



# Status of Adoption of Sesame (*Ncriben Spp.*) Production Technologies by Women Farmers in Southern Parts of Taraba State, Nigeria

<sup>1</sup>Adie, Linus Akomaye; <sup>2</sup>Audu, Ignatus Angum & <sup>3</sup>Dibah James Bala

Department of Agricultural Economics and Extension  
Faculty of Agriculture & Life Sciences  
Federal University, Wukari, Nigeria

<sup>1</sup>[linusadie2020@gmail.com](mailto:linusadie2020@gmail.com); <sup>2</sup>[ignatusaudu24@gmail.com](mailto:ignatusaudu24@gmail.com) & <sup>3</sup>[jigizak@gmail.com](mailto:jigizak@gmail.com)

## ABSTRACT

The study assessed women's adoption of Sesame (*Ncriben Spp.*) Production technologies in southern part of Taraba State, Nigeria. The objectives of the study was to examine the socio-economic characteristics of women farmers involved in Sesame (*Ncriben Spp.*) Production ; and to ascertain the level of women involvement in Sesame production technologies in the study area. Primary data were collected from 250 randomly sampled respondents (Sesame women farmers in southern part of Taraba State). The data were analysed using frequency distribution and percentage. Regression analysis was used to determine effect of independent variable on adoption level, while t-test was used to analyse test of significance. The result obtained revealed 86.5% of the respondent were women; 62.2% were between 31-40 years age brackets; 42.5% have household size of 5-8 persons. Majority (85.6%) of the respondents indicated farming as their primary occupations. The regression analysis revealed that age, farm size, and membership of co-operative organisations significantly influenced adoption level of Sesame Production technologies among women farmers. The findings revealed that 81.7% of the women farmers were faced with the challenges of poor finance and poor breeds in adoption of sesame production technologies. Based on the findings it was recommended among others that the supply of farm inputs should be made timely; credit facilities and subsidies should be provided for farmers; awareness programme and farmers training on sesame production technology should be optimised in the study area.

**Keywords:** Women, Adoption, Sesame production technologies.

## INTRODUCTION

Nigeria is endowed with abundant human and natural resources in terms of vast land mass of about 923,766 square km, favourable climate condition for growing of varieties of crops (trees, cereals and vegetables), livestock production and fisheries including wildlife (shellang Ja'afar-furo & Donye, 2001). However, of the total population over (150 million) of the country about 80% reside in rural areas and their primary occupation is farming .

In recognition of the contribution of agricultural sector to Nigeria Gross Domestic Product, the Nigerian government has initiated and endorsed many national and international programmes and policies aimed at rapidly growing the agricultural sector of the economy. Among these programmes include National Economic Empowerment and Development Strategies (NEEDS I and NEEDS II), Comprehensive African Agriculture Development Programme (CAADAP), Seven Point Agenda of President Buhari Administration, National Food Security Programme (NFSP), presidential initiatives on Cassava, Rice and other crops. Ensuring government's food security for the population with diminishing cultivable land resources necessitates the use of high yielding variety of seeds, balance use of fertilizers, judicious use of

quality pesticides and educating the farmers on the the use of modern agricultural technologies (Okowiche, Obinne & Onuga, 2012).

The re-organisation of the agricultural research system in 1987 gave the National Cereal Research Institute (NCRI) new mandate. These include (1) researching into rice, soyabeans, beniseed (sesame), sugar cane, and their farming systems in the middle belt and north east zones of the country; (2) generating and disseminating improved technologies for agricultural production in food and industrial raw materials with surplus for export. Presently, the research institute has a mandate to conduct research into the genetic improvement of rice, soybean, beniseed (Sesame), ache, castor and sugarcane as well as overall farming systems and resources management research and extension in North-East and North Central zones of Nigeria (Abo, 2013).

Beniseed (*Sesame indicum*) belongs to the family *Pedaliaceae*. It is commonly called Benised in Nigeria. The tiny spherical seeds are edible with milky flowering flavour. it is an important oil seed believed to have originated from tropical Africa with the greatest diversity (Raw Material Research and Development Council, 2004). Beniseed is a stable food among many ethnic groups in Nigeria (Olanyanju., Akinso & Oresanya, 2008). The seeds are consumed fresh, dried, fried or when blended with sugar. It is also used as a paste in some local soups. National Cereals Research Institute (NCRI) released beniseed varieties and introduced a number of improved beniseed production technologies to rural farmers. Such varieties include NCRIBEN OIM, 02M, 03M, and other. Other technologies include use of herbicides, use of pesticides, Nitrogen, Phosphorus and Potassuim (N.P.K) fertilizer application, use of correct spacing distance and timely planting etc.

Agricultural development implies the shift from traditional methods of production to new science-based methods of production that include new technological components (such as new varieties, cutlural practice, commerical fertilizer and pesticide, new varieties of crops and new farming systems. For farmers to adopt these new production technologies sucessfully they must first learn about them and how to use them correctly in their farming systems (Swanson, 2008). Investment in agricultural research often yield good returns. Although a lot of studies have been carried out in the Sesame production technologies but little or no study has been carried out specifically on women's involvement in sesame production technologies in the study area. However to develop and derive more rewarding benefits from sesame production a study of its technologies and analysis becomes pertinent.

#### **State of the problem**

The productivity of Nigeria agricultural sector is relatively low in spite of enormous possibilities for growth and improvement. The use of agricultural technologies and external inputs to enhance productivity is sub-optimal in Nigeria (Natural Centre for Genetic Resources and Biotechnology, 2008). Studies have shown that agricultural research findings meant for farmers' adoption are designed to primarily improve farmers yield. According to Agbarevo and Obinne (2009), the adoption of improved crop production technologies package by agricultural extension agents will not only significantly improve poor farmers income but also enable farmers to increase the purchase of production inputs that are necessary for increased productivity that translate into improved living standards of farm household. In spite of all efforts made by concerned agencies and government to bring scientific discoveries to the door steps, farmers seem not to respond readily to the waves of these changes .

The National Cereal Research Institute has been established to ensure that high yielding crop varieties are developed and released to farmers in order to boost food production yet these is still food shortage in Nigeria. To achieve self sufficiency in food production therefore, a number of problems had to be tackled through the application of science to agricultural production so that the gap between the high yielding crop varirties available on research station and the pitiable poor yield recorded by farmers couldbe be minimised.

#### **Objectives of the study**

The main objective of the study was to ascertain sesame production technologies in southern part of Taraba State. The following objectives were drawn to guide the study.

- i. Determine the socio-economic characteristics of women farmers on the adoption level of sesame production technologies in southern part of Taraba State, Nigeria

- ii. Ascertain the level of women involvement in sesame production technologies in southern part of Taraba State, Nigeria
- iii. Identify the constraints affecting women involvement in sesame production technologies in southern part of Taraba State, Nigeria

## METHODOLOGY

The study was conducted in southern part of Taraba State, Nigeria which comprised of Wukari Ibi, Takim, USSA and Donga L.G.A. The southern part of Taraba State, Nigeria is predominantly agrarian in nature with about 80% of its inhabitant depending on subsistence agricultural practices. The southern part is endowed with great potential for agricultural production because of the availability of abundant areable land and livestock production. The climate, soil and hydrology of the area provide viable environment for the cultivation of most staple food crops, raising of livestock, fresh water fishing and forestry production. The population for the study included all women involved in sesame production. They were selected using multi-stage random sampling technique. In the first stage, five (5) local government areas, Wukari, Ibi, Takim, Ussa and Donga were purposefully selected. The second stage involved identification of wards in each local government area. The third stage was the development of sample frame of women farmers and 50% of the women farmers were selected proportionally across the five (5) local government areas. This gave a total of 250 respondents for this study.

The data was collected using a structured questionnaire which was validated by Agricultural extension experts. Instrument was subject to face and content validity. The items were structured in such a way that it enabled the respondents provide information about their personal characteristics and the production technologies associated with sesame production activities. The respondents were required to indicate the various adoption level they were involved in the production technologies employed. Their perceived adoption level of sesame production technologies was measured on a 4-point scale of Aware, Not Aware, Adopted, and Not Adopted. To determine which level was adopted or aware perceived mean of 2.00 was used. Thus any level with a mean score of 2.00 and above was considered Adopted and Aware or otherwise. That less than 2.00 was regarded as Not adopted and Not aware. The reliability of the instrument was estimated using the test retest technique. This was accomplished by administering the instrument to the same group of respondents at different times and the correlation between the two administrations computed. A correlation value of 0.54 was obtained and was considered accepted. Data collected were analysed as follows: frequency and percentages; binary logit regression analysis, and dependent sample t-test were used to analyse data aimed at achieving objectives 1, 2, and 3 respectively.

## RESULT AND DISCUSSION

### **The socio-economic characteristics of women farmers on adoption level in southern part of Taraba State**

The result of logit regression analysis performance to test the effect of sex ( $X_1$ ), Age ( $X_2$ ), Educational level ( $X_3$ ), Household size ( $X_4$ ), Farm Size ( $X_5$ ), Farming Experience ( $X_6$ ), Farm status ( $X_7$ ), Farm annual income ( $X_8$ ), and membership of production technologies is presented below

$$Z = 0.25 + 0.876X_1 + 1.055X_2 + 1.031X_3 + 1.001X_4 + 0.510X_5 + 0.972X_6 + 1.253X_7 + 1.000X_8 + 6.567$$

The R-Square ( $R^2 = 0.470$ ) showed the total percentage variation in adoption score as explained by the joint contribution of the independent variable, which had significant relationship with adoption level of the respondents. The result of the analysis revealed that Sex ( $w = 0.062$ ), Age ( $w = 5.582$ ), Educational level ( $w = 1.171$ ), Household size ( $w = 0.000$ ), Farm status ( $w = 1.171$ ), Farming experience ( $w = 1.066$ ), Farm size ( $w = 6.428$ ), Annual farm income ( $w = 1.404$ ) and Membership of co-operative ( $w = 23.769$ ) explained 47% (percent) of the variation in adoption level.

The regression analysis results showed that age, farm size, and membership of co-operative was statistically significant at 5% level of probability. The significant influence of age on adoption level ( $N = 5.583$ ;  $P \leq 0.05$ .) implies that older women respondents adopted less of sesame Production technologies while younger women farmers adopted more sesame Production technologies in southern part of Taraba States, Nigeria.

**Table 1: Regression analysis result showing socio-economic characteristics variables of women farmers on adoption level of sesame production technologies in southern part of Taraba State**

Variables	Regression co-efficient	S.E	WALD	df	P.value	EXP(B)
Sex	-133	.533	5.582	1	.018*	.876
Age	.053	0.23	1.171	1	.279	1.0551
Educational level	.030	.023	.000	1	.988	1.031
Household size	.0001	.032	0.000	1	.214	1.001
Farming status	.673	.541	1.547	1	.302	.510
Farming experience	.29	.028	1.066	1	.011*	.972
Farm size	.226	.089	6.428	1	.236	1.253
Annual income	.000	.000	1.404	1	.000*	1.000
Membership of cooperative	1.882	.386	23.769	1		6.567
Constant	-3.076	1.000	13.503	1	.000	.025

*Wald is significant at  $P < 0.05$ ;  $df=9, R^2=0.470$*

This result showed that increase in age of respondents leads to increase in adoption level. This is contrary to the expectation that younger women have been found to adopt innovation more easily than the older women. Young women farmers tend to be more flexible in their decision. They adopt new ideas more readily because of anticipated life span within which investment in new technologies will pay off.

There exists a significant relationship between the adoption of new farm practices and size of land of women farmers (Agbamu, 2009). The significant effects of membership of co-operative on adoption level ( $w=23.769$ );  $P < 0.05$  implied that members of co-operatives organisations adopt more technologies than non-members. The non-significance of the co-efficient for other variables was probably because the availability of improved sesame varieties and production practices recommended by extension agents served as motivating factors for technology adoption.

**Table 2. Women farmers' awareness and adoption of sesame production technologies in southern part of Taraba State**

Technologies	Awareness		Adoption	
	Ranked frequency	%	Ranked frequency	%
Improved varieties				
a. NCRIBEN -01m	37 <sup>11th</sup>	15.1	28 <sup>13th</sup>	11.4
b. NCRIBEN -02m	24 <sup>14th</sup>	9.8	24 <sup>14th</sup>	9.8
c. NCRIBEN -03m	33 <sup>12th</sup>	13.9	43 <sup>11th</sup>	13.9
d. E8	164 <sup>5th</sup>	69.9	161 <sup>5th</sup>	65.7
e. Yandev 55	229 <sup>1st</sup>	93.5	231 <sup>1st</sup>	94.3
<b>1. Fertilizer use</b>	198 <sup>3rd</sup>	80.7	191 <sup>3rd</sup>	78.0
NPK 2 bags/ha				
<b>2. Use of pesticides</b>				
a. Upper cot: 100Lt/ha	165 <sup>4th</sup>	67.3	162 <sup>4th</sup>	66.1
b. Septermethrine: 100Lt/ha	30 <sup>13th</sup>	12.2	29 <sup>12th</sup>	11.8
<b>3. Use of herbicides</b>				
i. <i>Pre emergence</i>				
a. Scepter 233.4Lt/ha	70 <sup>9th</sup>	28.6	62 <sup>9th</sup>	25.3
b. Pendilin: 2Lt/ha	85 <sup>8th</sup>	34.7	83 <sup>8th</sup>	33.9
ii. <i>Post emergency</i>				
a. Fusillade: 21 t/ha	145 <sup>6th</sup>	59.2	128 <sup>6th</sup>	52.2
<b>4. Single cropping</b>	213 <sup>2nd</sup>	86.9	207 <sup>2nd</sup>	84.5
<b>5. Seed rate</b>				
a. 5kg/ha	106 <sup>7th</sup>	43.3	105 <sup>7th</sup>	42.9
b. 4kg/ha	49 <sup>10th</sup>	20.0	38 <sup>10th</sup>	15.5
c. 3.5kg/ha	19 <sup>15th</sup>	7.8	19 <sup>15th</sup>	7.8

The result on Table 2 shows women farmers' awareness and adoption level of Sesame Production technologies in the study area. The result revealed that 93.6% and 85.8% of the respondents were aware of the use of Yandom 55 and single cropping respectively, meaning that the awareness level of these

technologies was high. The result also revealed that 80.5% and 66.5% of the respondents were aware of N.P.K fertilizer 2bags/ha and upper cot 100/ha respectively. About 65.8% of them indicated that they were aware of E8-seed while 58.5% of them indicated that they were aware of fusillade 21 t/ha as post emergence herbicides. It is pertinent to note that the first phase of adoption of innovation starts when women farmers first heard of the innovation and began to try it out. This result was a clear indication that information on the use of sesame Production technologies in the study area was widespread.

Result in Table 2 also showed the adoption of sesame production technologies by women farmers. The result revealed that majority (93.4%) of the respondents adopted Yandev 55 varieties of sesame. this could be as a result of its high yielding potential over other varieties. Many 83.6% and 76.2% of the respondents adopted single cropping and fertilizer application (NPK) 2 bags/ha respectively indicating the possibility of increase in crop yield as application of improved agricultural practices have positive impact on crop yield.

The results also showed that 43.9% and 34.7% of the respondents adopted seedrate of 5kg/ha and pendillin; 21 l/ha respectively, while 25.3% of them adopted seedrate of 4kg/ha. The result further revealed that 13.8% and 11.9% of the respondents adopted NCRBEN-013m and septermethrine 100/ha respectively, while 11.4% of them adopted NCRIBEN-01m. Besides, 9.8% and 7.9% of respondents adopted NCRIBEN-02m and 3.5kg/ha respectively. This findings agreed with Onjuwu (2009) who reported that most of the sesame production technologies were highly adopted by women farmers in the southern part of Taraba State, Nigeria. High level adoption of the technologies of sesame production could be associated with women farmer's awareness that the use of improved technologies increases crop yield, income availability and better living standard. This is associated with the intensity of agricultural extension delivery to farmers, as the main source of farmers' information on improved agricultural production technologies.

**Table 3: Constraints faced by women farmers to adoption of sesame production technologies in southern part of Taraba State, Nigeria**

Barriers indicators	Ranked frequency	%
Lack of capital and credit	230	93.9
Lack of labour operation	27 7 <sup>th</sup>	11.0
Incompatibility of technology to local norms	60 5 <sup>th</sup>	24.5
Lack of access to land	14 9 <sup>th</sup>	5.7
Low demand for the processed products	23 8 <sup>th</sup>	9.4
High cost of agricultural inputs	167 3 <sup>rd</sup>	68.2
Time consuming and tedious nature of the technologies	7 10 <sup>th</sup>	2.9
Ineffective extension services and coverage	4 11 <sup>th</sup>	1.6
Market situation of Processed Product Limit their spread & profitability	34 6 <sup>th</sup>	13.9
Poor road Network	161 4 <sup>th</sup>	65.7
High cost of transport	174 2 <sup>nd</sup>	71.0

Results in Table 3 showed the constraint faced by women farmers in adoption of sesame production technologies in southern part of Taraba State. The findings revealed that 93.8% of the respondents were faced with the constraint of inadequate capital and inadequate credit implying that without credit facilities, women farmers will find it difficult to carry out farm work in large scale. Inadequate access to agricultural loan is one of the major problems hindering agricultural production in Nigeria (Raw Material Research and Development Council, 2004). This view was also supported by Agbarevo and Obinne (2010) who

reported that adoption of innovation often fail due to high cost of investment among other factors. The result also showed constraints of high cost of transportation as a pertinent factor likely to limit farmers' level of technology adoption. This finding gave credence to the study of Mustapha, Salau and Ezra (2012) who maintained that poor transportation systems, among others were the most important constraints affecting women farmers in adopting agricultural production technologies in Nigeria.

The study showed that 68.2% of the respondents indicated high cost of agricultural input as a constraint to adoption of sesame production technologies by farmers in southern part of Taraba State, Nigeria. Women farmers are normally repelled by high cost of input. Most times, adoption level could not be sustained due to high cost involved (Kumar, Jyotish & Benzamin, 2011). The study further revealed that 65.7% of the respondents were faced with the constraints of poor road network. The results agreed with the finding of Aina (2007) that farmers in Africa live in areas where there is inadequate basic infrastructure such as good road network, portable water supply among others. Also, 24.5% of the respondents indicated incompatibility of the technology to local norms as a constraint to adoption, while (13.8%) of them were faced with the constraints of market situation of processed product (after producing sesame, the women farmers still find it difficult to market their farm produce, 11.0% of them indicated lack of labour for farm operation. This result was in line with (Ajao, 2008) who reported that high cost of labour and other related factors have adverse effects on sustainable adoption of crop and livestock production technologies in Nigeria.

### CONCLUSION

Women farmers' adoption of sesame production technologies in southern part of Taraba State was positively and significantly influenced by age, farm size and membership of co-operative organisation. Sustainable adoption of improved agricultural technology is unquestionably a mean of increasing farm output. It impacts positive changes in livelihood of adopters, as income derived from sale of crops can be used to purchase other necessary goods.

### RECOMMENDATIONS

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

1. Improved varieties of sesame (NCRI-BEN-01m, NCRI-BEN-02m, NCRI-BEN-03m), fertilizers, pesticides and herbicides should be timely supplied to farmers.
2. Government should subsidize price of sesame production inputs and also provide loans to enable farmers acquire the necessary technology inputs.
3. Government and related agencies should create awareness on the need for women farmers to imbibe improved sesame production technologies.

### REFERENCES

- Abo, M. E. (2013). Mandate crops and organisation of Research on NCRI. A paper presented at induction course for newly employed staff of the National Cereals Research Institute (NCRI), Badeggi, Niger State, Nigeria
- Agbamu, J. U. (2009). *Essentials of Agricultural Communications in Nigeria*. Makurdi: First Schim Publishers
- Agbarevo, M. N. & Obinne, C. P. O (2009). An evaluation of the effect of agricultural production technologies on selected cereals in Benue State. *National Cereals research Journals*, (B) 35-58.
- Aina, D. P (2009). Economic analysis of sesame production technologies in Jigawa State, Nigeria. *Taraba Journal of Agricultural Research (TAJAR)* 2 (1), 20-28.
- Ajao, J. A. (2008). Analysis of loan repayment among small scale farmers in South Western Nigeria: A discriminate approach. *Journal of social Science* 17 (1), 83-88.
- Kumar, B.; Jyotish, B, & Benzamin, K. (2011). *Adoption behaviour of the farmers' Goalpara District of India towards aquaculture technology*. India: National Research Centre on pig.
- National Centre for Genetic Resource and Biotechnology (2008). Country Report on the state of plant genetic resources for food and agriculture. Abuja: Federal Department of Agriculture.

- Obinne, C. P. O. (1991). Adoption of improved cassava production technology by small scale farmers in Edo State. *Journal of Agricultural Science and Technology*. 1(2) ,14-30
- Okuoche, V. A.,; Obinne, C.P.O. & Onuga J. A. (2011). Adoption of herbicides and fertilizers among rural farmers of Zone B Area of Kogi State Agricultural Development Project, Kogi State, Nigeria. *Asian Journal of Agricultural Science* 3(5), 389-392.
- Olanyanju, T. M. A; Akinto, R. & Oresanya, M. O. (2008). Effect of worm shaft spread moisture content and variety on oil recovery from expelled Beniseed. *Agricultural Engineering International* , 8,1-7.
- Onjuwu, S. S. (2009). Assessment of the adoption of sesame innovation among resources poor farmers in Nasarawa State, Nigeria. M.Sc thesis, Department of Agricultural Extension and Communication Federal University of Agriculture. Makurdi, Nigeria.
- Raw Materials Research and Development Council (2004). Survey Report of selected agro-raw materials in Nigeria. October , 1-4 .
- Swanson, B. E. (2008). Global review of good agricultural extension and advisory service practices. Rome: Food and Agriculture Organisation.