

**ENVIRONMENTAL INTERVENTION PROGRAMME AMONG UNIVERSITY
UNDERGRADUATES IN RIVERS STATE UNIVERSITY OF EDUCATION
PORT HARCOURT**

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Abstract

This article, examines the prevalent environmental sanitation attitude in the Port Harcourt Metropolis, Rivers State with special focus on Ignatius Ajuru University of Education, Rumuolumeni. It theorizes that the challenge of Refuse disposal in the school Metropolis will increase as the population of the students improves and recommends that government, companies and philanthropic individuals should assist in the building of more hostels to reduce the number of students in a room per hostel.

Introduction

Rivers State university of Education is one of the tertiary institutions awarding first degrees to Nigerians and non-Nigerians. Most Nigerian universities like their counterparts world over are faced with the challenges and commitment to the collection, sorting, disposal and the management of waste products generated from the running of the university system. Most universities do not have the required finance and the administrative wizardry cum technical know-how to manage waste products they generate (poor waste management). An overview of the Rivers State University of Education Campus reveals that there exist several public health concerns or problems that should be attended with uttermost seriousness. Some of the identified problems that have bedeviled the smooth running of the university are as follows:

- (1) Lack of proper and working drainage system.
- (2) Inconsistent and epileptic power supply.
- (3) Insufficient waste bins or baskets for the collection of wastes at the point of generation.
- (4) Lack of the requisite knowledge of the need to sort waste.
- (5) Indiscriminate waste disposal.
- (6) Poor toilet facilities that are also insufficient to the population.
- (7) Over-populated hostel accommodation.
- (8) Lack of recreational facilities, sports facilities, both in-door and outdoor, to mention but a few

A critical overview of the above identified problem reveals the fact that about 70% of these challenges to the smooth running of the system are environment health related. Hence, the most pressing need of the population is poor environmental sanitation which is the primary fact that spurred these researchers into carrying out the intervention programme to find a solution to the problem.

Waste generation is an unavoidable consequence of human existence and quest for survival. In order to live, human beings (undergraduates) eat and drink and remove waste products. In the process of carrying out activities to satisfy the basic need of survival. Students consume different substances and discard left over. That is, dispose the ones they see as worthless or unwanted.

Nze, (2010) defined waste as any substance or material discarded as worthless or unwanted, defective and of no use or value to the individual. Students in the University take their bath and generate waste water from the bathrooms and toilets (sewage). Most of the time, they do not have working toilet systems and so resort to different unhealthy measures which if not checked could result into different forms of disease outbreaks. In recent times, cholera has taken more than 200 lives in Nigeria.

This work will concentrate on the solid waste aspect which is within the scope of the students' pressing health problems. This work will help students to join efforts to make the university vicinity a healthful place.

Purpose of the Study

The purpose of this programme is to institute measures that will bring about a healthy environment for undergraduates at the Rivers State University of Education. Specifically, this research will achieve the following objectives:

- (1) Create an environmental sanitation campaign among university undergraduates. Hence, create awareness of environmental awareness among the students.
- (2) Involve students in keeping the environment clean, specifically institute environmental sanitation day/days first and last days of every month.
- (3) Provide waste buckets and encourage the use of waste buckets with cover.
- (4) Institute punishment means for offenders of environmental laws as:
 - Making use of the lavatory without flushing properly
 - Throwing of waste materials of any type from the windows
 - Urinating at the corners of the blocks and bathing outside or in front of the hostels.
- (5) Evaluate the level of compliance with the set rules after two (2) months.

Literature Review

Literature related to this study was reviewed under the following headings:

- Concept of waste
- Commonly generated wastes among undergraduates methods adopted by undergraduates (students) for waste disposal.
- Problem faced by undergraduates in waste disposal.
- Health implications of poor waste management.

Concept of Waste

It is imperative for us to understand what waste is all about, before discussing the concept of solid waste. According to Karly (2009), waste as the name implies, is subjective and inaccurate because what is regarded as waste to one person, community or nation is not waste to another. But, for the purpose of this study, wastes are substances which are disposed off or are intended to be disposed off or are required to be disposed off by the individual or group in question.

In the view of Pacey (2008), waste is any substance be it solid, liquid or gaseous that remains as residue or an incidental by-products of a substance and for which no other use can be found by the person, company, organisation or system that produced it. The author further States it is a material of either solid or semi-solid character which the processor or individual no longer considers important to retain. This agreed with Anyebuanyi (2010), who stated that waste includes all items that people no longer have any use for, which they either intend to get rid off or have discarded.

Solid waste as the name implies, is the term used to describe non-liquid waste materials arising from domestic (homes), schools, agricultural and from public services. Solid wastes are materials which are generated as a result of normal operation over which we have control in terms of their production, disposal or discharge. Omotosho (2004) defines solid waste as everyday items we use and then throw away, such as product packaging, grass clearing, furniture, clothing, bottles, food scraps, newspapers, appliances, containers and batteries which come from our homes, schools, hospitals and business.

The aforementioned definition agreed with Ndasa (2007) who defined solid waste as the useless and unwanted products in the solid state derived from the activities of and discarded by society. In the same vein, Aziogba (2007) defined waste as any material generated by everyday human activities which come in form of garbage, left-over of foods and other wastage that include old items such as papers, plastic, waste in form of kitchen equipments or any other products that are consumed during everyday activities. Solid waste comprises all materials arising from human and animal activities that are normally solid, which are discarded as useless or unwanted. According to Kofoworda (2007), the unhealthy disposal of solid waste is one of the greatest challenges facing developing countries like Nigeria and Port Harcourt Metropolis in particular.

In the opinion of Ajani (2007), indiscriminate dumping of solid waste, improper handling of storage and disposal of solid wastes are major causes of environmental pollution, which provides breeding grounds for pathogenic organisms and encourages the spread of infectious diseases. However, solid waste generation problem and management in Port Harcourt metropolis is not only a social behavior, but there are also socio-economic and cultural factors associated with them. This includes population growth, poor waste handling practices, and inadequate solid waste management facilities. The increase in population combined with impact of good salary review has led to rising level of consumption, the consequences of which is increase in solid waste generation and unhealthy living conditions. Abel (2009), further stated that the phenomenon can escalate the outbreak of different kinds of epidemic, for example,

the polluted ground water can affect food chain, has negative effect on the health of any human environment.

Commonly Generated Solid Waste among Undergraduates. Hostellers live in houses built by the Authority within the School Enclosure

Household solid wastes are wastes generated as consequences for household activities such as cleaning, cooking, repairing empty container packaging, huge use of plastic carry bags, huge garbage etc. A busy household can generate a great deal of waste.

In Port Harcourt Metropolis, household accounted for 53% of waste disposal compared to 24% produced by dwellers at the hostels. According to Obioma (2011), from 2010 to 2013, the amount of household solid waste increased radically in Port Harcourt Metropolis, by 20%, from 3,446,766 tonnes to 8,536,891 tonnes due to poor attitude of residents and packaging for a wide variety of products. Hullock (1990), as cited by Anyebuenyi (2011), defined household solid waste as waste which is generated in the day-to-day operations of a household. He further stated that rising urbanization and change in lifestyle has been increasing rapidly leading to products being packed in cans, aluminum foils, plastics and other such non-biodegradable items that cause incalculable harm to the environment and human health.

Also, in the view of Afoma (2010), some households solid waste are hazardous which cannot be handled by the normal waste and recycling programmes, usually because it is environmentally harmful or because it poses a health hazard to collection and processing staff. He further argued that these household solid materials may exhibit characteristics such as flammability, corrosiveness or toxicity and require special treatment before disposal.

According to Afoma (2010), commonly generated solid wastes among the households in Port Harcourt Metropolis include:

- (i) **Cellophane/Plastic:** cellophane is one of the commonly generated solid wastes among households in Port Harcourt Metropolis. According to Ekph (2009), cellophane is defined as a thin, transparent material made from cellulose used as a moisture-proof, wrapping foods, tobacco etc. Household members use cellophane to cover up bowls containing food to keep it fresh, vegetables can be wrapped in it to be kept fresh Open packets are closed with cellophane. Also, sandwiches can be wrapped in it for freshness and also to prevent mess. Lunches are carried in them. Students carry books in them. Abel (2009) pointed out that while much of the world has turned against the use of cellophane and plastic bags as an ecological hazard, in Nigeria and Port Harcourt Metropolis, they remain an essential and omnipresent part of daily living.
- (ii) **Food/Kitchen Wastes:** Most households in Port Harcourt Metropolis discard uneaten foods such as garri, soup, banana peels, oranges, beans, rice, among others daily. Rodman (2011) stated that food/kitchen waste is an uneaten food and food preparation wastes from residence and commercial establishments such as restaurants, institutional cafeteria and kitchens. The author further stated that households are unable to eat and discarded properly.
- (iii) **Cans:** This is another solid waste generated by household in the Port Harcourt Metropolis. Can is a container for the distribution or storage of goods, composed of thin metal. Many

cans require opening by cutting the “end” open; others have removable covers. Cans hold diverse contents: foods, beverages, oil, chemistry etc. These cans are discarded indiscriminately after using the contents by users of which the Hostellers are not exempted. Also, Anyebuanyi (2011) stated that there are household hazardous solid waste which include compact fluorescent lights (CFLs) and fluorescent tubes, both of which contain mercury, batteries that contain acids and heavy metals such as cadmium and lithium: electronics such as cell phones and televisions, paints and medications.

Badmus (2010) argue that with the rapid increase in the popularity of cellular phones, computers, televisions and other electronic devices, every household has one or all, which at the end of its useful life, they discard it indiscriminately. He further argued that in 2013, 77% of households in Port Harcourt Metropolis had at least one cellular phone 82% had at least one home computer and 99% had at least one colour television. Many of these products contain copper, aluminum and gold, as well as metals such as lead, mercury and cadmium which affect human health when they are indiscriminately disposed because they react to form very harmful compounds.

Methods Adopted by Undergraduates for Waste Disposal

Following the onset of industrialization and the sustained urban growth of large population in Port Harcourt Metropolis, solid waste disposal has been a major challenge facing the residents of Port Harcourt Metropolis. The streets have become choked with filth due to lack of proper waste disposal.

According to Ajani (2007), these wastes are harmful to the environment and individual health and how you dispose them off depends on how they affect the environment. Given below are four major methods used in disposing solid waste by residents of Port Harcourt Metropolis including students at the University of Education (Pacey, 2008).

- (1) **Open dump:** This is one common method used for disposing solid waste among households in Port Harcourt Metropolis. They dump their solid waste in the bush or underdeveloped plots of land close to their houses, backyards, abandoned buildings and disposed on the streets. Abel (2009) defined open dumping as an illegal disposal site at which solid wastes are disposal off in a manner that does not protect the environment. Open dumps are susceptible to open burning, and are exposed to chemical reactions, vectors and scavenges. Rodman (2011) further stated that open dump poses a lot of health problems which include inhalation of toxic gases by the residents, injury to children playing around the dump site, diseases carried by mosquitoes, flies and rodents; contamination of streams, rivers, contamination of soil and groundwater and decrease in the quality of life to nearby residents. A study conducted by Okechukwu (2011) reported that open dumps create a public nuisance, divert land from more productive uses and decrease the value of surrounding land. It is disheartening to observe that virtually all hostels in the school dump refuse around the building normally by throwing them away from open windows making the surrounding littered with refuse.
- (2) **Burial or landfill method:** This is another method of disposal solid waste among household in Port Harcourt Metropolis. Amongst the many waste management methods,

using a landfill is probably the most practiced in more areas of the world than any other method. Landfills are often old and abandoned quarries and mining areas. Under this method, refuse is literally buried, unwanted materials like broken bottles, pot shreds etc. are buried in the ground.

According to Abel (2009), this was considered the most cost-effective way of waste disposal, about 75% of the cost of implementation is attributable to the collection and transportation of waste from residential and businesses to the landfills. According to the author, the waste is layer of clean earth covering the waste material before more layers are added over time.

Badmus (2010) pointed out that this method has impacted seriously on the health of man himself. For instance, nobody would like to have refuse-burial site within his vicinity because of the harmful effect it generates. He further stated that after the burial of organic matter, there may be leachate that often pollutes the aquifers, wells and boreholes. Hole dug in that premises will definitely not produce portable water for human consumption. According to Anyebuanyi (2011), it is common knowledge that organic matter generates heat when buried, thereby causing the production of methane known as biogas, and when penetrated further into the soil is capable of killing vegetations which hamper agricultural activities and has far reaching effects on man.

(3) **Open burning method:** Open burning has remained one of the widely practiced methods used among households in Port Harcourt Metropolis. Abel (2009) argued that an average Nigerian produces about 0.45 gram per day of refuse; the composition and quality of the refuse varies depending on factors guiding refuse disposal as mentioned earlier. Uchegbu (2011) stated that open burning is a disposal method in which solid organic wastes are subjected to combustion so as to convert them into ashes. It is attained by setting the waste such as cloth, wrapper, paper ablaze.

Budmus (2010) defined open burning as the destruction of combustible waste using direct flame plus oxygen and the waste reduced to ashes. However, Rodman (2011) argued that people don't understand the wider issues of public health and environmental damage caused by waste burning. He further stated that open burning has remained one of the widely practiced methods of waste management. However, the author argued that open burning releases toxic gases directly into the atmosphere and has many negative effects on our environment. The poisonous gases that are released into the atmosphere are harmful for humans as well as animals. In support of the above points. Badmus (2010) stated that open burning releases gases that affect the respiratory and productive system, and therefore, this sort of waste management should be discouraged and other methods in which the poisonous gases are not released in the atmosphere should be opted for. Also, in the view of Abel (2009), the smoke from the waste burning activity has a serious effect on our health and environment. The smoke can spread around the atmosphere, and once it gathers up in the air, it will precipitate in the form of acid rain and pollute water systems. In the view of Uchegbu (2011), the poisonous gases that are released into the atmosphere are harmful to human beings.

Problems Associated with Household Solid Waste Management

Household solid waste is a common problem of affluent societies. Especially when people can afford greater conveniences and more purchases they tend to throw away

more rubbish; Port Harcourt Metropolis is no exception of this. Port Harcourt Metropolis, like many developing places has seen its solid waste loads grow as its economy has grown. According to Ajani (2007), the deterioration of Port Harcourt Metropolis in terms of irresponsible dumping and accumulated solid waste today is due to population growth. This growth in human population gives rise to mountainous heaps of solid waste which characterizes the town. According to the author, as more people move to this city in search of better life, the generation and disposal of waste becomes a major public issue affecting both health and the aesthetic value of the city. Aziegbe (2007) further stated that 85% of the population dump their waste in unauthorized sites in their neighborhood, and due to weak capacity to handle this population growth by the relevant authorities, unsanitary conditions are created.

Nze (2010) outlined several factors which have conspired to promote the massive problems associated with household solid waste management to include inadequate and deficient infrastructure, inadequate structures for environmental administration, lopsided planning pastures and disregard for basic aesthetic and other human factors by the government and residents.

Afoma (2010) blamed the problems of solid waste management in Nigeria on the government. He stated that since waste management is a discipline associated with the control of generation, storage, collection, transfer and transport, processing, and disposal of solid wastes in a manner that is in accord with the best principles of public health, economic engineering, conservation, aesthetic, and other environmental considerations, is the responsibility of the government which has the power to finance, plan, administrate and provide legal and engineering functions to the citizenry that they govern. In support of the above, Badmas (2010) stated that the main problem associated with solid waste management in Nigeria and Port Harcourt Metropolis in particular is lack of goodwill for disposal of solid waste and the lack of seriousness in the enforcement of solid waste disposal laws by the government. This is very pertinent in Port Harcourt Metropolis where the enforcement of the solid waste disposal law is not effective or hinged on impunity and bribery.

In the view of sucker (2009), insufficient communal transpiration has led to dumping of solid wastes indiscriminately on drains, breaches, streets and open spaces and the tendency for faecal materials to become intermixed with household solid waste. This is an undeniable fact in Rivers State and Port Harcourt Metropolis because waste management system is starved of resources to tackle the increasing demands associated with growing waste generation. Due to budgetary constraints and inadequate equipment, house-to-house collection is very rare in Rivers State, particularly in Port Harcourt Metropolis where waste is not collected properly. According to Rufus (2011), it is estimated that up to 30 – 40 percent of disposed solid wastes are left uncollected. The areas, which are not served are left with clogged wastes and litter which create serious health problems for the resident population. The view expressed by Sucker (2009) is relevant to the study because Port Harcourt Metropolis is densely populated. The cities are also not served with adequate sanitary facilities. These inadequacies have led to indiscriminate disposal of solid waste into drains, gutters, and water ways.

Also in the opinion of Edmunson (2012), lack of finance, cost recovery and resource constraint are the major problems facing community and household solid waste management in Nigeria. According to the author, most of the waste management authorities are severely constrained by the lack of resources to finance their services. According to Song Sore (2011), peoples attitude towards solid waste management has remained one of the intractable problems with waste management. His argument supports the fact that solid waste producers generate large volumes of wastes but do not dispose of waste in an acceptable manger.

Edmund (2012) studied solid waste management in Makurdi, Nigeria. He conclusively pointed out that most of the designated disposal sites do not take into consideration the distance to be covered by residents. Thus, one cannot dispute the fact that long distance disposal sites discourage inhabitants from making use of them, they therefore, resort to littering their surroundings.

Health Implications of Poor Waste Management

Waste management has a civil, social and health problem and has not been taken seriously. The trend of unsustainable patterns of production and consumption is increasing the quantity of the waste and the amount will increase four to five fold by the year 2020 (Earth Summit, 1992). The health implication of poor household solid waste management in Nigeria and Port Harcourt Metropolis is particularly becoming alarming. The deterioration of Port Harcourt Metropolis in terms of indiscriminate dumping and accumulated solid waste in most places such as Wimpey, Town, GRA phase I and II, Mile III, etc. is apparent. According a Aziegbe, the dehumanizing effects of these accumulated wastes in Port Harcourt Metropolis and its environment have often been cited and noted as contributing causes of various diseases among household in Port Harcourt while the University is not an exception.

It is based on the above points that Ajani (2007) stated that among the disposing system of solid waste, open dumping system is the worst because it has scrap tires and stagnant water which provide good breeding ground for such annoying disease bearing organisms such as mosquitoes, rats, cockroaches, flies, which can multiply 100 times faster than normal in the warm stagnant water causing outbreak of diseases like cholera, malaria, typhoid, etc. Also, in the view of Abel (2009), this wet solid waste decomposes and releases a bad odour which leads to unhygienic conditions and thereby leads to a rise in the health problems, especially those that live around the dump site. Based on this, Rurus, B.N. (2011) stated that as many as 5.2 million people, including 4 million children under five years of age die each year from waste related disease. The health impacts are particularly severe for urban poor. According to the author, at present, over 60 million people are without access to basic sanitation, and an estimated half of the urban population in developing countries is without adequate solid waste disposal services.

In support of the aforementioned points, Okechukwu (2010) stated that the group at risk from the unscientific disposal of solid waste includes pre-school children, people living close to a waste dump and those whose waste supply has become contaminated either due to waste dumping or leakage from landfill sites.

In the same vein, Badmus (2010) pointed out that solid wastes disposed indiscriminately are harmful to human health, especially coloured plastics. According to the author, the pigment in

coloured plastics contains heavy metals that are highly toxic. Some of the harmful metals found in coloured plastic are copper, lead, chromium, cobalt, selenium which causes cancer. Anyebuenyi (2011) opined that those areas used for open dumping of solid waste are easily accessible to people, especially children, who are vulnerable to the physical protruding nails or sharp edges which can result in various types of injury and infectious diseases with the waste workers and the rag pickers being the most vulnerable. Also, direct exposure can lead to diseases through chemical exposure as the release of chemical waste into the environment leads to chemical poisoning (Anyebueyi, 2011).

Ajain (2007) argued that decomposed solid waste emits carbon dioxide (CO₂), methane gas (CH₄), which enhances global warming while nitrite and nitrate emission from solid waste cause health hazard such as carcinogenic and mutagenic nitrosamines. Also, Uzonicha (2011) opined that open dump sites serve as a breeding place for rats, which are known to involve in the spread of lassa fever. Rats also contaminate food with their urine transmitting leptospirosis and infective hepatitis and salmonella and other infecting organisms. Ajani (2007) also stated that health implications of poor household solid waste management include low birth weight (less than 2500g), fetal and infant mortality, spontaneous abortion and the occurrence of birth defects.

To solve the problem of solid waste management in Port Harcourt Metropolis, both the dwellers and government should come together to maintain a legal and institutional workable framework for solid waste disposal and management.

Research Method

Plan of Action

Weeks	Activities
1 - 5	Seminar presentation
In all the hostels	Environmental sanitation is a requisite for good health
6 - 7	Operation keeps the environment clean. All students resident on campus were made to carry out environmental sanitation in conjunction with the labourers from the works department, under supervision of the researcher and the school medical centre.
8	The research provided waste bins of 150 litres bucket with well fitted covers each cost N3,500.00. 8 of such were provided with sponsorship from the students who gave willingly at the view of the ambience created by the environmental sanitation earlier carried out.
9	Interactive measures on way forward to keep the environment status quo. This gave birth to some laws made by the students to be executed by the SUG and the Security Department.

Week II especially featured evaluation of the programme. Method adopted for this evaluation was by:

- (1) **Interview:** Accidental interview of students on the level of compliance was done and the results were that students are very compliant with the stipulated environmental laws and environment regulations in the programme for ensuring the cleanliness of the environment but however they complained of some who do not comply and further suggested the need to empower a group made of securities, lecturers and the works department to enforce environmental laws among students not only in the hostels but should be extended into the classrooms.

- (2) **Observation:** Researchers walked round the hostels during the evening hours of 5-7 p.m. and at about 8-10a.m, the results showed that there had been a whole lot of improvement.

Recommendation

In view of the results of the programme and the contribution from students, the following recommendations have been made;

- (1) Hostels pollers and wardens should redouble their effort and continuously emphasize environmental sanitation among undergraduates.
- (2) The University should as a matter of urgency, employ more labourers and cleaners to bring about reduction in the amount of work per officer since one of the reasons for poor sanitation was lack of staff (cleaners and labourers).
- (3) Government, companies and private philanthropists should assist in the building of hostels to reduce the number of students in a room per hostel.

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