

Full Length Research

Impact of innovative approaches of agricultural extension services on rural women for profitable crop production in Benue State, Nigeria

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The study investigated the impact of innovative approaches of Agricultural extension services on rural women for profitable crop production in Benue State, Nigeria. Three research questions and two hypotheses were formulated to guide the study. The study adopted survey research design. The study was carried out in Benue State, Nigeria. The population of the study was 503 made up of 77 extension agents and 426 registered women farmers. The sample for the study was 360 selected using multi-stage sampling techniques (Stratified random sampling was used to select a sample of 283 rural farmers from the three strata (Zone A, B and C agricultural zones of Benue state) while the whole 77 extension agents in the state were purposively selected and used for the study). Checklist and A 17- items structured questionnaire titled 'Agricultural extension service innovative approach questionnaire' (AESIAQ) was developed from literature and used for data collection. The instrument was face and content validated by three experts. Cronbach alpha method was used to establish the internal consistency of the items which yielded a reliability coefficient of 0.99. Percentage and mean were used to answer the research questions and chi-square statistics to test the hypotheses at 0.05 level of significance. Findings from the study revealed that BNARDA has a total of only 280 staffs made up of 209 (74.6 %) males and 71 (25.4%) females who uses the training and visit (T&V) approach for information dissemination, Agricultural extension services of BNARDA have four influences on rural women's crop production practices in Benue state, there are six challenges encountered by rural women in utilizing BNARDA agricultural extension services for crop production in Benue state, BNARDA agricultural extension service has significant impact on crop production practices of rural women and the challenges encountered by rural women in Benue State in utilizing agricultural extension services significantly influence their crop production practices. It was recommended amongst others that Research institutes in agriculture should use other methods of information dissemination to rural farmers' aside T &V approach which has shortcomings.

Key words: Innovative approach, extension services, rural women, crop production.

Introduction

Agricultural extension services deals with the transfer of technology to farmers putting into consideration their socio economic and cultural background. Ekele (2015) asserts that the information obtained from transfer of

technology could improve farmer's livelihood. The author explained that for extension services to be functional, the extension agent acts as a catalyst in the dissemination of information to rural farmers. The extension agent according to Davies (as cited in Amonjenu, 2016) support people engaged in agricultural production and facilitates their effort to solve problems, adopt new innovation approaches that could provide for local farmers, and

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discuss issues that affects crop production.

Innovation refers to new ideas or discovery of an improved system of doing things. An innovation is an idea, practice or object that is perceived as new by an individual or other unit of adoption (Rogers, 1995). An agricultural innovation refers to modern/improved production practices and methods that will enhance crop yield for profitability (Yates, 2006). Innovations adopted by small group of rural farmers in the view of Ekele (2015) are those that prevent the farmer from wasting time in implementing new methods and technology in agriculture particularly in crop production. Swanson (2008) affirms that if innovative farmers were targeted to adopt innovations, other farmers would soon follow, speeding up the adoption of new agricultural practices. In the opinion of Usman, Umar and Goni (2011), few innovators try new technology slowly. The speed of the process increases as others are able to observe results and as interaction between innovators and others take place. It is important to note that the point at which diffusion tends to progress at a more rapid rate after a slow start, results from a social process of interaction among farmers. Innovation adoption by farmers in the context of this study is geared towards achieving the objectives of agricultural extension services.

The objectives as enumerated by World Bank (2007) and embedded in Benue State Agricultural and Rural Development Authority (BNARDA) were to assist small scale farmers to increase food production and raise the level of their incomes and living standards, focus on agricultural potentials by effectively utilizing intensive programme of on-farm adaptive research, develop an effective unified training and visit (T&V) agricultural extension system in the state, establish and operate a workable inputs procurement and distribution system and provide rural infrastructures for sustainable development. Food and Agricultural Organization (1993) reported that Benue State Agricultural and Rural Development Authority (BNARDA) was established by edict number 7 of 1985 under the world Bank assisted ADPs programme which became operational in June 1986 with a broad aim of providing effective agricultural extension services to farmers (rural women farmers inclusive).

Women engaged in rural farming in this study are those that are principally involved in crop production. Women in developing countries have not benefited as much as men have from publicly provided extension services. Consequently, Tologbonse, Jibrin, Auta and Damisa (2013) observed that women's low participation in national and regional policy making, their invisibility in national statistics and their low participation in agricultural extension services suggest that most women have been neglected in the design and implementation of policies and programme. In corroborating this view, Usman, Umar and Goni (2011) posit that an extension service which ignores women's participation can at best achieve false growth. Taye (2013a) reiterates that extension services

have often been ineffective in food and agricultural production, and that the problem was more compounded in the case of women because of the uniform extension system, where men are perhaps the first and main target recipient of the planned change in agriculture. The author lamented that quite often women are the poor and deprived class within a community; they often work very long hours and are poorly remunerated. Hence, approaches are required for effective extension services.

Approaches to achieving effective extension services include the training and visit system, community development approach, agricultural development approach and transfer of technology approach (Dash & Misra, 2004; Ekele, 2015). However, the training and visit system seems to be the most popular in the area of study. This process offers advice and information to help the rural population to solve their problems. In this context, extension aims to increase the efficiency of the family farm, increase production and generally increase the standard of living of the farm family. The objective of extension here is to change farmer's outlook towards their difficulties. Extension agents, therefore, discuss matters with the rural people and help them to gain a clearer insight into their problems in order to overcome such problems. Davies (2009) reported that extension involves helping farmers to improve on their abilities to direct their own future development by facilitating transfer of technology develops human and social capital, enhances skills and knowledge for production and processing. Ajibade, Ocheni and Adefemi (2013) submitted that extension facilitates access to markets and trade, organizes farmers towards sustainable natural resources management.

It is an established fact that majority of women in Benue state especially those in rural areas depend mostly on subsistence agriculture. Much of their time is devoted to crop production. However, due to their low level of formal education, they are less likely to adopt modern improved crop production practices. The researchers observed that despite the extension services offered to improve the livelihood of rural women farmers, it appears they are still practicing subsistence farming, have low capital, use crude tools and engage in mixed cropping with low yield which does not in any way reflect the objectives of agricultural extension services in the state. Hence, the researchers deemed it appropriate to investigate the impact of innovative approaches of agricultural extension services on rural women for profitable crop production. Specifically, the study determines,

1. The distribution of human resources and approach available for the delivery of agricultural extension services to rural farmers in Benue State.
2. The influence of BNARDA (agricultural extension services) on rural women crop production.
3. The challenges encountered by rural women in utilizing

agricultural extension services for crop production.

Research Questions

1. What is the percentage distribution of human resources and approach available for the delivery of agricultural extension services to rural farmers in Benue state?
2. What is the influences of agricultural extension services on rural women crop production practices?
3. What are the challenges encountered by rural women in utilizing agricultural extension services for crop production?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance.

H0₁: The BNARDA agricultural extension service has no significant impact on crop production practices of rural women.

H0₂: The challenges encountered by rural women in Benue State in utilizing agricultural extension services do not influence their crop production practices.

Methodology

The study adopted survey research design. The study was carried out in Benue State. The state has a good climate for growing crops such as yams, Cassava, Maize, and other crops, hence, the state was considered suitable for conducting this study. The population of the study is 503 made up of 77 extension agents and 426 registered rural women farmers (Ministry of Agriculture, Makurdi, 2015). The sample for the study was 360 selected using multi-stage sampling techniques. Stratified random sampling was used to select a sample of 283 rural farmers from the three strata (Zone A, B and C agricultural zones of Benue state) while the whole 77 extension agents in the state were purposively selected and used for the study. The instruments used for data collection were a checklist and a 17- items structured questionnaire titled 'agricultural extension service innovative approach questionnaire' (AESIAQ) developed by the researchers from literature reviewed. The response scale for each item were based on a 4 - point rating scale of strongly agree, agree, disagree and strongly disagree with their corresponding value of 4,3,2, and 1 respectively. The instrument was face and content validated by three experts, one from the Department of Agricultural extension, and two from the Department of Vocational Agriculture and Technology Education, all from the University of Agriculture, Makurdi. Cronbach

Alpha method was used to establish the internal consistency of the questionnaire items. A reliability coefficient of 0.99 was obtained. The instrument was administered by the researchers to the respondents with the help of two research assistants. Three hundred and sixty questionnaires were administered and all 360 were retrieved from the respondents. The data were analyzed using percentages and Mean to answer the research questions and chi-square statistics to test the hypotheses at 0.05 level of significance.

Results

The results of the study were obtained from the research questions answered and the hypotheses tested through data collected and analyzed.

Research Question 1

What is the percentage distribution of human resources and approach available for the delivery of agricultural extension services to rural farmers in Benue State?

Data presented in Table 1 gives the distribution of agricultural extension staff by gender and local government area as at December 2014. The table revealed that BNARDA has a total of only 280 staffs made up of 209 (74.6 %) males and 71 (25.4%) females. There are only 77 extension workers to a total of 46 blocks, which leaves a short fall of 291 extension staff or 79.1%. The shortfall is so severe that 17 out of the 23 local governments in the state have less than 5 extension agent, while one local government has no extension staff. Out of the 77 extension staff, only 28 or 34.4% are female, while 49 or 63.6% are male. The respondents also indicated that all the extension staffs use the training and visit (T&V) approach for information dissemination.

Research Question 2

What are the influences of agricultural extension services on rural women crop production practices? The data analysis which provided answer to this research question is presented in Table 2.

Data presented in Table 2 revealed that the respondents rated 4 out of the 5 items in the cluster above the cut-off point of 2.50; this indicates that the respondents agreed that the 4 items were the influences of agricultural extension services on rural women's crop production practices in Benue state. However, only one item had its mean value as 1.94 which is below mean 2.50 indicating that it was not an influence of agricultural extension services on rural women's crop production practices in

Table 1. Percentage Distribution of Agricultural extension agents/services (BNARDA) staff in Benue State.

S/No.	Location of staff	Agric extension staff (as at Dec 2014)			No of Blocks	No of Cells	Optimum field extension staff	Extension staff short fall
		Female	Male	Total				
Eastern Zone A								
1	Konshisha	--	2	2	2	16	16	14
2	Vandeikya	1	3	4	4	32	32	28
3	Kwande	1	4	5	2	16	16	11
4	Ushongo	1	--	1	3	24	24	23
5	Katsina-Ala	2	1	3	3	24	24	21
6	Ukum	--	1	1	2	16	16	17
7	Logo	--	2	2	2	16	16	14
Zone totals		5	13	18	18	144	144	126
Northern Zone B								
8	Buruku	4	4	8	3	24	24	16
9	Gboko	4	7	11	2	16	16	5
10	Tarka	--	1	1	1	8	8	7
11	Guma	4	2	6	3	24	24	18
12	Makurdi	3	1	4	1	8	8	4
13	Gwer-west	1	1	2	1	8	8	6
14	Gwer	--	2	2	2	16	16	14
Zone totals		16	18	34	13	104	104	70
Central Zone C								
15	Apa	--	1	1	1	8	8	7
16	Ado	1	--	1	1	8	8	7
17	Agatu	--	--	--	2	16	16	16
18	Otukpo	2	8	10	2	16	16	6
19	Ohimini	--	2	2	1	8	8	6
20	Okpokwu	2	2	4	3	24	24	20
21	Ogbadibo	1	1	2	1	8	8	6
22	Obi	--	3	3	1	8	8	5
23	Oju	1	1	2	3	24	24	22
Zone totals		7	18	25	15	120	120	95
State totals		28	49	77	46	368	368	291

Benue state. The table further revealed that the grand standard deviation of the item ranged from .58 to .87 indicating that the respondents were not too far from the mean and from the opinion of one another in their responses on the influence of agricultural extension services on rural women's crop production practices in Benue state.

Research Question 3

What are the challenges encountered by rural women in utilizing agricultural extension services for crop production?

Data presented in Table 3 revealed that the respondents rated 6 items above the cut off point of 2.50 except for item 5. This indicates that the respondents agreed that there are six challenges encountered by rural women in

utilizing BNARDA agricultural extension services for crop production in Benue state. The table further revealed that the grand standard deviation of the item ranged from .85 to .1.01 indicating that the respondents were not too far from the mean and from the opinion of one another in their responses on challenges encountered by rural women in utilizing BNARDA agricultural extension services for crop production in Benue state.

Testing of Hypotheses

H0₁: The BNARDA agricultural extension service has no significant impact on crop production practices of rural women.

Table 4 analysis showed that the $X^2(3, N=360)=112.8$ is greater than the set alpha value of 0.05 at 3 degree of freedom. The null hypothesis which states that the BNARDA agricultural extension program has no

Table 2. Mean and Standard Deviation of the influence of BNARDA agricultural extension on rural women's crop production practices. (N=360).

Item	Item Description	\bar{X}	ST.D	Remarks
1	Attending BNARDA agricultural extension sessions improves farmers' crop production practices.	2.99	.87	Agreed
2	BNARDA agricultural extension workers do regularly visit our farms.	3.28	.58	Agreed
3	The BNARDA agricultural extension service has greatly influenced farmers' participation in farmer-based organizations in my community.	3.45	.72	Agree
4	Rural women in my community learn new crop production techniques by listening to BNARDA agricultural extensions programs through radio broadcasts.	1.94	.82	Disagree
5	Rural women in my community who participate in BNARDA agricultural extensions are more likely to adopt improved crop production practices.	2.99	.77	Agree

Keys: X=Mean; ST.D= Standard deviation; BNARDA=Benue Agricultural and Rural development Authority.

Table 3. Mean and Standard Deviation of Respondents on challenges faced by rural women in utilizing agricultural extension services for crop production in Benue State.(N=360).

Item	Challenges	\bar{X}	STD	Remarks
1	Lack of farm inputs, especially fertilizers, constitute serious challenge to crop production.	3.54	.85	Agreed
2	Many women in my community have difficulties in land preparation, especially digging.	3.08	1.01	Agreed
3	High cost of farm labor limits crop production activities of most women in my community.	2.90	.99	Agreed
4	Most women in my community do not have access to credit facilities.	2.95	.96	Agreed
5	Access to farm land is a serious challenge to crop production by women in my community.	2.31	.94	Agreed
6	Declining interest of youths in farming adversely affects the performance of women in crop production in my community.	2.64	.99	Agreed
7	Frequent communal clashes and other civil unrests limit the access of many women in my community to their farm lands.	2.99	1.01	Agreed

N= number of respondents, X = mean and STD = standard deviation.

significant impact on crop production practices of rural women in Benue state is therefore rejected. In other words, agricultural extension services significantly influence crop production practices of rural women.

H0₂: The challenges encountered by rural women in Benue State in utilizing agricultural extension services do not influence their crop production practices

Data presented in Table 5 revealed that X^2 (3, N=360)=44.867 is greater than the set alpha value of 0.05 at 3 degree of freedom. The null hypothesis is therefore rejected. This means that challenges encountered by rural women in utilizing BNARDA agricultural extension services significantly influences their crop production practices in Benue state.

Major findings of the Study

1. BNARDA has a total of only 280 staffs made up of 209 (74.6 %) males and 71 (25.4%) females who uses the training and visit (T&V) approach for information dissemination.
2. Agricultural extension services of BNARDA have four influences on rural women's crop production practices in Benue state.
3. There are six challenges encountered by rural women in utilizing BNARDA agricultural extension services for crop production in Benue state.
4. The BNARDA agricultural extension service has significant impact on crop production practices of rural women.
5. The challenges encountered by rural women in Benue

Table 4. Chi –square Analysis for BHARDA extension services on crop production practices of rural women.

Response	F _o	F _e	Df	Level of Sig	χ^2	Decision
Strongly Agree	37	90	3	0.05	112.8	Reject
Agree	53	90				
Disagree	166	90				
Strongly Disagree	104	90				
Total	360					

Table 5. Chi-Square Analysis for the Influence of challenges encountered by rural women in Utilizing BNARDA Agricultural Extension Services on their Crop Production Practices in Benue State

Response	F _o	F _e	Df	Level of Sig	χ^2	Decision
Strongly Agree	52	90	3	0.05	44.867	Reject
Agree	70	90				
Disagree	103	90				
Strongly Disagree	135	90				
Total	360					

State in utilizing agricultural extension services significantly influence their crop production practices

Discussion of findings

The findings that the human resources (extension agents) uses the training and Visit (T&V) approach in providing agricultural extension services in Benue State did not receive the support of Glendenning, Babu, Aseno-Okyere (2010). The authors explained that the (T & V) innovation extension system approach need not be performed by extension workers but by farmers and other actors. Swanson (2008) has also faulted the (T & V) agricultural extension approach, stating that it places the farmers at the end of the information chain. Similarly, Suleiman and Van den Ban (2003) criticize the approach by asserting that it places little opportunity for providing feedback. The finding that there exists shortage of human resources in terms of extension staff was supported by the work of Chukwuemeka and Nzewi (2011) who assert that inadequate qualified extension staff is one of the perennial problems confronting ADPs in Nigeria.

The finding from Table 2 that agricultural extension services has four significant influence on crop production practices of rural women in Benue State was in agreement with the report by Ammani, Sani, Kura and Husain (2011) in their assessment of agricultural extension services in irrigation scheme under RBDAs in Nigeria: the case of Kano irrigation project. The authors noted that agricultural extension services by the Kano state ADP and the Kano River Basin Development Authorities (KRBDAs) served a large population of

farmers by providing the necessary ideas and trends of farming. The finding was further supported by the work of Sulaiman and Hall (2002) who noted that the roles of modern agricultural extension system should include organizing, strengthening and supporting farmer organizations. The finding was also in consonance with the study by Sabo (2006) who conducted a participatory assessment of the impact of women in agriculture (WIA) component of the Bornu State ADP. The author reported that the program led to an increase in agricultural production and income level of women who participated in WIA program in the study area.

The findings that there are six challenges encountered by rural women in utilizing BNARDA agricultural extension services for crop production in Benue state was in line with Ovwigho and Effie (2014) who found out that WIA faced the challenge of access to labor which was inadequate. The finding was further supported by the work of Yusuf, Arigbede and Kolade (2010) who reported the result of their study on the constraints to women participation in agricultural production in rural areas of Kaduna State. The authors also found out that 83.6% of the respondents agreed to have encountered several socio economic constraints among which were financial and socially embedded constraints.

Conclusion

Training and visit approach to extension was mainly used for information dissemination to rural women involved in crop production. BNARDA agricultural extension services has influence on rural women in terms of technology

transfer, advisory services and adult education aimed at improving access to food through increased agricultural productivity. However, rural women still face daunting challenges in their attempt to utilize BNARDA agricultural extension services to earn decent standard of living through crop production.

Recommendations

1. Research institutes in agriculture should use other methods of information dissemination to rural farmers' aside T & V approach which has shortcomings.
2. Ministry of agriculture in Benue State should employ more extension agents to meet the demands in the rural areas.
3. Ministry of agriculture should provide farm inputs for rural women to ensure increased farm productivity and overcoming the challenges encountered.

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