	SD	Df	t-cal	t-critical	Decision
Male maize farmers man day	160	2.3719	.48328	318	11.987	0.000	Reject
Female maize farmers man day	160	1.7898	.37903				

Source: Field survey, 2018

N = 160, p < 0.05

X = Mean, SD = Standard deviation, Df = Degree of freedom

IV. CONCLUSION AND RECOMMENDATIONS

Based on the findings of this research, it can be concluded that the female gender in the maize farming households was significantly dominated by the male gender in terms of decision-making. The observed indicators in decision-making index show that the men dominated the women in decision-making. This shows that farming enterprise was a male-dominated sector as such the male solely made decisions as regards productive resources and other farm activities that they are dominant in. The study revealed that the extension contact was very low in the area, as most of the respondent had never received an extension agent on their farms. This implies that extension contact which is supposed to be one of the main sources of agricultural information/ technologies for improved methods of agricultural activities was insufficient in the study area.

The female gender must be more involved in households' decision-making as their insights and perspectives can lead to higher productivity. Most constraints identified both around institutional and infrastructural inadequacies in Nigeria's rurality therefore better extension service provision should be provided to the rural farmers, higher access to credits and provision of more access roads in rural areas.

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