

SUSTAINABILITY OF ADOPTED CROP YIELD IMPROVEMENT PRACTICES BY ARABLE CROP FARMERS IN OYO STATE, NIGERIA

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Abstract

Adoption of innovative practices in agriculture is very germane to aiding farmers at increasing their productivity. If farmers adopt practices that could lead to high yield, their socio-economic status will be enhanced. This study had assessed the sustainability of adopted crop yield improvement practices by arable crop farmers in Oyo State, Nigeria. Interview schedule was used to elicit the needed information from the respondents. Multistage sampling procedure was employed in selecting 180 respondents for the study. The results revealed that 98.3% of the farmers reside near their farms by not frequently going to big towns. Various crop yield improvement practices were adopted and their usage sustained. The results further revealed that all (100%) arable crop farmers did not have knowledge or information on bio-fertilizers while 93.3% enjoyed low extension visits and 77.8% experienced inadequate guidance on package of recommendations. There was a significant relationship between the effects of crop yield practices ($\chi^2 = 1162.00$; $p_v = 0.000$) and sustained adoption of crop yield improvement practices at 0.05 level. It was concluded that extension practices was very low in the area. It was hereby recommended that extension advocacy should be invigorated because of the poor/weak extension services in the study area.

Keywords: Sustainability; adoption; crop yield; improvement; practices

Introduction

Agriculture provides food and nutrition for the survival of mankind. Before the advent of modern technology, farmers contended with traditional or local system of farming which always results in perpetually low yield. This is in support of Yokamo (2020); Muzari *et al.* (2012) that most farmers relied on traditional methods of production which usually responsible for their low productivity and reduced farm yields. However, all over the world, concerted efforts had been expended on how best agricultural productivity could be increased so as to meet ever increasingly surging population. This could be achieved by constantly evolving agricultural production practices or technologies that can increase yield per unit hectare over the traditional system of cultivation. Empirical studies abound that adoption of modern cultivation technologies actually resulted in increase in farmers' yields. Hence, the adoption of agricultural technology by farmers brings higher yields leading to increased income and improvement in socio-economic status of the farmers, thus making improved agricultural production technology directly related to increased yields (Danso-Abbeam and Baiyegunhi, 2019; Awotide, *et al.*, 2016).

The adoption and internalizing the practices or technologies that aimed at increasing the yields of crops are very important steps in achieving economic buoyancy of the farmers. This will eventually translate into economic prosperity of the nation at large. Adoption of modern agricultural practices, when applied, aids farmers to get bumper harvest. This was supported by the assertions of Ruzzante and Bilton (2021); Oriakhi and Okoedo-Okorojie (2013) that various initiatives had been undertaken by government and development agencies to educate farmers to adopt improved modern agricultural practices to boost the yields of crops if adopted. Such initiatives were transmitted by way of extension communication to the farmers by some agencies that were saddled with the mandate of extension advocacy. Thus, the efficacy of these practices that had been passed down to farmers had the potentials to positively impact crop yields thereby contributing to food security of the farmers and that of the nation at large. In view of aforementioned, therefore, this study had assessed the sustainability of adopted crop yield improvement practices by arable crop farmers in Oyo State, Nigeria. The objectives of the study were to: examine the cosmopolitaness (urban orientation) of the respondents; determine the annual income of the



arable crop farmers; identify the sustained adopted crop yield improvement practices in the study area; determine the effects of the sustained adopted crop yield improvement practices; and identify the constraints to the sustained adopted crop improvement practices in the study area. The only hypothesis was stated in null form that there is no significant relationship between effects of crop yield practices and sustained adoption of crop improvement practices.

Methodology

The study was conducted in Oyo State which comprised thirty three (33) Local Government Areas (LGAs). A multistage sampling procedure was used to select the respondents for this research. From 33 Local Government Areas (LGAs)/Blocks in the study area, 28 of them were purposively chosen for the study due to their rurality. Stage II: ten percent (10%) of 28 LGAs chosen to give three (3) Local Governments. Stage III: to avoid contiguity, the selected Blocks/(LGAs) were stratified into rainforest, derived Savannah and guinea Savannah areas. Applying random selection method, Ido block represents forest area, Orire blocks represents derived savannah while Tede block represents guinea savannah. Therefore, all the twenty four (24) cells in the chosen blocks were selected. Hence, 50% of the selected cells was randomly selected giving 12 cells. Finally, on the average, 30

people formed a farmer group giving 360 farmers. Hence, 50% randomly selected giving 180 arable crop farmers as respondents. Structured interview schedule was used to elicit the needed information from the respondents. Both descriptive statistics such as frequency counts, percentages and mean were used while chi-square analysis was used in establishing the relationship that existed between the variables.

Results and discussion

Socio-economic characteristics

Data in Table 1 depicted the distribution of socio-economic characteristics of the arable crop farmers in the study area. The results revealed that 56.7% of the respondents were 41-50 years old; 23.1% were 51 years old and above while the mean age was 45 years old. This implies that the farmers were old enough to engage in farming enterprises. Educational distribution revealed that 46.7% had secondary school education and 31.1% had primary education. However, 16.6% did not have any form of formal education. This implies that majority of the respondents had one form of educational attainment or the other which may aid their adoption of innovation and also their propensity to sustaining the usage of such practices. About 73% were married while the mean farming experience was 36 years. The mean farm size cultivated by the farmers was 1.5ha.

Table 1: Distribution of respondents by socio-economic characteristics

Socio-economic characteristics	Frequency	Percentage	Mean
Age (years):			
20 – 30	12	6.7	
31 – 40	24	13.5	
41 – 50	102	56.7	45
51 and above	42	23.1	
Marital status:			
Single	9	5.0	
Married	132	72.8	
Widowed	40	22.2	
Educational distribution:			
No formal education	30	16.6	
Primary school	56	31.1	
Secondary school	84	46.7	
Tertiary education	10	5.6	
Household size:			
1 – 4	24	13.3	
5 – 8	138	76.7	6
9 – 12	18	10.0	
Years of farming experience:			
1 – 10	41	22.8	
21 – 30	23	12.8	
31 – 40	90	50.0	35.5



41 – 50	11	6.1	
51 and above	15	8.3	
Farm size:			
1 – 2	101	56.6	1.5
2.1 – 3	53	29.4	
3.1 – 4	20	11.1	
4.1 and above	6	3.3	

Source: Field Survey, 2022

Cosmopoliteness or urban orientation of the farmers

Table 2 showed the urban orientation of the arable crop farmers in the study area. It was revealed that 63.8% usually go to urban centres on weekly basis. Also, 27.8% usually go to big city on fortnightly basis while 1.7% of the farmers go to city on daily basis.

This implies that majority of the farmers domiciled near their farms. However, when there was needs, they do go to urban centres and not necessarily for frivolities. Residing very close to the farms allows for good farm operations and adequate monitoring of farm progress by the owners.

Table 2: Cosmopoliteness of the farmers

Cosmopoliteness	Frequency	Percentage
Daily	3	1.7
Weekly	115	63.8
Fortnightly	50	27.8
Monthly	12	6.7

Source: Field Survey, 2022

Annual income

Data in Table 3 revealed the general outlook of annual income of arable crop farmers. About 33.3% realized 201, 000 – 300, 000 while 26.6% realized 100, 000 –

200, 000 and 20.0% realized 401, 000 – 500, 000 as their annual income. However, the mean income of the arable crop farmers was 316, 000 in the study area.

Table 3: Annual income of arable crop farmers

Annual income	Frequency	Percentage
100,000 – 200, 000	48	26.6
201, 000 – 300, 000	60	33.3
301, 000 – 400, 000	12	6.7
401, 000 – 500, 000	36	20.0
501, 000 – 600, 000	12	6.7
Over 600, 000	12	6.7

Mean income 316, 000

Source: Field Survey, 2022

Sustained adopted crop yield improvement practices

Data in Table 4 showed the sustained crop yield improvement practices by arable crop farmers. All the farmers (100%) sustained the use of harrowing their farmland before planting their crops. Majorities (96.7%) adopted and still make use of herbicides. Sustained harrowing and use of herbicides on farms might be as a result of dearth of supply of farm labour to carry out operations on their farms. It was as well, revealed that 80.0% still use disease and pests resistance varieties as planting materials. Also, 60.0% continuously use high yielding seeds/seedlings as

cultivars on their farms; 53.5% engaged in fertilizer application as well as pesticides as adopted practices to boost their crop yield. Furthermore, 53.3% still followed package of recommendation practices on their farm. About 47% and 10.0% of the farmers embraced ridging and harrowing, respectively as practices on their farms. This implies that most arable crop farmers in this area do not frequently plant tuber crops which mandatorily needed ridged plot/land because they might not thrive well on flat land. Data from the Table further revealed that 3.3% engaged in bulldozing of their farms and the use of mechanical shelling machine. Probably, most farmers that do not

bulldoze their farmland have been continuously cropping their pieces of land/plot that had been bulldozed for very many years ago.

Table 4: Sustained adopted crop yield improvement practices

Sustained adopted crop yield improvement practices	Frequency*	Percentage
Bulldozing	6	3.3
Use of mechanical shelling machines	6	3.3
Harrowing	18	10.0
Erosion control	30	16.7
Seed dressing	48	26.7
Ridging	84	46.7
Following package of recommendation	96	53.3
Use of pesticides	96	53.5
Application of fertilizers	96	53.5
High yielding seeds/seedlings	108	60.0
Pests and diseases resistant varieties	144	80.0
Use of herbicides	174	96.7
Ploughing	180	100

*Multiple responses

Source: Field Survey, 2022

Effects of sustained adopted crop yield improvement practices

Data in Table 5 showed the effects of sustained adopted crop yield improvement practices where it was revealed that 90.0% of the farmers attested that the sustained adopted practices really brought increase in their yields and income. Majority (86.6%) opined that the practices resulted in getting fascinating good

quality seeds output. Data further revealed that 66.7% of the farmers agreed that the practices brought about highly palatable and nutritional farm produce while 63.5% asserted that the practices made them have good post-harvest quality output. Also, 46.7% indicated that the practices resulted in early maturity and harvesting of their produce.

Table 5: Effects of sustained adopted crop yield improvement practices

Effects of sustained adopted crop yield improvement practices	Frequency*	Percentage
Increased yields and income	162	90.0
Fascinating good quality seed	156	86.6
Good post-harvest pest resistant output	114	63.5
Highly palatable and nutritional farm produce	120	66.7
Early maturity and harvesting of farm produce	84	46.7
Lodging resistance by crops	36	20.0

*Multiple responses

Source: Field Survey, 2022

Constraints to sustained adopted crop yield improvement practices

Data in Table 6 depicted various constraints to continued sustenance of adopted crop yield improvement practices in the study area. It was revealed that all the arable crop farmers (100%) lack knowledge or information on bio-fertilizers; 93.3% affirmed that low extension services was their constraints. This attests non-recruitment of extension staff over the years leading to dwindling extension personnel and their impacts on the field. Also, 88.9%

declared that shortage/non-availability of needed inputs as their constraint; 86.7% opined that high cost of the technology/practices was their constraint and as well, 83.5% opined that they had little or no adequate information about the seed treatment constituted a constraint. However, 80.0% of the arable crop farmers alluded to the fact that rainfall variability was their constraint to the crop yield improvement practices in the area. The general implication is that extension advocacy in the area was very poor. This further affirmed the result of a study conducted by

Osabuomen and Okoedo-Okojie (2011) where they found majority of the farmers had no contact with extension agents thereby lacked technical guidance. This is in line with Chekene and Chancellor (2015)

that weak extension services will always have a negative effect on adoption of improved practices for lacking technical guidance.

Table 6: Constraints to sustained adopted crop yield improvement practices

Effect of crop yield improvement practices	Frequency *	Percentage
Lack of knowledge/information on bio-fertilizers	180	100
Low extension services	168	93.3
Non-readily availability of improved seeds/seedlings	162	90.0
Shortage/non-availability of needed inputs	160	88.9
High cost of the practices/technology	156	86.7
Little/no information about seed treatment	150	83.5
Rainfall variability	144	80.0
Inadequate guidance on package of recommendation	140	77.8

*Multiple responses

Source: Field Survey, 2022

Test of hypothesis:

There is no significant relationship between effects of crop yield practices and sustained adoption of crop improvement practices. Data in Table 7 had revealed that a significant relationship existed between the effects of crop yield practices ($\chi^2 = 1162.00$; $p = 0.000$) and sustained adoption of crop yield improvement practices at 0.05 level of significance. This implies that positive effects of crop yield practices made arable crop farmers sustained the

application of improved crop yield practices by abandoning their traditional way of farming. This could be traced to ease of applying the technologies coupled with high crop yields obtained as the outcome, which made farmers to continuously applying the adopted crop yield improvement practices. This was supported by the assertion of Tologbonse *et al.* (2013) as quoted in Oyelere (2020) that adoption of improved production technologies by farmers always lead to increased crop yield.

Table 7: Chi-square analysis showing relationship between crop yield practices and sustained adoption of crop yield improvement practices by arable crop farmers

Variable	χ^2 – value	df	P – value	Remarks
Effects of crop yield improvement practices	1162.00	5	0.000	S

Source: Field Survey, 2022

Conclusion and recommendations

It could be concluded that most of the arable crop farmers lived very close to their farms, probably to be able to adequately monitor their farms. Arable crop farmers, in the study area, made appreciable income from their farms. The farmers sustained the of adopted crop yields improvement practices in the area and that the adopted practices positively influenced their farm operations as well as their farm produce and income. Extension advocacy was very poor/weak in the study area. It was therefore, recommended that extension services should be invigorated in the area.

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