

Used of Burning and Incineration Method of Solid Waste Management Practices in Public Secondary Schools in Katagum Zone Area, of Bauchi State

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ABSTRACT

This study investigated used of burning and incineration method of solid waste management practices in public secondary schools in katagum zone Area of Bauchi state. The overall objective of this study was to find out the used of designated burning and incineration method of solid waste management practices in public secondary schools in Katagum zone area of Bauchi state .one research question, one Hypothesis were formulated. A descriptive survey research design method was used in this study. The population for the study comprised the entire public secondary schools in Katagum zone area of, Bauchi state with a population of eighteen thousand, five hundred and ninety five (18,595). The sample size used for this study was three hundred and seventy seven (377) respondents. The researcher used simple random sampling technique to select three local governments in Katagum zone area of Bauchi state .six public secondary schools were selected from the three (3) selected local Governments Katagum zone area of Bauchi state. Data collection instrument was researcher developed questionnaire; duly validated by the expert of Health Education and a reliability index of 0.84.Out of three hundred and seventy seven questionnaires that were administered, three hundred and forty nine were duly completed and returned for analysis. Percentage/count was used to organize and described the demographic characteristics of the respondents; chi-square was used to test the Hypotheses at significant level of 0.05. The findings for this study revealed that, public secondary schools in Katagum zone area of Bauchi state significantly practiced the used of designated dump site method of solid waste management in their schools. The implication of this findings is that there are proper used of burning and incineration method of solid waste management practices in public secondary schools in Katagum zone area of Bauchi state. Therefore, public schools environment is free from anything capable of causing harm which would hinder the promotion of health status of students living in the schools. It was recommended among other things that, Bauchi state governments and pubic secondary school administrators should collaborate with NGOs and Ministry of Health to double their effort on awareness on the dangers of hazards of solid waste like sharp objects and improved training on how to master scientific strategies of burning and incineration method of solid waste management before final disposal.

Key words: *Burning, Incineration, Solid waste, Public schools, Katagum zone.*

INTRODUCTION

Burning garbage causes air pollution which brings about another set of problems. Burning chlorine-containing materials for example, certain types of plastics can produce the toxic compounds, dioxins and furans. It has been found that even some garden waste can produce these chemicals when burned. This is the reason incinerators have been banned in the Clean Air Act and open burning is not allowed in the Ecological Solid Waste Management Act. Furthermore, burning of carbon-based materials produces carbon monoxide which is hazardous, and, carbon dioxide which contributes to global Warming. Also, bringing garbage to dumpsites and landfills simply transfers the problem from one site to another.

We can turn waste into resource by disposing of waste where it can be useful again. For example, recyclables should go back to factories, biodegradables can become feed for animals, or be composted and applied in gardens or to crops when we recycle glass, we lessen the pressure on our beaches from which silica, the main material for glass, comes. When we recycle metals like aluminum, tin and iron, we help lessen mining which brings about a host of problems - deforestation, soil erosion, siltation, toxic chemicals, etc. When we recycle plastic, we conserve petroleum, the raw material for plastic. When we recycle paper, we conserve trees. When we compost, organic matter and minerals are returned to the soil and enrich it, minimizing the need for artificial fertilizer. Schools which care to make money from waste need a higher-order system to coordinate the activities involving human resources and possibly, some infrastructure (Gamba, & Oskamp, 2011).

METHODOLGY

Descriptive research survey design was used for the study; the design is suitable to gather information for the study, for the purpose of describing study variables. The population for this study comprises all public secondary schools in Katagum zone, area of Bauchi state, Nigeria. with an estimated population of 18,595 in thirty six (36) schools of the seven (7) local governments of Katagum zone, Bauchi state. : The sample was selected using Krejcie and Morgan in their table for “Determining Sample Size for Research Activities.” the selected sample size for the purpose of this study was three Hundred and seventy seven (377). Since the population of this study was 18, 595. Simple random sampling method was used to select three (3) Local Government Areas out of the seven (7) Local governments in the study area. This means that two secondary schools were selected randomly from each Local Government, one from rural and another from urban locality. This was achieved through using slips of paper and the representative of the local governments were asked to pick the pieces of paper, those that pick ‘yes’ were part of the sampled schools and those that picked ‘no’ were not part of the schools conducting the research. To achieve the purpose of the study, a researcher developed questionnaire was used to find out the burning and incineration method of solid waste management practices in Public Secondary Schools in Bauchi North Local Governments. This questionnaire comprise two (2) sections namely: Section ‘A’ was designed to find out the demographic information of the respondents, and section ‘B’ was also designed to determine use of burning and incineration method of solid waste management practices method. Similarly, a four points (4) modified Likert scale response mode was adopted to collect data for the study and the rating scores were as follows: Strongly agree = 4 points; Agree = 3 points; Disagree= 2 points; strongly disagree=1point To ensure that the instrument measures what it is supposed to measure, face and content validity of the instrument was done by the experts in the field of health education, Department of Physical and Health Education, Bayero University kano. The necessary corrections, suggestions and comments by all these experts were taken care of before the administration of the instrument.

The reliability of the developed questionnaire was tested using test re-test reliability method with the aid of Correlation coefficient statistics. A pilot study was conducted using 40 samples of both staff and

students of General Hassan Usman Katsina College Secondary School, Bauchi southern zone other than the schools in focus. After two weeks of first administration, the same instrument was administered on the same participants again. Results obtained from the first and second tests were subjected to statistical analysis of correlation (r) using Pearson product Moment Correlation coefficient and a reliability (r)=0.84 was established. This shows that the developed questionnaire is 84% reliable to be used as data collection instrument to elicit information on burning and incineration method of Solid Waste Management Practice in Public Secondary Schools in Katagum zone, Bauchi State. The researcher used frequency count and percentage to analyze the demographic data of the respondents while the inferential statistics of Chi-square was used to test the Hypothesis. The decision criteria were set at 0.05 alpha levels.

RESULTS AND DISCUSSION

This contain presentation of results of analysis done on the data collected via questionnaire distributed to sampled respondents in Public Secondary Schools in Katagum zone, Bauchi State, Nigeria.

Table 4.1: Response Rate to the Study

School Name	Questionnaire Administered		Questionnaire Returned	
	Population	Percentage	Population	Percentage
	N	%	N	%
GSS Gamawa	86	22.8	76	21.5
GDSS Udubo	31	8.2	21	6
GSS Azare	80	21.31	80	22.7
GDSS Azare	79	120.89	79	22.4
GGSS Yana	62	16.42	54	15.3
GSS Disina	39	10.33	39	11.1
Total	377	100%	349	99%

It can be clearly observed from the statistics displayed in Table that, out of 377 questionnaires administered three hundred and seventy seven (377) 100% in six (6) public secondary schools in three (3) selected Local Governments of Katagum zone, Bauchi State, Nigeria. Bauchi State; 349 (92.57%) questionnaires were successfully completed and collected for further analysis

H_0 : Burning and incineration is not a significant Waste Management Procedure Practice in Public Secondary Schools of Katagum zone, Bauchi State.

Table 4.2: Ch-square Summary of Respondents on Burning and Incineration in Public Secondary Schools of Bauchi North Local Government Area of Bauchi State

Burning	Observed	Expected	df	χ^2 Value	Sig.
Strongly Disagreed	65	87.3	3	18.805	.000
Disagreed	85	87.3			
Agreed	120	87.3			
Strongly Disagreed	79	87.3			
Total	349				

$$\chi^2 \text{ Cal} = 18.805, \text{ df} = 3 \text{ (P} < 0.05) \quad \chi^2 \text{ tab} = 7.82$$

With respect to testing of hypothesis three, statistics displayed in Table 4.2 with respect to burning and incineration method practices shows a chi-square value of 18.805 with 3 as degree of freedom (df). Similarly, the critical value of chi-square at 0.05 (alpha) is 7.82. As such, the chi-square value is greater than critical value; which mandated the rejection of null hypothesis that says Burning and incineration is not a significant Waste Management Practice in Public Secondary Schools in Katagum zone, Bauchi

state. This decision implied that Burning and incineration is a significant Waste Management Practices in Public Secondary Schools of Katagum zone, Bauchi State.

DISCUSSION:

The outcomes of the study further showed that, public secondary schools in Katagum Zone, Bauchi state practice burning method of solid waste management in their schools. The finding is in line with the study conducted by Weinnah (2007) on sustainable solid waste effects of burning method practice in schools of Accra, Ghana, where he reported that, burning practice reduces the solid waste generation stress, characterization, monitoring and treatment disposal in schools. It is also revealed that, Combustible waste materials such as paper, cardboard, furniture parts, textiles, rubber, leather, wood, plastic and garden trimmings are burned in their school. With regard to the incineration method of solid waste management practices in public secondary schools in Bauchi north. The result also indicated that, significant number of respondents showed that, they practice incineration method of solid waste management using local incinerator to manage their solid wastes, but they do not have modern incinerator in their schools. The finding is in line with the study conducted by chakrabarti and Kuma (2009) on effective solid waste management practice among schools in India. Finding revealed that, they are using incineration method because, it requires minimum land, and can be operated in any weather, and produces stable odor free residue reduced volume of refuse by half. Furthermore, it also showed that, the use of incineration method is moderately practice because, it is expensive to build, and its operation needs high energy requirements, continuous maintenance and skillful personal.

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