Determinants of Farmers Access to Ginger Production Resources in Kaduna State, Nigeria.

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Abstract

This study investigated the determinants of ginger farmers' access to resources in Kaduna State, Nigeria. Data for the study were obtained from primary sources by the use of structured questionnaire. Multistage sampling technique was used to select 250 farmers. The data obtained from the study were analysed by the use of descriptive statistics and regression model. Farming was found to be the most important occupation of the household heads (80% of men and 68% of women) in the study area. Age, income and access to credit are determinant factors in accessibility to resources (seed, fertilizer and agrochemicals). Result of the study revealed farmers to be constrained by lack of access to extension services, storage facilities and credit were limited in the study area. The study recommended among others that NGOs and other relevant organization should intensify their efforts in the provision of these resources to farmers.

Keywords: Determinants, Access, Resources, Ginger, Kaduna State.

Introduction

Agricultural performance in many developing countries is low due to a number of reasons. Among these is the fact that farmers lack the resources and opportunities they need to make the most productive use of their time. International labour organization (ILO,2003) defined accessibility as the ability, the level of difficulties people encountered to reach facilities and locations to use or obtain goods, information or services. Access to agricultural resources are crucial in maintaining and improving agricultural productivity. The use of purchased inputs depends on the availability of complementary assets such as land, credit, education and labour, all of which tend to be more constrained for female-headed households than for male-headed households (Blackden *et al.*, 2006; FAO, 2011).

Modern farming equipment such as tractors and tillers are not commonly available to farmers, especially in sub-Saharan Africa. The share of farmers using mechanical equipment and tools is quite low in some countries, but it is significantly lower for female farmers. In a study of productivity differences by gender in a rice irrigation scheme in Central Benin, Kinkingninhoun-Mêdagbé *et al.* (2008) noted that equipment such as motor cultivators used for ploughing and transport were managed by groups, but women's groups were unable to start ploughing until the drivers had completed work on men's fields.

Resources are the key considerations for rural livelihoods. Rural households negotiate their livelihoods by obtaining access to land, labour and market which leads to enhanced family wellbeing and sustainable use of resources (Valdivia and Gilles, 2001; Shahnaj, 2008). Adequate access to production resources among farmers is needful if food production rates are to be enhanced in Nigeria. This is especially so, given the increasing deficit in the food demand and supply gap in the country resulting from population growth exceeding food production growth.

This study aims to identify the determinants of farmers' access to resource (seed, fertilizer and agrochemicals) for ginger production with the following objectives: describe socioeconomic characteristics of farmers, determinants of seeds, fertilizer, agrochemicals and identify constraints of the farmers. It is hypothesised that socio-economic and institutional variables have no significant influence on farmers' access to productive resources.

Methodology

Study was carried out in Kaduna State, located in the Northwest of Nigeria. Kaduna is the third most populous State after Kano and Lagos States (Kaduna State government, 2017). Hausa, Fulani, Gbagyi, Adara, Ham, Atyap, Bajjuu and Agworok are the major ethnic communities in the State. The state is well suited for the production of cash and arable crops such as; cotton, groundnuts, maize, yam, beans, guinea corn, millet, ginger, rice, sugarcane, cowpea, mango, cocoyam, banana, soya bean, onions, sorghum and potatoes. The major cash crops are ginger and cotton which the state has a comparative advantage in as it is the leading producer in the country (Kaduna State government, 2017).

For this study, multistage sampling technique was used to select the farmers. The first stage involved purposive selection of three LGAs. In this regard, Kachia, Kagarko and Jaba LGAs were purposively selected for this study, due to the high level of ginger production in these places. In the second stage, random selection of three villages from Kachia, Kagarko and Jaba LGAs. In Kachia LGA, Assako, Yarbung 1 and Gidan tagwai were selected. Nok, Kurmin Jatau and Fai were selected from Jaba LGA, while Kenyi, Kurmi dangana and Katugal were also selected from Kagarko LGA to give a total of nine villages. In the third stage, sample of ginger farmers was drawn randomly, thereby giving each farmer an equal chance of being selected. Random sampling of 15% female (826) and 15% of male (860) ginger farmers from the villages was done. A total of 250 ginger farmers were randomly selected for this study.

Method of Data Collection

Descriptive statistics was used to organize, summarize and describe the socioeconomic characteristics of the farmers, while liner regression model was used to identify the determinants of farmers' access to resources. The multiple regression model is represented as

$$Y = \alpha_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + U$$

Where

Y	=	Accessibility to seed, fertilizer, and agrochemicals (kg; litres)
X_1	=	Age (years)
X_2	=	Level of education (years spent in schooling)
X_3	=	household size (number of people)
X_4	=	Income (₦)
X_5	=	Extension contacts (number of times per year)
X_6	=	Membership of a cooperative (yes or no)
X_7	=	Credit (amount received (₦))
U	=	Error term
α_o	=	Constant term
β_{1-7}	=	Regression coefficients.

Results and Discussion
Occupations of respondents
 Farming was found to be the most important occupation of the household heads (80% of men and 68% of women) in the study area. This showed that majority of the ginger farmers are primarily into farming. 15% (male) and 19% (female) of household heads were identified to be civil servant which was the second most important occupation in the study area. In sub-Saharan Africa, it is common for some farm household to engage in other non-farm occupations to complement their earnings from farming. Differences were observed between the male and female farmers in terms of their employment status. It was observed that 15% of the male farmers were civil servants and about 2% found to be traders (Table 1). However, 10% of female farmers were traders and 19% revealed to be civil servants. Furthermore, 2.3% male and 1.7% of female farmers engaged in craftwork (such as carpentry and tailoring). The implication of this finding is that the diversification of income source by the farming household heads can help to reduce the risk associated with income from a single source especially a very risky enterprise such as agriculture. These findings compared favourably with those of Adejobi (2004).

Extension visits
The result revealed that 58% of the male ginger farmers had no contact with extension agents; likewise, 73% of the female ginger farmers had no contacts too with extension agents. Results in Table 2 indicate that more male farmers (20%) had extension contacts between 3-4 times in the last couple of years, while only 11% of female farmers had such number of extension contacts. This study revealed extension contact to be low in the area; many of the female ginger farmers (73%) had never received an agent on their farms. Consequently, extension training and information on ginger farming were received by only few farmers. The reason for low extension contacts is probably due to the increasingly low extension- farmer ratio in the country. Nigeria has elaborate agricultural research and extension system, far reaching innovations that are capable of boosting farmer's agricultural production and Nigeria's economic development (Oladele, 2004). Unfortunately, most of these innovations do not reach the farmers.

Membership of cooperatives
 The result in Table 3 showed 80.6% of male and 87% of female farmers not belonging to cooperative societies, while 19% (male) and 12% (female) farmers were members of a cooperative society. This showed that, most of the ginger farmers in the study area do not enjoy the assumed benefits accrued to cooperative societies through pooling of resources together for better expansion and effective management of resources.

Determinants of Famers' Access to Seed Resource
The adjusted R square of 0.52 and 0.46 for male and female ginger farmers presented in Table 4 implies that 46 and 52 percent in the variability in accessibility to seed resource in the study area was explained by the explanatory variables (age, level of education, household size, income, extension contacts, membership of cooperative and access to credit) specified in the model. The F value of 64.6 and 37.9 were statistically significant ($p < 0.01$) and this indicates the joint significance of the specified variables on farmers' accessibility to seed resource in the study area.
The estimated coefficients of age for male (59.581) and female (39.219) were found to be positive and significant ($p < 0.01$) to farmers access to seed resource respectively. This implies

that increase in age to a certain extent would increase farmers' access to seed resource. Age has been found to determine how active and productive the head of the household would be (Bashaasha *et al*., 2006). The coefficient of Education variable was found to be statistically significant (p < 0.01) for both male and female ginger farmers. This implies that as the level of education of ginger farmers increased, their accessibility to seed resource will also increase *ceteris paribus*. A plausible explanation for this is that, higher educational level leads to high rate of adoption of improved technologies and techniques of production.

Access to income (0.003) was found to be positive and significantly (p < 0.01) determine accessibility to seed resource among the male farmers who engaged in ginger production and insignificant for the female farmers. This means that, increase in income would increase male farmers' access to seed. Surprisingly, was expected the variable to be significant for the female farmers too. The reason given as to why this result is insignificant for the female farmers as against *aprori* expectation; is not too far from the fact that the female farmers had less accessibility to income. The female farmers cannot afford to acquire seeds compared to the male farmers who on the other hand have the means and can also acquire larger quantities of seeds.

Determinants of farmers' access to fertilizer resource

The result presented in Table 5 showed the estimated coefficient of income was positive and significant at p< 0.01 and p< 0.05 for male (0.0004) and female (8.652E-6) farmers respectively. This showed that; increase in income would increase both male and female farmers' access to fertilizer resource. Income provides the farmers with a means of expanding farm size and improving his farm and also determines the ease with which the farmer adopts new practices and technologies. Increased income of the farmer could reduce liquidity constraint thereby enhances farmers' accessibility to resources.

The estimated coefficient of extension contact was significant among the female farmers (0.656) and also positive and significantly (50.218) determine access to fertilizer resource among male farmers at p< 0.01. This indicates that, accessibility to fertilizer resource among farmers increased when farmers had more contact with extension agents. Availability of extension could play an important role on information dissemination which could lead to awareness of resource availability. According to Obwona (2000), extension service is very essential to the improvement of farm productivity and efficiency among farmers.

Cooperative membership was significant at p< 0.01 for the male farmers and insignificant for the female farmers. The positive coefficient (185.160) indicated access to fertilizer resource to increase as a result of belonging to a cooperative society. The non-significance of this variable among female farmers may be explained by the leadership's inability to source for agricultural assistance for its members to acquire fertilizer resource. Access to credit was also found to be positive and significantly determine accessibility to fertilizer input resource among the male (259.314) and female (3.757) farmers at p < 0.01 respectively. This suggests that availability of credit is an important factor in resource accessibility among the ginger farmers. Ekong (2010) asserts that credit is a very strong factor that is needed to acquire or develop any enterprise; its availability could determine the extent of production capacity.

Farmers' access to agrochemical resource

The factors that determine accessibility to agrochemical resource were income and credit. The estimated coefficient of income was positive and significant at p< 0.01 and p < 0.05 for male (2.985E-5) and female (2.152E-5) farmers respectively. The implication of this is that, increase

in income would increase both male and female farmers' access to agrochemical resource. Income provides farmers with a means of expanding farm size and improving his/her farm. It also determines the ease with which he/she adopts new practices and technologies in his enterprise. However, this situation varies with gender due to gender-differential access to production resources. A number of studies, exemplified by Barne (1984) and Kanu (2012), confirmed that access to production resources, including farm inputs varies by gender.

The estimated coefficient of access to credit was positive and significant for male (1.694) and female farmers (0.533) respectively. The implication of this is that increase in credit accessibility would enhance farmers' accessibility to agrochemical. This suggests that availability of credit is an important factor in resource accessibility among the ginger farmers. Tijani *et al.* (2006), opined that access to credit provides the farmer with a means of expanding and improving his farm.

Test of Hypothesis

The results on regression coefficient of factors such as age, income, education, membership of cooperative group and extension contacts were found to be positive and significant (Tables 4-6). This implies that socioeconomic and institutional factors influence farmers' accessibility to productive resources in the study area. Thus, the hypothesis that socio economic and institutional factors have no significant influence on farmers' access to productive resources in the study area was therefore rejected.

Constraints encountered by the farmers

Farmers in the study area lack improved technologies for ginger harvesting and processing (59.7% male and 91.7% of female farmers). According to the farmers, ginger harvesting, weeding, cutting and peeling were done manually. Accordingly, ginger production is laborious without the use of modern tools. In Nigeria, access to improved farm technology is yet to be seen, this makes farming a time intensive venture, without the necessary technology to accomplish tasks. The share of farmers using mechanical equipment and tools is quite low in all countries, but it is significantly lower for farmers in female headed households (FAO, 2011).

Ninety-eight percent (98%) male and about 100% of female farmers (Table 8) indicated lack of extension services as a problem in the area. This supports the view given by FAO and IFAD (2005) that the extension delivery system is inefficient, and as a result is not effective in the delivery of extension services in rural areas. The provision of agricultural extension can lead to significant yield increases. Yet, extension provision in developing economies remains low for both women and men (Meinzen-Dick *et al.,* 2010; Adamu and Park, 2014). Purchasing farm inputs such as seeds and fertilizers are being limited by lack of capital or lack of access to credit facilities as reported by 69.8% of male and 93% of female farmers. This result conforms with earlier findings of DeBrauw *et al.* (2008) and Fletchner (2009) that women are less likely to use credit than men under equivalent socio-economic conditions.

Result of the study showed 55% of the farmers lack storage facilities in the area. It is known that almost all farmers who grow crops, encountered heavy post-harvest losses due to inadequate storage facilities in the country. Due to lack of storage and processing facilities, farmers are usually compelled to sell farm produce at ridiculously low price. Wastage of farm produce is a perennial conundrum Nigerian farmers have been battling with due to lack of storage and agro-processing facilities, this pose great impediments to Nigeria's agriculture (Punch newspaper, 2016).

Conclusion and Recommendations

Income and access to credit are major determinant factors in accessibility to resources. Increasing farmer's access to inputs would generate broader socio-economic benefits. Purchasing farm inputs such as seeds and fertilizers are being limited by lack of capital, or by the lack of access to credit facilities that would enable farmers to use more of these inputs. This study recommended that, appropriate farm inputs should be available and affordable to farmers. Nigerian commercial banks should be willing to grant loan to farmers with very low interest rates. The provision of agricultural extension can lead to significant yield increases, the extension services provided in the area be improved upon to enhance farmers' productivity. Given the rate of post-harvest losses, there is the need to introduce storage solutions in the study area.

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TABLES

Table 1: Distribution of ginger farmers based on types of occupation

Variable	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Major occupation				
Farming	104	80.6	83	68.6
Trading	2	1.6	13	10.7
Civil servant	20	15.5	23	19.0
Craftwork	3	2.3	2	1.7
Total	129	100	121	100

Table 2: Distribution of farmers according to extension contact

Variable	Male		Female	
Number of Extension Contacts	Frequency	Percentage	Frequency	Percentage
No contact	75	58.1	89	73.6
1-2	17	13.2	12	9.9
3-4	27	20.9	14	11.6
5-6	10	7.8	6	4.9
Average	4			4
Total	129	100	121	100

Table 3: Distribution of ginger farmers based on membership of cooperative society

Variable	Male		Female	
Membership of cooperative society	Frequency	Percentage	Frequency	Percentage
No	104	80.6	106	87.6
Yes	25	19.4	15	12.4
Total	129	100	121	100

Table 4: Determinants of gender accessibility to seed resource

Variables	Male			Female		
	Coefficient	St. error	t-value	Coefficient	St. error	t-value
Constant	-2082.653	1383.35	-1.506	-902.834	618.529	-1.460
Age	59.581	23.698	2.514***	39.219	12.361	3.173***
Education	181.637	68.465	2.653***	88.593	19.587	4.523***
Household size	90.683	85.612	1.059	65.633	55.267	1.188
Income	0.003	0.001	2.697***	0.003	0.007	0.428
Extension visit	-95.577	127.981	-0.747	-18.903	66.763	-0.283
Membership of cooperative	785.937	504.574	1.558	356.673	323.302	1.103
Access to credit	343.456	510.138	0.673	-311.866	223.540	-1.395
R-square		0.57			0.52	
R-square adjusted		0.52			0.46	
F-value		64.6***			37.9***	

*** P<0.0 1

Table 5: Determinants of gender accessibility to fertilizer resource

Variables	Male			Female		
	Coefficient	St. Error	t-value	Coefficient	St. error	t-value
Constant	118.286	201.697	0.586	3.211	1.948	1.648
Age	1.618	3.455	0.468	-0.007	0.039	-0.180
Education	-41.148	26.483	-1.554	0.158	0.279	0.566
Household size	12.482	26.312	0.474	-0.044	0.174	-0.254
Income	0.0004	0.0019	2.938***	8.652E-6	0.000	2.208**
Extension visit	50.218	18.660	2.691***	0.656	0.210	3.120***
Membership of cooperative	185.160	73.569	2.517***	0.708	1.018	0.695
Access to credit	259.314	74.380	3.486***	3.757	0.705	5.332***
R-square		0.71			0.61	
R-square adjusted		0.67			0.57	
F-value		96.7***			79.5***	

*** P<0.0 1,   ** P<0.0 5

Table 6: Factors determining gender accessibility to agrochemical resources

Variables	Male			Female		
	Coefficient	St. Error	t-value	Coefficient	St. error	t-value
Constant	-6.316	5.397	-1.170	-0.468	2.182	-0.215
Age	0.097	0.092	1.047	0.062	0.043	1.427
Education	0.047	0.709	0.067	-0.234	0.313	-0.748
Household size	0.301	0.334	0.900	0.057	0.194	0.294
Income	2.985E-5	0.000	6.697***	2.152E-5	0.000	4.916***
Extension visit	-0.154	0.499	-0.307	-0.056	0.239	-0.235
Membership of cooperative	1.747	1.969	0.888	-1.283	1.137	-1.128
Access to credit	1.694	0.1990	8.513***	0.533	0.078	6.833***
R-square		0.35			0.32	
R-square adjusted		0.21			0.21	
F-value		81.7***			74.4***	

*** = P<0.0 1

Table 7: Distribution of ginger farmers based on constraints encountered

Constraints	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Lack of credit	90	69.8	120	93.0
Poor storage facility	72	55.8	70	54.3
Poor extension services	127	98.4	121	100
Inadequate improved technologies	77	59.7	111	91.7

*Multiple responses