



Assessment of the Use of Municipal Solid Waste by Rice Farmers in Ayamelum L.G.A of Anambra State for Food Security and Improved Nutrition

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Abstract

The study aimed at assessing the use of municipal solid waste by rice farmers in Ayamelum. L.G.A for food security and improved nutrition. The specific objectives of the study includes; to ascertain the perception of extension agents on the use of Municipal solid waste, determine rice farmer's level of awareness and use of Municipal solid waste and identify challenges of composting municipal solid waste by farmers. The research adopted descriptive survey design. The population comprise of 300 registered rice farmers in "Omor" one of the communities in Ayamelum L.G.A of Anambra State, 125 registered rice farmers and 25 extension workers were randomly selected for the research. A four point scale type of questionnaire made up of 18 items was used to gather information from respondents. Data collected from respondents were analyzed using mean a criterion mean of 2.50 was set for decision on the research questions. Finding indicates that rice farmers in the area of study do not use municipal solid waste as their major source of plant nutrient because they are not aware of the advantages of MSW over chemical fertilizer also lack of skills required in formulating MSW is one of the challengers rice farmers in the area of study face in using MSW. It was recommended that extension workers explore every avenue such as farmer's

co-operative society meeting, village meetings and one on one visit to farmers to educate them on the advantages of MSW and how to formulate it.

Keywords: *Municipal solid, waste, food, security Nutrition and rice farmers.*

Introduction

Rice botanically known as *Oryza sativa* is one of the world's most valuable cereal grains. Its worldwide production is slightly above that of corn and a little less than that of wheat (Okemah and Eruotor, 2012). Rice is grown in more than a hundred countries with a total harvested area of approximately 158 million hectares, providing more than 700 million tones annually, that is about 470 million tons of milled rice (Maclean, Daive, Hardy and Hettel 2002). Rice cultivation requires application of organic and inorganic fertilizer for better yield. Inorganic fertilizer can be applied at the rate of 150kg (NH₄)₂ SO₄, 100kg, dicalcum phosphate and 100kg/ha kcl. There is an increasing relevance and high demand for home grown rice among consumers, but rice yield across Nigeria is yet to match with the demands. According to BBC report of 12 April 2019 by Russon Mary- Ann, the average rice production in Nigeria is 3.7million tones per annum, while the yearly consumption stands at 7 million tones,

while Anambra state produces an average of 345,000 metric tones of rice yearly. The gap between the production rate and consumption of rice in Nigeria can be traced to the following factors, decline in soil fertility caused by intensive use of land and reduction of fallow period, underutilization of soil boosting materials such as organic manures. Application of nutrients in form of inorganic fertilizers or organic manures improves crop yield, Dania, Fagbola and Alabi, (2014). However continual or excessive application of inorganic fertilizer leads to soil degradation, contamination of underground water resources, environmental pollution, reduces the storage period of agricultural product and deposits of chemicals used in formulating inorganic fertilizer which may stick to crops posses' danger to human health. There is therefore need to integrate Municipal Solid waste in rice cultivation for better yield improved food security and nutrition. Municipal Solid Waste (MSW),

includes waste from households, non-hazardous waste from industries, commercial, institutional sources such as markets, schools, streets compound waste, (Schubeler, Christian & Wehrler 1996). Kavitha and Subramanian (2007), reported that application of enriched MSW in rice farm leads to increased plant height, had significant influence on dry matter, high grain and straw yield, and increased up take of plants macronutrients.

These findings indicates that application of MSW in rice farm will result in better yield, food security and improved nutrition. Food security is a condition in which all people have access at all times to enough food of an adequate nutritional quality for a healthy and active life (Okpokiri, Agwu & Onwukwe 2017). Improved nutrition in food can be achieved when the right nutrients are added to the soil for plant absorption. Therefore to achieve better yield in rice production and improve nutrition the use of MSW in cultivation of rice should be encourage.

Statement of Problem

There is an increasing demand on home grown rice in Nigeria, especially owing to the fact that there is a ban on importation of rice and the resent closure of Nigeria land boarder. To meet these demand more in expected of rice farmers. Rice farmers are faced with the challenge of cultivating enough rice with high nutritional content. To be able to achieve this,the use of MSW should be encouraged by all the stakeholders in rice production. Rice farmers in the area of study are faced with the challenges of lack of awareness on the inherent benefits of using MSW and lack of skills for formulating MSW.

Purpose of Study

This study sought to assess the use of MSW by rice farmer for food security and improved nutrition, specially the study sought to:

1. Ascertain the perception of extension agents on the use of MSW
2. Determine rice farmers level of awareness and use of MSW
3. Identify challenges of composting MSW by rice farmers.

Research Questions

1. What is the perception of extension agents on the use of MSW?
2. What is the level of rice farm awareness and use of MSW?

3. What are the challenges of composting MSW by rice farmers?

Methodology

The research design adopted for the study was descriptive survey design. Descriptive research involves collection, organization, analysis and description of data as they exist without interfering with them (Uzoagulu 2011). The research was conducted in “Omor” a rice producing community in Ayamelum Local Government Area Anambra State. The population was made up of 300 registered rice farmers in the community and 25 extension workers from Ayamelum L.G.A and ministry of Agricultural Awka Anambra State. 125 rice farmers were selected through simple random sampling technique. A 4 point scale type questionnaire made up of three sections were used to solicit information from respondents. The questionnaire consist of 18 items with the rating scale of strongly Agreed “SA”, Agreed ‘A’ Moderately Agreed “MA” and Not Agreed “NA”, with corresponding value of 4, 3, 2 and 1 respectively. The instrument was validated by three experts two from Agronomy department Delta State University Asaba campus and one from Education Measurement and Evaluation department Federal College of Education (Technical) Asaba. Data collected from respondents was analyzed using mean scores. A criterion means score of 2.50 was set for decision on the research questions.

Results

Research Question 1. What is the perception of extension agents on the use of MSW for rice cultivation?

Table 1: Show perception of extension agents on the use of MSW.

| S/N | Items statement | SA | A | MA | NA | Total | Mean | Remark |
|-----|--|----|---|----|----|-------|------|----------|
| 1 | Municipal Solid Waste can boost decomposition of solid organic matter. | 20 | 4 | - | 1 | 25 | 3.76 | Accepted |
| 2 | MSW improve solid physical of soil and enhance | 15 | 8 | 1 | 1 | 25 | 3.48 | Accepted |

| | | | | | | | | |
|----------|--|----|----|---|---|----|------|----------|
| 3 | MSW can restore soil polluted by plastics. | 10 | 5 | 5 | 5 | 25 | 2.80 | Accepted |
| 4 | MSW can restore soil polluted by plastics | 12 | 5 | 5 | 3 | 25 | 3.04 | Accepted |
| 5 | MSW has rich organic materials constant nutrient elements like copper, zinc, iron, manganese and has some amount of course residue. | 14 | 6 | 3 | 2 | 25 | 3.28 | Accepted |
| 6 | Crops grown with MSW stores longer than those grown with fertilizers. | 20 | 5 | - | - | 25 | 3.80 | Accepted |
| 7 | Rice grown with MSW is more healthier for human consumption | 10 | 10 | 3 | 5 | 25 | 3.12 | Accepted |
| 8 | Application of 75% MSW and 25% inorganic fertilizer will lead to improved yield, improved nutrition, better storage healthier rice for man | 20 | 5 | - | - | 25 | 3.80 | Accepted |

Source field work
2019

Table 1 presented the mean rating of extension workers perception on the use of MSW for rice cultivation, the data in table one revealed that all the items had mean rating ranging from 2.80 – 3.80. The implication of this is the respondents agreed in their opinion that those items are the perception of extension workers on the use of MSW for cultivation of rice.

Research question 2: What is the level of rice farmer's awareness and

Table 2 : Rice farmers level of awareness and use of MSW

| S/N | Items statement | SA | A | MA | NA | Total | Mean | Remark |
|-----|--|----|----|----|-----|-------|------|----------|
| 9 | I do not use MSW | 70 | 40 | 5 | 10 | 125 | 3.36 | Accepted |
| 10 | I use MSW sometimes but not as my main source of plant nutrient | 5 | 10 | 20 | 90 | 125 | 1.44 | NA |
| 11 | I combine MSW with inorganic fertilizer in my rice farm | 5 | 5 | 20 | 95 | 125 | 1.36 | NA |
| 12 | I know that MSW can increase soil fertility | 10 | 10 | 20 | 85 | 125 | 1.56 | NA |
| 13 | Am aware of the benefits of MSW to the soil and quality of rice produced | 5 | 10 | 10 | 100 | 125 | 1.36 | NA |

Source Field Work 2019

Responses in the table 2 indicates that rice farmers in the area do not use MSW as indicated in their mean rating of 3.36. Items 10 to 13 revealed that rice farmer

do not sometimes use or combine MSW with fertilizer an indication that they are not aware of the benefits of using MSW at all. This is represented in their mean rating of 1.44, 1.36, 1.56 and 1.36 respectively.

Research Question 3: What are the challenges of composting MSW by rice farmers?

Table 3: Showing Challenges of Composting MSW

| S/N | Items statement | SA | A | MA | NA | Total | Mean | Remark |
|-----|---|-----|----|----|----|-------|------|----------|
| 14 | Gathering and sorting of MSW is very tedious and time consuming. | 100 | 10 | 9 | 6 | 125 | 3.63 | Accepted |
| 15 | It cost a lot of money to pay people that will gather MSW for composting | 90 | 21 | 10 | 4 | 125 | 3.58 | Accepted |
| 16 | Composting of MSW requires skill and most rice farmers do not have these skills. | 75 | 25 | 14 | 11 | 125 | 3.25 | Accepted |
| 17 | Composting of MSW requires skill and most rice farmers do not have these skills. | 66 | 35 | 19 | 5 | 125 | 3.29 | Accepted |
| 18 | Rice farmers do not have sufficient, skilled extension workers who will teach how | 58 | 39 | 16 | 12 | 125 | 3.14 | Accepted |

Responses in table 3 indicated that all the item statements are challenges of composting MSW in the area of study as indicated in the mean rating of 3:14 – 3.63 in the data.

Discussion of Findings

Findings on the perception of extension workers on the use of MSW revealed that the use of MSW for rice cultivation has many benefits, to the soil nutrient content, the environment and human health. This agrees with (Dawe et al 2002), who observed that rice cultivation requires application of organic for better yield, also (Kavitha & Subramanian 2007) reported that application of enriched MSW in rice farm led to increased plant height, had significant influence on dry matter, high grain and influence on dry matter, high grain and straw yield and increased uptake of plant macronutrients. Responses of extension agent to item statements in table one indicates that they are aware of the benefits of using MSW for rice cultivation as a means of improving food security and improved nutrition and yield of rice. The findings on research question two on to level of awareness and use of MSW by rice farmers in the area of study revealed that rice farmers do not use MSW and are not aware of the benefits of MSW to the soil, crop, environment and human health even when MSW are found everywhere in the environment as stated by (Kavitha *et al* 2007) yet they are not aware of the inherent benefits of the waste the generate to their rice farms. Furthermore responses from rice farmers to research question three indicates that rice farmers are faced with a of challenges in composting MSW, these challenge ranges from tedious nature of sorting MSW, cost of labour, time taken for decomposing of MSW, lack of skills for composting MSW and insufficient skilled extension workers. These agrees with the findings of (Chukwukelu & Eze 2017) who observed that most farmers lack the competences required in producing organic manure for crop production leading to total dependent on inorganic fertilizer. These findings has been able to reveal why rice farmers in the area of study do not use MSW in cultivating rice.

Conclusion

Achieving food security and improved nutrition in rice cultivation calls for a concerted effort by all stakeholders in the rice value chain especially at this time when Nigeria has placed a ban on rice importation. This research has been able to establish that MSW has a lot to offer rice farmer, environment and the consumers. Therefore the application of MSW should be encouraged. It was also observed that rice farmers do not have the required skills needed to compost MSW, owing to the fact that they lack the awareness of its benefits and insufficient skilled extension agents. If these areas identified by the research are addressed the issues of food security and improved nutrition in rice production will be resolved.

Recommendations

1. There is need for government through the ministry of agriculture to train and retain extension workers on the competences required in formulating MSW.
2. Extension workers should explore every avenue such as farmer co-operative meeting village /town hall meetings and one on one visit to rice farmers to educate them on the benefits of using MSW.
3. Rice farmers should be encouraged by village heads and community leaders to embrace changes and adopt the trending global practices in agriculture which encourages the use of organic manure as it is environmentally friendly healthier and provides better nutrient to plants.

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