



Assessment of Extension Programmes and Technology Adoption In Suleja Local Government Area of Niger State, Nigeria

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ABSTRACT

The study assessed the cassava farmer's participation in extension programs and technology adoption in Suleja Local Government Area of Niger state, Nigeria. Multistage sampling procedures and purposive selection were used to select the sample size of 80 respondents. The data for the study was collected using a structured questionnaire while the analysis was done using frequencies, percentages and means. The finding from the study shows that 93.8% of the respondents were male, with mean age of 45years and 45% of the respondents were married with a mean household size of 7 persons. About 98.1% of the respondents had formal education. The mean farm size was 4 hectares and the mean income was ₦448,725:00K. The result also revealed that 93.8% of the respondents were aware of the cassava technology adoption for 3 years. The result further revealed that majority (47.6%) of the cassava farmers in the study area were informed of the new technology by their friends. Furthermore, majority (46.0%) of the respondents adopts the new innovation of using knapsack sprayers. About 68.8% of the respondents had extension agent visits and 56.2% participated in extension programmes. The farmers' perceived effects towards cassava technology showed that the adoption of improved cassava production practices is only used by the rich farmers ($\pi = 2.99$) ranked first followed by inputs for cassava production are not readily available ($\pi = 2.97$). The constraints to adoption of cassava technology in the study area include Lack of capital, Lack of information and climatic condition. Farmers should be encouraged to form cooperative societies to make fund and information available and extension service stations should be established for effective extension delivery programme were offered as recommendations.

Keywords: Assessment, cassava, participation, extension, technology

Introduction

Agriculture occupies a key position in the Nigerian economy judging by its critical role of providing food security, provision of employment, revenue generation and provision of raw materials for industrial development (Ajala, *et al.*, 2013). It continues to remain a major driver of economic growth in Nigeria especially from cassava production. Cassava is a crop with enormous potentials. It provides a stable food base for the food need of the populace, components in livestock feeds and raw materials for industries. Cassava also seems to be recording resounding success in sub-Saharan Africa out of the numerous stories of crop intervention failures in the region. As a result of this, many African countries have embraced its cultivation with renewed vigor. Cassava provides food and income to over 30 million farmers and large numbers of processors and traders in Nigeria (Abdoulaye *et al.* 2014). Despite cassava being regarded as poor man's food, is consumed by both rural and urban households.

Cassava production is dominated by small-holders farmers operating on a small-scale with fragmented plots and crude implements resulting into poor yield. The high tendency to serve as a relief crop to food insecurity because of its copious consumption in various forms by people and its ability to subsist and give appreciable yields on soils where many other crops fail to perform, has endeared its cultivation by many smallholder farmers. Majority of the cassava farmers are small-scale farmers who cultivate mostly less than 2 hectares of land using rudimentary implements. Generally, cassava farmers are constraint by a wide range of technical, institutional and socio-economic factors (Anaglo *et al.* 2020).

It is noteworthy that extension training programme could be accomplished by providing access to information and technologies. Moreso, by enhancing agricultural skills and practices, capacity to innovate, and address varied rural development challenges through training programs. Extension service providers usually foster the advancement of the agricultural sector by encouraging farmers' participation in training programmes for technology adoption. Most of the extension training activities are based on voluntary participation as farmers usually participate in a programme that addresses their needs and preferences. Participation of farmers in extension training programmes also gives them the chance to improve on their decision-making process and application of technical skills for increase agricultural production and income (Mwamakimbula, 2014)).

Even though considerable work has been done on adoption and the impact of extension service delivery among cassava farmers in Nigeria, participation of farmers to extension programs is not given much attention this affects the technology adoption in Suleja Local Government Area. It is against this background that this study assesses cassava farmers' participation in extension programme and technology adoption in Suleja Local Government Area of Niger State, Nigeria. The specific objectives are to: i. describes the socio-economic characteristics of the cassava farmers in the study area, ii. determine the level of farmers' awareness on cassava technology in the area, iii. identify the cassava technology

adopted in the study area, iv. determine the level of cassava farmers' participation in extension programs; v. analyze the perceived effects of cassava Technology Adoption in the study area and vi. identify the constraints to participation in extension programs in the study area.

Materials and Methods

The Study Area

The study was conducted in Suleja Local Government Area of Niger State. It is situated in the North-Central region of the country and shares borders with the Federal Capital Territory (FCT) to the south and Kaduna State to the north. Suleja is a bustling urban area and serves as a major satellite town to the capital city, Abuja. Suleja is geographically positioned between latitude 9°9'N and longitude 7°11'E. The local government area covers a land area of approximately 1,231 Km². Suleja Local Government Area has ten (10) wards namely: Bagama I, Bagama II, Hasimi A, Hashimi B, Iku South I, Iku South II, Kurmin Sarki, Magajiya, Maje North and Wambai. Suleja is located within the Nigerian Middle Belt region and enjoys a semi-arid climate and diverse tribes. Suleja has an estimate population of 284,903 people (NPC, 2006).

The economy of Suleja is diverse and multi-sectoral. The town hosts various commercial activities, including small-scale businesses, markets, and trading centers. Agriculture also plays a significant role in the local economy, with farming activities such as crop cultivation and animal husbandry being prevalent. The crops cultivated include the following: cassava, maize, millet and beans.

Sampling Techniques and Sample Size

The sampling frame of this study comprises of all cassava farmers in Suleja Local Government. A multistage sampling technique was used to collect the sample size for the study. The first stage involved a Purposive selection of four (4) wards from the ten (10) wards. The wards selected were Bagama I, Bagama II, Kurmin Sarki and Wambai. These wards were selected based on the dominance of cassava producers in the study area.

Table 1: Sampling Techniques, Sample Size and Location of the Study

S/N	Wards	Villages selected	Number of Respondents
1	Bagama I	Dikko, Numba	10 10
2	Bagama II	Numba	10
3	Kurmin Sarki	Numba Sarki	10
		Maje	10
4	Wambai	Kwamba	10
		Konkwashi	10
	Total		80

Source: Field survey, 2023

The second stage involved a selection of two (2) villages each from the selected wards to make a total of eight (8) villages. The third stage involved a Simple Random Selection of ten (10) cassava farmers from each of the selected villages to make a total of one eighty (80) respondents as sample size for the study (Table 1).

Data Collection

Both primary data and secondary information will be used for this study. Primary data will be collected with the aids of questionnaires to be administered by the researcher with the help of enumerators from the Suleja Local Government. The questionnaires will be used to collect data on specific objectives of the study. Likert type scale was used to collect data on farmers’ perception at five points namely: strongly agree = 5, agree = 4, undecided = 3, strongly disagree = 2, disagree = 1.

Data Analysis

Data for this study will be analyze using descriptive statistics (frequency, percentages and mean), to achieve the specific objectives (Objectives i –vi). Objective v was achieved by analyzing the information obtained on perception using Likert scale.

Results and Discussion

Socioeconomic Characteristics of the Respondents

Table 2 shows that 37.5% of the respondents were within the age of 20– 30 years, 33.8% within the age of 31 – 40 years, 22.5% within the age of 41- 18% and 6.2% above 50 years old with mean age of 47 years in the study area. This implies that the respondents were at productive age. This finding is related to Stephen and Eric (2009), who reported that cassava farmers in their study area were in their reproductive years with the mean age of 42 years.

The table 2 reveals that 93.8% of the respondents were male and 6.2% of the respondents were female. This implies that male dominate female in cassava production. Farming generally requires energy which could be handled effectively by male while processing requires less energy which could be handled effectively by female.

Table 2 shows that 45% of the respondents were married, 38.8% were single and 16.2% were widowed. This ensures availability of labour supply in the near future as most farmers married for the purpose of pro-creation that will give a helping hand on the farm.

Table 2 reveals that 33.7% of the respondents had household size within the range of 1 – 7 persons, 56.3% had 8 – 14 persons and 10% had more than15 persons. The mean household size in the study area was 7 persons. This implies that the cassava farmers have relatively large household size which could assist in the farm as family labour.

Table 2 shows that 48.8% of the respondents had primary education, 27.5% had secondary education, 18.8% had tertiary

education and adult education was 5%. This implies that the respondents in the study area had formal education.

Table 2 reveals that 93.8% of the respondents had farming as their primary occupation and 6.3% were traders. This implies that majority of the respondents engaged in farming for their livelihood.

Table 2 shows 70% of the respondents had farm size within the range of 3-5 hectares, 15% less than 3 hectares and15% also, having more than 6 hectares. The mean farm size in the study area was 4 hectares. Farm size is affected by many factors including household size, available arable land, level of capital of the farmer among others.

Table 2 reveals that 20% of the respondents earned between ₦100,000 – ₦299,999 per annum, 43.8% earned ₦300,000 to ₦499,999 per annum, 12.4% earned ₦500,000 to ₦699,999 per annum and 23.8% earned more than ₦700,000 per annum. The mean annual income was ₦448,725: 00K.

Table 2: Distribution of Respondents based on Socioeconomic Characteristics

Variables	Frequency	Percentage	Mean
Age (years)			
20- 30	30	37.5	47 years
21- 40	27	33.8	
41-50	18	22.5	
>50	5	6.2	
Sex			
Male	75	93.8	
Female	5	6.2	
Marital status			
Married	36	45.0	
Singled	31	38.8	
Widowed	13	16.2	
Household size (in number)			
1 – 7	27	33.7	
8 – 14	45	56.3	
>14	8	10.0	
Educational status			
Adult education	75	93.8	
Primary	5	6.3	
Secondary education	12	15	
Tertiary education	56	70	
Occupation			
Farming	16	20.0	
Trading	35	43.8	₦448,725:00k
Farm size (hectares)	10	12.4	
< 3	11	20.0	
3- 5	6	10.9	
>5	4	7.3	
Annual income (₦)			
100,000	2	3.6	
-	32	58.2	

299,999
300,000 -
499,999
500,000 -
699,999
Extension visits
Once per month
Twice per month
Thrice per month
Four visits per month
No visits

Source: Field survey, 2023

This implies that cassava farming is lucrative in the area and the farmers are earning substantial amount of money per annum. This further implies that the respondents will adopt the cassava technology because it yields more money.

Table 2 shows that 20% had extension agent visits once in a month, 10.9% had visits twice in a month, 7.3% had visits thrice in a month and 3.6% had visits four times in a month. This implies that cassava farmers in the study area had extension agent visits during their growing season. The presence of extension agents in respondents' farms is catalysis to adoption of cassava technology.

Farmers' Awareness of Cassava Technology

Table 3 reveals that 93.8% of the respondents were aware of cassava technology while 6.3% were not aware. This implies that the respondents were aware of the technology that was the main reason they adopted it. This agreed with Ani (2007), Yakubu (2011) and Ubandoma, *et al.* (2016). They states that awareness of technology leads to its adoption.

Table 3 shows that 47.6% of the respondents know the technology from their friends and 13.85 know the new technology from extension agents. This portray the significance of farmer – to – farmer contact as it is very important in dissemination of agricultural information especially in small-scale farming system.

Table 3: Distribution of Respondents based on Awareness, Source Awareness, Types of cassava Technology and Duration of Cassava Technology Adoption

Cassava Technology	Frequency	Percentage	Mean
Awareness			
Yes	75	93.8	
No	5	6.3	
Sources of Awareness			
Friends	38	47.6	
Colleagues	31	38.8	
Extension agents	11	13.8	
Types of cassava Technology			
Improved seeds varieties	14	28.0	
	7	14.0	
	23	46.0	
	6	12.0	

Fertilizer application at correct rates	14	17.5	3 years
Using knapsack sprayers in the farm	42	52.5	
Using machines	21	26.3	
Duration of Adoption	3	3.7	
<1 year			
1 – 3 years			
4 – 5 years			
>5 years			

Source: Field survey, 2023

Table 3 shows that 46% of the respondents adopted Knapsack sprayers, 28% of the respondents adopted improved seeds varieties, 14% adopted fertilizer application at the correct/recommended rates and 12% adopted machines such as tractor, planter and harvester or their farming operations. The low in percentage adoption of this technology could be attributed to the fact that the farmers in the study area are peasant farmers hence may not be able to afford the cost of these technologies.

Table 3 further reveals that 42% of the respondents had between 1-3 years of cassava technology adoption, 21% had between 4-5 years and 3% above 5 years with the mean of 3 years of adoption in the study area. This implies that the more the years of adoption the more the respondents awareness of technology and benefits.

Farmers' participation in extension programs

Table 4 shows that 56.2% of the respondents participated in extension programmes and 43.8% did not participate. The table further revealed the level of participation of respondents in extension programmes. The result showed that 62.3% of the respondents participated very often, 8.9% participated often, 4.4% participated mildly often and 24.4% of the respondents do not participate in extension programme. The participation in extension programmes leads to awareness, interest, willingness, evaluation, trial and adoption of technology.

Table 4: Distribution of Respondents based on Extension Programme Participation

Variables	Frequency	Percentage
Participation extension programme		
Yes	45	56.2
No	35	43.8
Level of participation		
Very often	28	62.3
Often	4	8.9
Mildly often	2	4.4
I don't attend at all	11	24.4

Source: Field Survey, 2023

Farmers’ Perceived Effects of Cassava Technology

Table 5 shows all the statements were positive except for not suitable to all environment (\bar{x} = 2.81) and they consumed much time (\bar{x} = 2.70) respectively while it is used by the rich farmers (\bar{x} = 2.99) rank first as the highest mean score which implies that cassava farmers in the study area things only rich farmers are opportune to adopt improved production practices.

Table 5: Distribution of Farmers’ Perceived Effects of Cassava Technology

Perceived Statements	N	Min	Max	Std error	Mean
It is used by the rich farmers	80	1	5	0.84	2.99
Inputs are not readily available	80	1	5	0.69	2.97
It requires more capital outlay	80	1	5	0.88	2.90
Better quality than local variety	80	1	5	0.75	2.86
They are not culturally suitable	80	1	5	0.84	2.81
Greater yield than local variety	80	1	5	1.04	2.74
Improved practices are only for the educated	80	1	5	0.91	2.71
They consumed much time	80	1	5	0.91	2.70

Source: Field data survey, 2023

N: number of respondents, Min: minimum, Max: maximum and Std error: standard error

Constraints to Adoption of Technology

Table 6 shows that 14.71% of the respondents had constraints as Lack of capital as one of the major constraints faced by cassava farmers in the study area and ranked 1st. Abdoulaye et al. (2019) reported fund as a major factor inhibiting smallholder farmers from adopting modern inputs. Lack of information and difficult to cultivate were also identified as severe constraints as they both ranked 2nd. Other constraints such as climatic condition 9.56%, lack of education 7.35%, shortage of labour; lack of market, late supply 6.62% each, farm size and not available 4.41% were ranked 4th to 9th respectively.

Table 6: Distribution of Respondents based on Constraints to Adoption

Problems	Frequency	Percentage	Rank
Lack of capital	20	14.71	1 st
Lack of information	17	12.50	2 nd
Difficult to cultivate	17	12.50	2 nd
Climatic conditions	13	9.56	4 th

Shortage of labour	9	6.62	5 th
Lack of market	9	6.62	6 th
Late supply	9	6.62	7 th
Farm size	6	4.41	8 th
Not available	6	4.41	9 th

Source: Field data survey, 2023

Conclusion and Recommendations

The findings from this study shows that the respondents were young and active, married, mostly male and had formal education. More than half of the respondents participated in extension programmes in the study area. Also, the respondents were aware of cassava technology and majority adopted it with 3 years of adoption. Among the cassava technology adopted were using improved seeds varieties, using knapsack sprayers and used of machines. The perceived effects of cassava technologies were positive. The constraints to adoption of cassava technology were lack of capital, lack of market and farm size. The respondents participated fully in extension programmes.

The study recommendations that:

- i. Farmers should be encouraged to form cooperative societies to make fund available for their agricultural activities.
- ii. Extension service stations should be established for effective extension delivery programme.
- iii. The Government should invest in agricultural sector to encourage diversification of cassava products, that is- value addition.
- iv. There should be provision of credit input materials to farmers. These will encourage undercapitalized farmers to adopt improved cassava technology for better production
- v. Government should encourage the youths who are sources of labour and more active in cassava production by giving them financial grants and/credit to discourage rural-urban migration for white-collar jobs.

References

Abdoulaye, Tahirou, A. Abass, B. Maziya-Dixon, G. Tarawali, R. U. Okechukwu, J. Rusike, A. Alene, Victor M. Manyong, and B. Ayedun. (2014). “Awareness and Adoption of Improved Cassava Varieties and Processing Technologies in Nigeria.” *Journal of Development and Agricultural Economics* 6(2):67-75.

Abdoulaye, Tahirou, A. S. Bamire, Adewale Oparinde, and A. A. Akinola (2019). “Determinants of Adoption of Improved Cassava Varieties among Farming Households in Oyo, Benue, and AkwaIbom States of Nigeria.” *Gates Open Research* (2):1-17.

- Ajala, A. O., S. I. Ogunjimi, and A. J. Farinde (2013). "Assessment of Extension Service Delivery on Improved Cassava Technologies among Cassava Farmers in Osun State, Nigeria." *International Journal of Applied Agriculture and Apiculture Research* 9(1-2):71-80.
- Anaglo, J. N., G. Antwi, S. A. Manteaw, and N. A. Kwabong (2020). "Influence of Agricultural Information Sources on The Practices And Livelihood Outcomes of Cassava Farmers in Eastern Region Of Ghana." *Journal of Sustainable Development* 17(2):2-10.
- Ani, A.O. (2007). *Agricultural Extension: A Pathway for Sustainable Agricultural Development*. 1st edition. Kaduna: Apani Publications.179.
- Mwamakimbula, Alunas Maxwell (2014). "Assessment of the Factors Impacting Agricultural Extension Training Programs in Tanzania: A Descriptive Study." *Graduate Theses and Dissertations*. 14227.
- Stephen, K. A., and K. G. Eric (2009). "Modification of the Designs of Cassava Grating and Cassava Dough Pressing Machines into a Single Automated Unit." *European Journal of Scientific Research* 38(2):306-16.
- Ubandoma G.A., Umar, B.F., Abubakar, B.Z. and Abubakar, S.D. (2016). Assessment of Farmers' Awareness of Climate Change and Adaptation measures in the Northern Zone of Sokoto State Agricultural Development Project. *Journal of Agriculture and Environment* : Vol.12. No.2. Page 47-58.
- Yakubu, .D.H. (2011). Socioeconomic Factors Affecting the Adoption of ICTs by Extension Workers in the North-West Zone of Nigeria. Unpublished M.Sc. Dissertation, Department of Agricultural Extension and Rural Development, Usmanu Danfodiyo University, Sokoto. Page 41-43.

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