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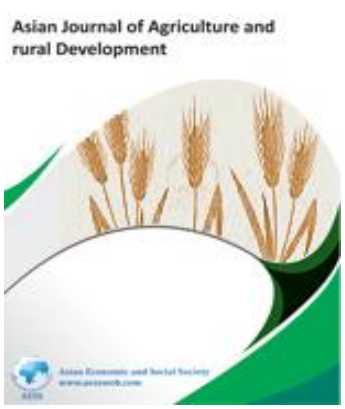

Socio-Economic Factors Affecting Adoption of Soya Bean Production Technologies in Takum Local Government Area of Taraba State, Nigeria

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Abstract

The study examined socio-economic factors affecting the adoption of soya bean production technologies in Takum Local Government Area of Taraba State, Nigeria. Interview schedules were administered to 180 respondents which were analyzed by the use of descriptive (frequencies and percentages) and inferential (multiple regression analysis) statistics. The study revealed that majority of the respondents adopted the recommended technologies with respect to improved seeds, planting time and harvesting time representing 52.20%, 50.70% and 68.90% respectively. While on the other hand, majority of the respondents did not adopt the recommended technologies with regards to fertilizer application, spacing, weeding frequency and the use of chemicals with 52.20%, 53.30%, 61.10% and 67.80% respectively. The regression analysis revealed that educational level, farming experience and sources of information had significantly and positively influenced the adoption of improved soya bean production technologies by respondents. The major constraints to adoption of soya bean production technologies by respondents were poor extension services (75.60%) and lack of credit facilities (72.20%. The study recommends that agricultural extension services should adequately be provided with input support services in the form of credit facilities among others.

Keywords: Adoption, Factors, Taraba State, Technologies, Soya bean

Introduction

Background to the study

Soya bean *(Glycine max L.)* is a leguminous crop that grows in tropical, sub-tropical and temperate climates (Adeniyan and Ayoola, 2006). It is originated from the peoples republic of china, other major producing countries include; U.S.A, Brazil and Argentina (Misari and Idowu, 1995). It was introduced to Nigeria in 1908 (Misari and Idowu, 1995).

The world experienced shortage of oil seeds immediately after the World War II which accelerated the drive for increased Soya bean production in Nigeria (Dugje et al, 2006). Furthermore, Soya bean cultivation in Nigeria has expanded as a result of its nutritive, economic and diverse domestic usage. The crop can be grown successfully in many states of Nigeria using low agricultural inputs (Idrisa, 2009). In the traditional Soya bean growing areas, it is most commonly intercropped with cereal crops like maize, sorghum and millet (Adeniyan and Ayoola, 2006). Soya bean is consumed as food (milk), used for production of edible oil, animal feeds, edible protein and for industrial purposes (Abdullahi, 2004).

Research efforts to improve the existing Soya bean varieties, to expand and increase production in Nigeria were initiated in different research institutes from the mid 1970's (Misari and Idowu, 1995). Notably among the various research institutes was the International Institute for Tropical Agriculture (IITA) by initiating research work on Soya bean in the 1970's and has made substantial effort to improve the output of the crop (Abdullahi, 2004). The good varieties of soyabean produced in Nigeria includes: TGX1448-2E, TGX1904-6F, TGX1830-2E; and TG X 1485-2E-ID (Adeniyan and Ayoola, 2006). Idrisa (2009) reported that, with the development of improved varieties, commercial production of soyabean has expanded beyond its "traditional home" (Benue, Kaduna, Niger and Plateau) states. It is now produced in other states, such as Bauchi, Borno, Jigawa, Kano, Kebbi, Kwara, Lagos, Nasarswa, Oyo, Sokoto, Taraba, Zamfara and Federal Capital Territory.

Improved technology is the systematic application of collective resources to solution of problems through the assertion of control over nature and all kinds of human processes (Roggers, 1993). This underlies the reason for the use of improved technology in the development of agricultural resources to make a better living. Dugje et al, (2006) reported the agronomic practices which are recommended for soyabean production in Nigeria to

include; site selection, land preparation, planting time, spacing and seed rate, fertilizer application, weed control, pest and disease control, harvest and storage. Yet the adoption of the recommended practices for production and management technologies for soyabean production is relatively low (Ani and Undiandeye, 2001). Therefore, it was found imperative to analyze the socio-economic factors affecting the adoption of improved farm technologies among soya bean farmers in Takum Local Government Area of Taraba State.

Statement of the Problem

Nigeria as a developing nation had long sought for the application of improved agricultural technologies through the launching of numerous projects and programmes. Notable ones are the Green Revolution (GR), Agricultural Development Programme (ADPs), and National Accelerated Food Production Projects (NAFPP), but with limited success. Despite all these efforts made by the Nigerian Government to boast agricultural production with a view to improving the living standard of the rural farm families, the effort have not been fairly reflected in the productivity of farmers, which remain at downtown of return to scale. This could be as a result of many constraints faced by farmers and thus, making it very difficult for improved agricultural technologies to be employed.

Some attempts have been made to study the adoption of farm technologies among soyabean farmers in Nigeria (Ani and Undiandeye, 2001; Idrisa, 2009). However, such studies did not address the factors affecting the adoption of improved farm technologies among soyabean farmers implied in Takun Local Government Area of Taraba State. The study was therefore conducted to fill this vacuum.

Objective of the study

The broad objective of the study was to examine the socio-economic factors affecting the adoption of improved farm technologies among soyabean farmers in Takum Local Government Area of Taraba State. The specific objectives were to:

i. identify the socio-economic characteristics of the respondents,
ii. examine the extent of adoption improved farm technologies among respondents,
iii. analyze the effects of socio-economic factors in adoption of improved farm technologies among respondents, and
iv. determine the constraints against adoption of improved farm technologies among respondents in the study area.

Methodology

The study area

The study was carried out in Takum Local Government Area (LGA) of Taraba State, Nigeria. The LGA is located between latitudes 7^0 3^1E and longitudes 10^0 01^1E of the equator; therefore, it lies on the southern part of the Guinea Savana zone of the state (Taraba State Agricultural Development Programme, 2009). The study area covers a land area of 600, 915km^2 with a population of 247, 657 (National Population Commission, 2006). The study area has dominant features of the middle belt of Nigeria with two main seasons: the wet and the dry season. The wet season usually starts from April and ends in November with an annual rainfall varying from 1250mm in the north to 2500mm in the southern part of the state per annum with an annual average temperature of 26.70^0C to 27.80^0C lowering towards the south (TSADP, 2009). The area is inhabited by a number of ethnic groups: Tiv, Kuteb, Chamba and Jukun who are predominantly farmers and engaged in different types of activities such as local craft, hunting, fishing and tailoring among others.

Sources of Data and Sampling Procedure

Primary source was mainly used for the study. These were generated from the respondents through the use of structured and pre-tested interview schedules which were administered by enumerators trained for the purpose under the supervision of the researchers. Secondary information sourced from textbooks, journal publications and records from Taraba State Agricultural Development programme (TSADP) were used to complement the primary data.

The sampling procedure was based on multi-stage random sampling techniques which give individuals of sampling unit equal chances of being selected. Among the five districts of the study area (kwambai, Takum I, Takum II, Chanchangi and Amadu), three districts were randomly selected (Amadu, Takum II and chanchangi) at the first stage. At the second stage, four villages were randomly selected from each of the three districts, making a total of 12 villages sampled. At the third stage, 15 respondents were selected from each of the villages, thereby giving a total of 180 respondents as the sample size for the study.

Data analysis

The analytical techniques employed for this study include the descriptive and inferential statistics. The descriptive statistics that were used to summarize the data were percentages and frequencies to measure objectives (i), (ii) and (iv).The inferential statistical tool used was multiple regression analysis to examine the effects of socio-economic characteristics on adoption of improved soyabean farm technologies among respondents (objective iii). The explicit form of the model was expressed as:

$$Y = F\ (X_1, X_2, X_3, X_4, X_5, X_6, X_7)$$

Where;

Y = Adoption of improved soya bean production technologies

X_1 = Age of household held (years)

X_2 = Sex of household head (male = 1, female = 0)

X_3 = Household size (numbers)

X_4 = Sources of information of household head.

X_5 = Farm size (hectare)

X_6 = Farming experience of household head (years)

X_7 = Educational level of household head

Results and Discussion

Socio-economic characteristics of respondents

The socio-economic characteristics of the respondents were examined with respect to their gender, marital status, age, farm size, household size and level of education as presented in Table 1. The study shows that majority (62.20%) were male, while female constitutes only 37.80% of the respondents. This implies that gender was a significant factor in agriculture, because of its vital role in determining farming activities in the study area. In addition, 68.90% of the respondents were married and were in their economically active and productive age (30-49years) representing 71.10% in the study area. This confirms with the report of Amaza *et al.* (2007) that most of the Nigerian farmers were between 30 and 50 years of age.

Table 1 also shows that 57.80% of the respondents cultivated less than one hectare of farmland, while 37.80% cultivated between 1 and 2 ha of farmland and only 4.40% cultivated above 2 ha of farmland. This was in agreement with that of Oriole (2009) who indicated that most of the soyabean farmers in Nigeria were small scale farmers, who cultivate less than 3 ha of farmland. The result further shows that most (24.20%) of the respondents had household size of 5-9 members. The implication could that provision of farm labour could not be a problem among the respondents. On the level of education, the result shows that most (41.10%) of the respondents had formal education. This implies that the respondents could apprehend the improved technologies being disseminated to them. The findings was not in agreement with that of Apata et al. (2010) and Tiwari (2010) who asserts that most of the Nigerian farmers have no formal education.

Extent of adoption of improved farm technologies by respondents

Respondent's extent of adoption of improved farm technologies was presented in table 2. The result shows that majority of the respondents; 52.20%, 56.70% and 68.90% adopted the recommended technologies with respect to improved seeds, planting time and harvesting time respectively. While on the other hand, majority of the respondents; 52.20%, 53.30%, 61.10% and 67.80% did not adopt the recommended technologies with respect to fertilizer application, spacing, mulching frequency and use of chemicals respectively. The study implies that the high level of adoption of the improved soyabean seed could be as a result of its availability which might aid the planting of the same at the time decided by the respondents. The adoption of harvesting time might not be unconnected to avoid post harvest losses. The study further implies that the non-adoption of fertilizer application, weeding frequency and use of chemical could be as a result of the high cost associated with these technologies, while that of the spacing could as a result of the technicalities involved in the recommended technology.

Effect of socio-economic characteristics on adoption of improved farm production technologies by respondents

Multiple regression analysis was conducted in order to determine the specific contribution of each independent variable and the total variance explained by all the variables on adoption of improved soya bean production technologies (Table 3). The result shows that the adjusted R^2 had a value of 0.819. This implies that the independent variables were able to explain the independent variables by about 82%. The F-value of 5.720 was significant at 5% level, indicating that the model fits. The study showed that the educational level, farming experience and sources of information had significantly and positively influenced the adoption of improved soya bean production technologies by respondents. While age and farm size had significant but negative influence among the respondents. The negative influence of age could be expected as a result of the fact that as a farmers grow old, there is tendency to reduce level of adoption as their ability to cope with various farm operation diminishes. The result indicated that sex and household size had no significant influence at 1%, 5% or 10% level of significance. The implication of the positive sign could be that an increase in each of this level would lead to an increase in the adoption level of respondents on the soya bean production technologies.

Respondent's constraints to adoption of improved farm production technologies

Table 4 shows the constraints against adoption of improved soya bean production technologies by respondents. The result indicated that the majority (54.40% and above) of the respondents agreed that all the variables were constraints to adoption of improved Soya bean production technologies with the exception of unavailability of market for produce with 24 respondents representing 35.60%. Notable among the constraints were poor extension services (75.60%), lack of credit facilities (71.10%), and high cost of fertilizer (72.20%). Poor extension services confirm the report by Tiwari (2010) that one of the major constraints of farmers was poor access to extension services. This implies that adoption level of the

respondents could be affected negatively. Constraints of credit facilities were also one of the major factors affecting the respondents. This was in agreement with that of Oriole (2004) who stressed that unless credit facilities are provided to small scale farmers, otherwise majority of them are seriously handicapped in adopting new and profitable farm technologies. The high cost of fertilizer among others was also a major constraint. The implication could that the respondents were unable to purchase the input as a result of the high price associated with the commodity (64.40%). However, the result reveals that majority (64.40%) of the respondents disagreed that unavailability of market for produce was a constraint. This could be as a result of the fact that market for Soya bean was readily available in the study area.

Conclusion and Recommendations

The study indicated that the adoption level of soya bean production technology was on the average in the study area. The socio-economic factors which positively affect the adoption of soya bean production technology were sources of information, farming experience and educational level of the respondents. However, the major constraint against the adoption of the technologies include poor extension services, lack of credit facilities and high cost of inputs such as fertilizer, chemicals etc.

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

1. Agricultural extension services should adequately be provided to respondents on soya bean production technologies in the study area.
2. Input support services in the form of credit facilities, fertilizer and chemicals should be provided with a view to enhancing adoption of soya bean production technologies.
3. Encouragement should be made to form soya bean cooperative societies by respondents in order to take advantage of government policies and programmes.

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Table 1: Distribution of respondents by socio-economic characteristics (N=180)

Socio-economics variable	Frequency (No.)	Percentage (%)
Gender		
Male	112	62.20
Female	32	37.80
Age (years)		
30 and below	22	12.20
30-39	52	28.80
40-49	76	42.30
49 and above	30	16.70
Marital Status		
Married	124	68.09
Single	46	25.06
Widow	10	5.50
Farming size		
Below 1	104	57.80
1-2	68	37.80
Above 2	8	4.40
Educational status		
Primary education	44	34.00
WAEC/SSCE/TC	16	35.00
Tertiary education	34	10.00
Adult education	24	13.30
None	64	35.50
Household size (number)		
Less than 5	74	41.10
5-9	76	42.20
10-15	24	13.30
16-20	4	2.20
Above 20	2	1.00

Source: Field survey, 2010

Table 2: Extent of adoption of improved technologies by respondents (N=180

	Adopted		Not adopted	
Technologies	**Frequency (No.)**	**Percentage (%)**	**Frequency (No.)**	**Percentage (%)**
Improved seeds	94	52.20	86	47.80
Planting time	102	56.70	78	43.30
Fertilizer application	86	47.80	94	52.20
Spacing	84	46.80	96	53.30
Weeding frequency	70	38.90	110	61.10
Use of chemicals	58	32.20	122	67.80
Harvesting time	124	68.90	56	31.10

Source: Field survey, 2010

* Multiple responses exist, hence % > 100

Table 3: Multiple regression results of the effect of socio-economic characteristics on adoption of soya bean farm technologies by respondents

Variable	Co-efficient	Std Error	t-value	Significance
Age (x_1)	- 0.0047	1.137	2.037**	0.045
Sex (x_2)	0.0990	0.021	4.309NS	0.000
Household size (x_3)	0.023	0.068	0.965NS	0.337
Sources of information (x_4)	0.0-132	0.057	2.024**	0.023
Farm size (x_5)	- 0.083	0.047	-3.543***	0.001
Farming experience (x_6)	0.046	0.214	0.036**	0.051
Educational level (x_7)	0.40	0.010	1.758*	0.082
R^2	0.846			
Adjusted R^2	0.819			
F – value	5.720**			
Source: Field survey, 2010				

*** significant at 1% level
** significant at 5% level
* significant at 10% level
NS Statistically insignificant

Table 4: Constraints against adoption of improved soya bean production technologies by respondents (N=180)

	Agreed		Disagreed	
Constraints	**Frequency (No.)**	**Percentage (%)**	**Frequency (No.)**	**Percentage (%)**
Lack of credit facilities	128	71.10	52	28.90
Unavailability of market for produce	64	35.60	116	64.40
Unavailability of improved seeds	98	54.40	82	45.60
Poor extension services	136	75.60	44	24.40
Insufficient land for farming	134	74.40	46	25.50
Constraints of labour	122	67.80	58	32.20
Poor transportation system	98	54.40	82	45.60
High cost of chemicals	122	67.80	58	32.20
High cost of fertilizer	130	72.20	50	27.80

Source: Field survey, 2010
*Multiple responses exist; hence % > 100