



Analysis of agricultural extension services in improving the standard of living of tomato farmers' in kebbi state, Nigeria

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Abstract

This study aimed at assessing the role of Agricultural extension services in improving the standard of living of tomato farmers in kebbi State, Nigeria. A multi-stage sampling procedure was employed for this study. Firstly, a purposive sampling was used to select three local government areas (LGA) out of each three senatorial zones and three villages from each LGAs while random and purposive sampling were used to select 206 participants and 206 non-participants, making a total sample size of 412 farmers in Kebbi State. Questionnaire and interview schedule were used for data collection and analyzed with descriptive statistics and inferential statistics such as chow test model. The result revealed that 90% of respondents were the participants and 77% were the male non-participants respectively while the females were 10% and 23% participants and the non-participants respectively. Chow test model analysis indicated a positive mean on output $F = 149.87$), income, ($F=3.95$) and level of living ($F=24.24$) of the participating' farmers than the non-participating farmers. The output, income and level of living difference were significant at 5% level of probability which means a significant difference in output, income level of living of farmers participating in tomato production. It was concluded that agricultural extension services had positive impact on improving the living standard of tomato farmers in the study area. The study therefore recommends that sustainability of agricultural extension services should be ensured in order to consolidate the achievement of the participating farmers in tomato production.

Keywords: analysis, agricultural extension services, standard of living, tomato farmers, kebbi state

Introduction

Adams (2012) ^[1] asserted that everywhere around the world, agricultural production is central to the overall wellbeing of the populace of its importance in the provision of food, income for farmers, raw materials for industries, and employment for foreign exchange for the nation. National Bureau of statistics/central Bank of Nigeria (2006) stated that agricultural production provides for 2/3 of Nigerians who are low income earners and it is presently one of the world largest producers of food and raw materials for its major enterprise. However, Nigeria is still facing serious food shortages to meet up the need of ever increasing population in the country which has manifested in food shortages.

In a bid to solve the declining food challenges, the Federal and State Government of Nigeria introduced many food production policies and programmes over the years to tackle the daunting challenges faced in the agricultural sector. For instance, the Operation Feed the Nation (OFN), the Directorate for Food, Roads and Rural Infrastructures (DFRRI), the National Accelerated Food Production Programme (NAFPP), National Agricultural Land Development Authority (NALDA) and many others. Besides these programmes and a number of other ones, failed to meet the target of food self-sufficiency. This raised serious concern regarding Nigeria's vision of becoming one of the world's twenty strongest economies by the year 2020.

Despite Nigeria's rank of 2nd to Egypt in Africa and 13th

position in the world hierarchy of tomato production, the country is still lagging behind in tomato production compared to Egypt and USA. Nigeria still imports 65,809 tonnes of processed tomato annually, worth over N11.7 Billion despite its massive local production (CBN, 2012). The yield of tomato in Nigeria is low, the average of Sudan savannah zones of the country being only 20 tonnes per hectares (FAO, 2010) ^[8]. For instance, Nigeria production was estimated at 1,860,600 tonnes in 2010 while the United State of America had an estimate for the same 1/7th of the yield per hectare of tomatoes in Nigeria is at 7.1 tonnes per hectare comparable to 39.5 tonnes per hectare for Egypt (CBN, 2012). This short fall necessitated the importation of processed tomato worth N11.7 billion (\$75.5million) yearly. The fact is that Nigeria only produces between 20-30 percent domestically far from expectation. Besides, 25-50 percent of the import of this domestics paste is from China (CBN, 2011) thus leaving the market for domestically produced tomato paste underserved. This makes Nigeria one of the primary importers of tomato globally and a major consumer of tomato paste. The vision is aimed at agrarian reform though the introduction of modern farming techniques referred to as protective farming system with inputs inclusion package, which makes tomato production attractive, create employment opportunities for the youths, and to prove that agriculture serve as the nation's dependable and sustainable alternative sources of income/revenue generation. According to Delta State Ministry

of Agriculture (2004) research findings showed that the reasons for failure of past development programmes were poor data base used for policy formulation. Also inadequate monitoring and evaluation of the programmes, made it unpredictable for one to be sure whether the objectives of the project were comprehensively achieved or not. It is therefore necessary to assess the role of agricultural extension services in enhancing the living standard of tomato farmers in the study area.

Food and Agriculture Organization (FAO)(1986) asserted that most development expert often remain frustrated by the limited success of most programmes, occasioned by small scale farmers frequently rejecting or partially participating in a Programmes regardless of how the agency's design and formulation demonstrate higher levels of productivity.

Objective of the Study

The broad objective of this study was to analyze the role of Agricultural extension services in improving the living standard of tomato farmer's in Kebbi State, Nigeria.

The specific objectives were to:

- i. Identify the socio-economic characteristics of tomato farmers in the study area; and
- ii. Analyze the role of agricultural extension services on the output of tomato production, income and living standards of tomato farmers' in the study area.

Methodology

The research was conducted in Kebbi State. Kebbi State was created out of the then Sokoto State in 1991. It lies in Northwestern region of Nigeria with its capital in Birnin Kebbi. Kebbi State is bordered by Sokoto to the north and east, Niger to the south. Dosso region in the Republic of Niger to the Northwest and Republic of Benin to the west. Kebbi State has a total land Area of about 37,698,685 square kilometers. Based on projections from 2006 census figure, Kebbi State is estimated to have a population of 4,629,880 (NPC, 2006) ^[11]. Sokoto State has a population of 427,760 based on 2006 census. Kebbi State is made up of 21 Local Government Areas (LGAs). It has four emirate councils (Gwandu, Argungu, Yauri and Zuru) and has four Agricultural Zones namely Argungu, Bunza, Yauri and Zuru zones respectively, for ease of administration. Kebbi State falls between latitude 12^o46'N and 12^o.27'N and longitude 4^o19'E and 4^o11'E. Agriculture is the main occupation of the people of the state especially in rural areas. Crops produced are mainly grains like Rice, Millet, Sorghum etc; animal rearing and fishing are also common agricultural activities that feature prominently in the State. The weather of the State is often dry with lots of sunshine. The wet season last from May to October while the dry season lasts for the remaining period of the year. Mean annual rainfall is about 800mm- 1000mm. Temperature is generally high with mean annual temperature of about 26^oC and above in all locations of the state. This climatic peculiarity allows for meaningful investment in agriculture (NPC, 2006) ^[11].

This study employed a multi stage sampling technique. In the first stage, three local government area were purposively selected from each of the three senatorial zones which are Zuru, Ngaski Yauri, Gwandu, Bunza, Jega, Argungu, Augie

and Arewa Dandi Local Government areas making a total of nine Local Government Areas, due to major activities on tomato production in the zones. In the second stage, three villages having high participating farmers were purposively selected making a total of twenty-seven villages. Reconnaissance survey was conducted to identify registered participating tomato farmers of in the first stage. The third stage was based on random selection of 50% of the 420 sampled frame of participating farmers of tomato production activities, making 210 participating farmers, while fifty percent 50% of the 420 non-participating farmers which is (210) were purposively selected because of high concentration of tomato farmers in the study areas. In all, 420 farmers were selected.

The primary data was used as sources of information for this study. Primary data were collected from participating and non-participating farmers, using questionnaires, interview schedule and assistance of extension agents. But 206 questionnaires were returned.

The analytical tools used for objectives of the study were the descriptive statistics used for objective 1 and Chow test model was used for objective 2 to measure the role of agricultural extension services on output, income and level of living of the participating and non-participating farmers. In Programme evaluation, the chow test is often used to determine whether the independent variables have different impact on different sub groups of the population (Mohammad, 2014) ^[13]. The model for chow test is expressed mathematically as

$$F^*_{\text{chow}} = \frac{(RSS_2 - SST_1 + SSR_2)/K}{(RSS_1 + RSS_2)/(n_1 + n_2 - 2K)} \dots\dots (1)$$

Where; RSS_3 = the sum of squared residuals from a linear regression in which b_1 and b_2 are assumed to be same (pooled data).

SSR_1 = the sum of squared residuals from a linear regression of sample 1 (participants)

SSR_2 = the sum of squared residuals from a linear regression of sample 2 (Non-participants).

Both have dimension K and these are number of observation in total. The total number of observation is; K = is the total number of regression estimates including intercept of $N_1 + N_2$ = number of observation of the regression of sample 1 and 2 (participants and non-participants). The decision rule for this model is that if Chow F-statistics is greater than that of F-table at 5% level of probability it then means that Agricultural extension services has made impact on the (output, income and level of living). This means there is a structural difference between the participating and non-participating farmers and if otherwise there is no impact of Agricultural extension services in the study area.

Result and Discussion

Socio-economic characteristic of the respondents

Table: 1 reveals that 134.8% of the participants were males while 28.2% for non-participants were females. The dominance by males may be attributed to land ownership system, religious beliefs and cultural purdah that inhibit female participation in tomato production in the area. This allows only males members of the society to inherit and own

land. Besides, the majority of (134.8%) of participants and (28.2%) of non-participant farmers examined fall within the age bracket of 31 – 40 years. This constitutes the age bracket of active labour force that is innovative and productive. Also, the majority (134.8%) of the participating farmers and (28.2%) of non-participating farmers were married. This means that farmers have higher engagement and commitment towards the project in order to support family livelihoods than the unmarried. The result also revealed that 134.8% and 28.2% of the participants and non-participant respectively have some form of education. This implies that respondents' level of participation, interpretation of information and acceptance of agricultural extension services will be made easier and accelerated. The result revealed that the majority (78.2% and 75.2%) of the beneficiaries and non-beneficiary farmers respectively have family size of 6-8. This level of household size implies the availability of family labour for tomato production. Also, the majority of the participants' farmer (52.9% are members of cooperative society while (78.6%) of non-participants farmers are not members of cooperative society. This implies that membership of cooperative society creates an opportunity for the participating farmers to share views. Those that do not join cooperative society may likely face some challenges in tomato production and ideas may not be shared. A scenario that often leads to ineffective and inefficient use of

Table 1: Distribution of respondents based on Socio-economic characteristics.

	Participants	Non-participants
Sex		
Male	89.8	77.2
Female	10.2	22.8
Age		
<20	0.0	0.0
20 – 30	6.8	4.9
31 – 40	72.8	72.8
41 – 50	12.1	12.6
51 – 60	2.4	4.9
61 – 70	3.9	4.4
71 – 80	1.9	1.5
Marital status		
Married	83.5	81.6
Single	10.7	12.6
Widow	5.9	.58
Educational qualification		
3 – 5	3.4	3.9
6 – 8	78.2	75.2
9 – 11	16.5	17.5
12	1.9	3.4
Membership of cooperative Society		
Yes	52.9	21.4
No	47.1	78.6

Source: Field Survey 2017

Role of agricultural extension services on the output of participating and Non-participating farmers
 Result on table 2 of Chow test showed that agricultural extension services and tomato output of the participants at (Chow test = 149.87 at 5% level of significance). This implies that the acceptance by farmers of agricultural extension

services has brought a significant improvement in tomato production. This is in line with the findings of Chukwuemeka (2012) [4] who observed that most assisted programmes by the government helped in promoting livelihoods of small-scale farmer, autonomous enterprises, increased productivity, and marketing of farm produce.

Table 2: Role of agricultural extension services on the output of participating and non-participant farmers

Group sample	R ²	Residual square	Sum of N	K
Pooled sample	0.738	11854774.121	412	10
Participants	0.458	19606179.872	206	
Non-participants	0.521	30726558.231	206	

R² = regression coefficient,

Role of agricultural extension services on Income of Participating and Non-participating farmers.

Result from table 3 reveals that significant relationship exists between agricultural extension services and the income of participating farmers at (Chow F calculated = 3.952 at 5% level of significance). This implies that higher income has been realized from the sales of higher output thus translating to better condition of living by the participating farmers. This is in line with Tologbonse (2013) [12] findings in the study of factors influencing women participation in Agricultural Programme of Kaduna State Agricultural Development Project. It was observed that the mean income of participants was N1344, 389.04 which was higher than the mean income of (N5, 605.35) for the non-participants in Kaduna State.

Table 3: Role of agricultural extension services on the income of participating and non-participating farmers on tomato production

Group sample	R	Residual square	Sum of N	K
Pooled sample	0.041	3060353513.647	412	10
Sample participants	0.176	128868664.061	206	
Non-participants	0.058	1464532002.645	206	

R=regression coefficient, N = numbers of observation and K numbers of parameters

Table 4 reveals that significant relationship exists between agricultural extension services and level of living of participating farmers in the study area (Chow F calculated = 24.24 at 5% level of significance) thus implying that extension services had made significant contributions on the level of living of participating farmers. This implies that participating farmers might have enjoyed some forms of asset in terms of increased household items and consumption or use of economic goods such as food, motor-cycle, bicycle, car, house, radio, television, motorized pump knapsack, thresher, fuel, and other non-durable goods. Use of these by farmers implied a significant improvement in their livelihood compared to the non-participating farmers.

Table 4: Role of agricultural extension services on the level of living of participating and non-participating farmers

Group sample	R ²	Residual square	Sum of N	K
Pooled sample	0.139	534868150308.257	412	10
Participants	0.026	293871317789.399	206	
Non-participants	0.063	6562229520.858	206	

R² = regression coefficient, N = numbers of observation and K = numbers of parameters

Conclusion and Recommendation

The study revealed that the majority of the respondents were young, married and had one form of formal education or the other. Male farmers dominated tomato crop production with the majority cultivating less than two hectares of land for production. The output, income and level of living of the participating farmers increased significantly than the non-participating farmer. The encouragement to farmers to join cooperative society in extension education provides a platform of farmers' interaction contributing to the success of tomato production enterprise in the study area. The inclusion of the role of cooperative society in extension teachings should be sustained in order to consolidate the achievement and involvement of the existing participating farmers as well as attracting other young entrepreneurs into tomato production enterprise in Kebbi State. The successes recorded by agricultural extension programmes in promoting tomato production in Kebbi State can however, be re-experimented in other states of the federation.

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