ANALYSIS OF FARMERS' PERCEPTION OF RECOMMENDED EXTENSION PACKAGES ON SELECTED CROPS IN YOBE STATE, NIGERIA

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ABSTRACT
The study analyses farmers' perception of recommended extension packages on selected crops in Yobe State, Nigeria. Multistage random sampling technique was used to select 230 respondents for the study. Structured questionnaire were used to elicit information from the respondents. Data obtained were analyzed using descriptive statistics and multiple regression analysis. The respondents were within the mean age of 36 years, with the mean house hold size of 5 persons. The respondents had the mean farm size of 2 ha and the mean farming experience of 16 years. Majority (87.0%) of the respondents were male. Majority (48.5%) of the respondents in the study area were contacted and taught by extension agents based on group teaching method. Majority (56.1%) of the farmers expressed opinions that administrations of agricultural extension activities in the study area were either very effective or effective. Most (71%) on average of the respondents used the nine (9) improved farm practices introduced to them frequently. Most (82.6%), (90.9%) and (80.9%) of the respondents had increase in yield of sorghum, millet and cowpea, respectively. Majority (40.0%) of the respondents in the study area had participated in project meeting and field days and majority (56.1%) of the respondents were visited once a month by the extension agent. The result of multiple regression analysis showed that variables such as farmers' age, farm size, level of education, visit by extension personnel, participation in project activities, farming experience and household size were positive and significantly influence the level adoption to extension recommendations at ($p<0.05$, $p<0.05$, $p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$ and $p<0.01$), respectively. Majority (61.8%) of the respondents discovered that lack of necessary inputs were the most serious problems responsible for some farmers in the study area not adopting the improved farm practice introduced to them. The study, therefore, concludes that agricultural extension activities were found effective in the study area and the adoption of improved farm practices introduced to the farmers by the agricultural extension agents led to increase in sorghum, millet, and cowpea productivity in the study area. Based on this study, it was recommended that, Government should provide the farm inputs to farmers at subsidized prices and at the right time.

Keywords: Extension, Package, Perception, Technology, Yobe.

INTRODUCTION

Agricultural sector was the mainstay of the Nigerian economy before independence and immediately after it, until the oil boom of the 1970s. In the Period before the 1970s agriculture provided the needed food for the population as well as serving major foreign exchange earner for the country. It is the main source of food for most of the population. It provides the means of livelihood for over 70 percent of the population, a major source of raw materials for agro-allied industries and potent source of much –need foreign exchange (Olufemi, 2003).

Agricultural extension covers all areas of agriculture including techniques of production, farm decision making, marketing, processing, storage and socio-economic as well

as cooperative matters. The importance of agricultural extension lies in the teaching of farmers on how to raise their own standard of living by adopting innovations that will help them in their farming practice, this largely increase their incomes derive from farming and improve their standard of living (Anthony, 2007). Innovation is a multi-stakeholders process that can be achieved by a group of stakeholders. The configuration of Agricultural research and extension provides outcomes that are now particularly dependent on the role that farmers play in the adoption of new technologies (Wennick and Heemskert, 2006).

According to Ajayi (2004), agricultural service is packages /system designed to assist farmers through dissemination of improved innovation, increase farmers production efficiency and income, better their levels of living and lift the social and educational standards of the farmers. The main objective of agricultural extension is the communication of useful information to people and then helping them to learn how to use the information to build a better life for themselves, their families and communities.

Despite all the efforts made by government 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. In most cases, farmers who are the target of the extension services were not involved in planning the extension programmes. Farmers may be reluctant to adopt new technologies, as a result of their perception of such technologies as inappropriate, completely expensive or irrelevant (Greely, 1991).

The study identified the limitations of farmers in the adoption of new technology in the study area. The recognition of farmers' perceptions as a key factor in the adoption of new technologies justify the need for empirical evidence that will acknowledge the significance of analyzing the farmers' perception of recommended extension packages and the effect it has on the farmers' adoption decisions. The specific objectives were to; identify the socio-economic characteristics of the respondents in the study area; identify the extension teaching methods used by extension agents in dissemination of improved production practices to respondents; determine the adoption rate of the recommended practices by the respondents; determine the influence of respondents' socio-economic characteristics on the adoption of recommended extension packages; and identify the factors militating against the adoption of recommended extension packages in the study area.

MATERIALS AND METHODS

The study covered the two agricultural zones of the state. Arable crop farmers' in the study area constituted the population of the study. A multi-stage random sampling technique was used for the study. Yobe State has a total of 17 Local Government Areas (LGAs). In the first stage, four LGAs were randomly selected from each agricultural zone making a total of Eight LGAs. These include; Gashua, Nguru, Geidam, Yunusari, Potiskum, Fune, Damaturu and Gujba. Meanwhile, in the second stage two villages were randomly selected from each LGAs to make a total of sixteen villages. These are; Dala, Amshi (Gashua), Jajimaji, Bukarti (Nguru), Kelluri, Balle (Geidam), Garin-gada, Usmandi (Yunusari), Danchuwa, Garin-dala (Potiskum), Jajere, Ngelzarma (Fune), Maisandari, Kalallawa (Damaturu) and Katarko, Goneri (Gujba). Finally, 15 farmers were randomly selected from each of the selected villages to make a sample size of 240 famers out of 800 farmers (household heads). The population for the study was obtained from Yobe State Agricultural Development Programme (YOSADP). A set of structured questionnaire was used in order to collect the relevant information for the study with the help of trained enumerators who understand the local languages. Data collected were subjected to statistical analysis using the statistical packages. Both descriptive and inferential

statistics were used for data analysis. Descriptive statistics (e.g., frequency and percentages) and inferential statistics e.g., multiple regression were used to analyze the objectives of the study.

The regression model is expressed implicitly as:

$$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8) \qquad \text{...(1)}$$

The explicit form of the regression model is specified as:

$$Y = a_o + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + U \qquad \text{...(2)}$$

where;

Y = Adoption (dependent variable)

a = Constant; $b(1....8)$ = Coefficient; U = Error term.

X_1 = Farmers' age (Years)

X_2 = Years of farming experience (Years)

X_3 = Years of education (Years)

X_4 = Farm size (ha)

X_5 = Household size (Number of persons)

X_6 = Visit by extension personnel (Number of visits)

X_7 = Participation in project activities (Number of participation)

X_8 = Distance of farm from homestead (Km)

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

As indicated in Table 1, the mean age of farmers was 36 years. Auta *et al.* (2012) indicated that age was found to be significantly associated with acceptance of improved farm practices. This agreed with the theoretical logic that young farmers tend to be more flexible in their decision to adopt new ideas and expected to be energetic. The mean household size was 5 persons, with the mean farming experience of 16 years and the mean farm size of 2 ha. Ikani (2004) reported that farming (experience, family size and farm size had a significant relationship with adoption of recommended technologies. Most (87.0%) of the respondents were males. Williams and Olowu (2010) indicated that male farmers were more likely than female farmers to have contact with agricultural extension agents, this might be linked to the religion inclination in the study area where women observed purdah and hence cannot be easily reached.

Methods used by extension agents to make contact with farmers

Table 2 shows that majority (48.5%) of the respondents in the study area were contacted and taught by extension agents based on group teaching method to disseminate improved farm practices to sorghum, millet and cowpea producing farmers. Agbamu (2006) recommended that group methods offered the possibility of greater extension coverage because large number of farmers could be reached at a time, and therefore were very appropriate for teaching skills to farmers.

Effectiveness of agricultural extension activities

The result in Table 3 reveals that majority (56.1%) of the farmers expressed opinions that administrations of agricultural extension activities in the study area were either very effective or effective. Agbamu (2006) recommended that if group method and method demonstrations were applied in teaching farmers, the farmers could easily adopt and the innovation introduced will be very effective.

Table 1: Summary Statistics of Respondents' Socio-economic Characteristics (N=230)

Variables	Minimum	Maximum	Mean
Age (years)	3.5	56.5	36.0
Household size (No.of person)	3.5	40.0	5.0
Farm size(ha)	1.3	43.0	2.0
Experience(years)	8.6	43.5	16.0
	Frequency	**Percentage**	
Sex			
Male	200	87.0	
Female	26	11.3	
No response	4	1.7	
Marital status			
Married	190	82.6	
Single	14	6.1	
Widowed	10	4.3	
Divorced	16	7.0	
Level of education			
Never attended school	26	11.3	
Qur'anic education	68	29.6	
Adult education	34	14.8	
Primary education	24	10.4	
Secondary education	60	26.1	
Tertiary education	18	7.8	

Source: Field survey, 2015

Table 2: Distribution of Respondents based on Methods Used by Extension Agents

Method used to make contact	Frequency	Percentage
Individual method	31	13.5
Group method	111	48.3
Mass methods	13	5.6
Combination of individual and group method	71	30.9
Others	4	1.7
Total	**230**	**100**

Source: Field survey, 2015

Table 3: Distribution of Respondents based on the Effectiveness of Agricultural Extension Activities

Farmers opinion	Frequency	Percentage
Very effective	46	20.0
Effective	83	36.1
Not effective	45	19.6
No idea	49	21.3
No response	7	3.0
Total	**230**	**100**

Source: Field survey, 2015

Extent of adoption of recommended practices by the respondents

The result in Table 4 shows most (71%) on average of the respondents used the nine improved farm practices introduced to them frequently, on average (21%) of the respondents occasionally. As for the impact of adoption of the improved farm practices on the yield of sorghum, millet and cowpea, it was observed that most (84.8%) on average of the respondents indicated that the production had increased. This was similar to Ogunwale *et al.* (2006) findings which showed that all the farmers sampled indicated that the adoption of farm technologies increased yield and productivity.

Table 4: Summary Statistics of the Use of Improved Farming Techniques by the Respondents (n = 230)

Variables	Minimum	Maximum	Rank
Use of fertilizer	2.6	74.3	1st
Use of seed dressing chemicals	2.6	70.4	5th
Use of weed control chemicals	4.3	65.2	8th
Use of storage chemicals	1.7	69.6	6th
Use of plant spacing techniques	3.0	73.5	2nd
Use of recommended seed rate	3.0	71.7	4th
Use of improved sorghum seeds	5.2	68.7	7th
Use of improved millet seeds	3.5	72.2	3rd
Use of improved cowpea seeds	6.1	45.2	9th

Source: Field survey, 2015

The yield of sorghum, millet and cowpea after adoption of improved farm practices

The result in Table 5 reveals that most (82.6%), (90.9%) and (80.9%) of the respondents had increase in yield of Sorghum, Millet and Cowpea respectively. All these findings above were similar to Ogunwale *et al.* (2006) findings which showed that majority of the farmers sampled indicated that the adoption of farm technologies increased yield and productivity.

Table 5: Distribution of Respondents based on Changes in Yields of Sorghum, Millet and Cowpea after Adoption of Improved Farm Practice (n = 230)

Variables	Minimum	Maximum
Sorghum	0.4	82.6
Millet	0.4	90.9
Cowpea	0.4	80.9

Source: Field survey, 2015

Types of participation in project activity and intensity of visit by extension agent

The results in Table 6 show that majority (40.0%) of the respondents in the study area had participated in project meeting and field days, (32.2%) had participated in field days only,

(17.8%) had participated in all of the project activities, (4.3%) of the respondents shared their experiences about their visits with others and the least was project meeting only with (1.3%).and also majority (56.1%) of the respondents were visited once a month by the extension agent, (20.0%) of the respondents indicated once per week, and (15.7%) of the respondents were visited by the extension agent twice per week. Adesina and Baidu (2009) found out that the number of times a farmer participated in training activities by extension agents is largely influenced by their perceptions and adoption of new technologies. Makokha *et al*. (2006) reported that information which farmers received from extension agents contain messages which encourage the farmers decision to adopt recommended technologies. Dorfman (2003) reported that contact with extension agents has a positive influence on the way such farmers perceive new technologies and hence it is significant in influencing their decisions.

Table 6: Distribution of Respondents according to the Types of Participation in Project Activity and Intensity of Visit by Extension Agents

Types of participation	Frequency	Percentage
Project meetings only	3	1.3
Field days only	74	32.2
Farmers exchange visit only	10	4.3
All of the activities above	41	17.8
Project meetings and field days only	92	40.0
None of the activities	10	4.3
Visit		
Twice/week	36	15.7
Once/week	46	20.0
Twice/week	19	8.3
Once/month	129	56.1
Total	**230**	**100**

Source: Field survey, 2015

Socio-economic factors influencing adoption of recommended extension packages

Table 7 shows the regression result of the relationships between some selected variables and farmers perceptions of recommended technologies/extension packages. The table revealed that the three equations estimated show R-Square value of 0.770, 0.646 and 0.621 respectively for the linear, semi log and double log functions respectively. According to the results the linear functional model was accepted as the lead equation since it produced more significant variable at P<0.05, P<0.01 and P<0.001 had the highest R- squared value of 0.770 and F-ratio Value of 49.712. showed that variables such as farmers age, farm size, level of education, visit by extension personnel, participation in project activities, farming experience and Household size were positive and significantly influence the level adoption to extension recommendations at (P<0.05, P<0.05, P<0.001, P<0.001, P<0.001, P<0.001 and P<0.01), respectively. Laogun (2010) reported that farmers' perceptions become more and more perfect with age, education and mental development. This is because perception now involves more accurate and complete

Table 7: Socio-economic Characteristics that Influenced the Perception of Recommended Technologies

Parameters	Linear	Semi-log	Double log.
Constant	3.5370 (1.182)**	2.6664 (10.655)***	1.7590 (4.688)
Farmer's age (X_1)	-78.807 (-2.088)*	0.047 (1.552)	0.057 (0.849)
Years of farming Experience (X_2)	100.486 (2.757)***	0.089 (2.057)**	0.097 (1.312)^{NS}
Level of education (X_3)	3.687 (13.277)***	0.84 (1.877)*	0.162 (5.317)*
Farm size (X_4)	36229.021 (6.576)*	0.0502 (8.776)*	0.096 (1.1905)*
Household size (X_5)	86.617 (10.061)**	0.228 (2.163)	0.024 (2.836)*
Visit by extension personnel (X_6)	3.553 (12.951)***	0.82 (2.836)**	0.159 (1.428)*
Participation in Project activities (X_7)	3.151 (2.441)***	0.70 (2.321)***	0.046 (3.520)***
Distance of farm from home stead (X_8)	-3.641 (-0.892)^{NS}	0.11 (0.830)^{NS}	0.018 (1.301)^{NS}
R-squared	0.770	0.646	0.621
F-statistic	49.712	39.981	31.962

Source: Field survey, 2015
Note: *** Significant at $p<0.001$ ** significant at $p<0.01$ * Significant $p<0.05$
NS: not significant

knowledge of the perceived object or activity. Findings of Abadi and Pannel (2011) agree with the findings of this study, where they concluded that farmers' perceptions of agricultural technologies are influenced by their experience, education and family size. Makokha *et al*. (2006) reported that contact with extension agents definitely has a positive influence on the way farmers perceive new technology, and it is significant in influencing their adoption behavior.

Factors militating against the adoption of improved production technologies for sorghum, millet and cowpea production in the study area
The result in Table 8 reveals that majority (61.8%) of the respondents discovered that lack of necessary inputs were the most serious problems responsible for some farmers in the study area not adopting the improved farm practice introduced to them. This was in line with Agbamu (2006) who said that the necessary inputs required by most of the innovations were supplied by agro-marketing companies or subsidized public agro-supply agencies. These were not effective in distributing the inputs to rural farmers. It was also discovered that delay in receipt of production input was the major problems that limited the success of majority of the extension agents in discharging their extension activities.

Table 8: Distribution of the Respondents according to the Factors Militating against the Adoption of Improved Production Technologies

Respondents' opinion	Frequency	Percentage
Cost of fertilizer	108	47.0
Unavailability of fertilizer	28	12.2
Cost of labour	11	4.8
Lack of ready market to sell the produce	17	7.4
Cost of agro-chemicals	6	2.6
Lack of adequate technical knowledge about recommended practices	37	16.1
Some practices run contrary to our needs	6	2.6
Inadequate rains	9	3.9
Delay in receipt of production inputs	8	3.5
Total	**230**	**100**

Source: Field survey, 2015

CONCLUSION AND RECOMMENDATIONS

The findings of this study revealed that farmers in the study area preferred group and demonstration teaching methods in disseminating improved farm practices by the extension agents. These methods were found to be effective in motivating the farmers to adopt improved practices introduced to them. The adoption of the improved farm practices by the farmers has been found to increase the production of sorghum, millet and cowpea in the study area. However, there were certain factors such as high cost of fertilizer, cost of agro-chemical, lack of technical knowledge about the recommended farm practices that caused some farmers not to adopt the improved practices. It is recommended that Yobe state government should recruit more trained male and female extension agents for more effective contact with farmers in order to increase agricultural production. Yobe ADP should also develop frequent and regular supervision of the extension agents in the rural areas by their senior officers in order to ensure effective monitoring and evaluation of agricultural extension activities in the study area. High costs and unavailability of farm inputs are the most prominent problems affecting the adoption of improved farm practices by the farmers in the study area. Therefore, it is recommended that Yobe state government should provide farm inputs to farmers at subsidized prices and at the right time. Tractors should also be given out and hired to farmers at a low price in order to reduce the cost of labour.

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