SOCIOECONOMICS OF ORGANIC MANURE FARMING: IMPLICATION FOR SOIL FERTILITY CONSERVATION EDUCATION

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ABSTRACT
Organic manure is any organic matter used in Agriculture to conserve soil fertility. Sustainability of agriculture has become a matter of concern for food security due to the problems of declining soil fertility in crop-based farming system of sub-saharan Africa. This study appraised the use of organic manure by farmers in Katsina-Ala Local Government, Benue State, using structured questionnaire of 120 respondents selected randomly. Data were collected from primary and secondary sources and analysed using simple descriptive statistics. The results revealed that majority of the respondents (78.33%) were between 18 and 40 years old and they were mostly males (75.83%). Findings further revealed that most of the respondents (70.0%) used farm yard manure which they prepared themselves and applied by majority (72.5%) at a rate less than 50 kg/ha by placing it directly in the holes, after planting the crops. Most respondents (78.33%) reported that manure applied at this rate did not increase their yield. The problems faced by the farmers in the practice of organic farming include: lack of funds (66.67%), non-availability of the manure (62.5%), transportation problems (51.67%), low yield of crops (35%) and health problems (12.5%). It was also found out that most respondents (81.67%) did not get any assistance from extension agents who were supposed to educate them on the proper methods of preparation and appropriate rates of application for an effective soil conservation to promote an increased yield of crops. The study, therefore, recommends that more extension staff should be deployed to rural areas to give the farmers adequate education on how to prepare organic manure, teach them methods of application and the appropriate rate of application for proper soil nutrients conservation required for sustainable food production.

Keyword: *Organic manure, Agriculture, Soil fertility, Food Security, Questionnaire*

INTRODUCTION

Nigeria has over 170 million people making it the most populous country in Africa. The country's economic mainstay before the oil boom was agriculture. The country is blessed with both natural and human resources. Sustainability of

Agriculture has been a matter of global concern with the problem of declining soil fertility in the crop-based farming systems of sub- Saharan Africa. This has arisen because the traditional soil fertility management practices which relied on shifting cultivation and fallow period are no longer sustainable as human population continues to increase. Continuous cropping without appropriate soil fertility management leads to deterioration in soil physical, chemical and biological properties. Consequently, declining yields and low resource productivity worsen poverty in rural agricultural areas (Nwajiuba and Akinsanmi, 2002); Ukohol *et al.*, 2019. Agriculture is a holistic agricultural system that combines animal manures and green manure, cover cropping, traditional innovation and science to benefit the shared application of compost, legumes, mineral-bearing rocks to environment and promote fair relationships.

The practice of organic agriculture in an organized manner is still new to the country, with less than ten years of application, (Obinne 2004). In 2009, Nigeria had about 3,154 ha under organic agriculture of which 59 ha were fully converted and managed by a few farmers and NGO's, with little government involvement (Adeoye2011).

However, it was reported that in 2010, land under organic production increased to 11,979 ha with 517 producers. In spite of the low level of activities in organic agriculture in Nigeria, the practice has great strengths that can be exploited to accelerate development. There are organizations and stakeholders that are involved in the development of organic agriculture in Nigeria. These main stakeholders include Dara/Eurobridge Farm, Organic Agriculture Project in Tertiary Institutions in Nigeria (OAPTIN), Olusegun Obasanjo Centre for Organic Agriculture Research and Development (OOCORD), Nigerian Organic Agriculture Network (NOAN), Organic Farmers Association of Nigeria, Organic Fertilizer Association of Nigeria, "Nigeria Go Organic", "Ibadan Go Organic" and many other organic stakeholders in the country IFOAM and FiBL (2006); Agbulu and Idu **(2017)** , (IFOAM, 2004).

Organic agriculture seeks to use those advances that consistently yield benefits, such as new varieties of crops, precision agricultural technologies, and more efficiently, machinery, while discarding those methods that have led to negative impacts on society and the environment, such as pesticide pollution and insect pest resistance (Delate, 2000). According to the International Federation for Organic Agricultural Movement (IFOAM) (2004) and Adeoluwa (2010), organic agriculture is a production system that sustains the health of soils, ecosystems,

biodiversity and people. Organic Manure is an important source of plant nutrients, replenishes soil fertility even more than inorganic fertilizers (Howard, 1989). It contributes to soil fertility by adding organic matter and nutrients such as nitrogen which it traps by bacteria in the soil (Gattinger *et al*., 2012). It is formed from decomposed dead plant and animal materials.

However, Obinne (2004) reported that the extent of the utilization of organic manure was found to be on small scale in Nigeria. Majority of the farmers (about 70 per cent) practiced organic farming by default either because of the prohibitive costs of chemical fertilizer and other agrochemicals or as a habit. Ephraim *et al*. (1997) reported that the use of organic manure tends to decrease due to high labour cost requirements associated with its use. Studies by Ayanwale and Bamire (1996) and Adepetu (1997) showed that literacy level and farm size of farmers had significant positive relationship with farmer's decision to adopt the use of organic manure. Despite all these problems against the use of organic manure, the demand for its use rises due to the increasing cost of organic fertilizers (Bamire, 1999). Moreover, organic farming incorporates many other farming systems and thus increases the flexibility of coping with adverse effects of climate change and variability, such as rainfall patterns which give higher economic and ecological stability (Eyhom, 2007). Farmers also believe that organic farm produce store longer and taste better than inorganic farm produce (Mgbenka, *et. al*., 2015). This study, therefore, appraises the use of organic manure in Katsina-Ala local Government, Benue State, Nigeria. Benue Valley of North Central Nigeria is basically an agrarian zone with about 95% of her inhabitants engaged in agricultural businesses (Ukohol *et al*., 2019).

PURPOSE OF THE STUDY

The main purpose of this study was to appraise the socio-economic status of organic manure farming in Benue State and their implication for soil fertility conservation.

Specifically, the objectives of the study were to:

i. Investigate the Socio-economic characteristics of organic manure users in Katsina-Ala Local Government, Benue State
ii. Determine the type of organic manure commonly used for their soil fertility in the study area.
iii. Assess the method of organic manure farming practice adopted by the farmers in the study area.

iv Determine the effects of organic manure application on crop yield
v. Investigate the problems associated with organic manure usage in the study area.
vi. Examine the level of assistance rendered by extension workers on the usage of organic manure in the study area

RESEARCH QUESTIONS

i. Do farmers that used organic manure have more yield than those that did not use manure?
ii. How does the yield affect farmers socio-economic values

HYPOTHESIS

HO1: Socio-economic characteristics of farmers in Katsina-Ala Local Government, Benue State do not significantly affect the adoption of organic farming technologies.

METHODOLOGY

The study was carried out in Katsina- Ala local Government Area of Benue state. The area is endowed with fertile soil which encourages the production of crops like yam, cassava, maize and groundnuts. Majority of the farming population are small-scale farmers practicing both sole and mixed cropping. Descriptive survey design was adopted for this study and data were randomly collected from one hundred and twenty (120) small-scale farmers from three districts (Shitile, Ikyurav and Tongov) using a structured questionnaires. Both primary and secondary data were employed and analyzed using descriptive statistics such as means and simple percentage.

RESULTS AND DISCUSSION

Results of the study (Table 1) showed that majority of the respondents (75.33%) were between the ages of 15 - 40 years.

Table 1: Socio-economic characteristics of the farmers

Variable	Frequency	Percentages
Ages (Years)		
18-40	94	78.33
41-50	20	16.67
51 and above	06	05.00
Total	120	100.00
Sex of the farmer		
Male	91	75.83
Female	29	24.17
Total	120	100.00
Marital Status		
Married	71	59.17
Single, widowed or divorced)	49	40.83
Total	100	100.00
Educational Status		
No formal Education	02	01.67
Primary	68	56.67
Secondary	32	26.67
Tertiary	18	15.00
Total	100	100.00

This shows that more youths are engaged in the use of organic manure than adults. These age groups are teachable and can easily adopt innovations in the use of organic manure. Similarly, majority of the farmers were males (75.83%). This indicated that the use of organic manure is dominated by males who take decisions without necessarily taking permission from their spouses. The distribution according to marital status showed that 59.17% of the respondents were married; while the remaining 40.83% were either widowed or divorced. This means that married couples were able to mobilize family labour more than single parents, in the application of organic manure which is labour intensive. On educational status, majority of the respondents (83.34%) had formal education (primary and secondary school education) This greatly enabled their level of adoption of new innovation as educational status of the farmer plays a vital role in adoption rate of the farmers according to Pandey, 1988.

The result (Table 2) showed that majority of the respondents (70%) applied farm yard manure.

Table 2: Types of organic manure used by the farmers

Types of Manure Used	Frequency	Percentage
Farm yard manure	84	70.0
Green Manure	3	2.5
Compost	33	27.5
Total	**120**	**100.00**

Other types of organic manure applied in the study area were compost (27.5%) and green manure (2.5%) by placing it directly in the soil (47.5%)**.**
The results in (Table 3) further showed that majority of the respondents (72.5%) applied less than 50kg of the farm yard manure to their farms. The manure was in most cases (66.67%) prepared by the farmers themselves (Table 4).

Table 3: Quantity of organic manure used by the Respondents

Quantity of Manure (Kg/ha)	Frequency	Percentage
< 50	87	72.50
50-100	17	14.17
> 200	16	13.33
Total	120	100

Table 4: Preparation of organic manure by respondents

Mode of Manure Preparation	Frequency	Percentage
Manure prepared by Respondents	80	66.67
Manure not prepared by Respondents	40	33.33
Total	120	100

Furthermore, most of the farmers (47.5%) applied the manure directly where the crops are planted. Many of the farmers (28.33%) applied the manure using broadcasting method while others practiced side and top dressing method after planting the crops (Table 5).

Table 5: Methods of application of manure by respondents

Method of Application	Frequency	Percentage
Side/Top dressing	29	24.17
Placed directly in the hole in the soil	57	47.5
Broadcasting Method	34	28.33
Total	120	100

Table 6: Time of application of manure

Time of Application	Frequency	Percentage
Before planting	31	25.83
After planting	89	74.17
Total	120	100

Research Question 4: What are the effects of organic manure application on crop yield?

The findings as presented in Table 7 shows that the organic practicing farmers (78.33%) reported that organic manures produced low yield of crops thus low income.

Table 7: Effect of manure application on crop yield

Manure Application	Frequency	Percentage
High yield	26	21.67
Low yield	94	78.33
Total	120	100

The findings as presented in Table 7 shows that the organic practicing farmers (78.33%) reported that organic manures produced low yield of crops thus low income.

This implied that maximum benefit of the organic manure practice cannot be obtained in only one cropping season but after two or three cropping seasons. In a similar study of Mgbenka *et. al*., (2015), it was reported that yields from organic farms are about 20% lower than from conventional farms. This was attributed to presence of high weed densities and weed biomass in organic farms. A number of problems were reported by the respondents on the use of organic manure. The result showed that most respondents (66.67%) experienced financial constraints on the manure application and on labor for weeding of their farms. This was in accordance with the findings Ephraim (1997) that traditional organic farming is labor and knowledge-intensive, capital-intensive and requires more energy. Non-availability of manure (62.5%) and transportation (51.67%) were also reported.

Just only 12.50% respondents indicated concerns on their health problems which indicates that majority of the respondents enjoyed health advantages from organic produce. This was collaborated in the findings of Baranski *et al*., (2014) which showed that organic produce has health advantages than conventional produce because they contain a range of antioxidants which are linked to reduced chronic diseases such as cancer and neurodegenerative diseases.

Table 8: Problems encountered by respondents in using organic manure

Nature of Problem	Frequency	Percentage
Lack of funds	80	66.67
Transportation Problems	62	51.67
Non-available of Manure	75	62.50
Low yield after application	42	35.00
Health Problems	5	4.17

The result (Table 9) indicated that most respondents (83.33%) were not visited by extension agents who would have given them valuable education on the effective organic farming practice. In support of this findings, Mgbenka (2015) indicated that some of the extension agents reported that they do not necessarily teach organic farming to farmers according to the modern methods but do so through alley farming (farming in the garden path or park).

Table 9: Visits and assistance rendered by extension agents

Visitation	Frequency	Percentage
Visit by extension agent	20	16.67
No visit by extension agent	100	83.33
Total	120	100

CONCLUSION AND RECOMMENDATIONS

The importance of organic manure in agriculture cannot be overemphasized due to the numerous advantages it has over inorganic fertilizers like replenishing and preserving resources, protecting the environment and maintaining biodiversity. Yet, the use of organic manure in the study area is low due to ignorance, low extension services and transportation problems.

It is, therefore, recommended that more extension staff be trained and deployed to the rural areas to educate them on the production and use of organic manure in agriculture.

Work on the organic fertilizer plant initiated by the Benue State Government should be completed on time so as to supply enough organic fertilizer to Benue state farmers. Farmers should be trained on how to make compost, farm yard manure and on the general principles of organic farming for proper usage.

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