American Journal of Service Science and Management
2019; 6(1): 37-40
http://www.openscienceonline.com/journal/ajssm
ISSN: 2381-4489 (Print); ISSN: 2381-4497 (Online)

Assessment of Sustainable Farm Production Technologies Among Farmers in Adani-Omor Zone, Southeast of Nigeria

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To cite this article

Samuel Olusola Oyewole, Adekemi Lizzie Oyewole, Emmanuel Ugbede Adejoh. Assessment of Sustainable Farm Production Technologies Among Farmers in Adani-Omor Zone, Southeast of Nigeria. *American Journal of Service Science and Management.* Vol. 6, No. 1, 2019, pp. 37-40.

Received: February 20, 2019; **Accepted**: March 28, 2019; **Published**: April 29, 2019

Abstract

Low agricultural productivity has been associated with inappropriate and inadequate application of improved farm practices resulting to food insecurity, poverty and poor socio-economic development. In order to take corrective measures and achieve primary purpose of farm production, there is need for a study to ascertain level of technology options among farmers and effect on crop productivity. This study evaluates the adoption of farm production technologies among farmers in Adani-Omor Zone, Southeast of Nigeria. Proportional sampling technique was used to select 60 respondents in the study area. Primary data were collected with aid of structured questionnaire. Data were analysed using descriptive statistics such as frequency counts, means and percentages. Effect of adoption of technologies on crop productivity was determined using t-test statistic. The results showed that respondents were youths and still in their active age group with average age of 43 years. The respondents had one form of education or the other. More than half of the farmers had above primary education. The average farming experiences was 13 and 80% of the farmers were members of farm association. Generally, there is high rate of adoption of improved farm technologies in the area. The output of the farmers after the adoption was significantly higher than their output before they embraced crop technologies introduced to them. The study therefore recommends that a continuous training on the use of improved technologies should be provided for the farmers to facilitate better understanding thereby sustain the adoption.

Keywords

Production Technologies, Farmers, Crop Productivity, Nigeria

1. Introduction

Management of farm production system to ensure sustainable food supply in the face of increased population without any adverse effect on the natural and agro-ecological areas remain a great challenge. It has been argued that unless farmers embrace the use of sustainable production methods and intelligent management, food prices would become unaffordable due to degrading agricultural environment. In respective of the view on production scale whether at subsistence level or large scale food production sustainability remains an option to address the need to feed ever growing population with due consideration on socio-environmental impacts (International Institute for Sustainable Development (IISD), 2009) [1].

Agriculture remains a road map to the attainment of livelihood improvement and bedrock of socioeconomic development especially in developing economy. Agricultural growth depends on interaction of economic development and resource endowment [2]. However, the state of agricultural production over the time continued to rely on crude and primitive methods reflecting on poor productivity, under performance and inability of the sector to perform its primary role in food production [3]. Over dependency on tradition technologies is one of the problems small scale agriculture in Nigeria, hence poor yield and inefficiency. Agricultural development depends, to a great extent, on the willingness and ability of the small scale farmers to make use of sustainable production technologies. New innovations in agricultural development are of little value until they can be put to use for the economic and social well-being of the people involved [4]. Agricultural productivity growth could be difficult without developing and disseminating cost effective yield and increasing technologies [5-7].

Despite the potential of some countries and comparative advantage in agricultural activities, the sector could not support economic improvement. Low agricultural productivity for example inNigeria has been largely due to low, inappropriate and inadequate application of good technologies and practices such as fertilizer, improved seed utilization, and a wide gamut of on-farm and post-farm activities related to food safety, food quality and food security, the environmental impacts of agriculture [8]. In order to address and take corrective measures and achieve the target of agricultural development programmes especially for staple crops such as cassava, rice and sorghum, concerted efforts must be made to provide information on the adoption of good practices among the farmers. This study particularly, evaluates the progression of adoption of disseminated technologies under Agricultural Transformation Agenda of the government in the study area.

The choice of a good variety of crop grown in a particular locality is a pre-requisite of achieving higher productivity. This in turn has a great role to play in achieving food security which is Food insecurity is a widespread problem in several African countries where growing population pressure, combined with climate change, presents a global challenge associated with social and economic costs. Farmers respond to agricultural technologies and innovations in different ways. This could be due to certain socio-economic and institutional factors. Institutional variables are reported to have either positive or negative influence on adoption of improved and recommended production practices. The institutional factors such as extension contact, access to credit, input delivery and sources of information have also been implicated [1]. It is therefore necessary to identify various sustainable production practices available for the farmers, estimate the extent of usage and identify factors influencing the adoption of sustainable production practices.

2. Methodology

The survey was conducted in Adani-Omor, the place is one of the four staple crop processing zones for ATASP Phase 1 program. It covers Anambra and Enugu States in the south east. It is located in the tropical rainforest in the South East. The study focused on the participate of ATASP programme to the rates of adoption of technologies disseminated to farmers under staple crops The multi-stage sampling procedure was used in selecting respondents for the study, the respondents were made up of 60 samples. Primary data were solicited through the use of structured questionnaire. The questionnaires were administered to the farmers. Data collected covered farmers' socioeconomic characteristics specific details, technologies disseminated, mode of practicing technology and rates of adoption. Data were analysed using descriptive statistics and z-statistic to determine the effect of adoption on crop output.

3. Results

3.1. Socio-economic Characteristics of Respondents

The results in Table 1 showed the socio-economic characteristics of the farmers. It was revealed that majority (66.67%) of the respondents was less than 50 years of age, those that were greater than 60 years constitute only 13%. The average age was 42 years this showed that respondents were youths and still in their active age group. This has a great implication for agricultural production and adoption of innovation. Age has a significant influence on the decision making process of farmers with respect to risk aversion and other production-related decisions. Agecould affect the rate of household adoption of innovations [10, 11]. More than two-third (61.67%) of the farmers were male this could be attributed to the fact that there are more male headed household in rural communities of Nigeria. It was revealed that 55% of the farmers were married while only 45% were still single. The significance of marital status among rural communities with respect to farm business and livelihood activities can be explained in terms of the supply of agricultural family labour. It is expected that family labour would be more available where the household heads are married. Educational attainment is one of the socioeconomic that is very important because it could enhance awareness of the possible advantages of modern farming techniques and decision related to technology adoption [12]. As shown in Table 1, the respondents had one form of education or the other. More than half of the farmers had above primary education. Those that had tertiary education constitute 38.33%. This result has significant implication because farmers are better placed to understand and be willing to adopt innovations that will enhance their productivity. The results of household size showed that

48.33% of farmers had between 1-5 persons per household. The average household size was 6 persons. The size is fairly large indicating that family labour could be available for farm operation. The result further revealed that 21.67% of farmers had farm size between 0.1-0.5 hectare, those that had between 0.1-0.5 hectare constitute 25%. Those that had above 2% constitute 30%. The average farm size was 2.17. This result implied that crop farms in the area had small farm sizes and could be classified as subsistence farmers [13]. Farming experience is an important factor determining both the productivity and the production level in farming business activities. About half 56.67% of the respondents had between 1-10 years of farming experience. Those that had farming experience between 21-30 years constitute 15%. The average farming experiences was 13. This indicates that farmers in the area have been cultivating cassava and rice for long period of time. The benefit of farmers' involvement in association with respect to agricultural production cannot be over-emphasized. Membership of cooperative can enhance the accessibility of farmers to credit facility, agricultural training, marketing and could also provide a platform for exchange of ideas that can improve their farm activities. Participating farmers in the area were found participating in association. As indicated in the results, 80% of the farmers were members of farm association. This is a good indication and it will enhance diffusion of innovation among farmers in the area [14, 15].

Table 1. *Structure of farmer's household in the study area.*

Variables	Frequency	Percentage
Age		
21-30	9	15.00
31-40	9	15.00
41-50	22	36.67
51-60	12	20.00
> 60	8	13.33
Average	42	
Gender		
Male	37	61.67
Female	23	38.33
Marital status		
Married	33	55.00
Single	27	45.00
Education		
None	1	1.67
Primary	10	16.67
Juninor	5	8.33
Senior secondary	14	23.33
Tertiary	23	38.33
Household size		
1-5	29	48.33
6-10	19	31.67
11-15	10	16.67
>15	2	3.33
Farm size		
0.1-0.5	13	21.67
0.51-1.0	15	25.00
1.1-1.5	12	20.00
1.51-2.0	6	10.00
>2.0	18	30.00
Average	2.17	
Farming experience		
1-10	34	56.67
11-20	15	25.00
21-30	9	15.00
>30	2	3.33
Average	12.85	
Membership of cooperative		
Yes	48	80.00
No	12	20.00

3.2. Rate of Adoption of Sustainable Production Technologies Among Farmers

The results presented in Table 2 showed the rate of adoption of farm technologies. It was revealed that all the farmers have adopted improve variety, recommended site selection, land preparation, plant spacing and weed management. Those that have adopted soil fertility, harvesting market and yield assessment constitute 90%, 50% and 60% respectively. It was only adoption of record keeping that can be described as low. Less than half of the farmers in the area claimed to have adopted it. Generally, there is high rate of adoption of improved farm technologies in the area. This is a good indication for improved farming and productivity.

Table 2. *Rate of adoption of cassava technologies.*

S/No	Technologies	Frequency*	Percentage
1	Improved variety	60	100
2	Site selection	60	100
3	Land preparation	60	100
4	Plant spacing/population	60	100
5	Weed management	60	100
6	Soil fertility	54	90
7	Harvesting market	30	50
8	Yield assessment	45	60
10	Record keeping	24	40

* Multiple responses were allowed

3.3. Effects of Adoption of Farm Production Practices on Crop Production

The results in Table 3 showed the effect of adoption of farm technologies on the crop of the farmers in the study area. The average output before adoption was 5898.97kg per hectare. The average output after the adoption was 8983.05kg per hectare. The estimated t-value was significant at 1% level of probability. This is an indication that the output of the farmers after the adoption was significantly higher than their output before they embraced crop technologies introduced to them. These significant increase observed among the farmers is due to the positive impact of the improved practices among the farmers in the area.

Table 3. *Effect of improved farm technologies on production per hectare in the study.*

Variables	Estimate	Values
Output Before adoption of GAP	Average	5898.97
	Min	2833.333
	Max	12000
	SD	5192.22
	CV (%)	65.55667
Output after adoption of GAP	Average	8983.05
	Min	3736.333
	Max	20933.33
	SD	5562.505
	CV (%)	69.67889
t-statistics		3.85***

*P<0.001

4. Conclusions

The study showed that a number of technologies were available for the farmers for sustainable farm production. Higher adoption rate observed among the farmers is a good indication for increased productivity. Technologies adoption was found exerting positive influence on crop. The study recommends a continuous training on the use and benefit of improved technologies in the study area. This will facilitate farmers' understanding of the importance of these technologies as well as techniques behind their utilization thereby sustain the adoption.

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