

## An Assessment of the Use of Agricultural Inputs and Farm machinery Among Food Crop Farmers in Kogi State, Nigeria

I. J. Memudu\* and A. Muhammad-Lawal

Department of Agricultural Economics and Farm Management, University of Ilorin

**ABSTRACT:** The need for the country to achieve food security has gained some attention in recent times. Yet food crop production growth rate figures are still low compared with other sub-sectors of agriculture. This might be as a result of the lack of cognizance of the constraints that inhibit food crop production. This study therefore assessed the constraints to the use of farm inputs and machinery among crop farmers in Kogi state, Nigeria. Primary data used for the study were collected using a well structured questionnaire. A four-staged random sampling technique was used to select a total of 109 farmers used for the study. The main tool of analysis of the study was descriptive statistics. The results showed that farmers in the study area were in their middle age group with an average of 45 years. The level of education of the farmers was low with the majority (46.2%) having only primary education. About 63.2 percent of the farmers did not own the farmland they cultivated. The average farming experience of the respondents was 18 years. The study showed that 87.2 percent of the farmers could not use modern farm machinery due to insufficient capital and high hiring cost. About 76.1 percent were unable to obtain credit due to lack of collateral. Also, 63.3 percent of the farmers did not use agrochemicals due to the high cost of purchasing the agrochemicals. The study therefore recommends that farmers should be encouraged to form cooperatives to make it easy for them to access farm inputs such as credit, execute bulk purchase for inputs like agrochemicals and collectively hire farm machinery. Bank policies on credit availability, especially loan services among small scale rural farmers should be made more farmers friendly. Farmers should be enlightened and encouraged on how to access loan from agricultural banks such as the Nigerian Agricultural and Rural Development Bank (NARDB).

**Keywords:** Agricultural Inputs, Crop Production, Food Security, Machinery, Small-scale Farmers.

### Introduction

#### Background to the Study

The incidence of food insecurity in Nigeria is widespread and increasing due to the country's inability to produce food for the teeming population. Efforts to boost agricultural production in the past include the Operation Feed the Nation of 1976, Green Revolution of 1980 and more recently, the World Bank sponsored Fadama Projects and the National Food Security Programmes (NFSP). However, despite these efforts to boost agricultural production, the challenge of food insecurity is still persisting. This may be due to the inadequate provision of farm inputs for the crop farmers in the country. In the rural areas where majority of the country's food crop producers reside, farm inputs are inadequate. This is buttressed by the assertion of the Nigerian Development Report (2001) that only about 33 percent of farmers in the rural area use inorganic fertilizers and other improved farm inputs including farm machinery.

Nigeria occupies a total land area of 92.4 million hectares, consisting of 91.1 million hectares of land and 1.3 million hectares of water bodies. The agricultural area is 83.6 million hectares, which comprises arable land (33.8 percent), land permanently in crops (2.9 percent), forest or woods (13.0 percent), pasture (47.9 percent), and irrigable land or Fadama (2.4 percent) (Adetunji, 2006). Average rainfall ranges from 300 mm in the extreme north to about 2,500 mm in the coastal areas. Of Nigeria's 160million population estimate, 65 percent live in rural areas and earn their living from agriculture (FDA/FMARD, 2005). Furthermore, the Nigerian soil and climatic conditions are very suitable for the production of wide varieties of crops. At present, over a hundred different food crops are produced by farmers in Nigeria on yearly basis some of these include yam, maize, millet, sorghum, beans, potatoes, rice, onions, garbage, carrot, pear, cocoa, cocoa yam, okra, and vegetables. The production of these crops is however not optimally realized. This might be due to the inadequate access to the needed farm inputs by these farmers.

Agricultural inputs are very important factors in crop production. The sufficient use of these agricultural inputs is known to improve the productivity of the farmers (Ajah and Okorie, 2011). Credit, one of the important factors in agricultural production, allows farmers to be able to sufficiently finance activities during crop production. Despite its importance, the potential for capital formation is severely constrained and the farmers rely on their meager savings and at times informal sources for the expansion of their farm capital. What is realized through such sources is actually lower than what is required for increasing productivity and income (World Bank, 1975). This lack of adequate access to credit is also found to have negative consequences on agricultural productivity and technological adoption in the use of modern farm machinery (Delgado, 1995; Zeller *et al.*, 1997; Diagne and Zeller, 2001). The use of agrochemicals such as fertilizer is found to shift the production frontier higher leading to more output produced. This can hereby be possible when the farmers have adequate access to these agrochemicals (Onyenweaku and Effion, 2005; Onyenweaku and Nwaru, 2005; Okoye *et al.*, 2008).

Given the afore mentioned details, Nigeria can achieve food security considering the available land resources, water resources, and prevalent favourable environmental resources bestowed on the country.

### **Statement of the Problem**

Crop production in Nigeria have suffered great decline in the past times. Data available from the National Bureau of Statistics (2011) revealed that crop production in 2011 had the least growth rate of 5.7 percent when compared with other sub-sectors of agriculture such as livestock production, fishery and forestry which realized growth rates of 6.2 percent, 5.9 percent and 5.9 percent respectively. This prevalent situation of inadequacy in crop production in the country gave rise to the importation of food crops to meet the food demand of the teeming population. This trend is food insecurity and it exists within household, regional and national levels (FAO, 2010). However the country's inability to achieve food security, that is, food availability to the teeming population in adequate quality and quantity, might be as a result of the inadequate cognizance of the constraints these farmers face in the production of crops. Credit facilities directed to the farmers for production have not being given adequate attention. This might be a major constraint for the farmers to produce crops efficiently.

Despite the availability of modern machinery, like tractors for land clearing and ridging, these farmers do not adequately make use of this advantage to employ the machinery in their farm activities. Farmers in the rural areas see the use of modern farm machinery as an 'out-of-reach' input. This will not only limit agricultural production of crops but also result into drudgery and little is achieved in greater time used on the farm.

The use of agrochemicals such as herbicides and fertilizers among rural crop farmers may be low because the inputs are mainly found in urban centers and most at times, are far from the reach of the rural farmers.

### **Research Objectives**

The main objective of this study was to assess the use of farm inputs and farm machinery among crop farmers during production of crops in Kogi State, Nigeria.

The specific objectives were to:

1. determine the socioeconomic characteristics of the crop farmers in the study area
2. assess the major factors that limit the use of agricultural inputs and farm machinery in crop production among crop farmers.

### **Research Methodology**

#### **The Study Area**

The study was carried out in Kogi State, Nigeria. The State covers a total land area of 2,831,353km<sup>2</sup>. It is located between Latitudes 6° 30' N and 8° 48' N and Longitudes 5° 23' E and 7° 48' E. The State has a population of about 3,314,043 comprising of 1,672,903 males and 1,641,140 females. A good expanse of arable land of about two million hectares exist within the State. Kogi State is bordered by the Federal Capital Territory, Niger, Nasarawa, Ekiti, Kwara, Edo, Benue, Anambra and Enugu States (Kogi State Ministry of Information, 2010).

Major crops cultivated in the state include yam, cassava, groundnut, cowpea, melon, pepper, and some leafy vegetables. Most of the crops produced are eaten, while some households sell part of their produce in the market to earn additional income for their household upkeep. The state is also divided into four zones by the Kogi State Agricultural Development Project (KGADP) in consonance with the agro-ecological characteristics, cultural practices and project's administrative convenience. These ADP zones have their headquarters at the following areas: Zone A- Aiyetoro-Gbedde; Zone B- Ayingba; Zone C- Koto-Karfe; and Zone D- Alloma.

#### **Sampling Techniques**

The study population consist of both men and women farmers who engage in crop production in Kogi state, Nigeria. A four-stage random sampling technique was used to collect the data needed for the study. The first stage was the random selection of zone A. In the second stage, two (2) Local Government Areas (LGAs) were selected using ballot/lottery system. A list of all the villages in the chosen LGAs was collected from the ADP zonal office. The third stage was the random selection of 10 villages from each of the two Local Government Areas. The fourth stage of the selection involved the random of selection of six (6) respondents from each of the 20 villages. A total of 120 respondents were sampled out of which responses from 109 respondents were found useful for the study.

#### **Sources of Data and Methods of Data Analysis**

Primary data was collected from respondents. Structured questionnaire was used to collect the data. Information on the characteristics of the farmers such as age, occupation, education were collected. Other information on factors that can affect their production with regards to their farm input availability and usage were also collected. The 2009/2010 crop production season was considered for this study. Method of analysis used for this study was descriptive statistics. this include frequency distribution, mean and percentage.

### **Results and Discussions**

#### **Socioeconomic Characteristics of the Respondents**

The result of the socioeconomic and farm characteristics analysis of the farmers in Kogi state (State), Nigeria is as presented in Table 1.

**Table 1: Socioeconomic Characteristics of the Respondents (n=109)**

Variables		Frequency	Percentage (%)
Age(years);	21-30	5	4.5
	31-40	35	32.2
	41-50	54	49.6
	51-60	20	13.7
Sex ;	Male	44	40.4
	Female	65	59.6
Marital status;	Single	5	4.6
	Married	104	95.4
Household size;	1—2	7	6.5
	3—4	28	25.6
	5—6	41	37.9
	6—7	24	21.6
	≥ 8	9	8.4
Education level;	No formal education	40	36.9
	Primary education	50	46.2
	Secondary education	8	7.7
	Post secondary	8	7.7
	Adult education	5	1.5
Farm size(ha);	0.1-0.5	74	67.7
	0.6- 1	23	21.5
	>2	12	10.7
Farmland ownership;	Yes	40	33.8
	No	69	63.2
Farming experience(years);	<5	10	9.1
	6-10	29	26.2
	11—15	15	13.8
	16-20	32	29.2
	21-25	7	6.1
	26-30	13	12.3
	>31	3	3

Source: Field Survey, 2011

Majority of the farmers in the study area were within the age group of 41-50 years. The mean age was  $45 \pm 8.38$  years. These farmers were within the middle age group. The study conducted had about 60 percent of its respondents as women who, according to FAO (1996), form majority of the world's food producers and produce more than 50 percent of food crops worldwide. About 95.4 percent of the respondents were married. This means that majority of these farmers had family members to cater for. Most of the farmers (37.9 percent) had family sizes of between five to six members. The mean family size observed was  $5 \pm 2.40$  members. This implies that the farming households were fairly large and this might reduce the cost of hiring labour during production. The level of education of the farmers was also very low. The average year of education observed among the farmers was  $3 \pm 2.4$  years. Majority of these farmers (83.1 percent) did not have more than primary education of which about 46.2 percent had only primary education. This might constitute a great challenge to the farmers in the aspect of understanding new innovations and in their ability to access agricultural inputs and machinery which are required to improve their production.

The analysis of the farming characteristics of these farmers revealed that about 68 percent of the farmers cultivated small units of land ranging from 0.1 to 0.5 hectare. The total area these farmers cultivated was very small compared to the average household size of five family members they have to sustain. About 63.2 percent of these farmers did not own the farmland they cultivated. This might be the cause of the farmers cultivating small pieces of land since they might not be able to afford the royalties charged on large parcels of land. This conform with the assertions of NARP (1994); Phillip *et al.*, (2009) and Onyebinama (2004), that the communal system of land ownership in which individual ownership of land is embedded in group or kinship prevail among most ethnic groups in Nigeria, with the community head acting as the custodian of the land.

Although the average farmland cultivated by these farmers was considerably small, results indicated a high level of farming experience with an average of  $18 \pm 9.55$  years.

#### **Constraints to the Use of Farm Inputs and Machinery**

This section discusses the constraints crop farmers encountered in the use of farm inputs and machinery in crop production. Usage of farm implements by farmers showed that 83.5 percent of these farmers were still producing crops using the traditional farming implements such as hoes and cutlasses. Only 16.5 percent of these farmers used some forms of modern farm machinery like tractors. This shows that the goal of food security in the country is still far from being achieved, considering the fact that crude farm implement will only increase drudgery and less farm work will be achieved in greater time. The reasons adduced by these crop farmers for their low level of use of these farm inputs especially machinery is as presented in Table 2.

**Table 2: Constraints to the use of modern farm machinery**

Constraints in the use of farm machinery	Frequency(n=109)	Percentage (%)
Lack of knowledge of their availability	2	1.8
Insufficient fund to hire the machinery	58	53.2
Modern implements are not available within reach	10	9.2
Lack of technical know how	2	1.8
Exorbitant charges on machinery hiring	37	34

Source: Field Survey, 2011

As shown in Table 2, 98.2 percent of the farmers were aware of the availability of farm machinery but insufficient fund to hire available modern farm machinery and the exorbitant cost of hire constituted the major limiting factors to the farmers' inability to use modern farm machinery. Precisely, 87.2 percent of the farmers were unable to use modern farm machinery due to the insufficient fund to hire machinery and the exorbitant charges placed on hiring of machineries. Insufficient fund can be seen to be a major constraint to crop production among farmer. This may be due to low capital base of rural farmers besides, some of them might not have savings to utilize when needed for their farm activities.

The use of agrochemicals have been found to reduce drudgery and improve crop production, however, while some farmers do not use it in adequate amount others do not use it at all. Constraints faced in the use of agrochemicals by small scale farmers are therefore presented in Table 3.

**Table 3: Constraints in the use of agrochemicals by the farmers**

Constraints in the use of agrochemicals by the farmers	Frequency	Percentage (%)
Lack of knowledge of their availability	5	4.6
High cost of purchase	69	63.3
Agrochemicals are not available within reach	19	17.4
Lack of technical know how	16	14.7

Source: Field Survey, 2011

As shown in Table 3, 63.3 percent noted that agrochemicals were only available at exorbitant prices which they could not afford considering the other farm activities that they needed to embark upon. As such, they often resorted to the use of old method of burying grasses to decay for fertility; and manual weeding than to spend high amounts purchasing agrochemical inputs. This is in spite of the fact that these crude practices may not help the optimum production of crops.

In view of the insufficient fund to hire farm machinery and acquire other agricultural inputs like agrochemicals by the farmers, reasons for the inability of these farmers to access loan and have sufficient capital for their crop production enterprises are presented in Table 4. These constraints might be responsible for their inability to obtain loan.

**Table 4: Constraints in obtaining loan**

Constraints in obtaining loan	Frequency	Percentage (%)
Lack of collateral	83	76.1
Ignorance	2	1.8
Lack of surety	9	8.3
Lack of closeness to bank	15	13.8

Source: Field Survey, 2011

As shown in Table 4, the constraints reports revealed that insufficient fund was the major factor that limited the ability of these farmers to use agricultural inputs and machinery for crop production. About 76.1 percent of the farmers could not access funds from the micro finance banks they approached due to lack of collateral. This is in conformity with the findings of Adebisi-Adelani *et al.* (2011) that capital is a major constraint in the production of crops in Nigeria in addition to high cost of inputs and unavailability of capital sources. Due to the low ability for capital formation among these farmers and their inability to access loans needed for the acquisition of necessary farm inputs and machinery, their crop production might continue to be low. Only 1.8 percent of these farmers claimed they were ignorant of the fact that they can obtain loan from the bank. This implies that majority (98.2 percent) of these farmers were aware that banks can grant loans but they did not have collateral sought by the bank to access the loans.

## Conclusion

Achieving increased agricultural production is dependent on the level of inputs used by the farmers. However, due to certain socioeconomic characteristics of the farmers, low usage of agricultural inputs and farm machinery is still evident in their low level of output produced. Efforts to encourage the use of agricultural inputs and machinery must therefore take cognizance of the characteristics of these farmers and factors limiting their use of farm inputs.

## Recommendations

Based on the findings of this study, the following recommendations are made;

1. Farmers should be encouraged to form cooperatives so that they can collectively access modern technologies.
2. Modern agricultural technologies such as the use of machinery and agrochemicals should be made available to the farmers at affordable prices to reduce the burden of high capital expenditure on the farmers.

## References

- Adebisi-Adelani FB, Olajide-Taiwo IB, Adeoye O and Olajide-Taiwo LO: Analysis of Production Constraints Facing Fadama Vegetable Farmers in Oyo State, Nigeria. *World Journal of Agricultural Sciences* 7 (2): 189-192, 2011.
- Adetunji O: Creating Appropriate Technology as a Means of Waste Minimization in Cassava End Products, 2006, [www.nifst.org/?nifst:articles](http://www.nifst.org/?nifst:articles). Retrieved on January 12, 2013.
- Ajah J and Okorie N: Perceptual Evaluation of Maize Farmers' Access to Farm Inputs in Uyo, Akwa Ibom State, Nigeria. In: Erhabor, PO; Ada-Okungbowa CI; Emokaro CO and Abiola MO (eds.) *National Association of Agricultural Economists (NAAE), 12<sup>th</sup> Annual National Conference Proceedings*. University of Benin, 12<sup>th</sup> - 16<sup>th</sup> of Nov., 2011. Pp. 404-407, (2011):
- Delgado C: Africa's Changing Agricultural Development Strategies. Past and Present Paradigms - A Guide to the Future 2020 Vision, Food, Agriculture and the Environment, Discussion Paper 3. International Food Policy Institute, Washington DC, (1995):
- Diagne A and Zeller M: Access to Credit and its Impact on Welfare in Malawi. Research Report No.116. International Food Research Institute. Washington DC, 2001.
- Federal Department of Agriculture/Federal Ministry of Agriculture and Rural Development (FDA/FMARD): Cassava Development in Nigeria—A Country Case Study Towards a Global Strategy for Cassava Development. Abuja, Nigeria, 2005.
- FAO: Women in Agriculture and Rural Development. Sustainable Development Department, Rome. Italy, 1996.
- FAO: The State of Food Insecurity in the World: Addressing Food Insecurity in Protracted Crises. Food and Agriculture Organization of the United Nations, Rome. Retrieved from <http://www.fao.org/docrep/013/i1683e/i1683e.pdf> accessed on 25/01/2013, 2010.
- Kogi State Ministry of Information, Lokoja, Nigeria, (2010)
- National Bureau of Statistics, Abuja, Nigeria, 2011.
- National Agricultural Research Project (NARP): National Agricultural Research Strategy Plan, Draft Report on North West Zone. Abuja, Nigeria, 1994.
- Nigerian Development Report, Abuja Nigeria, 2001
- Okoye BC, Onyenweaku CE, Ukooha OO and Asumughu OC: Determinant of Labour Productivity on Smallholder Cocoyam Farm in Anambra State, Nigeria. *Nigerian Academic Journal for Scientific Research Essay* 3(11):559-561, 2008.
- Onyebinama UAU: Land Reform, Security of Tenure and Environmental Conservation in Nigeria. *International Journal of Agriculture and Rural Development*. 5:86-90, 2004.
- Onyenweaku CE and Effion EO: Technical Efficiency in Pig Production in Akwa Ibom State. *Nigerian Journal of Sustainable and Tropical Agricultural Research*. 6:51-57, 2005.
- Onyenweaku CE and Nwaru O: Application of Stochastic Frontier Production Function to the Measurement of Tropical Efficiency in Food Production in Imo State, Nigeria. *Nigerian Agricultural Journal*.36:1-12, 2005.
- Phillip D, Nkonya E, Pender J and Oni OA: Constraints to Increasing Agricultural Productivity in Nigeria: A Review. International Food Policy Research Institute, Washington D.C., U.S.A., 2009.
- World Bank: Global Development Finance: Striving for Stability in Development Finance. Washington, DC: World Bank, 1975.
- Zeller M, Schrieder G, von Braun J and Heidhus F: Rural Finance for Food Security for the Poor. Implication for Research and Policy. Food Review Policy No. 4, Washington DC, 1997.