

ROLES OF AGRICULTURAL EXTENSION WORKERS IN DISSEMINATING AGRICULTURAL TECHNOLOGIES TO VEGETABLE FARMERS UNDER JIBIA IRRIGATION PROJECT, KATSINA STATE, NIGERIA

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Abstract

This study was carried out to analyze the roles of agricultural extension workers in disseminating agricultural technologies to farmers' under Jibia irrigation project, Katsina State, Nigeria. A multistage sampling technique was used to arrive at the sample size of one hundred (100) vegetable farmers. Data obtained through the administration of structured questionnaire were analyzed using both descriptive (frequency counts and percentage, mean and Standard deviation) inferential (Chi-square) statistics. The findings revealed that a majority of the vegetable farmers were male (99%), married (72%) and in active productive years. The major source of agricultural information of the farmers was from the extension workers and mass media, and a majority (100%) of the farmers adopted the agricultural technologies disseminated. They were educated on adoption of the technologies through the individual extension teaching methods and were convenient with the information disseminated. The Chi-square analysis result revealed a significant relationship ($P < 0.05$) between adoption of seed varieties by the farmers and individual extension teaching methods.

Key words: Agricultural Extension Workers; Information dissemination; Agricultural Technologies; Vegetable Farmers; Jibia Irrigation Project.

Introduction

Agriculture is considered as one of the important sector of the Nigeria economy. It provides employment opportunities to the world especially developing countries like Nigeria. However, the productivity of the sector is still lagging behind its huge potentials, (Khan and Waseem, 1999). In order to improve the level of productivity of the sector, there is need for dissemination of improved science-based agricultural technologies to farmers for adoption through agricultural extension services. It is the duty of agricultural extension personnel to disseminate and teach agricultural technologies to the ultimate users (farmers) and to persuade farmers to adopt the disseminated technologies with a free flow of feedback process. The process of agricultural extension services keeps agricultural research abreast of real problems faced by the farmers. Thus, extension services play a vital role in the agricultural development (Adams, 1988).

Agricultural extension can be described as the process of introducing new agricultural information, knowledge and technologies to farmers to enhance

their production, income and welfare (Adam, 1988). According to Asiabaka (2010) agricultural extension is viewed as an educational programme that provides support to the farmers, to set and fulfill their own developmental goal. Therefore, the main goal of agricultural extension service is to provide information that will guide and assist farmers to identify their own problems and means of making decision (Purcell and Anderson, 1997).

The services rendered by agricultural extension service are advice and assistance to farmers necessary to improve their farming methods and marketing (Khan and Waseem, 1999). In the process, information and training are being provided to the farmers in each field of agriculture, such as animal production, fisheries, crops and vegetables production. Vegetables are grown mostly in the study area, some of which are tomatoes, onion, spinach, lettuce, and bell pepper.

Agricultural extension workers are saddled with the responsibility of disseminating agricultural technologies to vegetable crop farmers operating under the project.

It was discovered that some of the farmers have neglected the production of vegetables due to the prevalence of pests and disease, farmer's pastoralist conflict, the late distribution of fertilizer and low market demand for vegetables. This necessitated questioning if the extension agents in the study area are actually alive to their responsibilities. Do they disseminate information to the vegetable farmers? If yes, what are the methods employed in teaching and disseminating information on improved technology to the vegetable farmers? What is the level of adoption of the technologies disseminated? The main objective of the study is to assess the roles of Agricultural Extension Workers in Disseminating Agricultural Technologies to Vegetable Farmers under Jibia Irrigation Project, Katsina State. The specific objectives of the study are to (a) describe the socioeconomic characteristic of the vegetable farmers under the project (b) find out the methods employed in disseminating agricultural technologies to the vegetables farmers by the extension workers (c) find out the extension teaching methods employed by the extension workers in dissemination and experimenting/adoption of the disseminated technologies and (d) to determine the level of adoption of technologies disseminated by the vegetable farmers.

Research Hypothesis

- (i) There is no significant relationship between the methods of disseminating agricultural information and the adoption of technologies by the farmers.

Research Methodology

Study Area

This study was carried out under Jibia Irrigation Project, Katsina State. The Jibia Irrigation Project is one of the many irrigation projects under Sokoto Rima River Basin Development Authority (SRRBDA). It is a multipurpose project consisting of three major features: the Dam; the irrigation network and water supply system (Yakubu, 2013). The project is located in Jibia Local Government Area. Jibia Local Government Area is located in the Sudan savannah agro-ecological zone of Nigeria. The Local Government Area covers a geographical area of 1037 square kilometer. The area lies between latitude 11° 08'N and 13° 22' N and longitude 6° 52' E and 9° 20' E. Jibia Local Government Area shares boundary with Niger Republic to the north, to the north east by the Kaita Local Government Area, to the south by Batsari

Local Government Area and with Zamfara State to the west.

The maximum and minimum temperatures of the area are 39°C and 15°C with an average temperature of 27°C. The rainfall of the study area is usually erratic and associated with periodic drought. The maximum and minimum rainfall of the project area is 900mm and 500mm with average rainfall 700mm. The dry season is hot and dry with the Harmatan period between November and February.

The inhabitants of the study area engaged more in dry season irrigation farming where different varieties of crops are cultivated, such include wheat, cowpea, cassava and assorted vegetables (tomatoes, onion, bell pepper and lettuce). Culturally; the majority of the people in the study area are homogeneous in nature. They are predominantly Hausa Muslims.

Sampling Procedure and Sampling Size

Three stages sampling technique was used to arrive at the sample size of the study. In the first stage, one district out of the two districts in the area was conveniently selected due to the location of the irrigation project in the district. In the second stage, proportionate sampling technique was used to select 50% of the 20 villages from the selected districts to arrive at 10 villages. The third stage included the random selection of ten farmers from each of the selected villages. This makes the sample size of the study to constitute one hundred vegetable farmers.

Data Collection and Analysis

Data for this study was generated from both primary and secondary sources. Primary data was directly collected from the farmers with the aid of structured questionnaire while the secondary information was sourced from text books, journals, and book of proceedings, project official records and internet sources. Data generated were analyzed using both descriptive (frequency counts, percentage, mean and standard deviation) and inferential (Chi-square) statistics respectively.

Results and Discussion

Socio Economic Characteristics of the Vegetable Crop Farmers

Findings in Table1 revealed that majority (99%) of the farmers were male while the female farmers constituted only 1%. These findings indicate that there were more male vegetable farmers in the study area than their female counterpart. This result is in line

with the findings of Ango, Illo, Abdullahi, Maikasuwa and Amina (2013) who reported that majority of the Fadama and Bakolori irrigation farmers were male and the reason behind these was that farm works are mainly for male while women are left with household chores. In support of this finding Chinyere (1993) reported that rural female farmers are not statistically identified as an active population; as a result, their productive and economic roles are regarded as part of their domestic responsibilities. According to him women are mostly engaged in processing of agricultural produce instead of being engaged in laborious agricultural activities such as farming.

Table 1 also shows that 45% of the farmers fall within the age range of 40 years and above, 33% were within the ages of 26-32 years, 14% falls within the ages of 33-39 years and only 8% of the farmers were within the age bracket of 18-25 years. These findings imply that most of the vegetable crop farmers were within their active and productive years. This finding is in agreement with Adamu (1997) and Oladosu, Adewala, and Kuponiyi, (2004) who reported that the active productive age of individuals are the ages in

which they are more capable and energetic to cope with the rigors of agricultural activities.

Most of the farmers' (72%) were married while 24% were single and only (4%) were divorced. This findings imply that majority of the farmers in the study area were married which goes in line with the tradition of the majority of people of northern Nigeria and neighboring Niger Republic where marriage is considered as a sign of responsibility and a factor that derives respect for any matured person.

Also (50%) of the vegetable farmers' attained Qur'anic education, 33% had primary education and 17% of them attained secondary school education. These findings imply that a majority of the vegetable farmers had attained one form of education or the other especially in Qur'anic education. Based on Agbamu (2005) reported that education is expected to promote transformation of agricultural activities in any community, especially vegetable crop production which goes in accordance with Rogers (1973) who theoretically proved that the level of education of the farmers enhances their ability to assimilate and adopt agricultural technologies.

Table 1: Distribution of Farmers According to their Socio-economic Characteristics (n = 100)

Variables	Frequency	Percentage	Mean	Standard Deviation
Sex				
Male	99	99.0		
Female	1	1.0		
Age				
18-25	8	8.0		
26-32	33	33.0	34.25	12.67
33-39	14	14.0		
40 years and above	45	45.0		
Marital Status				
Single	24	24.0		
Married	72	72.0		
Widowed	0	0.0		
Divorced	4	4.0		
Educational Attainments				
Primary Sch. Educ.	33	33.0		
Secondary Sch. Educ.	17	17.0		
Tertiary Education	0	0.0		
Qur'anic Education	50	50.0		

Source: Field survey, 2014

As indicated in Table 2, 27% of the farmers had a family size of 1-7 people in the household, 26% had 8-14 members in the household, 17% of the farmers

had a family size of 15-21 people and 8% had a family size of 22 people and above. The mean family size is eight members. This finding implies that a

majority of the farmers in the study area had large family sizes; the large family size of the farmers could be due to polygamous nature of Hausas and their dependence on family members as a source of farm labour. This finding is supported Ango, Illo, Abdullahi, Maikasuwa and Amina (2013) who reported that 70% of the farmers in north western Nigeria had moderate to large family size and which help them to provide cheap labour in their agricultural activities.

Moreover majority (85%) of the farmers did not register with any cooperative association, 12% of the farmers belonged to farmers' cooperative society, 2% belongs to Fadama Users Association (FUA) and only (1%) of the farmers belonged to Water Users Association (WUA). These findings imply that most of the vegetable farmers did not register with any cooperative association and which may affect their having access to loan and other subsidized farm inputs.

In addition 54% of the farmers had a farm size of 3 - 4 hectares, 33% had 2-3 hectares of farmland while

13% of them had a farm size of 5-6 hectares. The finding implies that most of the farmers had medium farm size for the vegetable crops production in the study area, and it has been noted that most of the Fadama farmers in north western Nigeria operate under a small fragmented farm size of 1-3 hectares.

The majority (64%) of the farmers acquired the land through inheritance, 32% acquired the land through rent and 4% of the farmers acquired the land through purchase. This finding implies that the common mode of land acquisition in the study area is through inheritance. This is because inheritance is the common mode of acquiring land and which is based on the strict Sharia laws where the land of any deceased person is normally passed to his heirs. The findings is also in line with Baba and Muhammad (1998) reported that majority of the farmers acquired lands through inheritance, therefore there is no constant commercial transaction in Fadama land and it is difficult for an outsider to acquire the land in the area.

Table 2: Famers Socio-economic Characteristics Contd (n = 100)

Variables	Frequency	Percentage
Family Size (People)		
Less than 1	22	22.0
1-7	27	27.0
8-14	26	26.0
15-21	17	17.0
Cooperative Membership		
Not registered with any Cooperative.	85	85.0
Farmers' cooperative society	12	12.0
Water Users Association	1	1.0
Farm Size(hectares)		
1 – 2	33	33
3 – 4	54	54
5 – 6	13	13
Mode of Land Acquisition		
Inheritance	64	64.0
Purchase	4	4.0
Rent	32	32.0
Barrow	0	0.0

Source: Field survey, 2014

Methods of Disseminating Agricultural Technologies to the Farmers

In addition, most (86%) of the famers were of the view that they were provided with agricultural technologies while only (14%) of the farmers disagreed that they were provided with improved technologies. Revealing that majority of the vegetable farmers benefitted from the provision of agricultural

technologies in the study area by the intake officers. This findings is in line with Ahmadi (2010) reported that provision of agricultural technologies may encourage farmers to continue with irrigation farming in the study area.

The findings in Table 3 also reveals that almost half (49%) of the farmers were provided with fertilizer,

34% were provided with agro-chemicals, and 17% were provided with improved seed varieties. The findings revealed that the intake officers from the Sokoto Rima Basin Development Authority through

the assistance of Katsina State Government were able to disseminate and provide the vegetable farmers in the project area with improved technologies.

Table 3: Distribution of Farmers based on Technologies Provided (n = 100)

Variables	Frequency	Percentage
Provision of Agricultural Technologies		
Yes	86	86.0
No	14	14.0
Technologies provided		
Seed Varieties	17	17.0
Fertilizers	49	49.0
Agro-chemicals	34	34.0
Tractor/work bull	0	0.0

Source: Field survey, 2014

Extension Education Teaching Methods Employed in Disseminating and Experimenting Technologies to the Farmers.

The Results in Table 4 shows that majority (62%) of the famers were educated by extension workers through individual extension teaching methods (Farm/home/office calls/telephone calls), 38% of them were educated through the means of mass media (Radio/television/handset) and none were taught through group extension teaching methods. As indicated in the findings, none of the farmers were taught how to adopt the disseminated technologies through group extension teaching method and which could be due to the inability of the farmers to form groups through which they could be able to access group training opportunities. Atala (1997) reported that farm visit/office call/radio and television programmes are the essential methods principally use by the extension services in disseminating agricultural technologies to the farmers.

Conveniences of the Agricultural Information Disseminated:

Results in Table 4 also indicated that almost all (90%) of the farmers in the study area were convenient with the agricultural information disseminated to them, 7% of the farmers were highly convenient with the agricultural information disseminated and only 3% of the farmers were of the view that the information disseminated were not convenient to them. This implies that a majority of the vegetable farmers were highly convenient with the agricultural information disseminated to them because it encourages them to engage more in vegetables production and the technologies disseminated enhances their productivity and income. This finding is in line with Adams (1988) who reported that without extension assistance it becomes impossible for a farmer to find all what he needs to know about new science based agriculture and to cope with rapid changes in the society.

Table 4: Farmers Distribution According to Teaching Methods Adopted in Dissemination and Experimenting Technologies (n = 100)

Variables	Frequency	Percentage
Extension Teaching Methods		
Individual Extension Teaching Methods	62	62.0
Group Extension Teaching Methods	0	0.0
Mass Media Extension Teaching Methods	38	38.0
Conveniences of Disseminated Agricultural Technologies		
Highly convenient	7	7.0
Convenient	90	90.0
Not convenient	3	3.0

Source: Field survey, 2014

Technologies Adopted by the Farmers

As shown in Table 5, most (60%) of the farmers adopted fertilizer, 24% adopted agro-chemicals and 16.0% of the farmers adopted seed varieties introduced to them. The findings imply that majority of the vegetable farmers in the study area adopted the technologies disseminated to them for better vegetable production in the study. It is informed by real problems on the ground and efforts are made to deliver solution to farmers by appropriate forms of extension focusing on the acceptance and adoption of that innovation (technologies) by the farmers.

Frequency of Adoption: Researches conducted by (Rogers, 1973 and Yakubu, 2013) reported that the higher the frequency of innovation dissemination to the farmers, the more the farmers decided to adopt the disseminated innovation. Results in Table 5 further indicated that the majority (93%) of the farmers often adopted the technologies disseminated while only (7%) of the farmers did not adopt the disseminated technologies based on the frequency of disseminating the innovation.

Table 5: Farmers Distribution based on the Technologies adopted (n= 100)

Variables	Frequency	Percentage
Technologies adopted		
Seed Varieties	16	16.0
Fertilizer	60	60.0
Agro-chemicals	24	24.0
Tractor/work bull	0	0.0
Adoption frequency		
Very often	0	0.0
Often	93	93.0
Not often	7	7.0

Source: Field survey, 2014

Relationship between the Extension Methods and Technologies Adopted

Chi-square analysis results used in analysis of relationship between the extension methods and technologies adopted indicated a significantly strong association between the seed varieties disseminated

and individual extension teaching methods employed by the extension workers ($P < 0.05$); and fertilizer disseminated by the extension workers and individual extension teaching methods employed by the extension workers ($P < 0.05$).

Table 6: Relationships between Study Variables

Variables	χ^2 - value	Df	P - value	Decision
Seed varieties and individual extension teaching methods	0.004	1	0.000	S
Seed varieties and group extension teaching methods	0.006	1	0.951	NS
Seed varieties and mass media methods	0.160	1	0.899	NS
Fertilizer and individual extension teaching methods	0.815	1	0.000	NS
Fertilizer and group extension teaching methods	0.005	1	0.367	S
Fertilizer and Mass media methods	0.158	1	0.692	NS

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$. NS = Not significant; S = Significant; Df = Degree of Freedom; P - value = Probability value

Conclusion and Recommendations

Conclusion: Based on the research questions, objectives and hypothesis that guided this study, it was concluded that most of the vegetable farmers in the study area were male, married and within their active and productive ages, and the main hindrance of the farmers to agricultural inputs, extension contacts

and bank loan was lack of registration with cooperative associations. Majority of the farmers adopted the agricultural technologies (improved seed varieties, fertilizer and agrochemicals) disseminated and majority of the farmers learnt about the adoption of the technologies through the individual extension teaching methods (farm/home visit and office call).

Recommendations

Based on the findings of this study the following recommendations were made:

1. It was recommended that more women folk should be included in the vegetable production in the project area irrespective of the tradition and religious restrictions that restricted women from participating in any activity outside their homes.
2. More agricultural extension workers should be employed to disseminate agricultural information to the farmers
3. Farmers are encouraged to join cooperative societies to gain access to improved technologies, trainings and credit facilities.

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