

ASSESSMENT OF FACTORS INFLUENCING THE USE INTENSITY OF IMPROVED SOIL MANAGEMENT PRACTICES IN IMO STATE, NIGERIA

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Abstract

The study evaluated the factors influencing the use intensity of improved soil management practices in Imo State, Nigeria. Data were obtained from 209 farmers with the aid of structured questionnaire. Data were analyzed using descriptive statistical tools such as the mean, frequency and percentages. The findings revealed that age, education, farming experience, household size, occupation and farm size etc are important factors influencing the use intensity of improved agricultural practices in the area. These factors probably could either mar or enhance the use intensity of improved agricultural practices. The study revealed that extension contacts are very vital in exposing the farmers to new innovations and modern farming technologies which improves the farm productivity and income of the farmers. Therefore, there is the need for increased extension services and technological education of the rural farmers via both the government and private enterprises to enhance farmers' perception and dispositions to socio-economic factors.

Key words: assessment, factors, use intensity, soil management, agricultural practices

INTRODUCTION

In recent times, farmers' productivity has been on decrease due to the use intensity of improved soil management practices occasioned by farmers' dispositions to certain socio-economic factors. Empirical studies have showed certain factors influencing the use intensity of farmers as regards to improved soil management practices in Nigeria [2]. These factors greatly influence the farmers' perception and attitude in using these enhanced techniques. Factors such as gender, household size, age of the household head, farmer's income, farm size, farming experience, livestock ownership, extension contacts etc affects farmers' use of improved soil management practices [3]. Age of the farmer's could either mar or build farmers perception towards the usage of enhanced soil techniques. This means that often times farmers could be conservative in the application and use of improved soil management practices. Farming experience and access to extension services exposes farmers to a wide range of enhanced soil practices which improves the productivity of

the land. Credit facilities cum small size nature of farm lands that characterized rural farmers in Nigeria are obviously important factors influencing farmers' attitudes in usage of enhanced soil packages [7].

Intensification of enhanced soil management practices encourages the growth of macro and micro nutrients in the soil and prepares the soil for maximum plant growth. The use of soil management practices such as organic manuring and mulching often improve the productivity of soils and the nutritional value of crops grown thereon. Plants and animal wastes are added to the soil and upon decomposition, increase the nutrient content of the soil thus facilitating crop yields. Increase use intensity of crop rotation mitigates the build-up of pathogens and pests that often occurs when crop specie is continuously cropped and can also improve soil structure and fertility by alternating deep-rooted and shallow-rooted plants. Appropriate crop rotation increases organic matter in the soil, improves soil aeration, reduce soil degradation, and can result in higher yields and greater farm profitability in the long-term. Leguminous crops in the rotation fix

atmospheric nitrogen and bind it in the soil thus, increasing fertility and reducing the need for synthetic fertilizers [5]. High use intensity of mulching improves root growth, increases water infiltration, and minimizes soil loss/run-off. As these mulches slowly decompose, they provide organic matter which adds nutrients to the soil and ultimately enhances the growth and yield of crops. Furthermore, combined effect of livestock production and agricultural soil management systems according to [4] demonstrated that crops and livestock's have the potential to sustain the soil and help prevent soil structures from becoming too brittle by promoting greater biodiversity, and thus increased capability of the soil to absorb shocks of the natural resource base. Also mixed farming systems maintain soil fertility by recycling soil nutrients and allowing the introduction and use of rotations between various crops and forage legumes. Apart from mixed farming, the use of vetiver grass as a sustainable technique used for erosion control can further sustain the soil physical properties and biodiversity. It is most effective in preventing soil and moisture loss, particularly in crop lands. Use of organic fertilizers, cover crops, multiple cropping, fallowing and other agro-forestry practices pose a positive impact on the productivity of the farmland [6].

Hence this study seeks to evaluate the factors influencing the use intensity of improved soil management practices in Imo State, Nigeria which has not been documented.

MATERIALS AND METHODS

This research was conducted in Imo State, located in the South Eastern part of Nigeria with a land area of 5,530 sq km. The State lies between latitudes $4^{\circ}45'N$ and $7^{\circ}15'N$ and Longitudes $6^{\circ}50'E$ and $7^{\circ}25'E$. The State shares boundaries with Abia, Delta, Rivers, Enugu and Anambra State. The State is made up of 27 Local Government Areas grouped into three agricultural zones. Two-stage sampling technique was use to select the sample. In the first stage, two local government areas (LGAs) were purposively selected from each of the three agricultural zones of the State. The selection of these

LGAs was based on their predominant agricultural activities and use of enhanced soil management practices. The second stage involved a random selection of farmers from the list of registered farmers kept with the zonal ADP's. However, the farmers' picked were administered with structured questionnaires, of which only 209 questionnaires were valid and used for data analysis using descriptive statistical tools.

RESULTS AND DISCUSSIONS

Factors Influencing the Use Intensity of Improved Soil Management Practices

Age. The distribution of the farmers based on age is shown in Table 1 which shows that 45.9 percent of the farmers fell within the age range of 50–59 years. The mean age of the farmers was 53 years. This implies that 25.8% of the farmers are over 60 years and thus, were ageing. This might have a tremendous influence on the use intensity of improved soil management practices. This is in line with [9], who reported that the more a farmer advances in age, the more conservative he becomes in usage of new technologies.

Table 1. The distribution of respondents by age

Age Range (years)	Frequency	Percentage
20 – 29	7	3.3
30 – 39	16	7.7
40 – 49	36	17.2
50 – 59	96	45.9
60 – 69	49	23.4
70 – 79	5	2.4
Total	209	100
Mean	53	

Source: Field survey data, 2015.

Gender. The distribution of the farmers based on gender is shown in Table 2 which shows that 64.1 percent of the farmers were males while 35.9% were females. This implies that Nigeria agriculture is still male dominated, due to the fact that men take full responsibility in providing for their families at every given time and may probably use more of the improved soil practices.

Table 2. The distribution of respondents by gender

Gender	Frequency	Percentage
Male	134	64.1
Female	75	35.9
Total	209	100

Source: Field Survey data, 2015.

Marital Status. The distribution of the farmers based on marital status is shown in Table 3. From this table, majority of the farmers, 88.0 percent were married with children which are significant indication of high family labour availability utilized in the farming business. This is true because marriage tends to provide farmers with the required family labour. This result further implies that majority of the farm households are stable and this stability could create conducive environment for good usage of enhanced soil techniques.

Table 3. The distribution of respondents by marital status

Marital status	Frequency	Percentage
Married	184	88.0
Single	6	2.9
Separated	2	1.0
Divorced	3	1.4
Widow/Widower	14	6.7
Total	209	100

Source: Field Survey data, 2015.

Household Size. The household size of the farmers is shown in Table 4. It shows that majority, 53.6 percent of the farmers had household size of 6-10 persons, while 42.6 percent and 3.8 percent had household sizes ranging from 1-5 and 11-15 persons respectively. The mean household size was 6 persons.

Table 4. The distribution of respondents by household size

Household size (No. of persons)	Frequency	Percentage
1 – 5	89	42.6
6 – 10	112	53.6
11 – 15	8	3.8
Total	209	100
Mean	6	

Source: Field Survey data, 2015.

This implies that the household size in the area was relatively large and therefore could enhance the usage of improved soil

management practices since rural households rely more on members of their households than hired labourers.

Educational Status. Table 5 shows the distribution of the farmers based on years of formal education. About 5.3 percent of the farmers had no formal education while 54.1 percent, 33.0 percent and 7.6 percent had primary, secondary and tertiary education respectively. The mean years of formal education of the farm households were 6 years. Thus, majority of the farmers had primary education which depicts a low educational background and may mar the intense usage of improved soil management practices in the area. Low educational levels retard farmers' ability to understand and evaluate new production techniques. Education has an important implication particularly for farm management, participation in economic activities, dissemination and adoption of new technology and practice [1].

Table 5. The distribution of respondents by educational status

Educational status (No. of years spent in school)	Frequency	Percentage
0 (No Formal Education)	11	5.3
1 – 6 (Primary School)	113	54.1
7 – 12 (Secondary School)	69	33.0
13-18 (Tertiary)	16	7.6
Total	209	100
Mean	6	

Source: Field Survey data, 2015.

Farming Experience. Table 6 shows the distribution of the farmers based on farming experience. According to the Table, majority that is 78.0 percent of the farmers had farming experience ranging from 11-20 years. The mean farming experience of the farmers was 17 years. This means that majority of the farmers are well experienced in the farming enterprise which might considerably reduce inefficiency in usage of improved soil management practices [10].

Table 6. The distribution of respondents by farming experience

Farming experience	Frequency	Percentage
1 – 10	18	8.6
11 – 20	163	78.0
21 – 30	14	6.7
31 – 40	10	4.8
41 – 50	4	1.9
Total	209	100
Mean	17	

Source: Field Survey data, 2015.

Extension Contacts. The distribution of farmers based on extension contact is shown in Table 7. The Table reveals that about 96.2 percent of the farmers had contact with extension agents during the cropping season while 3.8 percent had no contact with extension agents. This implies that, on the average most of the household farmers were exposed to a wide range of improved soil management packages and other technical innovations from the extension agents, thus the utilization of these packages tends to increase the land productivity and net income of the crop farmers. Extension contacts enhance information dissemination amongst farm households [8].

Table 7. The distribution of respondents by extension contacts

Extension contacts	Frequency	Percentage
Contacts	201	96.2
No contacts	8	3.8
Total	209	100

Source: Field Survey data, 2015.

Sources of Fund. The distribution of farmers based on their sources of fund for their farm work is shown in Table 8.

According to this Table, the major sources of funds for farm households were from co-operative societies and local money lenders which accounted for 89.0 percent and 81.8 percent respectively. This implies that farm households in the study area relied more on co-operative societies and local money lenders for funds due to the little or no interest charges placed on such funds. Thus, this helps to improve the usage of improved soil management practices in the area.

Table 8. The distribution of respondents by sources of fund

Sources of fund	*Frequency	Percentage
Friends and Relatives	54	25.8
Local Money Lenders	171	81.8
Age Grade	49	23.4
Co-operative Societies	189	89.0
Banks	12	5.7
Personal savings	16	7.7

Source: Field Survey data, 2015.

* Multiple responses

Sources of Labour. Table 9 shows the distribution of the farmers based on sources of labour. The Table reveals that majority 66.0 percent of the farmers made use of family labour compared to 21.1 percent of the farmers who used hired labour in their farm operations. This finding shows that a greater percentage of the respondents used family labour. Thus, this could either enhance or mar the use of improved soil management practices if the family labour were not fully utilized [8].

Table 9. The distribution of respondents by sources of labour

Sources of labour	Frequency	Percentage
Family Labour	138	66.0
Hired Labour	44	21.1
Both Labours	27	12.9
Total	209	100

Source: Field Survey data, 2015.

Sources of Farm Land. The distribution of farmers based on sources of farmland is shown in Table 10. The Table showed that the major source of farmland for farm households in the area was inheritance which accounted for 95.0 percent.

This implies that majority of the farmers in the area obtained their land through inheritance. This could be true because the cultivation of most arable crops in Nigeria is carried out on inherited farm lands. Furthermore, land hereditary is a common practice in Nigeria agriculture where land is passed on from one generation to another.

This method of land ownership tends to accommodate increased usage of enhanced soil techniques.

Table 10. The distribution of respondents by sources of farm land

Sources of farm land	*Frequency	Percentage
Inheritance	198	95.0
Gift	34	16.3
Lease/Rent	14	6.7
Outright Purchase	12	5.7
Pledge	28	13.4
Communal	36	17.2

Source: Field Survey data, 2015.

*Multiple responses.

Farm Size. The distribution of farmers based on their farm size is shown in Table 11. According to the Table, majority of the farmers, 60.3 percent had farm sizes ranging from 0.01 – 1.00 hectares. However, the mean farm size was 1.0 hectares. This implies that majority of the farmers in the area operated on small-scale bases (cultivating less than 2.0 hectares). This supports the findings [9] who reported that rural farm lands are characterized by small-sized holdings, fragmented and scattered which poses a great threat to land productivity and mechanization. Rural farmers cultivate arable crops operate on small scale bases probably due to the land tenure system available to them. Thus, this small size nature of the farm lands distorts the use of improved soil management practices. However, the mean farm size in the area is typical subsistence farming where a farmer majorly provides for himself and his family.

Table 11. The distribution of respondents by farm size

Farm size (ha)	Frequency	Percentage
0.01-1.00	126	60.3
1.01 – 2.00	73	34.9
2.01 – 3.00	8	3.8
3.01 – 4.00	2	1.0
Total	209	100.0
Mean	1.0	

Source: Field Survey data, 2015.

Occupation. Table 12 shows the distribution of the farmers based on occupation status. The Table shows that majority, 96.7 percent of the farm households had farming as their major

occupation as well as engaged in other forms of occupation such as fishing, 22.0 percent; trading, 29.2 percent; artisans, 9.1 percent, etc. This implies that, apart from farming, farmers in the area also engaged in other forms of occupation to earn a living, improve their living standard and also raise off-farm income to enhance the use of improved farming practices.

Table 12. The distribution of respondents by occupation

Farm size (ha)	*Frequency	Percentage
Farming	202	96.7
Fishing	46	22.0
Trading	61	29.2
Artisans	19	9.1
Civil Service	39	18.7
Hunting	8	3.8
Apprenticeship	2	1.0

Source: Field Survey data, 2015.

*Multiple responses.

CONCLUSIONS

Over the years farmers have witnessed a dwindling output and yield due to the influence of certain factors. Thus, the findings of the study showed that the use of improved farming practices is dependent upon some socio-economic factors which by disposition of the farmers affect their output, yield and income.

Use of improved agricultural practices is a prerequisite to increased output and productivity of the farmers. For farmers to increase their output and yield, the use of improved farming practices is not negotiable. Furthermore, the use of extension contacts is very vital in exposing the farmers to new innovations and modern farming technologies which improves farm productivity of the farmers.

The findings further revealed that age, education, farming experience and farm size etc are essential factors influencing the usage of improved agricultural practices in the area. Therefore, there is the need for increased extension services and technological education of the rural farmers via both the government and private enterprises to enhance farmers' perception and depositions to socio-economic factors.

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