E-ISSN: 1115 – 831X P-ISSN: 3027-2963
MPRI-JAVS | INTERNATIONAL JOURNAL OF AGRICULTURAL AND VETERINARY SCIENCE
VOL. 14 NO. 1 - OCTOBER, 2026

AWARENESS ON ORGANIC FERTILIZER USAGE AMONG RICE FARMERS IN LAPAI LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA

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DOI: https://doi.org/10.70382/mejavs.v14i1.058

Abstract

This study assessed the awareness on organic fertilizer usage among rice farmers in Lapai Local Government Area of Niger State, Nigeria. Multistage sampling procedure was used to select a sample size of 110 farmers. Descriptive research design was adopted for the study. Structured questionnaire was used to collect data for the study while descriptive statistics were used to analyze the data. Findings on socioeconomic characteristics revealed that the farmers were relatively young with the mean age of 40 years, married and mostly male. The findings on awareness on organic fertilizer usage showed that majority (86.4%) of the respondents were aware of organic fertilizer while 31.82% used organic fertilizer in rice production. The findings on the source of organic fertilizer revealed that less than half(47.3%) of respondents obtained organic fertilizer from personal compost pits. The constraints to use of organic fertilizer showed 32.7% of the respondents had high labour demand as the main constraint. The government, in collaboration with NGOs and local cooperatives, should establish community-based composting centers to train farmers on the use and application of organic fertilizer was offered as recommendation.

Keywords: Awareness, organic, fertilizer, usage, rice

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Introduction

Agriculture remains a cornerstone of Nigeria's economy, providing employment for a significant portion of the population and contributing substantially to the nation's Gross Domestic Product (GDP) (Oyelade and Abiodun, 2024). Among the various agricultural activities, rice production holds a prominent position due to its role as a staple food for many Nigerians (Abubakar and Yusuf, 2021). The increasing demand for rice, driven by population growth and changing dietary preferences, has led to intensified efforts to boost rice production across the country. However, the reliance on chemical fertilizers to enhance rice yields has raised concerns about environmental degradation, soil health deterioration, and the sustainability of agricultural practices. Chemical fertilizers, effective in the short term, can lead to long-term negative impacts such as soil acidification, water pollution, and reduced biodiversity (Adamu and Hassan, 2019). These challenges necessitate the exploration of more sustainable and environmentally friendly alternatives to maintain and improve rice production.

Organic fertilizers, derived from natural sources such as animal manure, compost, green manure, and crop residues, offer a viable alternative to chemical fertilizers. They improve soil structure, enhance microbial activity, and increase nutrient availability, leading to sustainable crop production (Adebayo and Tijjani, 2023). Moreover, organic fertilizers contribute to environmental conservation by reducing pollution and promoting biodiversity (Ahmad and Ibrahim, 2019). Despite the recognized benefits of organic fertilizers, their usage among smallholder rice farmers in Nigeria remains limited. Farmers' awareness of organic fertilizers depends significantly on access to information. Sources include extension agents, fellow farmers, non-governmental organizations, and media. Farmers with regular access to agricultural extension services demonstrate higher knowledge and adoption rates of sustainable practices, including organic fertilizer usage. In Lapai Local Government Area (LGA) of Niger State, rice farming is a significant agricultural activity However, the extent to which farmers are aware of and utilize organic fertilizers in rice production is not well-documented. Understanding the awareness on the usage of organic fertilizers is crucial for developing strategies to promote organic fertilizer use for sustainable rice production practices. This study therefore, assessed the awareness on organic fertilizer usage in rice production in Lapai Local Government Area of Niger State, Nigeria.

Statement of the problem

The increasing demand for rice in Nigeria has led to intensified cultivation practices, often relying heavily on chemical fertilizers to boost yields. Chemical fertilizer is effective in the short term, the overuse poses significant environmental and health risks, including soil degradation, water contamination, and reduced soil fertility over time. These issues threaten the sustainability of rice production and the livelihoods of smallholder farmers. Organic fertilizers present a sustainable alternative, offering benefits such as improved soil health, reduced environmental impact, and enhanced crop resilience and yield. However, the use of organic fertilizers among rice farmers in Nigeria, particularly in Lapai LGA, remains low due to lack of awareness. Many farmers may not be adequately informed about the benefits and application methods of organic fertilizers on their farms.

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In view of the above discussions, the study seeks to answer the following research questions:

i. What are the socio-economic characteristics of rice farmers in the study area?

ii. What is the level of awareness on the use of organic fertilizers among rice farmers?

iii. What are the sources of information on the use of organic fertilizers among rice farmers?

Objectives of the Study

The main objective of the study is to assess the awareness on organic fertilizers usage among rice farmers in Lapai Local Government Area, Niger State, Nigeria. The Specific Objectives were to:

1. describe the socio-economic characteristics of rice farmers in the study area.
2. determine the awareness on the use of organic fertilizers among the rice farmers,
3. examine the sources of organic fertilizers among rice the farmers and
4. identify the constraints to use of organic fertilizer among the rice farmers.

The Study Area

The study was conducted in Lapai Local Government Area of Niger State, Nigeria. The area lies between latitude 6.2°E and longitude 8.2° N, it is situated at 75kms to the state capital (Minna). It has boarder with Agaie Local Government to the West, Kogi State to the South, Federal Capital and Gurara Local Government to the North. According to the 2006 National Population Census, Lapai LGA had a population of 110,127. With an annual growth rate of about 2.8%, the population is estimated at 170,000 as of 2024. It occupies a total area of about 3,730km^2 (National Population Commission, 2024). Lapai It comprises of eleven Districts and each of the districts is headed by a district head. The two major languages are Nupe and Dibbo. However, some minority tribes are found in different locations scattered in the area. Also, the Local Government has two distinctive seasons namely: wet and dry seasons. The wet season commences from April to October while the dry season commences from November to March respectively. The annual rainfall distribution pattern shows a maximum of 1300mm rainfall and minimum of 900-1000mm. Mean maximum temperature remains high throughout the year. The average minimum temperature is about 21.10C. The people are mostly farmers and the climate condition in the area favors the cultivation of variety of crops. The main crops cultivated in the area includes: rice, sorghum, maize, cassava, sesame, melon and yam (NBS, 2016).

Sampling Procedure and Sample Size

The rice farmers in Lapai Local Government Area (LGA) constituted the population for this study. Multistage sampling procedure and proportiate sampling were used to select the sample size for the study. The first stage, involved the selection of four (4) districts in Lapai Local Government (LGA) namely: Gupa, Muye, Ebbo, and Gulu. They were purposively selected based on their high level of rice production (SADP, 2025). The second stage involved the selection of one (1) village in each selected district. The third stage involved a random selection of rice farmers at 10% proportiate sampling to give a total of one hundred and ten (110) rice farmers as sample size for the study (Table 1).

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Table 1: Sampling Frame and Sample Size

Local Government Area selected	Districts selected	Names of Villages selected	Number of farmers in the selected villages	Number of farmers selected @10%
Lapai	Gupa	Takalafiya	290	29
	Muye	Gunu	280	28
	Ebbo	Egboko	270	27
	Gulu	Vatsa	260	26
	Total		**1100**	**110**

Source: Field Survey, 2025

Data Collection

Both primary and secondary sources of data were used for this study. The primary data was collected through the use of a structured questionnaire administered with the help of extension agents in Lapai Local Government Area. The secondary data will be obtained from relevant publications, journals, books, reports, and other documented sources related to the study.

Measurement of Study Variables

The variables used for the measurement are: socio-economic characteristics of rice farmers, awareness on the use of organic fertilizer among the rice farmers and sources of organic fertilizer among the rice farmers in the study area.

Socioeconomic Characteristics

The description of emigrants based on age, sex, marital status, education level, occupation, household size, years of farming experience and income.

***Age*:** This is the number of years an individual spent from childhood to adulthood by the emigrant. It was measured in years.

***Sex*:** This refers to either male or female. It was measured as dummy variable with (a) female = 1 and (b) male = 2.

***Marital status*:** One's situation with regard to whether one is single, married, separated, divorced or widowed. This was measured as: married = 1, single = 2 and divorce = 3

Household size: The number of individual residing in the same dwelling and also share meals and accommodation. It was measured in the number of household members.

Occupation: This refers to whether the farmer is having other activities as source of income apart from rice farming. This was measured as: farming = 1, non-farming = 2.

***Educational level*:** Educational attainment or level of education of individual. This was measured on the basis of years spent in acquiring formal education through attendance of schools and colleges. a. Primary education = 6 years, b. Secondary education = 12 years, c. Tertiary education >12 years.

Farm size: This refers to size of farmland used for cultivation of rice. This was measured in hectare (ha).

Years of farming experience: This refers to the number of years farming rice. This was measured using years.

***Annual Income*:** This refers to amount of money realized from rice. It was measured in naira.

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Awareness on use of Organic Fertilizer

Awareness entails knowledge of organic fertilizer by the farmers. This was measured using: Yes = Aware, No = Not aware.

Sources of Organic Fertilizer

This refers to how and where the farmers obtained the organic fertilizer to use in their rice farm. This was measured using: i. Own production, ii. Local market, iii. Cooperative society; iv. Government support programmes, v. NGOs

Constraints to use of Organic Fertilizer

Constraints refer to the problems encountered when using ICTs. This was measured using: i. Scarcity, ii. High cost, iii. Lack of knowledge, iv. Labour demand, v. Low effectiveness.

Data Analysis

Descriptive (frequency counts, mean and percentages) statistics were used to analyze the study objectives i to iii

Socioeconomic characteristics of the farmers

Table 2 showed that 30.0% of the farmers were between the age ranges of 30-39 years with mean age of 40 years in the study area. Similar studies conducted by Vihi (2024) on Nigerian smallholder farmers show that active farm operators are frequently within the age of 40 years, which is favorable for adoption of new practices. The table also, revealed that78.2% of the farmers were males. This aligned with Iguda, (2024) who reported higher male participation in staple crop production. Table 2 further, revealed that 61.8% of the farmers were married. Yahaya *et al.*, (2023) reported that male dominancy is common in rural farming communities where family labor contributes to farm operations. In addition to that, the table showed that 64.6% of farmers had formal education. According to Iguda (2024), higher education levels with greater likelihood of adopting improved practices. On households' size, the table revealed that 49.1% of the farmers had most household size between 4-6 persons. Etim *et al*., (2019) reported that larger households can supply family labor for labor-intensive activities like composting and organic manure application. The table revealed the mean farm size of 2.1 ha. According to Eze *et al*. (2021), small-scale farmers often face resource constraints but can still benefit from organic fertilizer if adequately supported. The table also, showed that 72.7% were full-time farmers. Ezeibe *et al*., (2020) Studies revealed that full-time farmers are more likely to invest time and resources into farm improvements compared to part-time farmers. The table further showed that 36.4% had farming experience within the range of 11–20 years with the mean of 18 years. According to Vihi, (2024) experienced farmers have deep local knowledge which can help or hinder adoption depending on perceived benefits.

Table 2: Distribution of farmers according socioeconomic characteristics

Variables	Frequency	Percentages	Mean
Age (in years)			
20-29	24	21.8	
30-39	33	30.0	

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Variables	Frequency	Percentages	Mean
40-49	28	25.5	40 years
50-59	17	15.5	
>59	8	7.2	
Sex			
Male	86	78.2	
Female	24	21.8	
Marital status			
Married	68	61.8	
Single	19	17.3	
Divorce	1	0.9	
Widow	22	20.0	
Educational status			
Informal education	26	23.6	
OND	22	20.0	
NCE	13	11.5	
HND	28	25.5	
B.Sc	21	19.1	
Household size (in No.)			
1-3	22	20.0	
4.6	54	49.1	
7-9	22	20.0	5 persons
>9	12	10.9	
Farm size (ha)			
<1.0	20	18.2	
1.0-2.0	48	43.6	
2.1-3.0	28	25.5	2.1 ha
>3.0	14	12.7	
Farming experience (in years)			
1-10	31	28.2	
11-20	40	36.4	
21-30	25	22.7	
31-40	11	10.0	18 years
>40	3	2.7	
Occupation			
Full- time farmers	80	72.7	
Part-time farmers	30	27.3	
Annual income (in ₦)			
< 50,000	12	10.9	
50,000-100,000	24	21.8	
101,000-150,000	33	30.0	₦210,100:00k
151,000-200,000	28	25.5	
>200,000	13	11.8	

Source: Field survey, 2025

Finally, the table 2 showed that 30.0% of the farmers earned between ₦101,000- ₦150,000 with the mean of ₦210,100 in the study area. According to Oyetunde-Usman (2021), Income influences the ability to purchase inputs or invest time in producing organic fertilizers.

Awareness and Use of Organic Fertilizer

Table 3 showed that 86.4% of the farmers were aware while 13.6% not aware of organic fertilizer use. Also, 31.82% used organic fertilizer while 64.18% were not using organic fertilizer. Ezeibe *et al*. (2020) found similar awareness among smallholders exposed to extension programs.

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Table 3: Distribution of farmers according to awareness and use of organic fertilizer

Variables	Frequency	Percentage
Awareness		
Yes	95	86.4
No	15	13.6
Use		
Yes	35	31.82
No	75	68.18

Source: Field survey, 2025

Sources of Organic Fertilizer

Table 4 showed that less than half (47.3%) of respondents obtained organic fertilizer from personal compost pits. This implies that the respondents had compost pits as the one recognized most in the study area. This further indicates that the use of organic fertilizer in the farm was well informed. This aligns with Adewale (2021) who observed that self-production dominates organic fertilizer sourcing due to limited market access.

Table 4: Distribution of farmers according to sources of organic fertilizer

Variables	Frequency	Percentage
Personal compost pits	52	47.3
Livestock waste	28	25.5
Fellow farmers	14	12.7
Market purchase	10	9.1
NGOs	6	5.4

Source: Field survey, 2025

Constraints to use of Organic Fertilizer

Table 5 showed that 32.7% of the farmers had labor intensity as the main constraint. This implies that labor intensity was the severe constraint. Onwualu and Nwankwo (2022) emphasized similar challenges, recommending mechanized composting and farmer training.

Table 5: Distribution of farmers according to constraints

Constraints	Frequency	Percentage
High labor demand	36	32.7
Limited raw materials	25	22.7
Inadequate knowledge	18	16.4
Slow nutrient release	15	13.6
Transportation difficulties	10	9.1
Odor/discomfort	6	5.5

Source: Field survey, 2025

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Conclusion

The relatively young age of farmers further implies that targeted training and support could yield long-term benefits for organic fertilizer adoption and broader agricultural development. Also, the farmers were aware of organic fertilizer usage in their rice farms. However, the usage was low due to high labor intensity in compost preparation. The greater awareness on the use of organic fertilizer witnessed will transform to use if there is effect communication and dissemination of information on the benefits of organic fertilizer use. Thus, given the rising cost and environmental impact of inorganic fertilizers, promoting the use of organic alternatives is not only necessary but also strategic for sustainable agricultural development.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The government should collaboration with NGOs and local cooperatives to establish community-based composting centers to train farmers on organic fertilizer making and application.
2. Policy interventions should transform the greater awareness on organic fertilizer to use and application by dissemination of information on benefit of organic fertilizer use
3. Government should strengthen extension services and all relevant organizations on the need to disseminate information on the benefit of organic fertilizer to the farmers.
4. Government should provide machine to reduce the manual labour used in organic fertilizer making.

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