ECOLOGICAL SUSTAINABILITY AND PUBLIC HEALTH EDUCATION: ENVIRONMENTAL POLLUTION PROBLEM REMEDIATION IN TERTIARY INSTITUTIONS

Chibuzor A. Ekwonye
Academic Programmes Department
National Commission for Colleges of Education (NCCE), Central Area, Abuja
E-mail: annygeorge4sure@yahoo.com

Abstract: *Ecological sustainability is one of the phenomena that have gained international attention. Many studies have been reported on the relevance of public health education to its actualization. This study was borne out of the zeal to verify the problems associated with point source pollutants and how they affect the environmental health of inhabitant of academic settings. Thus, studies of all the dumpsites present in Federal College of Education, (FCE) Zaria. Observation and interview were employed for the data collection. Based on the findings, suggestions were made on how to improve on Environmental refuse disposal system for good Environmental health and ecological sustainability in the campus. The suggestions made centered on the prime role of public health education not only being limited to the Zaria local Government Area alone in Kaduna State but also to the tertiary institutions in its domain. These institutions are equally advised to set up public health education department, with the view of sustaining our ecosystem via environmental problem remediation.*

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INTRODUCTION

All ecological life depends on a wholesome and well-functioning ecosystem and the earth has no limitless supply of resources which must be proportionately shared by all living things, Okueso (2008). Human beings disobey the law of nature at their own risk. Human success results from cooperation with nature and fitting into the web of life. The environment has remained consistently bad over the years and the problem has become so difficult to solve, as a result the environment continues to deteriorate leading to environmental related diseases, Ivbijaro (2007). The primordial aim of development in the environment is to improve the quality of life and enable people to realize their potentials and lead lives of dignity and fulfillment.

The population of Nigeria has risen rapidly to about 140million going by the latest National Census (2006) without commensurate provision of infrastructure and supporting services to cope with the rising population. The situation is poor environmental sanitation which is visible in form of increased waste generation, over utilization of limited existing facilities, inadequate supply of potable water, poor land use, conversion of residential accommodation to commercial use, increase in urban screen and shanties on the edge of the city as a result of acute rural-urban migration and a general decline in the quality of human lifeIvbijaro (2007). The Millennium development goal 7 is to ensure environmental sustainability and achieving sustainability means ensuring that current actions do not lead to future decline in human well-being.

According to Miller (1975), the term "environment" could be perceived as "the aggregate of external conditions that influence the life of an individual or population, specifically the life of man and other living organisms on the earth's surface". The Federal Environmental protection Agency (FEPA) Act of 1990, under section 38 also gave a very lucid definition of environment, thus; Environment includes water, air, land and all plants and human beings and/or animals living there in and the inter- relationships which exist among these or any of them. From the above definitions, the term

"environment" comprises land, air, water and all the physical structures surrounding us. In this project therefore, the concept "environment" refers to the totality of space, time and socio-cultural settings of man and other living organisms therein. Pollution: the term pollution is derivations of the word pollute which means, to make something dirty or no longer pure, especially by adding harmful or unpleasant substances to it.
Over the last three decades there has been increasing global concern over the public health impacts attributed to environmental pollution, in particular, the global burden of disease. The World Health Organization (WHO) estimates that about a quarter of the diseases facing mankind today occur due to prolonged exposure to environmental pollution, most of these environment-related diseases are however not easily detected and may be acquired during childhood and manifested later in adulthood. Improper management of solid waste is one of the main causes of environmental pollution and degradation in many cities, especially in developing countries. Such waste may be infectious, toxic or radioactive. Municipal waste dumping sites are designated places set aside for waste disposal. The poor disposal and handling of waste thus leads to environmental degradation, destruction of the ecosystem and poses great risks to public health. Hence the forms of this study on its implication in academic institutions of learning, with special reference only on point source pollutants.

Environmental education is the process of recognizing values and clarifying concepts that develop skills and attitudes require understanding and appreciating the relationships between people, their culture, physical and biological environment. Education about the environment also includes a decision-making approach and self-attitudinal training in relation to environmental quality. Environmental education, viewed from the perspective of sustainable development, is education that prioritizes values.

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In view of the aforementioned background, this work wants to investigate into the nature of point source pollutants that emanate principally from the dump-sites of academic institution of learning. The wastes generated from such system, their classification and possible health problems as a result of improper handling. The locations and system of waste disposal will equally answer the same question. It's in line with this thought that this paper hopes to add to existing encyclopedia of knowledge in this chosen area.

Objectives of the Study

The aim of this research project is to know the effect of point source pollutants in the dumpsites of an academic environment, and the objectives are to:

- Explain in concrete terms the harmful nature of substances found in our dumpsites and how they may affect educational achievement.
- Classify all the items likely to be found in a dumpsite and their quantity respectively.
- Evaluate the current locations of dumpsites in relation to possible health hazards that may emanate from there

RESERCH QUESTIONS:

The following are research questions formulated to the study:

- What are the roles of tertiary institutions towards the development of pollutant in their environment?

- What are the health problems likely to be encountered from dumpsites of academic institutions?
- How can our educational institutions avoid environmental health problems associated with wastes generated and arbitrarily disposed in their environment?

Scope of the Study

This study intends to consider possible health challenges associated with environmental pollution as they relate to environmental changes and/or ecologically related trends of population growth and the need to devise and sort out techniques of tackling the problems. The study would cover only FEDERAL COLLEGE OF EDUCATION, ZARIA.

Significance of the Study

Information from a study like this will go a long way to sensitizing the stake holders, and government especially on the need to plan on how to control problems associated with environmental pollution in academic institutions and the society at large.

RESEARCH METHODOLOGY

Description of the Study Area

Zaria Local Government is located within the plain of Northern Nigeria in Kaduna State. The town has between latitude 11.07 degrees north and longitude 07.448 degrees cast located at a distance of about 962km from the Atlantic Ocean. It is about 80km north of Kaduna. And its height is about 2,22H above the sea level (Nigeria Master Plan, 2000). Federal College of Educational is located in Gyallesu, in Tudun Wada Zaria, Nigeria.

Research Design

The research design adopted for the study was a case study research design. This was done through direct interview, observation, collection and analysis of data. The data collected from the field were analyzed using percentages.

RESULTS AND DISCUSSIONS

Table 1: Shows the Dimensions of the Dump Sites.

DIMENSION	DS/A	DS/B	DS/C	DS/D	DS/F
Length (m)	12.20	6.90	4.00	21.20	6.10
Breath (m)	6.70	4.87	2.25	7.00	3.20
Area (m^2)	81.74	33.603	9.00	148.4	19.52

Dump site "D" is the largest followed by jump site "A", then jump "B", then site "E" then followed by jump site "C" which is smallest, and all these jump site are permanent none of them are mobible dump site "A".

Dump site "A" has the length 12.20m and breath 6.70 that gives the total area of 81.74. it is located between the blocks of schools of education and language respectively.

Dump site "B" has the length 6.90 and breadth 4.87 that gives the total area of 33.603. it is located adjacent to the collage central mosque.

Dump site "C" has the length 4.00 and breath 2.25 that gives the total area 9.00. It is located behind the schools of art and social science.

Dump site "D" has the length 21.20 and breath 7.00 that gives the total area of 148.4 the largest. It is located behind the college consultancy unit.

Dump site "E" has the length 6.10 and breath 3.20 that gives the total area of 19.52. It is located behind the female student hostel.

Table 2: Shows the proximity of the lecture venue from Dump Site:

	Close	Very Close	Far	Total
How close is any college dump site from lecture venues	6	-	4	10

Table 3: Proximity of Refuse bin to academic staff offices:

	Yes	No	Others	Total
Is there refuse bin in the vicinity of the academic staff offices	3	6	1	10
Are the venues always under lock and key when not in use	3	6	1	10

Table 4: location of Dump Site from staff offices:

ITEM	Close	Very Close	Far	Total
How close is any college dumpsite from the academic staff/department	5	-	5	10

Table 5: Location and Nature of Dumpsite:

	True	False	Others	Total
There is appropriate site for refuse disposal	10	-	-	10
Dump sites in the College are permanent or temporal	9	-	1	10
The method employed by college cleaners for refuse disposal is effective	5	5	-	10
Do you have specific dumpsite for specific waste materials	7	2	1	10
Are the dump sites monitored by people on daily basis	7	3	-	10
Are there plans to move some dumpsites away from lecture academic staff student academic areas	9	1	-	10

Table 6: System of waste disposed at Dump site:

ITEM	Burning	Taking Away	Others	Total
System of refuse disposal at the D/S	10	-	-	10

Table 7 : Shows the distribution of waste materials in the dump sites.

WASTE MATERIALS	DS/A	DS/B	DS/C	DS/D	DS/E
PAPER	Little	Little	More	Little	More
PLASTIC/LEATHER	More	Most	Little	Most	Most
ORGANIC/PLANTS	Most	More	Most	More	Little

FINDINGS/DISCUSSION

From the data collected in tables it has shown that dumpsite "D" is the largest dumpsite with about 148.4m^2, followed by "A" which has land area of about 81.74M^2. The smallest dumpsite is "C" with the land area of about 9.00M^2. Summary of waste composition of the different dumpsite from the analysis of the data collection in table 1 has been observed that:

- Dumpsite D composed of all almost highest percentage of all the different kinds of waste materials.
- Dumpsite A is the second largest in terms of the composition of the different kinds of wastes.
- The least dumpsite in terms of composite of waste is dumpsite "C" followed by "B" and followed by "E".

The data collected and analysis of results; Dumpsite "D" is the largest dumpsite and far from the school building. It also has the highest composition of the different types of waste materials. Staff and students who have anything to do around dumpsite "A" area are more exposed to dangers than all other people. This is because the area is second to the largest dumpsite which is most close to living areas. Due to the fact that it contains high composition of different types of waste, there will be release of high amounts of poisonous gasses and bad odour, and also the environment will look somewhat fifty. As a result of these, people living in this area are more prone to diseases like cholera, malaria, typhoid, lungs cancer etc. people

living in area around dumpsite "A" are also faced with the same problems, even though the dumpsite is second to the largest but due to its closeness to living area, it will have same effect.

CONCLUSION

Ecological sustainability is our biggest challenge – as educators, the future poses its challenges and if those challenges are met, the sustainability of our total environment will be overcome. Based on this platform our academic environment is presently suffering a great deal from environmental pollution occasioned by poor treatment of wastes generated continuously. Locations of refuse/waste dump sites are all not given adequate attention in the course of design of the masterpiece of academic institutions. This oversight has led to much complicated health hazards freely destroying the lives of students, lectures and all other non teaching staff in our academic institutions throughout the country. All these will the long run affect the ecological stability when the environment continues not to sustain itself.

RECOMMENDATION

Based on this research work conducted, and data collected and analyzed, we are hereby recommending that:

a. In the architectural design of academic settlement, there should be a provision of refuse dumpsite.
b. The dumpsite should be far away from living areas and preferably away from lecture or staff office arena.
c. State government or local authority of the area (F.C.E. Management) should provide a proper waste disposal method.
d. People should be enlightened on the dangers of indiscriminate refuse disposal.
e. Dumpsite "D" and "A" should be moved to other areas far away from school buildings.
f. The F.C.E. Management should employ experts on refuse management who will be taking care of the college refuse.

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