



## **Environmental Adult Education Delivery Strategies for Promoting Effective Participation in Activities for Proper Solid Waste Management among Urban Dwellers in Abia State**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author OFO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors PCI and PENO managed the analyses of the study. Author OFO managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

This study investigated environmental adult education delivery strategies for promoting effective participation in activities for proper solid waste management among urban dwellers in Abia state. The researchers used a structured questionnaire to collect data from sampled health workers and residence in the study area. A total of 195 health workers and residence of Abia State participated in the study as a sample. The instrument was validated by two experts and had a reliability coefficient of 0.85. Data collected were analyzed using mean and standard deviation for the research questions and z-Test for the hypothesis. The results of the study revealed that the environmental adult education delivery strategies promoted effective participation in activities for proper solid waste management to a large extent as a grand mean score of 3.48 which is within

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the range was realized. Also, the use of print media; electronic media, door to door visits, educational forum and natural group are the environmental adult education delivery strategies for solid waste management, and these strategies created proper solid waste management awareness to a large extent. Also, there is no significant difference in the mean ratings of health workers and residents on the extent to which they promote effective participation in activities for proper solid waste management. It was recommended among others that the State Environmental Workers should always have a better time to relay their programmes on the electronic media such as television or radio to capture a wider audience for effective participation.

*Keywords: Environmental sustainability; solid waste management; environmental adult education; adult education delivery strategies.*

## 1. INTRODUCTION

The issue of environmental sustainability is one that has become foremost in the minds of educationists, politicians and the society at large. In the recent past, the issue of sustainable development has been the bane of most global conferences and summits. The United Nations Conference on Environment and Development (UNCED) otherwise known as the Rio Earth Summit held in Rio de Janeiro in Brazil; detailed some action plan which was referred to as Agenda 21. The Agenda specifically deals with the management of waste. According to [1], wastes include all unwanted materials that result from human activities which are discarded purposefully or accidentally into the environment. He further classified wastes as solid, semi-solid, liquid, gaseous and radioactive. Wastes are produced everywhere and at any time in the homes, schools, markets, commercial and industrial centers.

The [2] however, recognized that management of waste among the environmental issues of major concern in maintaining the quality of the Earth's environment. Management of waste is one of the major environmental problems confronting many developing and even developed nations of the world. Wastes are inevitable consequences of human activities. In defining waste management, [3] saw it as 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 anaesthetics. Similarly, [4] defined it as the collection, transport, processing, recycling or disposal and monitoring of waste materials for sustainable development. [5] further stated that waste management usually relates to materials produced by human activities and all the processes generally undertaken to reduce the negative impact on the environment and human health.

Writing on the sources of waste, [6] identified household solid waste as one of the most difficult sources of solid waste. More so, the household wastes are most difficult to manage. This is because of its diverse range of composite materials. [6] further posited that substantial portion of household waste is made up of garbage (a term for the waste matter that arises from the preparation, and consumption of food) consisting of waste food, vegetable peelings and other organic matters. Similarly, [1] posited that waste include plastics, paper, glass, textiles, cellophane, metals and some hazardous components from paint, garden pesticides, pharmaceuticals, fluorescent tubes, personal care products, batteries containing heavy metals, and discarded wood treated with dangerous substances such as anti-fungal and anti-termite chemicals, which could emanate from household and environmental waste. Such hazardous waste ordinarily should not be disposed in common waste but must be segregated for collect and disposal, to be used by manufacturers and importers who could recycle medical wastes, waste packaging of agrochemical and pesticides, batteries and others [6].

The problem of waste generation grew in Nigeria due to the overwhelming explosion in population. Consequently, indiscriminate dumping of refuse in the gutters, roadsides, drainages, bushes, streams, rivers and other unwarranted and unauthorized places became the order of the day. Indeed indiscriminate dumping of refuse has become a common feature of most cities and towns in Nigeria since the recent past. Inhabitants in the urban areas tend to dump refuse waste as if it does not imply their community health and social welfare [7]. In most cities in Nigeria, population surges have given rise to a heavily built-up environment, wherein houses are most closely built than before, which has also resulted in the dumping of more refuse on the streets. Considering the rate of waste

released daily into the environment, there appear to be no serious organized programmes for the efficient management and disposal of these wastes in Abia state.

[8] posited that there is a need for an understanding of the dynamics that are essential for the explanation of the trends and emerging disease epidemics in the human environment. To ensure the evolution of effective government and public policies, programmes towards control and efficient water management policy should be put in place [1].

Unfortunately, many people in African countries including Nigeria, until recently, regard the concern for effective strategies for managing waste as a less important issue which may distract attention from the most urgent and serious problem of achieving a fast rate of economic growth. This attitude stems in part from the belief that environmental degradation with waste generation is an inevitable price of development [9,7]. Poor waste handling practices and inadequate provision of solid waste management facilities in cities of developing countries results in indiscriminate disposal and unsanitary environments that pose threats to the health of residents. According to [10] improper handling, storage and disposal of wastes are major causes of environmental pollution, which provides breeding grounds for pathogenic organisms and encourages the spread of infectious diseases. The author went further to posit that ensuring that waste generated in the home is properly stored and promptly picked up for proper disposal will help in reducing the incidence of infectious diseases in our urban areas. Identifying areas of deficiency and planning strategies for addressing these deficiencies will help achieve sound environmental health.

In Nigeria, governments at various levels have made serious efforts to arrest the ugly situation. Various governments embarked on an environmental awareness campaign to educate the citizenry on the dangers of indiscriminate dumping of refuse. Efforts are made to map out dumping sites, collection bins are placed at various intervals within reach, incinerators are provided and defaulters sanctioned. Refuse are regularly cleared by various environmental workers to avoid their spilling on the ground. The question at this point is how can this achievement be sustained? How can waste management strategies be sustained in the

different Nigeria cities? Education is seen as a veritable tool for transformation and enlightenment. In the words of [11], education is a process of fostering in the individual desirable changes in behaviour and attitude. [12] further posited that education is any planned series of incidents having a humanistic basis and directed toward the participants learning and understanding. For a sustainable environment, the citizenry must be involved in environmental education which is, however, an aspect of adult education. It is expected that through environmental adult education, unpleasant environmental habits are modified for the better [9].

[13] defined environmental adult education as education aimed at producing an adult citizenry that is knowledgeable concerning the biophysical environment and its associated problems. According to Adara in [1], environmental adult education enables individuals to acquire experiences about the physical environment as well as study the natural resources that are in it for optimal use. Environmental adult education is about commitment to environmental protection and conservation of natural resources for the present and future generation. It promotes man's relationship with his environment and inculcates in the adult practical knowledge, information and necessary skills and competencies for waste management. Environmental adult education delivery for effective waste management can be achieved through the use of posters and flyers, radio and television jingles and dramas, traditional institutions among others. [14] suggested the use of cinemas, educational forums, household door to door campaign, street plays, street dances and animation like puppet shows and cartoons. Environmental campaigns could be pursued using different media like radio and television. It is believed that the use of radio is popular and a credible medium for reaching out to any heterogeneous audience [15].

[16] noted that radio could be powered by an ordinary battery with very little or no literacy skill to operate. Radio is the most potent and effective environmental communication tool for reaching a vast range of audience in developing nations like Nigeria. Similarly, [15] observed that television makes the most impact on the audience. This is because of its audio-visual advantage. It is believed that the use of television has a lasting impression on the minds of the audience. At the same time reach diverse people simultaneously and provide an opportunity for a message to be



**Fig. 1. Poor waste management in Abia State**

demonstrated in images or pictures. It is instructive to know that the degree to which the broadcast media devote air time to environmental news also affect people's attitudes towards the environment. Dependency and exposure to the media tend to shape peoples beliefs and perceptions about various issues concerning the environment. In this wise, environmental news is a potent force for a responsible environmental behaviour.

The beauty of any environment lies in its good sanitary condition. This is so because when an environment is clean, it promotes good health and reduces the chances of the citizenry being threatened by illnesses and diseases. Effective waste management involves the dumping of wastes whether (solid, liquid or gaseous) 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. In Abia State, people are in the habit of dumping their refuse (solid waste) indiscriminately along major roads, water and streets, thereby causing environmental pollution as shown in Fig. 1.

In other to prevent people from this habit, Abia State Environmental Workers adopted different environmental adult education strategies for solid waste management, to educate the urban dwellers on how to manage wastes generated in their homes and surroundings. Notwithstanding

this effort, solid waste disposal habit of urban dwellers in Abia State negates the provisions made by workers to reach out the populace on how to properly manage waste. However, these situations poised the researchers to examine educational delivery strategies, for effective solid waste management participation among urban dwellers in Abia state.

## **2. RESEARCH QUESTIONS**

The following research questions were answered in this study:

1. What are the environmental adult education delivery strategies adopted by Abia State Environmental Workers for educating urban dwellers on solid waste management in Abia State?
2. To what extent have the identified delivery strategies effectively promoted participation in activities for proper solid waste management among urban dwellers in Abia state?

## **3. HYPOTHESIS**

This hypothesis was tested in this study at 0.05 level of significance:

- $H_{01}$  There is no significant difference in the mean ratings of health workers and residence on the extent to which they promote effective participation in activities for proper solid waste management among urban dwellers in Abia State.



**Fig. 2. Map of Nigeria showing the study area (Abia State)**

**4. METHODS**

This study adopted the descriptive survey design. This involved the collection of sample data and treating it in a systematic manner, to show the characteristics features of a given population. The study centred on Abia State which has a population of about 2,845,380. The State is bounded on the north and northeast by Anambra, Enugu and the Ebonyi States, the West by Imo State, to the east and southeast by Cross River and the Akwa Ibom States. The map of Nigeria showing the study area is shown in Fig. 2.

The target population for the study comprised all the 1,956 health workers and residence in Aba South, Aba North, Umuahia South, and Umuahia North Local Government Areas (LGAs) of Abia state. Ten percent (10%) of the population was sampled, using simple random sampling technique without replacement. 195 health workers and residence in Abia State participated in the study. The instrument was validated by two experts in Measurement and Evaluation, two experts in Environmental Adult Education, and one expert in Geography and Environmental Studies, which yielded a reliability coefficient of 0.85. Data collected were analyzed using mean

and standard deviation to answer the research questions, while Z-test was used to test the hypothesis at 0.05 level of significance.

**5. RESULTS**

Results from Table 1, indicates that health workers and residence of the study area accepted items 1, 2, 3, 4 and six as the environmental adult education delivery strategies for solid waste management. This is because their mean scores were above 2.50. They rejected the use of dramas, as a strategy with a mean score of 2.37. However, the grand mean has a value of 3.21 which is within the range of acceptance. Hence, the summary of the results is that items, as enlisted in the table, are the environmental adult education delivery strategies for solid waste management.

From the results of the Z-test analysis, as shown in Table 3, the statement of the hypothesis is accepted; implying that there is no significant difference in the mean ratings of health workers and residence on the extent to which they promote effective participation in activities for proper solid waste management among urban dwellers in Abia State. This is because the summary (0.756) is less than the (1.96).

**Table 1. Mean responses on the environmental adult education delivery strategies for solid waste management**

S/N	Items	Mean	SD	Decision
1	Use of print media	3.33	0.82	Accepted
2	Use of electronic media	3.52	0.88	Accepted
3	Use of door to door visits	3.58	0.76	Accepted
4	Use of educational forum	3.10	0.91	Accepted
5	Use of dramas	2.37	1.13	Rejected
6	Use of natural group	3.38	0.85	Accepted
	<b>Grand Mean</b>	<b>3.21</b>		<b>Accepted</b>

**Table 2. Mean responses on how strategies promoted effective participation in solid waste management**

S/N	Item	Mean	Decision
1	Use of print media	3.66	Large Extent
2	Use of electronic media	3.65	Large Extent
3	Use of door to door visits	3.35	Large Extent
4	Use of educational for a	3.26	Large Extent
5	Role playing	3.23	Large Extent
6	Monthly clean up	3.24	Large Extent
7	Town criers	3.74	Large Extent
8	Radio Announcement	3.67	Large Extent
9	Bill boards	3.07	Large Extent
10	Television broadcasts	3.91	Large Extent
	<b>Grand Mean</b>	<b>3.48</b>	<b>Large Extent</b>

**Table 3. Z-test result on the promotion of effective participation in activities for proper solid waste management**

Variables	N	Mean	SD	t <sub>stat</sub>	t <sub>table</sub>	Decision
Health workers	94	3.48	0.62	0.756	0.05	H <sub>0</sub> Accepted
Residence	1862	3.53	0.74			

## 6. DISCUSSION OF RESULTS

From the results shown in Table 1, the grand mean result indicates that the use of print media, electronic media, door to door visits, educational forum, and natural group are the environmental adult education delivery strategies for solid waste management. This result is in agreement with Adebayo (2009), who rated print media as the most widely used strategy for disseminating information on solid waste management. The electronic is highly rated because it appraises current events through broadcasts, documentaries, commentaries etc.; which evoke interest in the people. On the other hand, dramas were rated lowest against the idea of some researchers as [17] and [18] who opined that the strategy is good because they expose social problems in stimulating ways.

The result, as contained in Table 2, revealed that the environmental adult education delivery strategies promoted effective participation in activities for proper solid waste management to a large extent. This is at variance with [19] and [19], which stated that environmental education is a process directed at creating awareness and participation about environmental issues. The result is supported by [20], who observed the development of waste collection disposal system suited for individuals' environments. The Government is not left out, with active participation in the solid waste disposal. They deploy daily waste disposal vehicles, to different LGAs to collect wastes and refuge in the state. He went on to explain that public, private partnerships are to be engaged to carry out

waste collection and disposal services. The results also collaborated with [21], who opined that through the print media many audiences could be reached, and the educational strategies create enough awareness among the public. This according to [18] approved the public of current events and thereby creates awareness and participation in the audience. [22] noted that in making the education more effective, the door to door strategies are used to meet the public in their homes to inspect their surrounding and to educate them on the importance of participation in solid waste management.

On the test of hypothesis, and from the result of the Z-test analysis as shown in Table 3, the statement of the hypothesis is accepted. This means that there is no significant difference in the mean ratings of health workers and residence on the extent to which they promote effective participation in activities for proper solid waste management among urban dwellers in Abia State. This implies that these strategies should be adopted for educating urban dwellers on solid waste management irrespective of job status, to participate actively in sustainable environmental development in the area.

## 7. RECOMMENDATIONS

In the light of the above findings, the following recommendations are made:

1. The State environmental workers should always have a better time to relay their programmes on the electronic media such as television or radio to capture a wider audience for their information.

2. The government should provide the public with disposal bins and incinerators at flash points of the cities and persuade families to provide some on their own.
3. The government should provide enough supervision on scheduled clean-up exercise days to ensure proper participation of the public.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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