INFLUENCE OF AGRICULTURAL EXTENSION PROGRAMME ON FARMERS' AGRICULTURAL PRODUCTION IN KANO STATE

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Abstract

The study was carried out to investigate the influence of agricultural extension programme on farmers' agricultural production in Kano State. Twelve local government areas were selected for this study and 8,866 farmers served as population for the study, out of which 370 were randomly selected from the population as sample. Survey research design was used for the study, and questionnaire was used as instrument for data collection. The data collected were analyzed using percentages and Spearman's rho correlation procedure at 0.05 level of significance. The results of the study showed that 87.6% of the farmers used improved farm practices introduced to them frequently, 85% had increase in yield after the adoption of the improved practices. The results of the tested null hypothesis 1 indicated that the personal characteristics of the farmers were highly correlated with adoption of agricultural innovation and that of null hypothesis 2 showed that the adoption of improved farm practices by the farmers was significantly correlated with change in agricultural production. Conclusively, from the findings, agricultural extension programmes were found effective in the study area, and led to increase in sorghum, millet and cowpea productions. It was recommended that famers should organize adult literacy classes in their areas in order to increase their literacy level. Kano State Government should provide agricultural inputs to farmers on time and at subsidized prices for more effective adoption of agricultural improved practices in the State.

KEYWORDS: Agriculture, Agricultural extension programme, Agricultural production

Introduction

Agriculture is the growing of both plants and animals for human needs (Ben, 2014). To practice agriculture means to use natural resources to produce commodities which maintain life, including food, fiber, forest products, horticultural crops, and their related services. Agricultural extension is a component of agricultural education (Mwamakimbula, 2014) which aims at teaching rural people how to live better by learning ways that increase their production and raise their general standard of living. It is a two-way channel; it brings scientific information to the village people, and also takes the problems of the village people to the scientific institution for solution.

Wambura, Acker and Mwasyete (2012) observed that "almost all countries in the world deliver some type of extension service to help rural people advance their agricultural productivity and improve their living standard". Eremie (2003) observed that prior to the World Bank's intervention in agricultural extension in Nigeria; the Government had tried various forms of the bureaucratic approach for the management of extension services.

The focus of the bureaucratic system was the achievement of some national or political objectives, as was the case in the decades of commodity development for cocoa, groundnuts, palm produce and robber. Similarly, the Farm Settlement Schemes of the 1960s, the National Accelerated Food Production Programme, the River Basin Development Authorities, the Operation Feed the Nation and the Green Revolution Programmes, all initiated in the 1970s, and the Directorate of Food, Roads and Rural Infrastructure (DFRRI) programme of 1986, relied on a bureaucratic extension system.

World Bank support to the Government of Nigeria for agricultural extension dated back to the mid-1970s with the establishment of the nine enclave Agricultural Development Projects (ADPs) in Funtua, Gusau, Gombe, Lafia, Ayangba, Bida, Ilorin, Oyo North and Ekiti-Akoko between 1975 and 1980. By the mid 1970s, there was increasing concern in Nigeria over the apparent stagnation of agricultural production.

The ADPs were designed to tackle three major constraints: generation and dissemination of improved technologies, supply of productive inputs and feeder roads to link the farms with markets. The enclave projects were followed by the generation of statewide ADPs (Bauchi, Kano, Sokoto and Kaduna) between 1981 and 1983, the multi-state ADPs (MSADP I, II and III) approved in 1986, 1988 and 1989 respectively, and the National Agricultural Technology Support Project (NATSP) approved in 1992.

Despite all the efforts made by governments to increase agricultural production by creating awareness of improved farm technologies among peasant farmers through agricultural extension services, the researcher observed that many farmers in the study area are still farming in the same old way as their ancestors, planting the same local seeds and raising the same local breed of animals. It is based on this problem that the researcher carried out a study to evaluate the influence of agricultural extension programme on farmers' agricultural production in Kano State.

Purpose of the study:

The main purpose of this study is to investigate the influence of agricultural extension programme on farmers' agricultural production in Kano State. The specific objectives are to:

1. examine the farmers' personal characteristics and their effect on the level of adoption of agricultural innovation in the study area, and
2. determine the level of adoption of the recommended practices by the farmers in relation to change in their agricultural production.

Research Questions:

The study provided answers to the following research questions:

1. What are the personal characteristics of farmers and their effect on the level of adoption of agricultural innovation?
2. To what level do farmers adopt the recommended practices in relation to change in their agricultural production?

Hypotheses:

The researcher tested the following null hypotheses at 0.05 level of significance

1. There is no significant relationship between the farmers' personal characteristics, and their levels of adoption of agricultural innovation.
2. There is no significant relationship between the level of adoption of the recommended practices by the farmers, and the change in their agricultural production.

Methodology

Survey research design was used for this study, with a population of 8,866. The Population was obtained from Kano State Agricultural and Rural Development Authority (KNARDA) Village Listing and Staff list (2010). A sample size of 370 out of 8,866 farmers was randomly selected using Krejcie and Morgan Table (1970) recommendation in determining sample size. Questionnaire and interview were used as instruments for data collection. The data collected were analyzed using percentage for the research questions, while Spearman's rho correlation procedure was used to test the null hypotheses at 0.05 level of significance.

Results

Research Question 1: ***What are the personal characteristics of farmers and their effect on the level of adoption of agricultural innovation?***

Table 1: *Personal characteristics of the farmers (n = 370)*

Personal characteristics	Frequency	Percentage
I: Gender:		
Male	324	87.6
Female	26	7.0
No response	20	5.4
Total	370	100
II: Age (years):		
Below 15	8	2.2
15 – 30	91	24.6
31 – 45	176	47.6
46 – 60	69	18.6

Above 60	26	7.0
Total	370	100
III: Marital status:		
Married		
Single	320	*86.5*
Widowed	24	*6.5*
Divorced	9	*2.4*
Total	17	*4.6*
IV: Number of children	370	*100*
0 to 3	153	41.4
4 to 6	113	30.5
7 to 10	51	13.8
More than 10	43	11.6
No respond	10	2.7
Total	370	100
V: Highest educational qualification:		
Never attended school	25	6.8
Qur'anic education	110	29.7
Adult education	38	10.3
Primary education	38	10.3
Secondary education	73	19.7
Post secondary education	81	21.9
Others (specify)	5	1.4
Total	370	100
VI: Farmers' relationship:		
Belong	202	54.6
Not belong	166	44.9
No respond	2	.5
Total	370	100

The data in Table 1 showed that 87.6 percent of the farmers were males and 7.0 percent females, while 5.4 percent did not respond to this question. This implied that majority (87.6%) of the farmers were males in the study area.

The data also revealed that 47.6 percent of the farmers were within the age bracket of 31 to 45 years, 24.6 percent within 15 to 30 years, 18.6 percent within 46 to 60 years, 7.0 percent were above 60 years, and 2.2 percent were below 15 years. This showed that majority of the farmers (72.2%) were middle age farmers (15-45 years).

It was observed from the Table that 86.5 percent of the farmers were married, 6.5 percent were single, 4.6 percent were divorced and 2.4 percent were widowed. This revealed that majority (86.5%) of the farmers were married.

It was also discovered that 41.4 percent of the farmers had 0 to 3 children, 30.5 percent had 4 to 6 children, 13.8 percent had 7 to 10 children, and 11.6 percent had more

than 10 children, while 2.7 farmers did not respond to this question. The data showed that majority (41.4%) of the farmers sampled had 0 to 3 children.

The data in the Table identified that 29.7 % had Quranic education, 21.9 % had post secondary education, 19.7 % had secondary education 10.3 % had primary education, another 10.3 % had adult education and 6.8 % indicated that they had never attended any school, but 1.4 % responded that they had other type of educational qualification beside those mentioned. This pointed out that majority (51.9%) of the farmers in the study area acquired formal education.

It was also indicated from the Table that 54.6 % of the farmers in the study area belonged to Farmers' Relationship, and 44.9 % did not, while 0.5 % did not respond. This implied that majority (54.6%) of the farmers belonged to Farmers' Relationships in the study area.

Research Question 2: ***To what level do farmers adopt the recommended practices in relation to change in their agricultural production?***

The data that addressed Research Question 2 were presented on Tables 2 and 3 below;

Table 2: *Frequency of using recommended practices (n = 370)*

Recommended practices	Frequency	Percentage
I: Use of fertilizer:		
Frequently	276	74.6
Occasionally	72	19.5
Used and discontinued	15	4.1
Never	7	1.9
Total	370	100
II: Use of seed dressing chemicals:		
Frequently	262	70.8
Occasionally	81	21.9
Used and discontinued	9	2.4
Never	18	4.9
Total	370	100
III: Use of weed control chemicals:		
Frequently	241	65.1
Occasionally	94	25.4
Used and discontinued	19	5.1
Never	16	4.3
Total	370	100
IV: Use of improved sorghum seeds:		
Frequently	254	68.6
Occasionally	64	17.3
Used and discontinued	20	5.4
Never	32	8.6
Total	370	100
V: Use of improved millet seed:		

Frequently	268	72.4
Occasionally	74	20.0
Used and discontinued	13	3.5
Never	15	4.1
Total	370	100
VI: Use of improved cowpea seeds:		
Frequently	167	45.1
Occasionally	96	25.9
Used and discontinued	22	5.9
Never	85	23.0
Total	370	100

The data in Table 2 showed that 74.6 % of the farmers used chemical fertilizers frequently, 19.5 % used it occasionally 4.1 % used it but discontinued, and 1.9 % never used it. This showed that majority (74.6%) of the farmers used chemical fertilizers, frequently on sorghum, millet and cowpea production in the study area.

The data also revealed that 70.8 % of the farmers used seed dressing chemicals frequently, 21.9 % used it occasionally, 2.4 % used it but discontinued, while 4.9 % never used it. This showed that majority (70.8%) of the farmers used seed dressing chemicals frequently on sorghum, millet and cowpea production in the study area.

It was observed from the Table that 65.1 % of the farmers used weed control chemicals (herbicides) frequently, 25.4 % used it occasionally, 5.1 % used it but discontinued, while 4.3 % did not use it. This revealed that majority (65.1%) of the farmers used weed control chemicals frequently to control weeds on sorghum, millet and cowpea farms in the study area.

It was also discovered that 68.6 % of the farmers used or planted improved variety of sorghum seeds frequently, 17.2 % planted occasionally, 5.4 % used it but discontinued, and 8.6 % never used it. This revealed that majority (68.6%) of the farmers used improved variety of sorghum seeds frequently when planting sorghum on their farms in the study area.

The data in the Table identified that 72.4 % of the farmers used improved variety of millet seeds frequently, 20.0 % used it occasionally, 3.5 % used it but discontinued, while 4.1 % never used it. This revealed that majority (72.4%) of the farmers used improved variety of millet seeds frequently in planting millet on their farms in the study area.

It was also indicated from the Table that 45.1 % of the farmers used improved variety of cowpea seeds frequently, 25.9 % used it occasionally, 5.9 % used it but discontinued, while 23.0 % never used it. This showed that majority of the farmers used improved variety of cowpea seeds frequently when planting cowpea on their farms in the study area.

Table 3: *Opinions of famers on changes in yields after adoption of improved farm practices (n=370)*

Changes in yield	Sorghum yield F.	%	Millet yield F.	%	Cowpea yield F.	%	Mean %
Increased	308	83.2	337	91.1	299	80.8	85.0
Decreased	17	4.6	10	2.7	21	5.7	4.3
No change	27	7.3	18	4.9	33	8.9	7.0
Uncertain	17	4.6	4	1.1	16	4.3	3.3
No response	1	0.3	1	0.3	1	0.3	0.3
Total	370	100	370	100	370	100	99.9

The data in Table 3 showed that 83.2 % of the farmers had increase in yield of sorghum, 7.3 % did not experience any change, 4.6 % experienced decrease in yield, while 4.6 % were not certain and 0.3 % did not respond. This pointed that majority (83.2%) of the farmers had increase in yields of sorghum after the adoption of improved farm practices on sorghum production in the study area.

The data also revealed that 91.1 % of the farmers had increase in yield of millet, 4.9 % did not experience any change, 2.7 % experienced decrease in yield, while 1.1 were not certain, and 0.3 % did not respond. This implied that majority (91.1%) of the farmers had increase in yield of millet after the adoption of improved farm practices on millet production in the study area.

It was observed from the Table that 80.8 % of the farmers had increase in yield of cowpea, 8.9 % did not experience any change, 5.7 % experienced decrease, while 4.3 % were not certain, and 0.3 % did not respond to the question. This observed that majority (80.8%) of the farmers had increase in yield of cowpea after the adoption of improved farm practices for cowpea production in the study area.

It was also discovered from the Table that the farmers' yield of sorghum, millet and cowpea had 85.0% mean increase, those that did not experience any change had the mean of 7.0 %, the mean decrease was 4.3%, while farmers who were uncertain had the mean of 3.0% and those that did not respond had 0.3 % mean. This pointed that the mean percent increase in yield of sorghum, millet and cowpea was 85.0% after the adoption of improved farm practices on sorghum, millet and cowpea production in the study area.

Testing of Null Hypotheses

Null Hypothesis 1:

There is no significant relationship between the farmers' Personal characteristics and their level of adoption of agricultural innovation. The Spearman's rho correlation procedure was used to relate the personal characteristics of the farmers with level of their adoption. The result of the correlation test is presented in square matrix in Table 4.

Table 4: *Correlation between personal characteristic of farmers and levels of their adoption of improved technologies:*

Variables	Adoption	Gender	Age	Marital status	No. of children	Highest educational qualification	Do you belong to any farmer relationship
Adoption	1.000	.015	.018	.013	.072	.117*	.234*
Gender	.015	1.000	.075	.310*	.038	.052	.021
Age	.018	.075	1.000	.213*	.628*	.181*	.008
Marital status	.013	.310*	.213*	1.000	.108*	.024	.081
No. of Children	.072	.038	.628*	.108*	1.000	.260*	.029
Highest educational	.117*	.052	.181*	.024	.260*	1.000	.237*
qualification	.234*	.021	.008	.081	.029	.237*	1.000
Do you belong to any farmers relationship							

* Correlation is significant at the 0.05 level

The correlation matrix showed the inter-correlation between the personal characteristics of the farmers and their adoption of the improved technologies. From the Table 4, gender, age, marital status, and number of children did not significantly correlate with adoption of improved farm technologies by the farmers (P>0.05). But the farmers' educational levels and membership of organizations were observed to be highly correlated with the adoption of the improved technologies by the farmers (P<0.05).Therefore, the null hypothesis was rejected. This means that personal characteristics of farmers could be a major influence in their adoption of improved technologies in the study area.

Null Hypothesis 2:

There is no significant relationship between the rate of adoption of the recommended practices by the farmers and the change in their agricultural production.

The Null Hypothesis 2 was tested using the expressed perceptions of the farmers on the levels of their adoption of various farm technologies for sorghum, millet and cowpea production introduced to them, and the change of crops yield they observed. Spearman's rho correlation procedure was used to correlate the change in the crops yield with the levels of adoption. The summary of the correlation test is presented in Table 5.

Table 5: *Correlation between adoption of improved technologies and changes in the production of farmers:*

Variables	Adoption	Change in sorghum	Change in millet	Change in cowpea
Adoption	1.000	.228*	.180*	.222*
Change in sorghum	.228*	1.000	.451*	.314*
Change in millet	.180*	.451*	1.000	.414*
Change in cowpea	.222*	.314*	.414*	1.000

* Correlation is significant at the 0.05 level

The test in the Table 5 revealed that adoption of the improved technologies was highly correlated with change in agricultural production measured in terms of changes in yield of sorghum, millet and cowpea

($P<0.05$). This then means that the null hypothesis was not retained. In other word, adoption of improved technologies led to increase in the yield of sorghum, millet and cowpea in the study area.

Major Findings

Based on the results of the analyses, it was found that:

1. Majority of the farmers in the study area had acquired formal education at different levels and belonged to farmers cooperative. It was discovered that these had effect on the farmers' level of adoption of improved farm practices.
2. Majority of the farmers in the study area used the six (6) improved farm practices introduced to them frequently. The improved farm practices were; fertilizers, seed dressing chemicals, weed control chemicals, improved sorghum seed, improved millet seed and improved cowpea seed.
3. Majority of the farmers in the study area indicated that the adoption of improved farm practices had increased in yield of sorghum, millet and cowpea.

Discussion of Findings

The purpose of this study was to examine the influence of Agricultural Extension Programme on farmers' agricultural production in Kano State. The findings of the study were discussed in line with the Research Questions and Hypotheses formulated.

The findings of the study pointed out that the majority of the farmers had acquired formal education at different levels. This finding agrees with Lawal, Torimiro, and Makanjuola, (2009) who observed in their findings that the educational level of poultry farmers was fairly high in the area they studied. Education is an important factor in farming and contributed significantly to the acceptance of agricultural innovation. It was observed that majority of the farmers belonged to farmers cooperatives. Therefore, through cooperatives, the members accepted agricultural innovation and also solved their problems collectively.

The findings discovered that 68.0 % of the farmers used the six (6) improved farm practices introduced to them frequently, 21.3 % occasionally, 4.6 % used but discontinued, while 6.2% never used. This also is in line with Lawal, Torimiro, and Makanjuola, (2009) who discovered in their findings that Majority of the respondents adopted most of the extended practices. For the impact of adoption of the improved farm practices on the yields of sorghum, millet and cowpea, it was observed that 85.0 % of the farmers indicated that the production had increased, 4.3 % said produce had decreased, 7.0 % had no change, and 3.3 % were uncertain, while 0.3 % did not respond to those questions. This was close to Ogunwale, Ayoade, and Ayansina, (2006) findings which showed that all the farmers sampled indicated that the adoption of farm technologies increased yield and productivity.

On the tested Null Hypotheses, the results showed that there was significant relationship between the personal characteristics of the farmers, and their level of adoption of agricultural innovation introduced to them. Therefore the Null Hypothesis I stated was rejected. It was also identified that there was significant relationship between the adoption of the recommended practices, and change in agricultural production, hence the Null Hypotheses II was also rejected.

Conclusion

It was concluded from the results of the findings that; the personal characteristics of farmers influence the adoption level of improved farm technologies introduced to them by agricultural extension agents. The majority of the farmers in the study area frequently adopted the recommended practices, and the adoption of the improved farm practices by the farmers led to increase in sorghum, millet and cowpea productivity in the study area.

Recommendations

The following recommendations are made based on the findings of the study:

i. Famers should organize adult literacy classes in their areas in order to increase their literacy level for more effective adoption of agricultural innovations in the study area.

ii. Farmers should also establish effective farmers' cooperatives in their areas in order to be used to facilitate procurement of the farm inputs from relevant agencies needed for the agricultural improved practices to be effectively adopted.

iii. Kano State Governments should provide farm inputs to the farmers at subsidized prices and at right time for more effective adoption of agricultural improved practices in the state.

iv. Extension agents should pay regular visits to the farmers' farms to ensure appropriate and correct adoption of improved farm technologies.

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