INFLUENCE OF EDUCATIONAL STATUS ON SOLID WASTE MANAGEMENT IN CROSS RIVER STATE, NIGERIA

BY

[1]Dr. (Mrs) Asor, Love Joseph,
E – mail: loveasor@unical.edu.ng,
Tel: 08038025375

[1]Dr. (Mrs) Cecilia, Akpana Beshel,
E-mail: beshelakpana@gmail.com,
Tel: 08033526415

[2] Ojong, Aganyi Asu, Ph.D
E-mail: aganyiojongasu@gmail.com,
Tel: 08063408399
ORCID NO: 0000000295607037

[2]Dr. Usang Nkanu Onnoghen
Email: Usangonnoghen@gmail.com,
Tel: +2348171953333
&
[1]Tawo, Catherine Njong, Ph.D
E-mail: katetawo001@gmail.com
Tel: 08037213699

[1]Department of Continuing Education and Development Studies
Faculty of Arts and Social Science education
University of Calabar
Calabar – Nigeria

[2] Department of Environmental Education
Faculty of Arts and Social Science Education
University of Calabar
Calabar – Nigeria

ABSTRACT

This paper examined the influence of educational status on Solid Waste Management in Cross River State, Nigeria. To achieve the purpose of this study, one hypothesis was formulated to guide the study. Literature review was carried out accordingly. Survey research design was adopted for the study. A sample of one thousand, one hundred and six (*1,106)* respondents were randomly selected from a population of 6,923 for the study. The sample was selected through stratified, simple random sampling and accidental sampling techniques. The questionnaire was the instrument used for data collection titled environmental self-concept on Solid Waste Management Questionnaire (ESCSWM). The questionnaire was validated by two experts in Measurement and Evaluation and one from the Environmental Education. The reliability estimate of the instrument was established through split half reliability method. Independent t-test was the statistical techniques employed to test the hypothesis under study. The hypothesis was tested at .05 level of significance. The result of the study indicated that, Environmental self-concept does not significantly relate with solid waste management. Based on the findings of the study it was recommended that there should be urgent environmental sanitation programme which is usually conducted monthly in most state of the federation with cross River state. In addition, proper awareness should be created on the dangers of indiscriminate waste disposal methods adopted by the residents of Cross river state. Above all, the state government should also provide waste management facilities to enable residents properly dispose of the waste.

Keywords: *Environmental, self-Concept, Solid Waste, Waste Management*

INTRODUCTION

A serious environmental menace occurred in November and December,2018, where the entire Calabar metropolis of Cross River State was filled up with solid waste, thereby constituting an eye sore to both visitors and inhabitants including schools, residential locations and open streets. Its effects were visible in flood disasters, road blockage and ill-health. Some of the major factors identified as contributing to this deplorable situation were lack of adequate storage bins for appropriate disposal of waste, lack of environmental awareness, the indiscriminate disposal habits of the residents, the negative attitudes posed by the dumping of refuse on roads and in gutters, in addition to, the use of unskilled manpower, (Calabar Urban Development Authority, 2018).

One of the major problems confronting the citizens of Cross River State is solid waste management. The need for people to develop positive attitude and participate actively in effective solid waste management has become imperative in view of the littering and unhealthy condition of the environment in the last decade. Rapid population growth has become a global problem which brings undue pressure on scare resources and adverse effects on the environment and well-being of the society. Anijah-Obi (2011) stated that, urban population has witnessed an alarming rate of rural urban migration in the past four decades and this has grown

because of increasing population combined with the improved standard of living and modernization, these have impacted so much leading to solid waste generation.

Cross River State is made up of both the literate and illiterate. The illiterate seems to outnumber the literate who do not have access to media programme like the radio, television usages on awareness creation on environmental sustainability. Their sense of belonging and commitment to proper urban life and waste management is very shallow. These people lack skills and, in most cases, lack jobs and do not realize the implication of their poor living attitude. Anijah-Obi (2011) opined that once an individual becomes averagely educated, his behaviour towards the environment and waste management changes. The author sees to the higher and better quality of life. This means that with good educational status there can be effective waste management knowledge that education enables people to change their consumption patterns with respect to sustainable eco-friendly diets, clothing, housing, and life in general.

Household solid waste is made up of a wide range of composite materials. It consists mainly of garbage, a process for the waste matter resulting from the preparation, and consumption of food which comprise waste food, vegetable peelings and other organic matter as well as plastics, paper, glass, textiles, metal objects and hazardous waste from household product, such as paint, pesticide, pharmaceuticals, fluorescent tubes, personal care products, batteries containing heavy metal or dispose wood treated with antifungal and anti-termite chemicals (Edu, 2003). Household waste consists mainly of garbage, a term for the waste matter resulting from the preparation and consumption of goods which comprises waste food, vegetable peelings and other organic matter as well as plastics and hazardous waste from household products (Azubike, Emelumadik, Ronebue, Sidney-Ronebue & Azubike, 2016).

Environmentally sustainable awareness through education can ensure proper waste management and disposal (Emeh 2010). The author further stated that there is need for participatory adult education based on productive activities and on helping them to restructure needs and goal the further waste management strategies. According to Peters (2014) education is necessary to create awareness of the causes of problem such as flood and solid waste pollution, waste generation among others. In a study by Mamady (2016) on factors influencing attitude, safety behaviour and knowledge regarding household waste management in Guinea, it was revealed that those with primary school level (47.99%) often disposed of waste in the open land, while the respondents with secondary school level (36.6%) and tertiary(38.8%) possessed adequate knowledge and practice proper waste management. from the view of the researcher, the knowledge of education help to imbibe and improve on the various issues of environmental challenges such as flood and solid waste pollution and generation and how best to ameliorate these challenges posed.

THEORETICAL FRAMEWORK

The protection motivation theory was propounded by Rogers (2003)

The protection motivation theory was propounded by Rogers in 2003. The theorist proposes a conceptual framework to explain factors predicting risk preventative behaviors exhibited by people. PMT assumes that individuals' decision to participate in risk preventative behaviors (sustainable waste management) is made based on their motivation to protect themselves from threats such as health complications, natural disasters, global climate change, and nuclear explosion, among others. People make decision to balance different risks and potential benefits based on the results of threat appraisal and coping appraisal. Rogers in 2008 further added that threat appraisal is a cognitive process that individuals use to estimate the level of threat (knowledge/education and self-concept). It includes two important elements: assessment of the perceived severity of the threat and the perceived probability of receiving adverse impacts from the threat (vulnerability). Perceived severity of the threat means the degree of seriousness of the possible harms that is perceived by an individual to occur when waste management is not sustainable.

Perceived vulnerability reflects an individual's perceptions of their susceptibility to the harms (health implications). Threat appraisal also includes the perception of the reward, which refers to perceived benefits of current practices. These perceptions of vulnerability, severity, and the reward can motivate individuals to perform adaptive responses, such as pro-environmental behaviours to ameliorate any environmental damaging activities. Higher perception of severity and vulnerability is likely to enhance individual motivation to perform risk preventative behaviour, while higher perception of rewards from current practices will inhibit risk preventative behaviours. In addition to threat appraisal, coping appraisal, which refers to the estimation of an individual's capacity to perform risk preventative behaviours, also influences the protection motivation.

The relevance of protection motivation theory to this study is primarily applied to explain people's decisions to partake in sustainable waste management, health risk mitigation, disaster prevention and other pro-environmental behaviours. That means; individuals' intention to engage in pro-environmental behaviours may be influenced by many PMT attributes, including the perceived severity of the consequences associated with health risk of unsustainable waste management, perceived response climate change, among others. The coping appraisal includes self-concept, attitude, awareness level (education) and even occupation (farming) as well as their capability to perform the behaviours which reflect the perceived effectiveness of the recommended risk preventative behaviours.

LITERATURE REVIEW

Azubike, Emelumadu, Nnebue, Sidnet-Nnebue & Azubike (2016) conducted a study on educational status and knowledge of meaning, composition and hazards of solid waste among residents in Onitsha metropolis Nigeria, a cross sectional study of 425 household in Onitsha metropolis was selected using multistage sampling techniques. Data were collected by

interview using a pretested semi-structured questionnaire and analyzed using computer graphs pad prim version 5.3, chi-square test to identify statistical significance associated within variables. The results showed that the mean age of the respondents was 36.84 (12-21) year, three hundred and fifty-five 355 (83.5%) of the respondents could give the correct meaning of the term solid waste, 312 (73.4%) knew its composition while 35.18 (2-6%) had an appreciable knowledge of the health hazards of improper waste management. It was concluded that Onitsha residents have a good knowledge of solid waste which was found to be associated with educational status. The researchers recommended sustained attitudinal change programme through regular and periodic health education on proper solid waste management patterns and this will help the inhabitant of this area build up positive attitude and health safety towards effective management patterns.

Anijah-Obi, Eneji, Ubom, Dunnamah and William (2013), noted that a key element in human capital-oriented strategy for environmentally sound and sustainable waste management is education. Effective waste management requires personal re-evaluation, as majority of our waste disposal problems are not only caused by large industrial facilities but also by everyday attitude of people at work, at home and on the street. According to Obot (2013) citizens with higher education benefit greatly from radio, television and print media that increase their knowledge of health hazards, information that helps them to avoid indiscriminate waste disposal, congestion, pest and help them reduce family sizes which the illiterate people do not have access to such information.

Ilevbare's (2015) findings have been found to corroborate with the pervious findings of Vining and Ebreo (2009), Gamba and Oskamp (2004) and Meneses and Palacio (2005) that established that education had no significant effect on recycling behaviour which is a core component of solid waste management. However, the study's finding contradicts the previous studies of Saphores, *et al* (2006) that found out that higher education increased the willingness to recycle though, it is expected that residents' level of education which is a socio-demographic factor to have main influence on waste disposal behaviour, but the outcome of the present study has shown that the level of education attained has no significant influence on solid waste disposal practices in the study location.

Sridhar, (2006) advocated environmental education training as well as the establishment of national consciousness over what should be done through public awareness and information sharing. Waste management can therefore be facilitated by environmental education programmes and training. Edu (2003) carried a survey study in Lagos State on demographic characteristics, residents' attitude towards solid waste management to determine the preferential methods of waste management among the higher educated and those lowly educated. The researcher sampled two residents of two randomly selected satellite towns and those outside the town. The study found that those outside the town preferred indiscriminate open dumping into the river, while those in the satellite town mostly high ranking and educated

preferred to dump their waste effectively in the waste bin, as well as a general clean environment.

Waste management activities generate potential environmental benefits if managed properly (Gentil, Christensen & Aoustin, 2009). There has been hardly any effort in the past to create community awareness, either about the likely perils due to poor waste management or the simple steps that every citizen can take. This could have helped in reducing waste generation and promote effective waste management by also producing organic manure to boast agricultural activities. But this scenario has changed. Nowadays more and more people are taking interest in environmental issues, as they have started to experience the ill-effects of ecological issues. Banga (2013) reported that participation in solid waste management activities depends on the level of awareness, household income, educational level, and gender.

Ayodeji (2012) studied the waste management awareness, knowledge, and practices of secondary school teachers in Ogun State and concluded that all the teachers were aware and knowledgeable about waste management even though they possessed negative waste management practices. The researcher reported appreciable awareness and knowledge about waste disposal among people in Nigeria but indicated that they were only aware of the crude and traditional methods and were oblivious of the modern methods such as incineration and recycling. Adeyemo and Gboyesola (2013) stated that, the attitude of people towards waste management can be affected by their level of knowledge and awareness of waste management. They also reported that homes with waste bins engage more in proper way of storing waste than homes without waste bins.

Adebisi (2017) assessed the effect of training on market women's level of awareness and their disposition towards solid waste management in Lagos State, Nigeria. A 2×2 schematic type of quasi-experimental design was used for this study. The population for this work consisted of all market women selling raw farm produce in Lagos State. A sample of forty women was selected from two markets using simple random sampling technique. A questionnaire on "effect of training on market women's awareness level on solid waste management" was used, having a reliability co-efficient (r) of 0.84. Analysis of Co-Variance (ANCOVA) was used to analyze the data while post-hoc analysis was further used to identify which of the variables allowed for the significant effect in the study. The result showed a significant effect among training on level of awareness, change in behaviour and rate of patronage of waste infrastructures in the respective markets sampled. It recommended that more efforts from private bodies, government and even market officials should be saddled with the responsibility of sensitizing these market women in other states so that waste management can be a thing to be practiced in our respective houses. The researcher recommended that activities of various stakeholders which encompasses private and government organizations including non-government organizations should come together for effective solid waste disposal.

In a cross-sectional study by Shahzadi, Hussain, Afzal and Gillani (2018) on determination of the level of knowledge, attitude, and practices regarding household waste disposal among people in rural community of Lahore with 100 households. The data collected by pre-tested questionnaire and directly interviewing the people about their routine waste disposal, revealed that majority of respondents (72.0%) were aware of the adverse effects of improper waste removal and (28.0%) respondent was not aware.95.0% of people have good attitude about waste disposal. Regarding practices most of respondent (52.0%) had poor practices towards waste disposal and 41.0% had satisfactory practices. It further showed that knowledge regarding waste disposal in the most of respondents was found good and in minimum of respondents having reasonable educational qualification. Despite good knowledge, the respondents were having poor practices regarding waste disposal due to lack of awareness and unavailability of public dustbins. The researcher supported the views of the authors that the inhabitant of this area has very high positive attitude towards household waste disposal.

Salequzzaman and Laura, (2001) argued that education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues. The education programme builds on the knowledge, values, skills, experiences, and determination of human capacity needed to work on solving waste management issues at an individual and community level. The World Bank (2012) argued that education equips people with knowledge, skills, and attitudes to tackle any crisis. Jatau (2013) stressed that sufficient knowledge of the impact of waste management on health may help people to protect themselves from diarrhea, typhoid fever, cholera, hepatitis, malaria, and other infections. Adequate education on the negative impact of poor refuse disposal may encourage people to adopt positive waste management practices which in turn may also promote personal hygiene and a healthy environment.

According to Hogan (2002), environmentally engaging education activities provide a platform on which a community begins to exercise the knowledge needed to improve its environment. Political and social changes across the continent, including the rise of NGOs, have fostered an increased awareness of environmental issues among the public. Urban populations have become more involved in the issues surrounding municipal Solid Waste Management (SWM) (UNEP, 2000). Education and change of attitude are interwoven. People are always adopting, modifying, and relinquishing attitudes to fit the ever-changing needs and interests. Attitude may not be changed by simple education. Research in sciences has shown that knowledge on a topic may increase; people may even change attitudes (values), but that the step to improved behaviours and practices depends on a complex set of social and psychological factors (Asmawati, Nor Abd & Fatima. 2012).

Fredrick, Oonyu and Sentongo (2018) investigated the influence of public education on solid waste management in Kampala city. A cross sectional survey research design was used because of the heterogeneous nature of the study population. The study employed both quantitative and qualitative methods. The sample size comprised 289 respondents selected per division using

multistage sampling, and guidelines provided by 1970 Krejcie and Morgan correlation tables. The study established the organizations involved in public education to include Kampala Capital City Authority (KCCA), Village Health Teams (VHTs), NGOs and the private sector companies. Public meetings, use of mass media, community demonstrations and instruction to individual heads of households were the key strategies used to educate the communities in the city on waste management. It was concluded that public education is improving waste management in the city. There was however less education on waste separation and organic waste management which constitutes over 50% of the waste generated in the city.

Olusola (2016) assessed the level of indigenous environmental consciousness and education in Nigerian cities using Ogbomoso as a case study. It identified the level and limitations to the consciousness of environmental issues; it also evaluated the presence and level of indigenous environmental consciousness; examined the forms of indigenous environmental education prevailing in the city, how it is acquired, and their relevance to environmental management. It also assessed the effectiveness of this indigenous environmental consciousness and relayed the outcome of the survey for further work, by the incorporation of indigenous knowledge into the educational curriculum. The study elicited various indigenous education relating to the environment, the level of awareness as regard such and the effectiveness. Data for this research were obtained mainly from a comprehensive questionnaire survey, which was administered to 3,000 (10%) households from the total of 30,020 households in the study area. The data collected were analysed using simple statistical techniques such as frequency table and percentages. Simple linear regression was used to explain the relationship between education, level of environmental consciousness of the people, income level and level of consciousness to environment. The study observed that the level of education is negatively related to the level of environmental consciousness and the level of income is directly related to environmental consciousness. The research views showed that traditional and indigenous education are the avenue through which indigenous knowledge is passed to people through gradual socialization of youths in the society into its norms, religious beliefs and moral values.

METHODOLOGY

The survey research design was used for this study, this is because survey research design involves the collection of data to describe existing phenomena accurately and objectively. It is directed towards determining the nature of a situation as it exists at the time of investigation. The area of the study is Cross River State, Nigeria. Cross River State is located in the South-South geopolitical zone of Nigeria which comprises eighteen Local Government Areas.The population of this study comprise three million, seven hundred and fourteen thousand, six hundred and seventy-eight (3,714,678) inhabitants in Cross River State, Nigeria (National Population Commission, 2018). The target population consists of 6, 923 adults between the ages of 18 and 40 years using 23% of the total population of adults (male and female). Multi-stage sampling technique involving the stratified random sampling technique, simple random sampling technique and accidental sampling technique was adopted in the study. The stratification was based on the Local Government Areas and the number of communities in that

Local Government Area stood as stratum. The sample for this study consisted of 1,106 respondents selected from 19 communities in Cross River State, Nigeria. The respondents comprised both males and females in the study area.

RESULTS

The independent variable in this study is educational status (primary, secondary, and tertiary), while the dependent variable is solid waste management. The statistical analysis technique deployed to test this hypothesis was one-way analysis of variance (ANOVA). The results of the analysis are presented in Table 1 below:

TABLE 1: Summary of data and one-way ANOVA of the influence of educational status on solid waste management (N=1085)

Educational qualification	N	$\bar{x}$	SD
Primary	340	34.5500	2.43145
Secondary	520	34.9250	2.48854
Tertiary	225	35.4667	2.45313
Total	1085	34.9198	2.48241

Source of variance	SS	Df	Ms	F	Sig of F
Between group	113.799	2	56.899	9.376	.000
Within group	6566.225	1082	6.069		
Total	6680.024	1084			

*Significant at .05 level, df= 2, 1082.

The result on the table revealed that the calculated F-value of 9.376 was higher than the P-value at .05 level of significance, with 2 and 1082 degree of freedom. With this result the null hypothesis was rejected. This result therefore implies that: educational status significantly influences solid waste management. Since educational status has significant influence on solid waste management, a post hoc analysis was employed using Fishers' Least Significant Difference (LSD) multiple comparison analysis. The result of the analysis is presented in Table 2.

TABLE 2: Fishers' Least Significant Difference (LSD) multiple comparison analysis of the influence of educational status on solid waste management

(I) Educational qualification	(J) Educational qualification	Mean Difference (I-J)	Std. Error	Sig.
Primary	Secondary	-.37500(*)	.17181	.029
	Tertiary	-.91667(*)	.21171	.000
Secondary	Primary	.37500(*)	.17181	.029
	Tertiary	-.54167(*)	.19658	.006
Tertiary	Primary	.91667(*)	.21171	.000
	Secondary	.54167(*)	.19658	.006

* The mean difference is significant at the .05 level.

The result of the analysis in Table 2 showed that respondents whose educational status is primary school are significantly different in their solid waste management from those whose educational status is either secondary or tertiary education. Also, respondents whose educational status is secondary are significantly different from those who are in tertiary education in solid waste management.

DISCUSSION OF FINDINGS

The result of the analysis indicated that, educational status has a significant influence on solid waste management. The findings are in line with the view of Azubike, Emelumadu, Nnebue, Sidnet-Nnebue and Azubike (2016) who showed that the mean age of the respondents was 36.84 (12-21 year), three hundred and fifty-five (355) (83.5%) of the respondents could give the correct meaning of the term solid waste, 312 (73.4%) knew its composition while35.18 (2-6%) had an appreciable knowledge of the health hazards of improper waste management. It was concluded that Onitsha residents had good knowledge of solid waste which was found to be associated with educational status. The researchers recommended sustained attitudinal change programme through regular and periodic health education on proper solid waste management patterns.

Anijah-Obi, Eneji, Ubom, Dunnamah and William (2013), also noted that a key element in human capital-oriented strategy for environmentally sound and sustainable waste management is education. Effective waste management requires personal re-evaluation, as majority of our waste disposal problem are not only caused by large industrial facilities but also by everyday attitude of people at work, at home and on the street. Anijah-Obi (2013) also opined that once an individual becomes averagely educated, his behaviour towards the environment and waste management changes. The author sees to the higher and better quality of life. This means that with good educational status there can be effective waste management knowledge that education enables people to change their consumption patterns with respect to sustainable eco-friendly diets, clothing, housing and life in general. Obot (2013) also noted that citizens with higher education benefits greatly from radio, television and printed media that increase their

knowledge of health hazards, information that helps them to avoid indiscriminate waste disposal, congestion, pest and help them reduce family sizes which the illiterate does not have access to such information.

People attitude towards recycling and waste management showed no significant effect on gender, employment, and educational statuses. Some public awareness being created with little supervision yielded results due to the rising indiscriminate disposal and littering in the municipalities. In the study, majority of people who were aware of solid waste management strategies did not put them to practice. Also, there was decrease in people's attitude towards social commitment to participate in solid waste management. Awareness on e-waste disposal was lacking and there was an urgent need to rectify this gap in knowledge and practice. The methods of solid waste management identified included open dumping, burning, and burying of solid waste. The study revealed that waste was usually transported to its destination by using closed trucks/vehicles and the frequency of collection was usually once in a week. Effective solid waste management enhances sustainable development of any city.

CONCLUSION

This paper examined the influence of educational status of inhabitants on Solid Waste Management in Cross River State, Nigeria. Literature review was carried out accordingly. Based on the results of the study it is concluded that educational status of inhabitants significantly relates with solid waste management in Cross River State, Nigeria.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made

1. There should be the urgent re-introduction of the bi-monthly or monthly environmental sanitation, and proper awareness should also be created on the dangers of indiscriminate waste disposal methods adopted by the residents of Calabar.
2. The use of all forms of media such as radio, television, social media, workshops and seminars at different levels and social gatherings including churches should be used as strategies for driving home the need of all stakeholders' involvement to fight indiscriminate littering in areas of residence, industry, and the central business areas.
3. The state Government and all the stakeholders who are; the private contractors, the non-governmental organizations, the multi-national agencies services on waste disposal, funding should be involved in environmental literacy activities to consciously concertize everyone about cleaner environment towards healthy livelihood in the communities.

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