AN ASSESSMENT OF FARMERS AWARENESS AND PERCEPTION ON USE OF SOIL INFORMATION IN NIGER STATE

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ABSTRACT

The study farmers awareness and perception about use of soil information in Niger state. Multi stage sampling technique was used to select 120 respondents within the three agricultural zones of the state for the study. Data for the study were collected using a structured questionnaire. Descriptive statistics was used to analyse the data. The result revealed 99.2 % of the respondents know about soil information with 64.2 % introduced to soil information by extension agents. Majority of the respondents were not aware of the importance and use of soil information, with the mean level of awareness of farmers towards soilinformation was low with an average of 1.78. Majority of the respondents agreed with the notion that soil information can increase productivity and lead to sustainable agriculture, with the mean level of agreement revealed to be high with an average of 3.64. The respondents disagreed with the notion that soil information is needed for only large-scale farming. The study also revealed that 66.7 % of the respondents locally classify their soils in the study area as a form of soil information, using topsoil physical characteristics such as soil colour, soil weight and feel as indicators for classification. The respondents were not aware of the importance of soil information, but are willing to adopt the use of soil information, if more awareness programs and reduced cost of soil analysis are in place.

KEYWORDS: Soil information, Local classification, Sustainable agriculture.

INTRODUCTION

Soil plays a major role in the quality of our environment. It is the foundation for food and fibre production. Knowledge of soil is required for land use planning activities and the decision of what use a particular soil type could be assigned. Moreover, understanding of soil properties and processes is important in evaluating the criteria for soil management and cultivation and agricultural production.

Esu (2004), Lekwa *et al.* (2004), Ogunleke (2004), Fasina *et al.* (2007), Lobry de Bruyn and Andrew (2016), noted that increase in demand and lack of information on soils contribute to the problem if soil degradation and world food crises, due to the wrong use and poor management of land resources. With existing soil information sources and soil characterization basic information can be provided to assess soil fertility in other to resolve soil problems in an ecosystem and help in the world food crisis. Onyekannc (2012), Achukwu *et al.* (2013), Sharu *et al.* (2013) stated that for sustainable land management, information on the soil resources and how to manage them is needed and this is achieved through characterization, classification and evaluation of the soil. Romig *et al.* (1995), liebig *et al.* (1995) and Lobry de Bruyn and Abbey (2003), Lobry de Bruyn and Andrews (2016) all noted that there a lot of barriers to collecting and acting on soil information, with majority of farmer's soil-information poor, or at least they are not informed as to the condition of their soil by soil testing, which highlight those soils which are at risk of land degradation. Increasing farmers access to the use of soil information means engaging farmers more directly with existing soil information resources (Lobry de Bruyn and Andrews, 2016). A challenge to agricultural production is that farmers, in particular small-scale farmers, do not know the status of their soils. The ability to have data that can move across

states and borders are vital for the agricultural sector in today's global market environment (FAO, 2017), the only way agricultural production can be sustained is when farmers can assess adequate and accurate data.

In Nigeria there is a lack of collection and management of agricultural data and inadequate data in agriculture will hinder foreign direct investment and governments efforts to reform the agricultural sector, since quality data improves both sectoral benefits and real economic benefits (Essiet, 2015). In Nigeria, like most developing countries, one primary constraint to sustainable and successful agricultural program, is lack of knowledge about the soil resources and how to manage them (Achukwu *et al.*, 2013). Boonsompopphan *et al.* (2008) noted that with the ability of farmers to identify soil series farmers could obtain site-specific nutrient recommendations and as a result of applying site-specific nutrient management, farmers have reduced their fertilizer use while maintaining yields and thus increased profit and reduced excessive fertilization. In Minna, there have been wide spread survey of the soil, documenting the fertility status in conjunction with management practices which can improve the soil fertility and reduce soil degradation. However, these recommendations have majorly not been adopted by farmers, with the reason for this basically being the lack of knowledge and information by the farmers. Also, there has been lack of knowledge of the perception of farmers towards soil data and their willingness to use the data presented to them, which might have led to bridging the gap between researchers and farmers. Since, there have been few studies in Minna, that document farmers view on soil data and their utilization. The study was therefore designed to identify how soils are classified, assess the level of awareness, perception and use of soil information by farmers in crop production in Niger State, Nigeria.

METHODOLOGY

The study was carried out in the three agricultural zones of Niger State, Nigeria. It lies between longitude 6^0 25' E and $6^0$45' E and Latitude $9^0$24' N and $9^0$48' N and is at an elevation of 299 m above sea level. Niger falls under the Southern Guinea Savanna agro-ecological zone of Nigeria, the climate of Minna is sub-humid with mean annual rainfall of 1284 mm and a distinct dry season of about 5 months duration occurring from November to March (Ojanuga, 2006). The mean maximum temperature remains high throughout, about 33.5^0 C, particularly in March and June (Ojanuga, 2006). The soils of the study area are grouped under the Southern belt of forest soils which have underlying rocks of granite or clay, with soils rich in clay loam, and zone of alluvial soils which are fresh - water soil of grey to white sand, grey clay and sandy clay with humic topsoil (Oyenuga, 1967; Iloeje, 2001). The soils are generally low in organic matter, total nitrogen and available phosphorus with high erodibility, are structurally weak, coarse textured with low organic matter status (Ahmakhian and Osemwota, 2012).

A multi-stage sampling technique was used to select the respondents for the study. Stage one involved random selection of one (1) Local Government Area from each agricultural zone, stage two (2) was random selection of two (2) villages from each Local Government Area. Stage three (3) was random selection of twenty (20) rural farmers from each village to give 120 respondents for the study. Primary data was collected with the use of structured questionnaire, complimented with an interview schedule. Data collected was analyzed using descriptive statistics such as mean, standard deviation, pie chart, bar chart, percentages and frequency distribution as appropriate. Attitudinal measuring scale like likert rating scale was also used to categorize the respondent responses into 3-point and 5-point likert rating scale. The research methodology used was the quantitative method of data collection, this provided general understanding of the research problem and generated empirical evidence that could be used to answer research questions. This quantitative data was collected with the use of primary data. The data was obtained through the use of structured questionnaires, with simple random sampling procedure being utilized in selection of respondents in other to be a representative sample of the population.

RESULTS AND DISCUSSION

Institutional characteristics

Table 1 shows that majority of the respondents (52.5 %) are permanently practising agriculture with 28.3 % utilizing trading as a secondary occupation. The table shows that (73.3 %) of the farmers belong to a cooperative society and (46.7 %) having access to agricultural credit majorly through agricultural banks (44.2 %), although the amount of credit is low which has little impact on increase in productivity. This is accordance with Odoemenem *et al.* (2010) who stated that productivity and growth of agriculture is hindered by limited access to credit facilities. The table also shows that (99.2 %) of the farmers have contact with agricultural extension agents, with frequency of the contact majorly bi-weekly (42.5 %),

which may lead to higher rate of adoption of information and new technologies. This is accordance with Shchu *et al.* (2016) who noted that farmers who had more contact with extension agents are more than two times likely to adopt modern technology than those with no access to extension agents. Majority (99.2 %) of the respondents know about soil information. This may be due introduction by extension agents, since the framers have a high level of contact with extension agents. Majority of the respondents (64.2 %) were introduced to soil information by extension agents and 57.5 % of the respondents use a form soil information, while carrying out farming activities.

Awareness of farmers to soil information

Table 2 shows the awareness of farmers about soil information in the study area. Awareness about soil information (1.98), awareness on use of soil information (1.93) and awareness that soil information improves yield (1.79) were the statements the farmers were most aware about. All the mean scores were less than 2.00 indicating they are generally not aware of all the statements on table 4. This may imply that most farmers do not use standard soil information for farming. Okunola (2009) stated that awareness is the first stage of adoption before respondents develop interest in the technology and later decide on adoption.

Farmers perception about soil information

Table 3 shows the perception of farmers towards soil information. Improvement of yield (3.98), improvement of soil fertility (4.20), encouragement to farm (3.86), lack of knowledge on soil information (3.83) and high cost of soil analysis (3.71) were the statements the respondents majorly agreed upon with the mean scores above 3.00. This means that if farmers are educated about soil information, they are able to understand, utilize and transfer soil information to other farmers. This is similar to the findings of Duruiheoma *et al.* (2015) who stated that highly aware farmers aid in transferring knowledge between older farmers and farm owners, through a possible knowledge transfer network, where knowledge about soils are shared.

The farmers majorly disagreed with the perception that soil information is only necessary for large scale farming (2.14), which may mean farmers are willing to adopt use of soil information in their farming activities if made available to them, with reduced cost of soil analysis being the incentive they require.

Barriers limiting use of soil information

Table 4 shows the constraints faced with by the farmers on the use of soil information. The result showed that lack of awareness on actual importance of soil information (99.2 %), lack of understanding of soil information (93.2 %), inadequate extension service (83.3 %), language barrier (80.8 %) and high cost of accessing soil information (72.5 %) the major barriers the farmers believe affect their adoption of soil information. This showed that farmers are willing to accept the use of soil information, if they are properly educated on soil information through the proper channels and they are made accessible.

Solutions to barriers

Table 5 shows the possible solutions suggested by the farmers that can aid them in utilizing soil information. Majority of the farmers stated that more awareness programs on soil information (64.2 %) will help them understand the use and importance of soil information. They also stated that Reduced cost of soil analysis (52.5 %) will encourage them to utilize soil information, with farmers stating that if the price is affordable they are willing to pay for soil analysis. The farmers also suggested to be giving more access to soil information (44.2 %) with most claiming that even though they have heard of soil information they have been taught how and where to access such information. Also 25% of the farmers believed that extension agents should be trained on soil information and should help in soil analysis, since the extension agents only introduced them to soil information but did not state its importance to them. This might be due to the fact most extension agents are trained in agriculture which does not give them enough knowledge on soil information. Kufoniyi (2000) and Okedi (2000) stated that a well trained extension worker in soil information can transform such complex soil data to customized or user-friendly forms.

CONCLUSION AND RECOMMENDATIONS

The result of this research showed that majority of the farmers have been introduced to soil information but not all use it for farming. Even though, they were introduced to soil information there is a gap in knowledge regarding the relevance and use of soil information, due to the fact that extension agents did not disseminate such information to the farmers. The farmers also agree with the notion that soil information can increase agricultural productivity and bring about sustainable agriculture, although this depends on the availability of soil information to them in terms of reduced cost of soil analysis and more awareness programs. Most of the farmers classify their soils locally as a form of soil

information and this serves as a means of selecting specific crops to suit specific crop types, although there is a gap between scientific classification of soils and local classification with local classification only taking into consideration the colour and texture of the soil, linkage between farmers, extension agents and soil scientist can bridge the gap in classification allowing for farmers to in-cooperate more parameters into their form of classification.

Table 1: Institutional characteristics of respondents

Variables	Frequency	Percentage
Secondary occupation		
Farming	63	52.5
Trading	34	28.3
Civil servant	2	1.7
Processing	21	17.5
Total	120	100.0
Cooperative Membership		
Yes	88	73.3
No	32	26.7
Total	120	100.0
Access to credit		
Yes	56	46.7
No	64	53.3
Total	120	100.0
Source of Credit		
None	58	48.3
Agricultural bank	53	44.2
Cooperative	9	7.5
Total	120	100.0
Extension Contact		
Yes	119	99.2
No	1	0.8
Total	120	100.0
Frequency of Contact		
Weekly	28	23.3
Bi-weekly	51	42.5
Monthly	41	34.2
Total	120	100.0
Introduction to Soil information by extension agents		
Yes	77	64.2
No	43	35.8
Total	120	100.0
Knowledge about soil information		
Yes	119	99.2
No	1	0.8
Total	120	100.0
Usage of soil information		
Yes	69	57.5

No	51	42.5
Total	120	100.0
Use of local soil classification		
Yes	80	66.7
No	40	33.3
Total	120	100

Source: Field survey, 2018

Table 2: Awareness of respondents about soil information

Statements	HA	A	NA	WS	WM	Decision
Awareness about soil information	0	118	2	238	1.98	Not aware
Awareness of use of soil information	0	112	8	232	1.93	Not aware
Awareness on importance of soil information	9	49	62	187	1.56	Not aware
Awareness that soil information improve yield	23	49	48	215	1.79	Not aware
Awareness that soil information improves fertility	13	61	46	207	1.73	Not aware
Awareness that soil information reduces cost of production	11	66	43	208	1.73	Not aware
Awareness that soil information reduces soil deterioration	14	61	45	209	1.74	Not aware

HA = Highly aware, A = Aware, NA = Not aware, WS = Weighted sum, WM =Weighted mean.

Table 3: Perception of respondents about soil information

Statement	SA	A	UD	D	SD	WS	WM	Decision
Soil information improves yield	0	118	2	0	0	478	3.98	Agree
Soil information improves soil fertility	27	90	3	0	0	504	4.20	Agree
Soil information is necessary for agricultural production	22	51	43	4	0	451	3.76	Agree
Soil information encourages people to farm	30	45	43	2	0	463	3.86	Agree
Soil information reduces soil deterioration	16	35	68	1	0	426	3.55	Agree
Soil information is only necessary for large scale farming	0	0	18	101	1	257	2.14	Disagree
Soil information reduces stress	1	72	47	0	0	434	3.62	Agree
Soil information is too expensive	0	85	35	0	0	445	3.71	Agree
There is lack of knowledge on soil information	4	93	22	1	0	460	3.83	Agree
Inadequate information on soil information	5	76	38	1	0	445	3.71	Agree

SA – Strongly agree, A – Agree, UD – Undecided, D – Disagree, SD – Strongly disagree, WS – Weighted sum, WM Weighted mean.

Table 4: Barriers limiting use of soil information

Barriers	Frequency	Percentage	Rank
Lack of awareness on soil information	119	99.2	1
High cost of accessing soil information	87	72.5	5
Unreliability of soil information	57	47.5	9
Lack of understanding of soil information	112	93.3	2
Change in soil fertility	83	69.2	6
Land tenure problem	65	54.2	8
Lack of subsidy for soil information	68	56.7	7
Inadequate extension service	100	83.3	3
Language barrier	97	80.8	4

Source: Field survey, 2018

Table 5: Solutions to barriers

Solutions	Frequency	Percentage	Rank
Reliable soil information	11	9.2	6

More awareness programme	77	64.2	1
Extension agents aiding in soil analysis	30	25	5
Reduced cost of soil analysis	63	52.5	2
Access to soil information	53	44.2	3
Training of extension agents on soil information	30	25	4

Source: Field survey, 2018

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