Constraints to Adoption of Farm Management Practices among Rural Farmers in Kogi State, Nigeria

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Abstract

The study assessed constraints to adoption of farm management practices among rural farmers in Kogi State, Nigeria. Specifically, the study assessed the socioeconomic variables of farmers; identified the various farm management practices available to farmers; found out the effect of farmers' socioeconomic variables on the adoption of modern farm management practices; and identified factors constraining farmers from adopting farm management practices. A total of 140 rural farmers were sampled from the 3 senatorial districts of the state, and a well-structured questionnaire was administered on the selected respondents for data generation. Data collected were analyzed using both descriptive and inferential statistics. The results showed that most (65.7%) of the respondents were males with mean age of 42.4 years and having secondary education as their highest educational attainment. And majority (60.7%) had farm size between 1-2 hectares, and with a mean household size of 6 persons. Curling/disposing of diseased or spent stock (57.1%) and taking records of purchases and sales (50.9%) were some of the farm management practices adopted by the respondents. Estimates of binary logistic regression analysis of the effect of selected socioeconomic variables of farmers on the adoption of farm management practices revealed that the coefficient of education (0.397; P=0.01) and income (0.00; P=0.05) have strong and positive effect on adoption of modern farm management practices. It was recommended that farmers' literacy be given premium and they should be encouraged to form cooperatives for knowledge-sharing, access to loan and joint problem-solving.

Keywords: Rural farmers, Farm management, Farm inventory, Agricultural productivity.

INTRODUCTION

The Nigerian agricultural sector is important to its economy as it engages about 70% of the labour force and contributes over 40% of the Gross Domestic product (GDP) (Federal Ministry of Agriculture and Rural Development FMARD, 2000). The sector is the principal source of food and livelihood in Nigeria, making it a critical component of programmes that seek to reduce poverty and food insecurity (Tsado; Adeniji; Olaleye and Gana, 2012). In spite of these noble contributions, the sector is faced with mirage of problems which militate against optimizing its potential. Some of the constraints include low productivity, poor marketing and distribution, infrastructure, inadequate access to credit, weak extension services, inadequate database and poor farm management among others. An attempt to ameliorate the constraints by the Federal Government was the adoption of the Agricultural Policy for Nigeria in 1988 (FMARD, 2000).

The Nigeria Agricultural Policy provided the framework for implementation of programmes and guidelines for agricultural development. The broad objective was to attain self-sustaining growth in all the sub-sectors of agriculture and realization of the structural transformation relevant for overall socio-economic development of rural areas (FMARD, 1988; Koyenikan, 2008).

Critical to higher farm productivity is the ability of stakeholders in farm business (especially small-scale farmers in rural areas) to adopt adequate farm management techniques to avoid waste of produce. This has become crucial as the current government of Nigeria has finally decided to diversify the nation's economy. Agriculture has now become the major area to diversify to as the oil sector is no longer sustaining the needed development. Farm management involved taking farm inventories, accurate record of farm inputs and outputs, records of stores, accurate records of farm labour, expenses and income among others. Management also encompasses all management functions from purchasing of raw materials (inputs) through the production processes to the final delivery of the end products. It brings together under one management responsibility for determining the production requirement, scheduling the production processes and procuring, storing and dispensing output or produce (Wild, 1995, Ondiek, 2009). According to Monday (2008), purchasing, procurement of materials, inventory management, storage, materials supply, transportation and materials handling are the activities of materials management in farm management.

Every organization invests a considerable amount of capital on materials. In many cases, the cost of materials exceeds fifty percent of the total cost of goods produced. Such a large investment requires considerable planning and control so as to minimize wastage which invariably affects the performance and profitability of organizations and farms. Materials are the lifeblood and heart of any firm/manufacturing system. No industry can operate without them. They must be made available at the right price, at the right quantity, in the right quality, in the right place and at the right time in order to co-ordinate and schedule the production activity in an integrative way for an industrial undertaking (Taiwo, Claudius and James, 2012). Farmers need farm implement such as hoes, cutlasses, plough, harrow and planters among others. These materials need to be carefully planned for and maintained in such a way that farmers' productivity can be maximized and wastage minimized.

Theoretical Consideration

In many countries especially in Japan, great emphasis is placed on inventory management. Efforts are made to minimize the stock of inputs and outputs by proper planning and forecasting of demand of various inputs and producing only that much quantity which can be sold in the market. Stocktaking or stock verification is done mainly with a view to finding out whether the book balances as revealed by the stock records agree with the physical or the ground balance (Taiwo, *et al*, 2012). Although, stock verification is one of the tools of inventory control, and is done for exercising control over the stock of every item, is an integral part of material control for the purpose of preparing the balance sheet (B/S), the physical verification of stock must be done at the end of year. Such verification at the end of the year is known as the periodical stock taking as against the continuous stocktaking, which is done throughout the year.

Inventory management and control concerns most managers of agricultural marketing and supply businesses, whether they are retail, wholesale, or service oriented. The value of a manager to an agricultural marketing and supply business depends on his ability to manage inventories effectively. The total cost of maintaining the desired inventory level must be held down to a reasonable figure, but the inventory must also be large enough to permit the company to effectively merchandise the products and services it sells. If the manager doesn't control his inventories to accomplish both of these objectives, the business may not be able to prosper or even to survive against competition (Ken, undated).

On the other hand, a low level of inventories may result in frequent interruptions in the production schedule resulting in under-utilization of capacity and lower sales. The aim of inventory management as a vital farm management strategy should be to avoid excessive inventory and inadequate inventory and to maintain adequate inventory for smooth running of the business operations. Efforts should be made to place orders at the right time with the right source to purchase the right quantity at the right price and quality. The effective inventory management should: (i) maintain sufficient stock of raw material in the period of short supply and anticipate price changes, (ii) ensure a continuous supply of material to production department facilitating uninterrupted production, (iii) minimize the carrying cost and time, (iv) maintain sufficient stock of finished goods for smooth sales operations, (v) ensure that materials are available for use in production and production services as and when required, (vi) ensure that finished goods are available for delivery to customers to fulfill orders, smooth sales operation and efficient customer service, (vii) minimize investment in inventories and minimize the carrying cost and time, (viii) protect the inventory against deterioration, obsolescence and unauthorized use, (ix) maintain sufficient stock of raw material in period of short supply and anticipate price changes, and (x) control investment in inventories and keep it at an optimum level (Ghosh and Gupta, 1979).

Small-holder farmers in Kogi State, Nigeria are constantly confronted with yearly wastage of produce vis-a-vis low yield which may be attributed to poor farm planning and management. This then calls for certain research questions such as: why are farmers recording low yields? Were farmers aware of modern farm management practices? And what factors constrained farmers from adopting farm management and control practices? The objective of this study is to assess the constraints to farm management and control among small-holder farmers in Kogi State, Nigeria. Specifically, the study was designed to: determine the socio-economic characteristics of farmers; identify the various farm management practices available to the respondents; determine farmers' socio-economic factors that influence the adoption of farm management and control practices, and; ascertain factors constraining farmers from adopting farm management practices.

Conceptual Framework

The conceptual framework for studying constraints to farm management practices is shown in Figure 1. Block A shows farm management practices available to farmers in the study area. Some of these practices are records of sales and purchases; maintenance and repair of farm materials (implements); records of farm yields; records of dates of planting and harvesting; farm budget; routine livestock vaccination etc. Block B reveals the factors that facilitate adoption of farm management practices such as high literacy level of farmers; improved economy; good produce price; accurate knowledge of farm information; availability of farm innovations.

Block C shows factors that constrained farmers from adopting farm management practices such as illiteracy; high cost of farm innovations; lack of fund; poor produce price; lack of access to agro-information; adverse climatic conditions; societal factors (norms); innovation characteristics (e.g. its complexity) etc. While Block D shows the benefits of farm management practices to farmers. Some of these are economies of scale; improved socio-economic status; good farm layout; reduced produce wastage; accuracy in farm forecast etc.
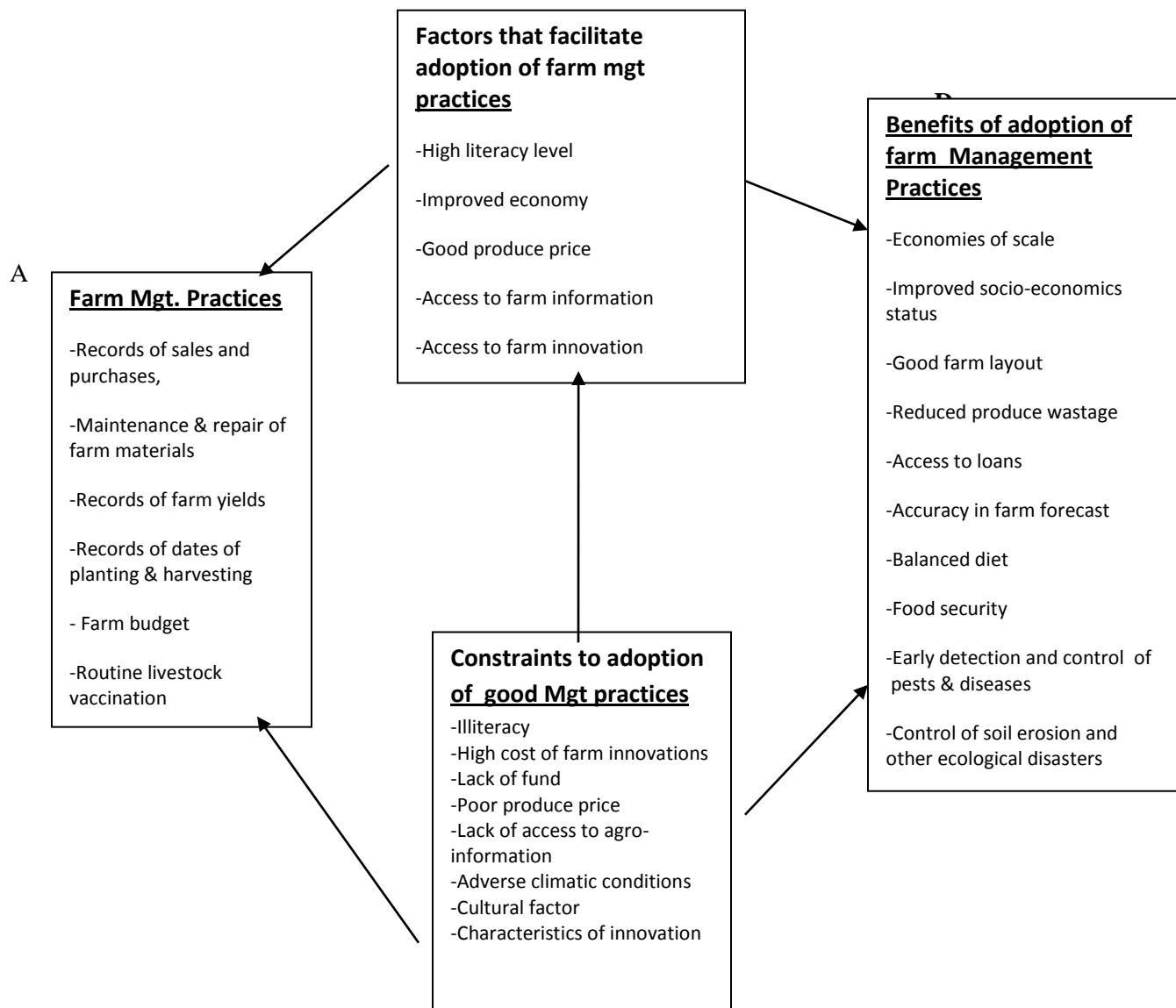
Factors that facilitate adoption of farm mgt practices

-High literacy level

-Improved economy

-Good produce price

-Access to farm information

-Access to farm innovation

A

Farm Mgt. Practices

-Records of sales and purchases,

-Maintenance & repair of farm materials

-Records of farm yields

-Records of dates of planting & harvesting

- Farm budget

-Routine livestock vaccination

Benefits of adoption of farm Management Practices

-Economies of scale

-Improved socio-economics status

-Good farm layout

-Reduced produce wastage

-Access to loans

-Accuracy in farm forecast

-Balanced diet

-Food security

-Early detection and control of pests & diseases

-Control of soil erosion and other ecological disasters

Constraints to adoption of good Mgt practices
-Illiteracy
-High cost of farm innovations
-Lack of fund
-Poor produce price
-Lack of access to agro-information
-Adverse climatic conditions
-Cultural factor
-Characteristics of innovation

 Fig. 1: Schema for Assessing Constraints to Farm Management Practices among Farmers in Kogi State, Nigeria

METHODOLOGY

The study was carried out in Kogi State, Nigeria. The state is located at 7^0 30" N and 6^0 42" E, with a total population of about 3.3 million (National Population Commission NPC, 2006). The three major languages in the state are Igala, Ebira and Okun, though there are other minor languages such as Bassa, Kakanda, Ogori, Oworo, Koto etc. Kogi State has a total land mark of 29, 833 Km^2. The area is bounded to the north by the Federal Capital Territory, to the south by Benue State, to the east by Nassarawa State and to the west by Niger State and River Niger. Kogi State is located in central Nigeria with the headquarters at Lokoja – nick named as the" confluence town" because both Rivers Niger and Benue joins there and runs out of the State together (en.wikipedia.org/wiki/kogistate). The state is found in the guinea savanna region of the country with two distinct seasons- the dry season which begins late March and ends by early November, while the rainy season commences from late March to early November. Majority of the people are farmers growing both food and cash crops such as maize, yam, beans, rice etc. and oil palm, cashew, kola nuts, cocoa among others. For administrative purposes, the state is divided into 3 senatorial districts namely; eastern, central and western senatorial districts.

To generate data for the study a multistage sampling technique was adopted to select the needed population of respondents.

First stage: the 3 senatorial districts (having a total of 21 LGAs) were purposively selected due to the volume of agricultural activities.

Second stage: from the 9 LGAs in the eastern senatorial district, 3 were selected through simple random sampling, and out of the 5 LGAs in the central senatorial district, 1 was purposively selected while 2 LGAs were selected from the 7 LGAs in the western senatorial district thus giving a total of 6 LGAs.

Third stage: four communities were randomly selected from each of the 3 LGAs selected from the eastern district making a total of 12 communities; and 2 communities were randomly selected from the 1 LGA in the central district making a total of 2 communities, while 3 communities were selected from the on 2 LGAs selected from the western district making a total of 6 communities.

Fourth stage: finally, 8, 4 and 6 farmers were randomly selected from each community in eastern, central and western senatorial districts respectively – thereby giving a total of 140 respondents for the study. Structured questionnaire was administered to the selected respondents to elicit the necessary data. And data collected were analyzed by using descriptive statistics (such as frequency distributions, percentages and mean scores), and inferential statistics (logit regression analysis). Dummy variable was assigned to either adoption or non-adoption of farm management practices by farmers (dummy 1 =adoption, and 0 = non-adoption).

Table 1: Population and sampling procedure

Senatorial District	No. of LGA sampled	No. of LGAs selected	No. of communities selected	No. of farmers selected	Total
Eastern	9	3	4 x3 =12	8	**96**
Central	5	1	2 x 1 = 2	4	**8**
Western	7	2	3 x 2 =6	6	**36**
Total	**21**	**6**	**9**	**18**	**140**

RESULTS AND DISCUSSION
Socio-economic Characteristics of Farmers

Data presented in Table 2 show the socio-economic variables of the smallholder farmers in Kogi State. The table revealed that most (65.7%) of the farmers were males while the womenfolk constituted 34.3%. The farmers had a mean age of 42.4 years, which implies that the farmers are within their productive age. The table further revealed that majority (53.0%) of the respondents had secondary education which also implies that the farmers are moderately literate. The farmers had a mean household size of 6 persons and with a mean farm size of 1.9 hectares and a mean farming experience of 30.3 years. The long years in farm business by the farmers suggests that they must have been exposed to some farm management practices over the years and their productivity must have been enhanced. But the mean annual income of ₦27,621.43, therefore implies that in spite of farmers long years in farm business little income accrued. This could be partially attributed to poor farm management and adoption of traditional technologies in their farm operations over the years.

Table 2: The socio-economic characteristics of respondents (n = 140)

Characteristic		F	%	X
Sex				
Male		92	65.7	
Female		48	34.3	
Age (years)				
< 20		12	8.6	42.4
21-30		38	27.1	
31-40		66	47.1	
>40		24	17.1	
Educational level				
No formal education		17	12.1	
Primary education		38	27.1	
Secondary education		74	53.0	
Tertiary education		11	7.9	
Household size				
< 5		96	68.6	6.0
6-10		30	21.4	
>10		14	10.0	
Farm size (Ha.)				
< 1		29	20.7	1.9
1-2		85	60.7	
•		17	12.1	
>5		9	6.4	
Income per annum (₦)				
< 30,000		24	17.1	27,621.43
31,000-40,000		35	25.0	
41,000-50,000		67	48.0	
>50,000		14	10.0	

Source: Field Survey Data, 2017

Farm Management Practices available to the Farmers

Table 3 presents the various farm management practices available to farmers in the study area. The table revealed that 57.1% of these farmers curled or disposed their diseased or spent farm animals, 54.3% kept records of pest and disease infestation, and about 51.0% of the farmers took records of every sales and purchases they made, 48.6% of the respondents kept records of extension visits, while 47.1% of these farmers kept records of dates of planting and harvesting of their crops. Periodic farm budget, drawing of balance sheet, and soil analysis (3.6%, 5.7% and 15.0% respectively) were not majorly practiced by farmers. This could be probably due to the technical nature of these practices and the equipment needed for laboratory analysis of farm soils could be strong factor inhibiting farmers from carrying out the practice.

Table 3: Distribution of respondents by farm management practices adopted

Farm management practice		*F	%
Periodic farm inventory		25	17.8
Records of sales and purchases		77	50.9
Records of dates of planting and harvesting		66	47.1
Records of all births and deaths of farm animals		31	22.1
Periodic farm budgeting		5	3.6
Keeping records of pests and disease infestation		76	54.3
Records of adoptions of innovations		58	41.4
Keeping records of farm labour		21	15.0
Grading of farm produce		32	22.9
Records of extension visits		68	48.6
Routine soil analysis		21	15.0
Periodic maintenance and repairs of materials/implement		63	45.0
Curling/disposing of spent or diseased animals		80	57.1
Periodic vaccination of farm animals		46	32.9
Drawing of balance sheet		8	5.7

Source: Field Survey, 2017   * Multiple Responses

The Relationship between Farmers' Variables and Adoption of Farm Management Practices

Estimates of the binary logistic regression analysis of the effect of selected socioeconomic variables of farmers on the adoption of farm management practices were presented in Table 4. The model's log likelihood ratio of 97.994 and X^2 value of 63.704 indicate that all variables included in the model significantly influence the probability of adopting farm management practices by farmers in Kogi state at 1%. According to the table, the coefficient of education (0.396) was positively signed and significant at 1%. This therefore implies that, the likelihood to adopt farm management practices increased among farmers with advancement in education. Olagunju (2008) asserts that, education plays an important role in agricultural operations since it

facilitates the adoption of agricultural innovations that will improve productivity. The coefficient of income (0.00) was positively related to adoption of farm management practices in the study area at 5%. This implies that, the likelihood to adopt farm management practices among farmers in the study area is a function of income. This finding is in contrast with that of Ibitoye, Shaibu and Omole (2015) who reported a low annual farm income among smallholder farmers in Kogi State.

Table 4: Determinants of Adoption Decision

Variable	Coefficient	Standard Error	Marginal Effect
Sex	0.861	0.588	2.146
Age	0.015	0.077	0.039
Education	0.396***	0.089	19.787
Household size	-0.208	0.205	1.029
Farm size	0.296	0.282	1.100
Farming experience	-0.029	0.106	0.075
Income	0.000**	0.000	5.039
Constant	-4.542***	1.581	8.255
Log-likelihood	97.994		
Chi square	63.704		
Prob. Chi square	0.000		
N	140		

Significance at the 0.05 level; * Significance at the 0.01 level

Factors Constraining Farmers from Adopting Farm Management Practices

The constraining factors that deter farmers from adopting farm management practices are shown in Table 5. According to the table, lack of finance, high cost of farm implement (M = 2.6 respectively) were identified as the major constraints to farm management adoption. Other constraining factors were unavailability of farm labour (M = 2.5), adverse climatic factor and high cost of farm inputs (M = 2.4 respectively).

Table 5: Distribution of respondents by factors that constraints to famers from   adopting farm management practices

Constraining factor	M
Illiteracy	1.4
Lack of fund	2.6*
High cost of farm implement	2.6*
Adverse climatic condition	2.4*
High cost of farm inputs	2.4*
Poor storage facilities	1.5
Pests and disease infestations	1.9
Fluctuation in produce price	1.6
Unavailability of farm labour	2.5*

Source: Field Survey, 2017   * Serious constraints

Conclusion and Recommendations

It is observed that, rural farmers in the study area in most cases do not keep records of their farm businesses which over the years have led to produce wastage and loss of reasonable amount of revenue. Farmers' literacy and income were found out to have great influence on their farm management capability, but it could be inferred that famers' did not utilize this opportunity to the fullest to boost their productivity, though, despite other challenges. It is therefore recommended that farmers should be encouraged to invest judiciously on their farms, this they can do by employing the services of extension workers or experts in farm business. They should be encouraged to form cooperatives for knowledge-sharing and joint problem-solving.

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