e-ISSN 2795-3272
p-ISSN 2795-3264

10.5281/zenodo.12158190 Vol. 07 Issue 05 May - 2024 Manuscript ID: #01427

Achieving Environmental Sustainability through Extension Education in Ugwunagbo Local Government Area of Abia State

By

Chinyere Chinwem Ngurukwem[1], Okop Ekaette Okon[2] & Kingsley Asogu Ogbonnaya[3]
Department of Adult and Non-Formal Education, Federal College of Education Obudu, Cross River State[1]
Department of Adult Education and Extra-Mural Studies, University of Nigeria, Nsukka[2]

Abstract

The study focused on achieving environmental sustainability through extension education in Ugwunagbo Local Government Area of Abia State. The population of the study comprised all the 216 members of Agro-Flavor Farms Ugwunagbo LGA. Census sampling technique was used. Descriptive survey research design was adopted for the study. Structured questionnaire was used for data collection. The instrument was face-validated and trial tested. Overall reliability coefficient of 0.79was generated using Cronbach Alpha method. Data collected were analysed using mean and standard deviation. Finding from the study revealed that the extent to which extension education can be used to achieve sustainable agricultural practices, and sustainable waste management system in Ugwunagbo LGA was high. Based on the findings, some recommendations were made, among which is that there is need to develop extension education programmes that focus on sustainable agricultural practices which will educate farmers in Ugwunagbo LGA on sustainable farming techniques.

Keywords:

Environmental sustainability; extension education, sustainable waste management; sustainable agricultural practices

Introduction

Environment is the space where life exists. It involves all the surrounding where human beings, animals, fishes and birds live, that is the land, sea and air. Environment is the set of conditions and circumstances affecting people's lives which includes water, air, soil and also the social and economic conditions under which we live (Park, 2011). The practice of using environmental resourcesin such a way that preserves the natural environment, ensuring its ability to support current and future generations is seen as environmental sustainability. Globally, environmental sustainability is seen as an endeavor which requires collaborative efforts across nations and sectors. International agreements, such as the Paris Agreement on climate change, exemplify the commitment of countries to limit global temperature rise and foster climate resilience (UNFCCC, 2015). Achieving global environmental sustainability demands overcoming geopolitical differences, promoting technological innovation, and fostering a collective sense of responsibility (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES, 2019).

In Africa, the vast natural resources and varied habitats make environmental sustainability a crucial issue. Rapid population expansion, deforestation, climate change, poor agricultural practices, poor waste management, and resource exploitation are some of the factors that African countries confront when it comes to environmental issues.An important problem in many African nations is poor garbage management. Ecosystem and waterway pollution is a result of improper garbage disposal, especially with regard to plastic. To lessen these effects, recycling initiatives and infrastructural improvements for garbage management are crucial (World Bank, 2018). Furthermore, Nigeria is experiencing a rise in garbage output as a result of its rapid urbanization and population growth. Pollution of the environment is caused in part by inadequate waste management infrastructure and practices. According to Adeoti, Adekoya, and Otun (2018), waste management issues must be resolved if Nigeria is to have sustainable development.

In addition, the idea of environmental sustainability lay emphasis on the need to use environmental resources without compromising the ability of the future generation to utilize theirs. The United Nations (2015) defines environmental sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own need. This definition underscores the intergenerational responsibility inherent in sustainable development. More so, the importance of achieving environmental sustainability made the United Nations to entrench it in sustainable development goals 6 Clean Water and Sanitation, 11 Sustainable Cities and Communities, 13 Climate Action, 14 Life Below Water, and 15 Life on Land. In this work therefore, environmental sustainability is defined as the prudent use of natural resources with the goal of preserving their availability for future generations and reducing unfavorable effects on ecosystems. To achieve environmental sustainability in Ugwunagbo Local Government Area of Abia State, there is need to promote activities that support sustainable agricultural practices, sustainable waste management, biodiversity, preserve ecological balance, and deal with problems like pollution, resource depletion, and climate change through extension education.

Extension education is the process of transferring knowledge or findings from institutions to people especially those in rural area. The Food and Agriculture Organization FAO, (2015) defines extension education as an informal educational process directed toward adult learners, primarily farmers, to assist them in developing the knowledge and skills they need to improve their farm management and income, to better their welfare, and to contribute to the development of their communities through agriculture. In addition to the above, the World Bank (2015) highlights extension education as a critical component of agricultural development, emphasizing its role in technology dissemination, knowledge transfer, and capacity building. It notes that effective extension

services can contribute to poverty reduction and food security. Extension education can be used to achieve environmental sustainability through achieving sustainable agricultural practices, and sustainable waste management system in Ugwunagbo LGA.

Extension education can play an important role in achieving sustainable agricultural practices by facilitating the dissemination of knowledge, technologies, and best practices to farmers. This educational approach helps farmers adopt environmentally friendly, economically viable, and socially responsible farming methods. According to FAO (2015) extension education serves as a bridge between agricultural research and farmers, facilitating the transfer of knowledge on sustainable farming practices. By providing information on techniques such as conservation agriculture, organic farming, and integrated pest management, extension services empower farmers to adopt practices that promote soil health, biodiversity, and resource efficiency. Furthermore, World Bank (2015) pointed out that climate change poses significant challenges to agriculture. Extension education contributes to building farmers' capacity to adapt to climate variability and adopt climate-resilient agricultural practices. This includes the promotion of drought-resistant crop varieties, water conservation techniques, and agroforestry practices that enhance resilience in the face of changing climatic conditions. In addition, Gupta, Srivastava and Yadav (2017) stated that extension education emphasizes the importance of crop rotation, cover cropping, and sustainable livestock management to maintain soil fertility and prevent degradation. It promotes practices that reduce reliance on synthetic inputs, such as the use of organic fertilizers and biological pest control methods, contributing to sustainable agriculture. Therefore, extension education is a powerful tool for promoting sustainable agricultural practices by providing farmers with the knowledge, skills, and technologies needed to adopt environmentally sound and economically viable approaches which can also be used to achieve sustainable waste management system.

Extension education promotes sustainable waste management systems by raising awareness, providing education, and facilitating the adoption of responsible waste management practices. Mollik, Paul, andJaman, (2018) stated that extension education programmes can inform communities about the environmental impact of improper waste disposal and the benefits of waste reduction, recycling, and proper disposal. Through raising public awareness, extension services can motivate individuals to adopt sustainable waste management behaviours. Sharma and Mahato (2019) pointed out that extension education provides training sessions to households, businesses, and communities on the importance of segregation at the source. Proper segregation of waste into categories like recyclables, organic waste, and non-recyclables is crucial for effective waste management. Furthermore, Fricke (2018) noted that extension services can educate individuals and communities on the benefits of composting and other organic waste management techniques. This includes training on home composting methods and the use of organic waste for agricultural purposes, reducing the burden on landfills and contributing to soil health. Again, Ghani, Noor, and Nordin (2019) stated that extension education can advocate for and implement incentive-based waste management programmes. These programmes may include reward systems for communities or households that excel in waste reduction, recycling, or other sustainable practices, fostering a sense of competition and community engagement. Therefore, extension education is a powerful tool for achieving a sustainable waste management system by fostering awareness, changing behavior, promoting responsible waste practices, and encouraging collaboration between communities and local authorities.

This study anchored on social learning theory by Albert Bandura (1977). Social Learning Theory emphasizes the role of observational learning and modeling in behavior change. In this study, this theory can be applied to understand how individuals and communities learn and adopt sustainable practices through extension education. It explores the influence of social interactions, role models, and community engagement in shaping attitudes and behaviors related to sustainable agriculture and waste management among the people of Ugwunagbo Local Government Area of Abia State.

Ugwunagobo LGA is one of the 17 LGAs in Abia State which also faces the challenge of achieving environmental sustainability. Therefore, the problem of this study is to ascertain the extent to which extension education can be used to achieve environmental sustainability.

Statement of the Problem

Ideally, Ugwunagbo Local Government Area of Abia State ought to have a well-established and effective system of extension education that actively contributes to achieving environmental sustainability. The agricultural sector ought to thrive with sustainable farming practices, leading to increased productivity, improved livelihoods for farmers, and minimal environmental impact. Similarly, the waste management system would be sustainable, with widespread community awareness, efficient waste segregation at source, and proper disposal methods, resulting in a cleaner environment and reduced ecological footprint.

However, agricultural practices seem to lack adherence to sustainable methods, leading to soil degradation, reduced crop yields, and potential environmental harm. Additionally, the waste management system seems to face challenges such as inadequate community awareness, improper waste disposal, and a lack of effective recycling initiatives, contributing to environmental degradation and health hazards.There is a lack of structured and comprehensive extension programmes that address the specific needs and challenges of the local community. As a result of this, farmers do not have access to updated information on sustainable agricultural practices, and communities lack the necessary knowledge and motivation to actively participate in sustainable waste management initiatives. Therefore, the problem of this study is to ascertain the extent to which extension education can be used to achieve environmental sustainability in Ugwunagbo Local Government Area of Abia State.

Objectives of the Study

The general objectives of the study are achieving environmental sustainability through extension education in Ugwunagbo Local Government Area of Abia State. Specifically, the study will seek to find out the extent to which:

1. Extension education can be used to achieve sustainable agricultural practices in Ugwunagbo LGA
2. Extension education can be used to achieve sustainable waste management system in Ugwunagbo LGA

Research Questions

The study was guided by the following research questions

1. To what extent can extension education be used to achieve sustainable agricultural practices in Ugwunagbo LGA?
2. To what extent can extension education be used to achieve sustainable waste management system in Ugwunagbo LGA?

Methodology

The study adopted descriptive survey research design. Descriptive survey aims at collecting data on, and describing in a systematic manner the characteristics, features or facts about a given population (Nworgu, 2015). The study was carried out in Ugwunagbo Local Government Area of AbiaState. This area was chosen as the area of the study in order to fill the gap in knowledge regarding the extent extension education can be used to achieve environmental sustainability. The

population of the study comprised all the 216 members of Agro-Flavor Farms Ugwunagbo LGA. Census sampling technique was used to sampled the entire population. The instrument that was used for data collection was the researcher's self-developed questionnaire titled achieving environmental sustainability through extension education questionnaire (AESEEQ). To determine the validity of the instrument the questionnaire was face-validated by three experts. to ascertain the relevance of the instrument and its appropriateness to the study. After thorough assessment, the validators recommended that some items should be removed or replaced with other items. The corrections made was used to draft the final copy of the instrument. The reliability of the instrument was determined by administering 20 copies of the instrument to farmers from Aba South LGA who are different from the area of the study but share the same characteristics in term of occupation. A reliability coefficient of 0.78and 0.81 were generated using Cronbach Alpha Statistical Tool. Therefore, the overall reliability of 0.79 shows that the instrument was reliable. The data were collected by the researchers through sharing the questionnaire to the farmers during their meeting. The questionnaire was collected on the spot to ensure high return. The data collected were analysed using mean and standard deviation.

Result

Research Question One: To what extent can extension education be used to achieve sustainable agricultural practices in UgwunagboLGA.

Table 1: Mean ratings on the extent extension education can be used to achieve sustainable agricultural practices.

S/N	**ITEMS**	X	Sd	Remarks
1	Extension education serves as a bridge between agricultural research and farmers	2.80	0.61	High Extent
2	Facilitating the transfer of knowledge on sustainable farming practices.	2.91	0.51	High Extent
3	providing information on techniques such as conservation agriculture	2.67	0.63	High Extent
4	Teaching organic farming	2.74	0.59	High Extent
5	Teaching integrated pest management	3.75	0.43	High Extent
6	Extension services empower farmers to adopt practices that promote soil health and biodiversity	3.90	0.29	High Extent
7	Building farmers' capacity to adapt to climate variability	3.54	0.65	High Extent
8	Teaching farmers to adopt climate-resilient agricultural practices	3.46	0.66	High Extent
9	Teaching farmers crop rotation and cover cropping	3.15	0.54	High Extent
10	Teaching farmers' sustainable livestock management to maintain soil fertility and prevent degradation	3.64	0.48	High Extent
	Mean of means	**3.26**	**0.54**	High Extent

Table 1 revealed the mean ratings on the extent extension education can be used to achieve sustainable agricultural practices. The mean ratings which ranges from 2.67-3.90 showed that all the

items in the cluster are of high extent. Therefore, the grand mean score of 3.26 revealed that the extent to which extension education can be used to achieve sustainable agricultural practices in Ugwunagbo LGA was high.

Research Question Two: To what extent can extension education be used to achieve sustainable waste management system in Ugwunagbo LGA?

Table 2: Mean responses on the extent to which extension education can be used to achieve sustainable waste management system

S/N	ITEMS	X	Sd	Remarks
11	Informing communities about the environmental impact of improper waste disposal	3.22	0.44	High Extent
12	Teaching the benefits of waste reduction	3.43	0.85	High Extent
13	Teaching recycling and proper waste disposal.	3.09	0.50	High Extent
14	Raising awareness on sustainable waste management behaviours	3.67	0.47	High Extent
15	Educating individuals and communities on the benefits of composting and other organic waste management techniques	3.39	0.50	High Extent
16	Training families on home composting methods and the use of organic waste for agricultural purposes.	3.45	0.64	High Extent
	Mean of means	**3.38**	**0.57**	High Extent

Table 2 revealed the mean responses on the extent to which extension education can be used to achieve sustainable waste management system. The mean ratings which ranges between 3.09-3.67 showed that all the items in the cluster has high extent mean. Therefore, the grand mean score of 3.38 revealed that the extent extension education can be used to achieve sustainable waste management system in Ugwunagbo LGA was high.

Discussion

The first finding of the study revealed that the extent to which extension education can be used to achieve sustainable agricultural practices in Ugwunagbo LGA was high. This is because the respondents agreed that extension education serves as a bridge between agricultural research and farmers. This finding is in agreement with FAO (2015) which stated that extension education serves as a bridge between agricultural research and farmers, facilitating the transfer of knowledge on sustainable farming practices. In addition, extension education provides information on techniques such as conservation agriculture, organic farming, and integrated pest management, extension services empower farmers to adopt practices that promote soil health, biodiversity, and resource efficiency. These are necessary for achieving environmental sustainability. More so, the respondents agreed that extension education facilitates the transfer of knowledge on sustainable farming practices, provides information on techniques such as conservation agriculture, including teaching organic farming. This finding was supported by Yadav (2017) who pointed out that extension education emphasizes the

importance of crop rotation, cover cropping, and sustainable livestock management to maintain soil fertility and prevent degradation. It promotes practices that reduce reliance on synthetic inputs, such as the use of organic fertilizers and biological pest control methods, contributing to sustainable agriculture. Extension services also empower farmers to adopt practices that promote soil health and biodiversity.

Finding from research question two revealed that the extent extension education can be used to achieve sustainable waste management system in Ugwunagbo LGA was high. This is because the respondents agreed that extension education informs communities about the environmental impact of improper waste disposal, and teaches the benefits of waste reduction. This finding was supported by Mollik, Paul, andJaman, (2018) who stated that extension education programmes can inform communities about the environmental impact of improper waste disposal and the benefits of waste reduction, recycling, and proper disposal. Furthermore, extension education raises public awareness and motivate individuals to adopt sustainable waste management behaviours. In addition to the above, finding further revealed that extension education
teaches recycling and proper waste disposal including educating individuals and communities on the benefits of composting and other organic waste management techniques. Sharma and Mahato (2019) supported the above findings when they pointed out that extension education provides training sessions to households, businesses, and communities on the importance of segregation at the source. Proper segregation of waste into categories like recyclables, organic waste, and non-recyclables is crucial for effective waste management.

Conclusion

Based on the findings of the study, it was concluded that the extent to which extension education can be used to achieve sustainable agricultural practices in Ugwunagbo LGA was high; and the extent extension education can be used to achieve sustainable waste management system in Ugwunagbo LGA was high.

Recommendations

Based on the findings of the study, some recommendations were made, some of the recommendations include:

1. There is need to develop and implement robust extension education programmes that focus on sustainable agricultural practices. These programmes should be designed to educate farmers in Ugwunagbo LGA on modern and sustainable farming techniques, resource conservation, and environmentally friendly practices.
2. There is need to integrate waste management education into existing extension programmes. This can include educating the community on proper waste disposal methods, recycling practices, and the importance of reducing waste generation. Collaboration with local authorities and waste management agencies may enhance the effectiveness of these efforts.

References

Adeoti, I., Adekoya, J., &Otun, J. (2018). Sustainable Solid Waste Management in Nigeria: A Case Study of Lagos State. *European Journal of Sustainable Development, 7*(1), 243

Food and Agriculture Organization, FAO, (2015). Agricultural extension and advisory services: Helping farmers to help themselves. Retrieved from http://www.fao.org/3/a-i4609e.pdf

Fricke, K. (2018). Evaluation of a home composting program in Edmonton, Canada.*Resources, Conservation and Recycling, 129,* 327-333.

Ghani, W. A. W. A. K., Noor, Z. Z., &Nordin, N. (2019).An assessment of solid waste management in Kuala Lumpur, Malaysia.*Procedia Environmental Sciences, 17,* 182-188.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES, (2019). Retrieved from https://www.ipbes.net/global-assessment

Gupta, R., Srivastava, A. K., &Yadav, A. K. (2017). Role of extension services in promoting sustainable agriculture. *International Journal of Current Microbiology and Applied Sciences, 6*(8), 1391-1400.

Mollik, A. H., Paul, R. K., &Jaman, J. (2018). Household waste disposal behavior and perceptions in urban areas: A case study of Rajshahi City, Bangladesh. *Environmental Science and Pollution Research, 25*(28), 28051-28062.

Nworgu, B.G (2015). Educational research, basic issues and methodology, University Trust Publishers, Nsukka, Nigeria.

Park J. E., (2011). Textbook of Preventive and Social Medicine. 21st Edition, Bharot Publishers, India.

Sharma, H. B., &Mahato, S. (2019). Role of urbanization in municipal solid waste management: A case study of Patna City, India. *Materials Today: Proceedings, 18*, 3435-3439.

United Nations Framework Convention on Climate Change (UNFCCC) (2015).The Paris Agreement. Retrieved from https://unfccc.int/process-and-meetings/the-paris-agreement

United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. Retrieved from https://sdgs.un.org/2030agenda

World Bank.(2015). Extension and advisory services in agriculture. Retrieved from https://openknowledge.worldbank.org/handle/10986/23786

World Bank. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Washington, DC