

ENVIRONMENTAL ADULT EDUCATION ON SOLID WASTE MANAGEMENT AMONG URBAN DWELLERS IN BAYELSA STATE: USING EMPIRICAL ANALYSIS

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Cite this article:

Owhonda-Wopara, Bobraye Mary Tubonimi. (2023), Environmental Adult Education on Solid Waste Management among Urban Dwellers in Bayelsa State: Using Empirical Analysis. International Journal of Environmental and Natural Sciences Research, 1(1), 16-25. DOI: [10.13140/RG.2.2.29450.13769](https://doi.org/10.13140/RG.2.2.29450.13769)

Manuscript History

Received: 10 Feb 2023

Accepted: 17 Feb 2023

Published: 07 Mar 2023

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ABSTRACT

The study investigated environmental adult education on solid waste management among urban dwellers in Bayelsa state: using empirical analysis. The study employed two objectives, research questions and research hypotheses respectively. A descriptive survey design was adopted for the study. The sample size consisted of 1,200 respondents representing a proportionate percentage of 0.133 percent of the population. The strata comprised of adult Male and Female respectively. The instrument was a structured questionnaire titled Environmental Adult Education on Solid Waste Management among Urban Dwellers Questionnaire (EAESWMUDQ). To validate the research instrument, the researcher presented the questionnaire to two experts in the Department of Adult and Non-formal Education for scrutiny and validation. A reliability coefficient index of 0.90 was obtained using Pearson product moment correlation coefficient. The data gathered were analyzed using mean (\bar{x}) and rank order level of significance for the Z-statistics at 0.05 level of significance for the hypothesis was used. The study revealed that the beauty of any environment lies in the culture and adherent to environmental policy and strategies set up by environmental government agency for a conducive environment for living and solid waste management. The study recommended that both the government and community leaders should create local public educational or awareness campaign to provide useful knowledge on the negative impact of improper disposal of solid waste materials in the area. This will lead to effective means of urban dwellers participation in community based solid waste management strategy not only the area but the state in general.

Key words: Environmental adult education, solid waste management, urban dwellers

INTRODUCTION

The magnitude of waste solid generated on a daily basis especially among urban dwellers has become disturbing and detrimental to human health. Solid-waste is an environmental problem that poses negative impact on the health and well-being of the human populace in the society. The increase in solid waste generation among urban dwellers has greatly complicates proper solid waste management activities in Bayelsa state.

Solid waste management in the past decades has become one of the major environmental problems among urban dwellers across Nigeria and Bayelsa state in particular. Thus, solid-waste management is a multidimensional issue that incorporates political, institutional, social, environmental, and economic aspects. To improve solid waste management in Bayelsa state requires efforts to raise public awareness, increase funding, build expertise, and invest in infrastructure. To make progress, environmental adult education will be required and embraced new systems for solid waste management that are participatory, contextually integrated, complex and adaptive.

Based on this study, environmental adult education simply mean the education which is more oriented to realistic application towards what is felt and faced in daily life and environment. Realities and experiences of adults have enriched knowledge, which the adults need a treatment which is appreciative, especially in taking a decision. The adults will refuse the learning situation whose conditions contradict their life concepts as an independent person (Indra, 2018). This education focus primarily on real life scenario not paper work and theory on solid waste management respectively.

However, solid waste management is one of the major environmental problems confronting third world countries especially Nigeria. Nigeria is increasingly experiencing environmental threats because of the ineffective waste management measures that have been adopted over the years. The fact that there are a different kind of wastes and the existence of specialized waste management techniques that could be tailored towards each kind of waste have made waste management more complex in the developing countries. Solid waste generated in many cities in Nigeria is composed of organic materials, plastics/polythene, cans/metals, bottles/glasses, clothes/shoes, and ceramics (Mailumo, Sambo, Peter and Dave, 2021). Solid wastes are inevitable consequences of human activities. But solid waste management which still applies to the collection, transfer, storage, separation, recovery, recycling and final disposal of waste materials usually produced by human activities to reduce their effect on human health or local anesthetics (Ononeze, Ibe and Okoroafor, 2018). The aim product of solid waste management is to reduce the negative impact of waste produced by human activities on the environment and human health respectively. There are different approaches to solid waste management. These include household-based approach, community based approach and government based approach and others.



There is a popular saying that “charity begins at home”, for effective solid waste management is traceable and started from its source or household-based. Every urban dwellers solid waste is processed at home. Household waste have been found to contain hazardous and toxic waste such as expired drugs, dried cells, broken glass, syringes which constitute serious environmental and health hazards (Mailumo, Sambo, Peter and Dave, 2021). The role of family education is very instrumental and very strategic in helping to improve the environment. The family is the smallest environment to be accustomed to sort and process waste from the source (Indra, 2018). The household-based approach to solid waste management is not to dump wastes or refuse gathered into the gutter or on the roadside rather designated point for easy collection by waste disposal agencies for recycling or incineration where it is less hazardous to human health.

The second approach to solid waste management is community based approach. It is defined as the process by which people living in the same locality are enabled to become actively and genuinely involved in defining issues of concern to them, in making decisions about factors that affect their lives, and in formulating and implementing policies that can bring about positive change in their environment (Daramola, 2017). Community participation in solid waste management covers a variety of types, and encompasses several forms of local involvement, including: awareness and teaching proper sanitary behaviour, cost recovery schemes, resource recovery actions, and participating in consultation, administration, and/or management functions. At the most basic level, participation might be providing separated waste to the waste collector, handing over separated waste at a particular time to the waste collector or granting space to park waste management vehicles. With greater public participation, the community can cooperate with public or private agencies to set payment rates for service charges. Community management, the highest level of community participation, gives the community authority and control over operation, management and/or maintenance services. It may come about through partnership with governmental agencies and Non Governmental Organisations (NGOs). Community-based waste management CBSWM projects require institutional support and recognition in order to be successful. An integrated system including waste separation at the source, resource recovery, and composting of organic waste requires the involvement of waste pickers, and integration of the community to work with all stakeholders. Local leaders are often active in the management of the service or maintain close contact with the municipality or community management agency (Rigasa, Badamasi, Galadimawa, & Abubakar, 2016).

The third approach to solid waste management is government based approach. The Federal Government of Nigeria has promulgated various laws and regulations to safeguard the environment. These include Federal Environmental Protection Agency Act of 1988. The Federal Ministry of Environment administers and enforces environmental laws in Nigeria. It took over this function in 1999 from the Federal Environmental Protection Agency (FEPA), which was created under the FEPA Act. Pursuant to the FEPA Act, each state and local government in the country set up its own environmental protection body for the protection and improvement of the environment within its jurisdiction. Municipal solid waste management is a major responsibility



of state and local government environmental agencies. The agencies are charged with the responsibility of handling, employing and disposing of solid waste generated. The state agencies generate fund from subvention from state governments and internally generated revenue through sanitary levy and stringent regulations with heavy penalties for offenders of illegal dumping and littering of refuse along streets (Ogwueleka, 2009). The rubbishes, which remain uncollected, are dumped in open spaces, street and drains, clogging the drainage system, which create serious environmental degradation and treats to health. Public awareness, political determination and public participation are essential for the successful implementation of the legal provisions and to have an integrated approach towards sustainable management of municipal solid wastes in the city as well as in the country (Ahasan, 2016). To ensure a clean and safe environment, the Bayelsa State Government established Bayelsa State Waste Management Agency (BSWMA) to monitor the environmental quality and to ensure a refuse-free environment.

Statement of the Problem

One of the greatest environmental challenges facing third world countries like Nigeria and Bayelsa state in particular is the unhealthy disposal of solid waste which is cause by human activities. The wastes or rubbishes dumped by urban dwellers in open spaces, street and drains, clogging the drainage system, which create serious environmental treats to human health. The negative impact of solid waste on human health ranges from lassa fever cause by rodent which deposited lassa virus into food human consume as a result of poor disposal of waste; malaria fever cause by mosquitoes as a result of improper disposal of waste; typhoid fever cause by contaminated water as a result of improper disposal of waste that find it way to the source of drinkable water. However, despite the government and community efforts to make the environment clean and safe in Bayelsa, people seem to be careless about their environment. The rising question is could environmental adult education serve as a strategic tool to help savage the situation of solid waste management among urban dwellers in Bayelsa state? Therefore, this study seeks to investigate environmental adult education on solid waste management among urban dwellers in Bayelsa state.

Objectives of the study

This study investigated environmental adult education on solid waste management among urban dwellers in Bayelsa state. Specifically, the study was designed sub-objectives:

1. To identity some of the environmental adult education strategy employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state.
2. To ascertain strategy that promotes effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state.

Research questions

1. What are some of the environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state?
2. What are the strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state?

Hypotheses

Based on the above stated research questions, the following hypotheses will be formulated to guide the investigation.

Ho₁: There is no significant difference between the mean rating of Male and Female on some of the environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state.

Ho₂: There is no significant difference between the mean rating of Male and Female strategies that promotes effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state.

METHODOLOGY

Research design: The study adopted a descriptive survey design.

Population: The population for this study consisted of 352,285 urban dweller in Yenagoa of Bayelsa state. The urban dwellers in this study are adult Male and Female in Yenagoa. There were one hundred and eighty-two thousand two hundred and forty (182,240) Male as respondents; while one hundred and seventy thousand and forty-five (170,045) Female as respondents.

Source: National Population Commission of Nigeria (Web) and National Bureau of Statistics (Web) (2016).

Sample and sampling technique: The total population of the respondent among the urban dwellers in Yenagoa is 352,285. According to Myer's (in Kpolovie, 2010:386) "where the entire members of a census population are not used as a sample, the sample size should not be less than 1,200 participants who are randomly drawn to cover all aspects or categories of people of the constituent population. In line with this prescription, the sample size for the study consisted of one thousand two hundred (1,200) respondents selected from the total population of 352,285 respondents within Yenagoa.

The study employed a proportionate random sampling technique in the selection of adult in Yenagoa of Bayelsa state. A proportionate percentage of 0.133 percent was applied across board to obtain the requisite sample among the urban dwellers in Yenagoa of 1200 respondents. The strata comprised of adult Male and Female respectively. The adult Males were 700 respondents; while the adult Females were 500 respondents for the study.

Instrumentation: The instrument was a structured questionnaire titled Environmental Adult Education on Solid Waste Management among Urban Dwellers Questionnaire (EAESWMUDQ).



The questionnaire which contained 12 items was divided into sections A and B. Section A, elicited information on the demographic background while section B dealt with issues on Environmental Adult Education on Solid Waste Management among Urban Dwellers in Bayelsa State. This section is structured on a modified Likert four-point rating scale; that is: Strongly Agree (SA) - 4 points, Agree (A) - 3 points, Disagree (D) - 2 points and Strongly Disagree (SD) - 1 point. Thus, to get the criterion mean for scoring the questionnaire, all the points of the alternative responses was added up and divided by 4, that is $(4+3+2+1)/4 = 10/4 = 2.50$. Therefore any mean value that is 2.50 and above was accepted and anyone below 2.50 was rejected.

Validity: To validate the research instrument, the researcher presented the questionnaire to two experts in the Department of Adult and Non-formal Education for scrutiny and validation. The corrections and observations made were incorporated into the final draft.

Reliability: To determine the reliability, the instrument was administered on 10 respondents outside the study area. After two weeks, the same instrument was administered on the same respondents. The scores obtained were collated and computed using the statistical method known as Pearson product moment correlation coefficient. The reliability coefficient index for the study was determined at 0.90.

Administration of instrument: The researcher used two weeks to go round the schools. The researcher observed, administered and retrieved the instruments from the participants. The researcher administered one thousand two hundred (1,200) instruments on the participants and was able to retrieve 980 instruments. This showed 81.7 percent return rate of instrument from the field.

Method of data analysis: The research questions were analyzed with the mean (\bar{x}), standard deviation (SD) and rank order statistics while the hypotheses formulated were tested with the Z-test analysis at 0.05 level of significance.

RESULTS AND DISCUSSION

Research questions 1: What are some of the environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state?

Table 1: Environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state

S/N	Items	Male N=530	Female N=450	Weight Mean	Rank Order	Remark
		\bar{X}	\bar{X}			
1	Creating public awareness through media	2.99	3.12	3.06	4 th	Accepted
2	Creating designated point for waste collection	3.18	3.14	3.16	1 st	Accepted



3	Door to door collection of solid waste materials	2.99	3.12	3.06	4 th	Accepted
4	Solid waste materials are well pack in cellophane bags for easy collection and disposal	3.13	3.15	3.14	2 nd	Accepted
5	Weekly clean-up of area supervise by community leaders	2.98	3.12	3.05	6 th	Accepted
6	Offenders are fined and punished for violation	3.07	3.11	3.09	3 rd	Accepted

From table 1, the high mean scores ranging from 3.18 to 2.99 indicated that all the items identified were accepted as environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state. This shows that the mean scores were above the criterion mean. It is evident that, creating designated point for waste collection, solid waste materials are well pack in cellophane bags for easy collection and disposal, and offenders are fined and punished for violation had the highest weight mean score from the items. In summary, the items above show environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state.

Research question 2: What are the strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state?

Table 2: Strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state.

S/N	Items	Male N=530	Female N=450	Weight Mean	Rank Order	Remark
		\bar{X}	\bar{X}			
7	Use of Radio jingle and announcement	3.34	3.11	3.23	5 th	Accepted
8	Monthly clean-up of the area	3.31	3.17	3.24	4 th	Accepted
9	Environmental agency moves house to house visits	3.39	3.54	3.47	1 st	Accepted
10	Creation of designated point for collection of waste	3.38	3.52	3.45	2 nd	Accepted
11	Mobile trucks for collection of waste from street to street on weekly bases	3.28	3.59	3.44	3 rd	Accepted
12	Television broadcast	3.18	3.10	3.14	6 th	Accepted

From table 2, the high mean scores ranging from 3.54 to 3.10 indicated that all the items identified were accepted as strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state. This shows that the mean scores were above the criterion mean. It is evident that, environmental agency moves house to house visits, creation of designated point for collection of waste, and mobile trucks for collection of waste from street to street on weekly bases had the highest mean score from the items. In summary, the items above show strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state.



H₀₁: There is no significant difference between the mean rating of Male and Female on some of the environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state.

Table 3: Mean, standard deviation and Z-statistic on the environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state.

	N	\bar{X}	std	Z-Cal.	Z-Cri.	DF	Decision
Male	530	3.06	0.73	1.39	± 1.96	978	Ho was accepted
Female	450	3.12	0.61				

Note: Level of significance = 0.05; N=980

The data in table 3, showed that the z-calculated value of 1.39 is less than z-critical value of ± 1.96 at 0.05 level of significance with 978 degree of freedom. The null hypothesis (H₀₁) was accepted. This means that there is no significant difference between the mean rating of Male and Female on some of the environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state.

H₀₂: There is no significant difference between the mean rating of Male and Female on the strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state.

Table 4: Mean, standard deviation and Z-statistic on the strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state.

	N	\bar{X}	std	Z-Cal.	Z-Cri.	DF	Decision
Male	530	3.31	0.80	0.04	± 1.96	978	Ho was accepted
Female	450	3.34	0.66				

Note: Level of significance = 0.05; N=980

The data in table 4, showed that the z-calculated value of 0.04 is less than z-critical value of ± 1.96 at 0.05 level of significance with 978 degree of freedom. The null hypothesis (H₀₂) was accepted. This means that there is no significant difference between the mean rating of Male and Female on the strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state.

Discussion of Findings

The first finding of the study revealed that environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state. The beauty of any environment lies in the culture and adherent to environmental policy for good sanitary condition by the citizen. The culture of proper waste disposal among the urban dwellers

is far from expectations, even when government and agencies that are responsible for disposal and management of waste made provisions for waste disposal points, the residents do not adhere to rules and regulations because they are used to the habit of dumping their wastes indiscriminating (Okorie and Mbalisi, 2018). The reason being that when an environment is clean, it promotes good health and reduces the chances of the urban dwellers being threatened and afflicted by strange sicknesses and diseases respectively. For effective solid waste management involves the dumping of wastes whether from our home, work places, industries and schools to a designated point for recycling or incineration. It is more effective if the refuse gathered are dumped at a specific place or in provided containers from a place where they could pose a health hazard to a place where they are less hazardous (Ononeze, Ibe and Okoroafor, 2018).

On the test of hypothesis, and the result of the Z-test analysis as shown in Table 3 stated that the hypothesis is accepted. The hypothesis stated that there is no significant difference between the mean rating of Male and Female on some of the environmental adult education strategies employed by Bayelsa state government on solid waste management among urban dwellers in Bayelsa state. This implies that these strategies should be adopted to educate urban dwellers on solid waste management for the safety and sanitary condition in the area, thereby reducing health risk and issues in the future.

The second finding of the study revealed that strategies employed promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state. In Bayelsa state environmental agency moves house to house visits, creation of designated point for collection of waste, and mobile trucks for collection of waste from street to street on weekly bases. This is to ensure and promote safety and sanitary environment for the urban dwellers. These strategies had been working effectively and enforce by government environmental agency. On the test of hypothesis, and the result of the Z-test analysis as shown in Table 4 stated that the hypothesis is accepted. This means that there is no significant difference between the mean rating of Male and Female on the strategies that promote effective participation of environmental adult education on solid waste management among urban dwellers in Bayelsa state. This implies that these strategies should be adopted to educate urban dwellers on solid waste management for the safety and sanitary condition in the area.

Conclusion

Environmental adult education is a platform of educating the urban dwellers on the dangers of improper disposal of solid waste materials. The beauty of any environment lies in the culture and adherent to environmental policy and strategies set up by environmental government agency for a conducive environment for living. These strategies adopted by urban dwellers on solid waste management could establish good sanitary condition in the area, thereby reducing human health risk and issues in the future.

Recommendations

1. The environmental government agency should engage in setting up the logistics of collecting, recycling and processing of solid waste from the collected areas in the state; this will lead to proper managing of solid waste materials in the state.
2. Both the government and community leaders should create local public educational or awareness campaign to provide useful knowledge on the negative impact of improper disposal of solid waste materials in the area. This will lead to effective means of urban dwellers participation in community based solid waste management strategy not only the area but the state in general. This will create a conducive and safe environment for living.
3. Environmental education should be taught as a compulsory course in schools, colleges and higher institutions of learning to help reduce and address the problem of solid waste generating in our cities and towns. This will help especial where volumes of waste are generated on a daily basis for human health's seek and better environment for living.
4. The government at all levels should adopt better strategy of disposing solid waste as well as enforcing punishment on defaulters like fines (pay a particular amount) or any positive measures on defaulters to make the environment safe to live.

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