

Attitude of Arable Crop Farmers Towards Adopting Agricultural Technologies in Etche Local Government Area of Rivers State

¹Manoah, E. A., ²Binaebi, E. & ³Odudu, V.

^{1&3}Department of Agricultural Extension and Rural Development,
Rivers State University
Nkpolu-Oroworukwo, Port Harcourt

²Department of Agricultural and Applied Economics,
Rivers State University
Nkpolu-Oroworukwo, Port Harcourt
ebisteve2008@gmail.com

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Abstract

The study examined the attitude of crop farmers towards adopting agricultural technologies in Etche Local Government Area of Rivers State. Specifically, the objectives of the study were to describe the socioeconomic characteristics of the respondents in the study area, ascertain the level of awareness of agricultural technologies in the study area examine the attitude of crop farmers towards the adoption of new technologies in the study area, determine the level of adoption of agricultural technologies and ascertain the factors that hinders crop farmers from adopting agricultural technologies in the study area. Questionnaire and interview schedules were used to gather information. A total of 100 respondents were used. Data were analysed with the use of percentage, frequency and mean score derived from Likert scale. Findings showed that (59%) of the sampled respondents were females, (51%) of the sampled respondents were within the age of 31-40. About (53%) of the respondents were married. About (69%) of the size of 4-6 persons. (46%) of the respondents had farming experience of 2-5 years and (39%) of the respondents earned 11,000-30,000 naira's as their income. The study further revealed that most of the respondents were aware of all the listed agricultural technologies in the study but only adopted a few. All the challenges listed in the study were identified as constraints to adopting agricultural technologies by the respondents. The study recommends that the cost of agricultural technologies should be subsidized by government to enable rural farmers acquire them in appropriate time, there should be recruitment of more extension field agents to enable effective extension service delivery and communication, also there is an urgent need for a change in people's attitude towards agricultural technologies especially among the youths who are the future.

Keywords: Arable Crops, Farmers, Agricultural Technology, Adoption

INTRODUCTION

Agricultural technology refers to the use of technology in agriculture, horticulture, and aquaculture with the aim of improving yield, efficiency, and profitability. Agricultural technology can be products, services or applications developed in agriculture that improve various input/output processes (National Institute of Food and Agriculture (NIFA), 2020). The history of agriculture has been shaped by technological advances. Historians have described a number of agricultural revolutions, which identify major shifts in agricultural practice and productivity.

Adaptation helps farmers achieve their food, income and livelihood security objectives in the face of changing climatic and socioeconomic conditions, including climate variability, extreme weather conditions such as droughts, floods and volatile short-term changes in local and large scale market (Kandlinker & Risbey, 2000). Farmers, can reduce the potential damage by making tactical responses to these changes. Analyzing adaptation is therefore important for finding ways to help farmers adapt in the rural economics of Nigeria on a sustainable basis (Henry & Adedapo, 2013).

In South-east rainforest zone of Nigeria, the common adaptation practices used by farmers are the portfolio diversification and soil conservation practices (Onyeneke & Madukwe, 2010). While in some part of the south southern mangrove swamps zone of Nigeria, the common adaptation practiced employed by farmers are delaying time of planting. After the first or second rain they watch the rain for a while to ensure that rain falls regularly enough before planting. This is done to prevent crops from drought when rain is delayed (Etiosa & Matthew 2007).

Another way rural farmers in this region overcome this problem is by using fast-maturing varieties. These fast-maturing varieties like maize with high yields have been introduced and are being used by farmers. The risk involved in this strategy is that local species are being displaced by improved species though some rural farmers still cultivate the local ones. In future, new and improved species may lead to the extinction of local ones. It is therefore important that the right mechanisms are put in place to protect local species from extinction and to strengthen community cohesiveness that will help protect traditional indigenous knowledge for responding to climatic viability in the study area (Henry & Adedapo, 2013).

The Niger Delta is highly susceptible to adverse environmental changes, because it is located in the coastal region of the world. Coastal regions of the world are already experiencing flooding due to rise in sea level. Amid the impact of climatic change, the region is also faced with myriads of environmental problems, resulting from oil exploration and exploitation activities (Etiosa & Matthew 2007).

Increasing agricultural efficiency is critical to satisfying the nations rising need for sustenance. The world's largest economic sector is agriculture, and a greater number of individuals are engaged with the agriculture than in all different occupations put together (EU, 2009). The population of the world is increasing rapidly; necessitating the need to ensure food security, which is hinged on effective and efficient agricultural production (Okidim, Odukwo & Ozah, 2023).

In a developing country such as Nigeria, a significant progression of appropriate improved technology provides a means of acceptance and eventual adoption among farmers. Adoption of improved technologies, especially improved pearl millet seed as the name implies, is a necessary precondition for plant breeding, thus creating a beneficial effect on farm households (Bantilan, *et*

al., 2006). Nonetheless, the effect can be achieved by growing the crop, improving the quality and reducing the risk of production.

OBJECTIVE OF THE STUDY

This was achieved through the following objectives:

- i. describe the socioeconomic characteristics of the respondent
- ii. ascertain the level of awareness of agricultural technology in the study area.
- iii. identify the types of arable crops grown in the study area.
- iv. determine the level of adoption of agricultural technologies in the study area
- v. identify the benefits of adopting agricultural technologies.
- vi. ascertain the factors that hinders the farmers from adopting agricultural technology.

METHODOLOGY

Study Area

Etche LGA: Etche, an ethnic nationality, is located in the northeast of Rivers State. It is bound in the east by Abia State, in the north by Imo State, in the west by the Ikwerre local government area, and in the south by the Obio/Akpor local government area. The land mass of Etche comprises of 97,500 hectares (376.5 square meters) with a population estimated to be about 600,000. Etche is nestled in two Local Government Areas of Rivers State – Etche and Omuma Local Government Areas (making up a National Assembly Constituency).

The Etche heritage is easily discernible in her distinct language, culture and tradition, with her symbolic ethnic head anchored on the stool of the paramount ruler OnyiIshi-Etche. In order to avoid confusion as to her relationships with other areas, it is important to note that Etche is neither Oyigbo nor Ibo. Additionally, it should not be viewed as a part of the Ikwerre. On the contrary, these areas are Etche's neighbours; with existing cordial and intense relationships with Etche.

The people of Etche are mostly engaged in agriculture, earning the nickname 'the food basket of the state'. Etche is one of the host communities of the government-owned multi-billion-naira palm oil production company Risonpalm now SIAT NIG. LTD, as well as Delta Rubber Production Company. In recent times, real estate development has grown in the area with rapid expansion going on in Igboh-Agwuruasa, Ulakwo-Umuselem, and Okehi Clans. Cassava, plantain, banana and yam are important crops. Agricultural plantation (notably Rubber, palm oil, pineapple, and plantain) was encouraged by the Eastern Nigerian government but this has since lost steam. Agriculture is mostly not mechanized and the use of tractors for farming these crops has dropped slightly in the 1986–date period.

Research Design

Survey research method was used in this study. The population of this study comprise all crop farmers in Etche Local Government Area of Rivers State. There are 271 registered crop farmers in Etche LGA (Agricultural Development Programme, 2022).

Sampling Procedure and sample size

Random sampling technique was used to select 2 communities from each of the 5 clans making it 10 communities and then purposive sampling was used to select 100 crop farmers from the communities.

Method of Data Analysis

To achieve the objectives of the study collected data were analysed using descriptive statistics such as frequency distribution, percentage mean. They were used to describe the data collected.

Objective 1, and 3 were actualized using percentage and frequency, while objective 5 and 6 were actualized using a 5 point Likert scale. Objective 2 with the use of 4-point Likert-type scale of Highly Aware, Aware, Fairly Aware, and Not Aware measures the level of awareness of agricultural technologies in the study area. Objective 4 which measured the level of adoption of agricultural technologies by crop farmers was realized using a four point Likert scale with the options VHE, HE, LE, and VLE.

RESULTS AND DISCUSSIONS

Table 1: Frequency distribution of respondents according to their Socio-Economic Characteristics

Variable	Frequency	Percentage %	Average
Sex:			
Male	41	41	
Female	59	59	
Age Range (Years)			
21 - 30	30	30	44 years
31 – 40	51	51	
41 – 50	12	12	
Above 51	7	7	
Marital Status			
Single	38	38	
Married	53	53	
Divorced	3	3	
Separated	3	3	
Widowed	3	3	
Level of Education			
Primary	8	8	
Secondary	56	56	
Tertiary	29	29	
Not educated	7	7	
Household size			
1 - 3	12	12	5 persons
4 – 6	69	69	
7 – 9	12	12	
10 – above	7	7	
Farming Experience (Year)			
2 -5	46	46	8 years
6 – 10	29	29	
11 – 15	15	15	
Above 15	10	10	
Farming Status			
Full Time	41	14	
Part Time	59	59	
Income Per month (₦)			

11,000 – 30,000	39	39	₦ 55,000
31,000 – 50,000	25	25	
51,000 – 70,000	19	19	
Above 70, 000	17	17	

Source; field survey data, 2023.

Socio Economic Characteristics of Respondents

Socio-economic characteristics of farmers form an important aspect of the study as it captures respondent's sex, age, marital status, level of education, household size, income level and farming status. The analytical result is presented in table 1 below using frequencies and percentages.

Table 1 shows the socio-economic characteristics of the respondents. The table revealed that most (59%) of the respondents were female while 41% were male. This difference in favour of female could be due to the fact that women were predominantly crop farmers while their male counterpart are mostly involved in livestock and fish farming in Nigeria. Women make essential contributions to the agricultural and rural economics in all developing countries. Rural women in the study area often manage complex household and pursue livelihood strategies activities include producing agricultural crops.

The table also revealed that 51% of the crop farmers in the area were within the ages of 31-40 years, 30% were within the ages of 21-30, 12% were within 41-50 years while just 7% the farmers were above 51 years, with an average age of 44 years. This could mean that crop farmers in the study area are young energetic and active. They are in their productive age. Oluwatayo and Oluwatayo (2012) noted that the mean age of active farmers in Nigeria falls around 44 years old. This is so because producing agricultural crops requires the activities of strong, active and energetic people. Among the respondents, 53% and 38% are married and single respectively while 3% each are divorced, separated and widowed. The findings could mean that the respondents are married for procreation as a way of raising families that could serve as source of farm labour force. According to the table, most (56%) of the farmers had secondary education as their highest level of educational qualification, 29% and 8% obtained tertiary and primary education qualification respectively while, while 7% of them do not have formal education. This implies that over 90% of agricultural crop farmers in the study area had one level of formal education or the other. This decision may be because the respondents have the understanding that education is the key to effective decision making in crop production. The role of education in agricultural production cannot be over emphasized. Education is power and a potent tool for all round development

The table also revealed that majority (69%) of crop farmers in the study area belong to household size of between 4-6 persons, 12% each of the farmers are members of family with household size of 1-3 and 7-9, with only 7% being a member of 10 persons and above. The average household size was revealed to be 5 persons per household. The result is in line with the findings of Wizor and Wili (2019) which revealed average household size in Nigeria to be about six persons per household. This is relatively large household size. Large households could exert greater impact on the farm labour. Usman, Sahhu and Musa (2016) opined that large household size is a human capital available for agricultural production. It is likely that members of the household could be used as farm labour (Adebayo, 2012).

The table further revealed that 46% of the respondent had farming experience of above 2-5 years, 29% of the respondents had farming experience of 6-10 years, 15% of the respondents had farming

experience of 11-15 years with 10% having an experience of above 15 years and above. The average farming experience of the crop farmers is 8 years. This could mean that the farmers have considerable good level of experience in the farming subsector and as such could use this expertise judiciously for improved livelihood. Usman, Sahhu and Musa (2016) maintained that experience is a vital tool for improved crop production. 59% of the farmers carry out the farming venture in a part time basis. This could imply that most of the crop farmers are engaged in other productive ventures other than farming. Also, the table shows that 39% of the respondents earn less than N30,000 monthly, 25% earned between N31,000-N50,000 monthly, 19% earned N51,000-N70,000 while 17% of the respondents earn above N70,000 while 44% of the farmers earn between N31,000 = N70, 00 on monthly basis.

The average income of the farmers per month was found to be N55,000. This could mean that crop production in the study area is an income generating venture. This is consistency with the findings of (Adebayo, 2012). who reported that the average income realized in crop farming in Jos, Plateau state per individual on monthly period was N52,000. This income is important to the farm family because it will enable them to purchase the food they are unable to grow (Adebayo, 2012).

Table 2: Distribution of respondents according to their awareness of agricultural technologies

S/No	Agricultural Crop Production Technologies	Level of Awareness				Mean
		HA	A	FA	NA	
1	Irrigation technologies	70	7	3	20	3.27
2	Minisett technologies	9	3	20	68	1.53
3	Pest control	81	10	1	8	4.26
4	Organic farming	50	20	2	28	2.92
5	New varieties (improved planting material)	19	46	6	29	2.55
6	Herbicides	6	39	2	53	1.98
7	Fertilizer	71	19	1	9	3.53
8	Preservation technologies	22	40	19	19	2.65
9	Planting space technologies	21	81	17	44	2.16

Source; Field Survey Data, 2023

G.M = 2.76

Criteria mean = 2.5; HA = Highly aware, A = Aware, FA = Fairly Aware and NA = Not Aware. Table 2 shows respondent's distribution based on their level awareness of agricultural technologies. The table revealed that majority ($\bar{X}=3.27$) of the respondents are aware of pest control technologies. This may imply that is an essential cultural practice in crop production. Pest control is an age long management practice to keep pests at bay in the farmland in other to foster improved crop production and environmentally sustainable agriculture. In traditional Nigeria, physical, biological and chemical methods have been adopted by farmers to control pests to ensure optimal crop performance (Udoh *et al.* 2005).

The table further revealed that the farmers affirmed that they are aware of fertilizer ($\bar{X}=3.52$) and preservation ($\bar{X}=2.65$) as agricultural crop technologies. This result may imply that the

respondents understand the importance of fertilizer use, crop preservation and processing of crop produce.

The study also revealed that ($\bar{x}=3.27$) of the farmers affirm that they are aware of irrigation technologies. This result may be because irrigation technologies are as old as the world and its practice is cost effective. The awareness and practice of irrigation among crop farmers in Nigeria is vital or successful green revolution all year round to achieving high crop productivity to aid food security, socio-economic and rural development which are the essence of the venture (Adelodun & Choi, 2018).

($\bar{x}=2.92$) and ($\bar{x}=2.55$) of the respondents indicated that they are aware of organic farming and new crop varieties. The implication of this result may be that organic farming and adoption of new crop varieties are most common among farmers in recent times. This result is in line with the findings of Olutokunbo and Ibikunle (2011) who assert that farmers in Ekiti State are aware and adopted organic farming in crop production. This awareness record could help the farmers to convert to organic food production which is a highly recommended healthy food substance. This would be effective if they are encouraged and motivated, since they have started practicing organic farming.

Whereas, only the mean score ($\bar{x}=2.16$), ($\bar{x}=1.98$) and ($\bar{x}=1.53$) of the respondents were aware of planting space technologies, herbicides and minisett technologies respectively. This may be probably because they are relatively more recent concepts in the study area.

Table3: Type of Arable crops in the study area.

S/No	Arable Crops	Freq.	Percentage	Rank
1	Cassava	100	100	1st
2	Maize	90	90	3rd
3	Okoro	95	95.0	2nd
4	Yam	65	65.0	4th
5	Sweet potato	35	35.0	5th

Source: field survey data, 2023

Table 3 revealed the type of arable crops grown by the respondents in the study area. It showed that cassava (100%), Okoro (95%), Maize (90%) Yam (65%) and potato (35%) were grown in the study area. This could be because of the soil type available in the study area as the respondents claimed that other arable crops could not thrive in the area.

Table 4: Level of adoption of Agricultural Technologies

S/N	Technology Type	VHE	HE	LE	VLE	Mean
1	Irrigation technologies	20	34	20	26	2.48
2	Minisett technologies	26	23	20	31	2.44
3	Pest control	35	27	13	25	2.71
4	Organic Farming	14	17	28	41	2.04
5	New/Improved varieties	28	33	16	23	2.66
6	Herbicides	24	24	12	40	2.32
7	fertilizer	46	29	11	14	3.07
8	Preservation technologies	40	26	11	23	2.83

9	Planting space technologies	32	17	16	35	2.46
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Source: Field Survey Data, 2023.

G.M = 2.56

Criterion mean = 2.5; VHE = Very High Extent, HE = High Extent, LE = Low Extent, VLE = Very Low Extent.

Table 4 shows the distribution of the respondents according to level of adoption of agricultural technologies. The study indicated that fertilizer (3.07), preservation (2.83), pest control (2.71) and improved varieties (2.66) were the only technologies adopted by the respondents.

The table revealed that the respondents agreed that the use of inorganic that fertilizer was adopted in the crop production. This may be due to the fact fertilizer use in crop farming is higher recommended as it leads to increase in yield. This result is in line with the findings of Usman, *et al.*, (2016) who maintained that fertilizer use is quite common in Nigeria. The result of the analysis as shown in Table 4.4 also indicates that crop farmers in the study area adopted the use of improved varieties of production inputs ($\bar{X} = 2.66$). this result may be because the crop farmers in the study area understands that adoption of improved production technologies encourages better yield and improves income of the famers thereby increasing their standard of living.

The table further revealed that the respondents rejected minisett technologies ($\bar{X} = 2.44$), herbicides ($\bar{X} = 2.32$), planting space technologies ($\bar{X} = 2.46$), and irrigation ($\bar{X} = 2.48$). This could be because the following agricultural technologies are totally new to the respondents and their cost is above their ability and reach.

Table 5: Benefits of adopting agricultural technologies

S/N	Benefits	SA	A	D	SD	Mean
1	Agricultural development	48	37	15	0	3.33
2	Development of high crop yields.	37	41	21	1	3.14
3	Development of pest resistant varieties	31	36	30	3	2.95
4	Employment in Agri. Industry	36	36	27	1	3.07
5	Establishment of Agric Industry	31	39	29	1	3.00
6	Food security	39	38	21	2	3.14
7	Large scale production	40	41	17	2	3.19
8	Socio-economic and cultural stability	21	42	36	1	2.83
9	Technological advancement	27	40	32	-	2.92
10	Increase production	40	36	24	-	3.16
11	Large scale farming	42	39	18	1	3.22
12	Improve rural economy	28	42	29	1	2.97

Source: field survey data, 2023.

G.M = 3.08

Criterion mean = 25; SA =Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree.

Table 5 shows the respondents distribution according to benefits of adopting agricultural technologies. The table revealed that the respondents adopted technologies for the benefit of agricultural development ($\bar{X} = 3.33$). This result may be due to the fact that crop producers in the study area see agricultural development as an important aspect of strategic aspect of livelihood improvement. This is why different government of developing nations of the world has continued to encourage her farmers to adopt new improved agricultural technologies to ensure development

in the agricultural sector. This is because agricultural development in any nation depends largely on technological adoptability of that nation (Udoh *et al.* 2005).

The respondents adopted agricultural technologies for the benefit of cultivating high improved crop varieties ($\bar{X} = 3.14$) and pest resistance varieties ($\bar{X} = 2.95$). This result may be due to the fact that crop pest is a major challenge facing crop farmers and adopting the cultivation of pest resistance will help the farmers increase yield which will in turn lead to increase income with the resultant improvement in rural livelihood.

Establishment of agricultural industry and job creation in the industry were agreed to be another benefits derived from adopting agricultural technologies ($\bar{X} = 3.00$ and $\bar{X} = 3.07$ respectively). This implies that new technologies used in crop production enable job creation and business establishment. This is so because agricultural practice is good employer of labour and an ideal business venture.

Food security ($\bar{X} = 3.14$) and sufficiency are twin benefits of technology adoption as indicated by the respondents. This may be because most countries of the world are in a dire need of attaining this freedom. African countries are faced with the task of producing adequate food, supplies of their teeming populations. This is coming as a result of the significant improvement in medical services, better eating and living habits and more peaceful-existence across national and tribal boundaries, thereby forcing farmers to meet the high demand of food and other essential farm resource.

Other benefits derived from adopting agricultural technology as shown in table 4.5 include large scale production ($\bar{X} = 3.19$), socio-economic and cultural stability ($\bar{X} = 2.83$), increase production ($\bar{X} = 3.16$), technology advancement ($\bar{X} = 2.92$) and improved rural economy ($\bar{X} = 2.97$).

Table 6: Factors that Hinders Crop Farmer from Adopting Agricultural Technologies

S/N	Factors	SA	A	D	SD	Mean
1	Personal characteristics	33	37	22	8	2.95
2	Cultural values, beliefs & norms	28	34	30	8	2.82
3	Relative advantage	10	41	49	-	2.61
4	Triability (Divisibility)	17	32	50	1	2.65
5	Visibility	13	39	46	2	2.63
6	Cost	52	38	10	-	3.42
7	Complexity	36	35	28	4	3.09
8	Lack of awareness	36	19	41	4	2.87
9	Poor extension services	24	37	33	6	2.79

Source: field survey data, 2023

G.M = 2.87

Criterion Mean ≥ 2.5 SA = Strongly Agree, A = Agree, SD = Strongly Disagree, D= Disagree.

Table 6 shows the assessment of factors that hinders farmers' adoption of agricultural technologies. The table revealed that all the factors listed in table 6 above were constraints to the adoption of agricultural technologies in the study area.

The respondents agreed that personal characteristics ($\bar{X} = 2.95$) are factors that hinders adoption of agricultural technologies. This may be because adoption is influenced by many factors including the farmers' personality. Adoption of agricultural technology is heavily influence especially by the

socio-economic characteristics of the farmer. This is the reason of existence of adopters' category. Also indicated as factor limiting technology adoption as shown in table 6 are cultural values, ($\bar{X} = 2.82$) and relative advantage ($\bar{X} = 2.61$). This result may be due to the fact the cultural values hold by the people in the study area do not encourage the use of certain agricultural technologies. Technology's relative advantage also plays major role in determining its adoptability. This is because agricultural technologies can only be adopted if it has an advantage over the conventional ones. The table also revealed that technology triability was agreed by the respondents to be among the factors hindering agricultural technologies adoption ($\bar{X} = 2.65$). This may be because most farmers would want to try the technology in trial plots before adopting. However, where the technology cannot be tried to test for efficiency, it hinders its adoption. Also, the respondents agreed that cost of the technology is one of the factors that hinders its adoption ($\bar{X} = 3.42$). This result may be because cost of technology is a major determinant of its use. If the technology cost is affordable, most farmers may likely adopt it and vice versa (Rogers, 2003). Complexity also hindered the adoption of agricultural technologies by the respondents. Complexity is the ability of an innovation or a technology to be relatively difficult to use, this is in line with (Rogers, 2003).

CONCLUSION AND RECOMMENDATIONS

The study showed that crop farmers in Etche Local Government Area of Rivers State were aware of agricultural technologies and know their benefits such as agricultural development, employment in Agric. industry, food security, increase production, poverty eradication, technological advancement among others. However, there are constraints to the adoption of the agricultural technologies in the study area (such as personal characteristics, cultural values, beliefs and norms, triability, visibility, complexity, cost, ineffective communication by extension agents), which have hindered them from adopting the technologies they are aware of. On the whole, it is concluded that the adoption level was not encouraging.

Based on the findings from the study, the following recommendations were made;

- i) The cost of agricultural technologies should be subsidized by government to enable the rural farmers acquire them in appropriate time.
- ii) There should be recruitment of more extension field agents to enable effective extension services delivery and communication.
- iii) There is an urgent need for a positive change in people's attitude towards agricultural technologies especially among the youths who are the future. This is necessary as most of the sampled youths claim that agricultural technologies alter the taste of their crop produce and that it is only for the rich and educated. To attain this, the government should facilitate campaigns through National Orientation Agency (NOA) to educate the people about the relevance of agricultural technologies.

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