Unlocking the Niche Market Potential of Organic Fertilizer: Evaluation and Projections for Nigerian Bio-Organic Input Market Development

Abstract

Organic fertilizers have several merits in support of their usage, including environmental friendliness, waste conversion purposes, and human hygiene considerations. These lend credence to the objectives of this paper. The study evaluated firm performance and market orientation with a view to profiling market segments within the organic fertilizer niche market and consumers' desire to use and willingness tobuy organic fertilizers. Six organic fertilizer factories and fifty-eight farmers were sampled and described. Results showed that there were no significant obstacles or societal prejudice against organic fertilizer usage in Nigeria, rather patronage was hampered by a lack of awareness about it. Consumers exhibited a high level of willingness to buy organic fertilizer. It was concluded that there is growing coverage in adopting organic fertilizers in Nigeria. The study recommended product promotion, close collaborations between industry and academia, a paradigm shift in the use of inorganic for farming, and market policies from the government as steps towards enhancing the marketability of organic fertilizer.

Keywords: Manure; production; market segmentation; technology option, economic performance, organic farming; composting; organo-mineral; pelletized fertilizer

Introduction

The importance of the agricultural sector in developing countries cannot be overemphasized as it serves as the largest source of employment. The sector provides ameans of livelihood for farming households with over 70% of Nigerians engaging directly or indirectly in the agricultural production of maize, cassava, guinea corn, and yam (Statista, 2022). However, the methods used in producing these crops create a continuous detrimental impact on the environment, as the majority of the farmers adopt the use of conventional farming practices which have been projected to result in future scarcity of suitable farmland for food production (Dipeolu*et al.,* 2009). As a result, the soil is over-fertilized, deteriorated, and overburdened with toxic chemicals, which significantly contributes to the loss of biodiversity (Puech *et al.*, 2014; Atoma *et al.*, 2019). This has been a key issue in terms of global policy, which has prompted efforts to find sustainable agricultural practices and long-term success in food production. As a result, organic farming is thought to be one of the best approaches to address this issue. The International Federation of Organic Movement (IFOAM) defines organic farming as a production method that relies on biodiversity, ecological processes, and cycles that are suited to local conditions to maintain the health of the soils, ecosystem, and people. To benefit the common environment, foster just relationships, and improve the quality of life for all parties concerned, it mixes tradition, creativity, and science. Organic fertilizer fosters a distinct production rationale for smallholder farmers, provides environmental insurance, and retains farm ecological characteristics to accomplish a genuine and long-term sustainable agricultural transformation (Conway and Barbier, 2013; Blank and Thompson, 2004; Ukoje and Yusuf, 2013). This farm input avoids the use of conventional farming methods such as growth regulators, pesticides, and chemical fertilizers in favor of organic fertilizers derived naturally from plant materials such as dried or fresh plant materials, litter, animal manure, and agricultural

by-products. Organic fertilizers sustain ecosystems, according to empirical data (Hartmann *et al.*, 2015; Atoma *et al.*, 2019). Furthermore, according to Omodara*et al.*, (2023), the usage of organic fertilizer offers both monetary and non-monetary benefits to farmers by enhancing agricultural output.

The usage of non-certified organic fertilizer has been a long-standing practice among Nigerian rural farmers. Traditional soil enhancement practices used in northern Nigeria included tannery sludge, excavation pit manure, municipal, and animal waste (Essiet and Wada, 1999; Yusuf et al., 2013). However, the usage of certified organic fertilizer in Nigeria is still in its early stages when compared to nations such as Ethiopia and Tanzania, which have approximately 220,000 and 149,000 certified manufacturers, respectively (Statista, 2022). Only 316 certified crop producers were growing 54,995 acres of land in Nigeria in 2021, which is equivalent to an estimated 0.1% of the country's total agricultural acreage. The government has made efforts to realize the full potential of the production of organic fertilizer by raising awareness, organizingseminars, and farmers' training on the techniques of preparation and the environmental significance of organic fertilizer. The production, demand, and supply of certified organic fertilizer have not, however, improved significantly (Mgbenka*et al.*, 2015). Farmers are reluctant to transition to organic fertilizers because they believe chemical-based fertilizers are effective and economical. Bulkiness, smell, and the lack of a dedicated market for organic fertilizers were also seen to have a substantial impact on adoption rates (Dipeolu, 2009), hence a need to explore the avenue to create amarket niche for organic fertilizer in Nigeria.

The emergence of the market niche would open up an enormous opportunity for organic fertilizer, which has been demonstrated to be a viable means of improving the soil in Nigeria. Crop type, source, nutritional content, region, and shape are the segments used to categorize the niche market for organic fertilizer ((Nagavallemma*et al.*, 2004). Wang *et al.* (2018) underlined that market drives the use and choice of organic fertilizer among crop farmers. Despite the enormous local market potential for organic fertilizers, the bulk market has not yet reached its full potential (Sridhar and Adeoye, 2003; Olanrewaju and Ilemobade, 2009). Little is known about the structure, market niche, and farmers' readiness to use this technique. Thus, the objectives of this research are to (i) evaluate market characteristics for organic fertilizer in terms of firm performance and market orientation; (ii) profile desire to use and willingnesstobuy organic fertilizers; and (iii) examine market segments within that niche market.

Materials and Methods

Six certified organic fertilizer manufacturing facilities and fifty-eight farmers from three southwestern Nigerian states—Lagos, Oyo, and Ondo—made up the study sample. The factories were situated at Lagos (factory A) Aleshinloye (factory B); Bodija (factory C); Ayeye (factory D); and Akure (factory E), respectively. Due to the high concentration of users of organic fertilizer in the three states, 58 crop farmers were also purposively sampled in a field survey using a structured questionnaire. Market variables for organic fertilizer, such as output, demand, prices, sales, revenue, desire to purchase, and willingness to pay, as well as market segmentation within the organic fertilizer market niche, are among the variables measured. Secondary data was sourced from relevant documents. Information gathered was analyzed with descriptive statistics method using Statistical Package for Social Statistics version 21.

Results

Characteristics of organic fertilizer market niche: Performance and Market Orientation

Organic fertilizers produced in Southwestern Nigeria comprise Organo-Mineral, pelletized compost, and compost, as illustrated in Table 1, with monthly output ranging from 4 to 30 metric tons. When compared to other forms of OFs, Organo-Mineral fertilizers have the largest monthly sales (above 80 percent), followed by compost (above 60 percent). This is consistent with the findings of Adulraheem*et al.* (2023), who discovered that most organic farmers buy organo-mineral fertilizer since it contains more minerals than compost and pelletized compost. In total, the average output of organic fertilizer in Nigeria was 77.7 metric tons. The largest producing firm was located in Lagos. This firm has a monthly production capacity of 30 metric tons of compost, followed by theBodija plant at Ibadan (20 metric tons of organo-mineral and compost) and Aleshinloye plant (15 metric tons). It was also gathered that demand for organic fertilizer did not exceed supply in most of the producing firms. In Lagos state for instance, while average monthly output stood at 30 metric tons of compost, demand for compost averaged 35 metric tons monthly. Similar records existed at Aleshinloye where demand and output for organic fertilizer (organo mineral, compost, and pelletized compost) stood at 15 tonnes monthly. However, the monthly output supply exceeded the demand for organo-mineral and compost fertilizers at Bodija firm. To buttress this, aside Lagos factory that sold 100% of the compost fertilizer produced monthly, the percentage monthly sales at most of the inorganic fertilizer-producing firms were mostly at 40% output capacity for compost and between 60-80% for organo-mineral fertilizers. The total monthly revenue from inorganic fertilizer production stood at ₦3,432,767 ($4,577.02), which shows that the market for inorganic fertilizer production is emerging in Nigeria.

Table 1: Organic Fertilizer Firm Performance and Market Orientation

S/N	Firm location	Average Output/ month (metric tons)	Average monthly demand (metric tons)	Range for Monthly demand (metric tons)	Manure Type	Price/ Kg (₦)	Monthly % Sale	Monthly Revenue (₦)
A	Lagos	30.0	35.0	20-50	Compost	64,000.00	100	2,000,000
B	Aleshinloye	15.0	15.0	10-20	Organo-Mineral	30,000 .00	80	816,667
					Compost	20,000.00	40	
					Pelletized Compost	20,000.00	60	
C	Bodija	20.0	15.0	10-20	Organo-Mineral	24,000.00	80	384,000
					Compost	20,000 .00	80	
D	Ayeye	4.0	1.5	1-2	Organo-Mineral	20,000.00	60	40,000
					Compost	30,000.00	40	
					Compost	20,000 .00	80	
E	Akure	8.5	7.5	5-10	Organo-Mineral	25,000.00	60	192,100
					Compost	19,000.00	40	
	Total	77.5	74.0					3,432,767

NB: $1.00 equivalent to ₦750.00

Desire to purchase and willingness to pay for organic fertilizer

Table 2 shows consumers' desire to purchase organic fertilizers. The majority (94.8%) of the farmers preferred the use of organic fertilizer over inorganic fertilizer. However, 62.1% of the farmers occasionally use organic fertilizer while about half (55.2%) of the farmers were willing to pay anaverage of ₦30.00 per kg of organic fertilizer while 10.0% were willing to purchase over 100kg of Organic fertilizers monthly. This finding also reveals that the major obstacles to the use of organic fertilizers in Southwestern Nigeria are non-availability (50%) and low awareness of the products (50%) among crop farmers. Meaning that substantial numbers of crop farmers have inadequate knowledge of organic fertilizers and their practices, limiting the niche market growth and potential.

The major incentives for the use of organic fertilizers are shown in Figure 2. In descending order, about 27% used organic fertilizer due to its environmental friendliness. This is followed by crop efficiency (24.2%), user-friendliness (15.5%), affordability (10.4%) and ready availability (6.9%). The lowest rating went to lasting long in the soil (1.7%), this contradicts the popular opinion that organic fertilizers last longer in the soil and do not run off easily (Sridhar*et al.*, 2003). This implies that the quality of organic fertilizers produced in Nigeria may lack these good retentive qualities and there were few certified producers in the country. The low quality of organic fertilizer may be regarded as one of the reasons why some farmers have failed to switch from inorganic fertilizer to organic fertilizer.

Table 2: Consumer Willingness-To-Buy and To-Pay for organic fertilizer

Willingness-To-Buy/pay	**Frequency**	**%**
Organic Fertilizer preference over NPK inorganic fertilizer		
Strongly Agree/Prefer	30	51.7
Agree/Prefer	25	43.1
Disagree/Decline	1	1.7
Frequency of use of organic fertilizer		
Occasionally	36	62.1
Always	19	32.8
Quantity of organic fertilizer willing to buy/month (kg)		
10-25	16	27.6
26-50	16	27.6
51-75	3	5.2
76-100	7	12.1
101-150	2	3.4
Above 150	4	6.9
How much in Naira are you willing to pay for a kilogram of organic fertilizer?	*n=58*	
15.00	1	1.7
20.00	7	12.1
25.00	1	1.7
30.00	32	55.2
60.00	2	3.4
Obstacles to theconsumption of OFs		
Non-availability of OFs	29	50
Non/Low awareness about OFs	29	50

OF- Organic Fertilizer, NPK- Nitrogen, Phosphorus & Potassium,

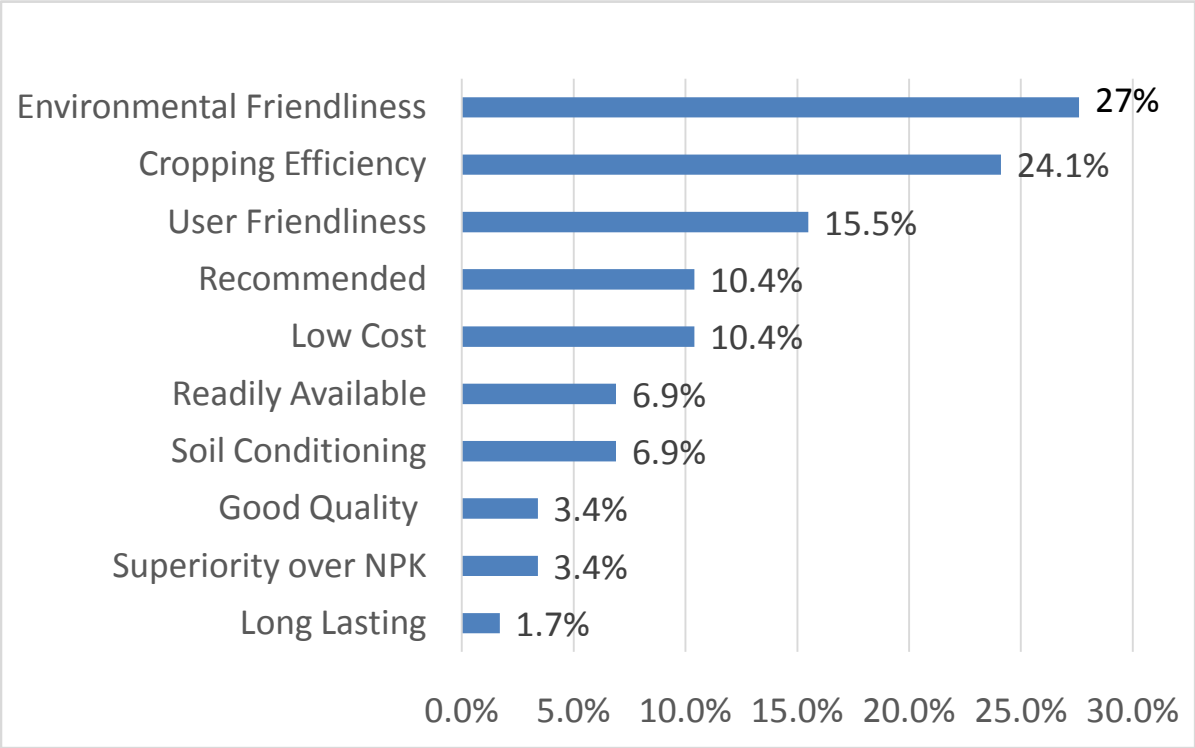

Fig 1: Market Segments within the Organic Fertilizer market niche

The results in Figure 1 indicate the distribution of organic fertilizer within its market segment. The governmental sector occupied about half (50%) of the organic fertilizer segment in Nigeria with cash crop farmers (30%) and individual farmers (20%), respectively.

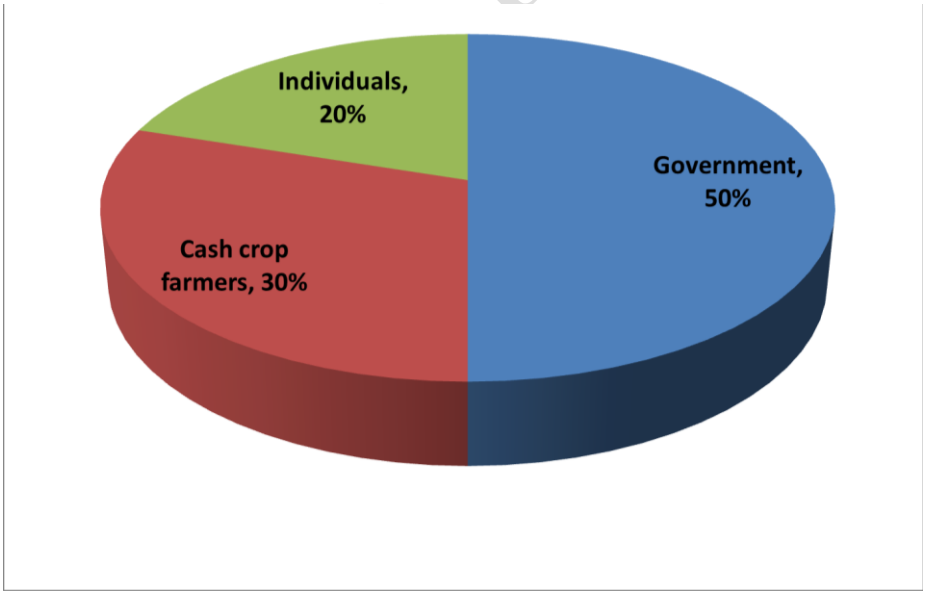

Fig. 2. Organic fertilizer consumers' distribution in Nigeria

Discussions

This article evaluates the potential of the bio-fertilizer input market in Nigeria. The result obtained showed that theorganic fertilizer market is at the formative stage in Nigeria as only a few individual farmers have tapped into this farming practice. The market targeted government patronage and cash crop farmers as the main consumers. Farmers were willing to venture into organic farming but were prevented by non-availability and low levels of awareness about organic farming. This is in line with Dipeolu (2009) that most farmers lack the technical knowledge about organic farming management practices.

It is worth knowing that several factors excluding the premium pricing have been identified to induce the farmers' willingness to convert to organic farming. This contradicts (Hassan and Hussain, 2018) who stated that the high cost of organic fertilizers prevents farmers from its usage. Environmental friendliness and cropping efficiency were major incentives that drove the preference for organic farming. Although, the practice is still occasional. This implies that certain factors influence the use of organic farmers among Nigerian farmers. This study thus supports the submission of Roba (2018) that farmers tend to combine organic and inorganic fertilizers due to the low nutrients of organic fertilizers and environmental pollution of inorganic fertilizers. He further stated that there was a negligible increase in yield if there was appropriate application of organic fertilizer

Conclusion and Recommendations

This article evaluates the potential of the bio-fertilizer input market in Nigeria and concludesthat theorganic fertilizer market is at the formative stage in Nigeria with a limited market segment. There is an increasing willingness to use organic fertilizer, however, non-availability and poor product awareness are inhibitors to the market growth.

Based on the foregoing, this study recommended that

1. Organic fertilizer production factories should develop strategies to promote and create awareness about their products to penetrate deeper into the local market potentials, improve and maximize their outputs, as well as leverage the merits of organic fertilizer.
2. A close collaboration between the organic fertilizer industry and academia through seminars, Research & Development, training, and regular advocacy visits is vital to raising the level of organic fertilizer acceptance among farmers.
3. Concerted efforts should be made to use farm extension programsto raise the level of organic fertilizer acceptance in Nigeria. The government on its part should evolve a strong financial, legislative, fiscal, and industrial policy in support of organic fertilizer production and utilization in the country.
4. The creation of a governmental agency or department within the Federal Ministry of Agriculture and Rural Development having oversight responsibility for the promotion and improved patronage of organic fertilizers as a viable local soil-improving technology would also go a long way in boosting organic fertilizer production capacity and sales.
5. Organic fertilizer products should also be listed among products that will be givenhigh priority in the current agricultural value chain development.

6. Conscious efforts should be made to change the peculiar agricultural system in Nigeria. This means a change from afallow system, shifting cultivation, and chemical-based agriculture. The government should realize and wake up to the fact that its fertilizer policy should look inwards. Encouraging organic fertilizer production using locally available raw materials is a sound strategy for sustainable development and food security.

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