

ENVIRONMENTAL GOVERNANCE ISSUES: HEALTH CARE WASTE MANAGEMENT IN NIGERIA

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ABSTRACT

There has been a strong feeling over the years in Nigeria on how to regulate and monitor the effective and efficient utilization of the environment so that it can continue to sustain the teeming population without creating challenging problems. This has been accompanied by the role of governance in Health care waste management in Nigeria. Thus good environmental governance could play a major role in awakening the public to the threats of pollutions, toxic chemicals and sharp objects that emanate from health care waste. Hence, this study examines the relationship between environmental governance and health care waste management. The data for the study were sourced from three federal universities in the Southeast geopolitical zone. To establish the need for the integration of sector policies, structured questionnaire was used to assess the opinions of the respondents, that is, the students, non-academic staff and academic staff totaling 300 from the three federal universities. Chi-square test was used to ascertain the needs for the integration of educational policies and environmental protection measures in tertiary institutions. The empirical result showed that the responses were homogenous indicating the need to enshrine environmental protection measures in educational curriculum of tertiary institutions in Nigeria. This will increase the awareness of the hazards and risks associated with improper health care waste management in Nigeria.

Key: *Environment, governance, health care waste, waste management.*

1.0 Introduction

According to wikipedia, Environmental governance is a concept in political ecology and governmental policy that advocated sustainable development as a supreme consideration for managing all human activities such as political, social and economic in order to make effective and efficient utilization of the environment so as to continue in its sustenance of the teeming population of the globe. It is mostly felt by over dependence on the environment and natural resources can lead to big threat around the world if this situation is unable to address environmental issues due to over use. Thus, environmental governance seems to govern the

environmental issues through the national government and other organizations because of the increasing complexity of environmental degradations (Wikipedia).

Environmental governance helps in creating policies that preserve, protect and monitor the use of environment and natural resources (Beeton, Buckley, Jones, Morgan, Reichelt & Trewn, 2006). It will also enable more efficient and effective approaches to conserve the environment and natural resources through educating, finding all provision of information which will translate to reducing pressure on the quality and quantity which will also positively affect biodiversity with the awareness that environmental governance provides enormous opportunities for greener societies and economies which can stimulate the delivering numerous benefits in addressing food, health, energy issues and in achieving sustainable development.

Also, as the surge of interest in health care waste management came more intensive due to the risk of exposure of health care workers, waste handlers, patients and the community at large to infection, toxic effects and injurious and risks polluting the environment. The attention of policy workers shuttled to the relevance of governance. Governance is seen to be a core factor in accelerating successful management of health care wastes (HCW) Health care wastes (HCW) is a byproduct of health care that includes sharps, non-sharps, blood, body parts, chemicals, pharmaceuticals, medical devices and radioactive materials (WHO, 1999).

The major challenges facing environmental governance in Nigeria is lack of integration of sector policies and there is lack of awareness of the threats and hazards of improper disposals of health care waste products. Therefore this study aims at providing alternative to the above challenging problem.

The government can effectively carry its responsibilities through appropriate institutional mechanism that can guarantee the provision of infrastructure in areas of needs that can play many roles in effective and efficient management of health care waste products. These assumptions led to the interest of policy makers and researchers on the role of government in health care waste management. Most of the studies on the topic have concentrated on public health benefits and the need for effective environmental regulatory surveillance. UN

Environment calls on governments and businesses to promote, protect a respectable environmental rights (Frank & Ositadimma, 2018; WHO, 1999).

Thus this paper examines the relationship between government educational policy and health care waste management policy in Nigeria. An inferential statistics method is adopted using chi square to test the findings of this paper. This paper will provide useful information for managing health care waste (HCW) in Nigeria using Southeast geopolitical zone in Nigeria as a case study. This paper is therefore of great benefit to medical doctors, health workers and the general public, civil society, academic, scholars, individuals that are interested in environmental governance and health care waste management issues. Its content is structured around five sections following this introductory section is the literature review. In this section, the concepts of environmental governance, health care waste management and dangers of improper disposal of health care waste products and the relationship between health care waste and governance are broadly considered. Section three is the methodology of the study. In this section the focus on the theoretical framework, method of data collection and analysis or estimation technique. Result and discussion of findings are presented in section four. The paper is rounded up in section five.

2.0 Literature Review

Environmental governance refers to the process of decision making involved in the control and management of the environment and natural resources. International Union for Conservation of Nature (IUCN) define environmental governance as the multi-level interactions (i.e. local, national, international/global) among but not limited to three actors i.e. state, market and civil society which interact with one another whether in formal and informal ways; in formulating and implementing policies in response to environment-related demands and input from the society bound by rules, procedures, behaviour characterized of good governance for the purpose of attaining environmental sustainable development (IUCN, 2014).

Environmental governance is concerned with how the decision are generally made with a particular emphasis on the need for citizens, interest groups and communities generally to

participate and have their voices heard. Stemming from the above scenarios citizens must have access to information to enable them participate in decision making and have access to environmental matters that will assist them to exercise their rights (United Nation Economic Commission, 2001).

It was further noticed that the revolution in electronic information technology as being very important to the promotion of environment governance (Swynage, 2005). Recognizing also that every person has the right to live in an environment adequate to his or her health and well-being and the duty both individually and in association with others to respect and improve the environment for the benefits of present and future generation. Within the framework of a good governance and respect for human rights can these challenges be met. The key principles of environmental governance include:

- Embedding the environment in all levels of decision making.
- Conceptualizing cities and communities economic and political life as a subset of the environment.
- Emphasizing the connection of people to the ecosystems in which they live.
- Promoting the transition from open/up/cradle-to-grave systems (like garbage disposal with no recycling) to closed/loop/cradle systems (like perm culture and zero waste strategies) (IUCN, 2014).

Theoretical Literature

This study adopts the structural-functionalism theory. According to the wikipedia, structural-functionalism theory is a sociological theory that attempts to explain why society functions the way it does. The theory explains the relationship between the various social institutions like the government, law, education, religion, etc. it also analyzed the society as a complex system whose parts work together to promote solidarity and stability. Crossman (2018) argues that structural functionalism focuses mainly in the macro-level of social structures rather than the micro-level of every day life. Functionalism address society as a whole in terms of the functions of its element example norms, customs, tradition and institutions. The major proponents of this theory include Herbert Spencer (1820-1903) and Talcott Parson (1930).

In relation to our study, environmental governance and health care waste management, the government or state should provide policy that will help to manage health care waste in order to sustain the environment. This will go a long way in preventing diseases, pollution, and dumping of toxic wastes in the environment. An unsustainable environment is a threat to animals, including human beings, and plants. The social institutions have a role to play because the society is a complex system in which all parts should work in order to promote solidarity. The government should also provide education to the masses, educating them on how to manage health care waste. There is no adequate policy towards that as a result there is inefficient and ineffective methods of disposal of health care waste in most areas in Nigeria such as the use of pits, burning among others. Yet, these wastes hardly decay under this condition when disposed in such manner. Abah (2011) analyzed that the quality of health care waste disposal is equal to zero and the training on how to manage the waste is 11.5% in Nigeria.

The incinerators are not adequately provided to cover the states in Nigeria. In order to encourage adequate disposal of health care waste other elements of social institutions should be put in place. The family should inculcate the habit of managing waste properly to their family members and such should also be done in churches and schools.

2.1 The Concept of Health Care Waste

Health care waste (HCW) is a byproduct of health care that includes sharps, non-sharps, blood, body parts, chemicals, pharmaceuticals, medical devices and radioactive materials. The waste generated by health care activities include a broad range of materials from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood chemicals, pharmaceuticals, medical devices and radioactive materials (WHO, 2011). These waste generated by health care activities if not managed well will potentially expose health care workers, waste handlers, patients and the community at large to infection, toxic effects and injurious and risks polluting the environment. WHO (2011) stressed that it is essential that all medical waste materials should be segregated at the point of generation, appropriately treated and disposed out safely.

Nkechi et al. (2012) classified health care waste according to sources for instance, about 80% of waste generated by health care activities is general waste. The remaining 20% are generated from hazardous materials that may be infectious, toxic and radioactive materials. And evidence have shown that every year an estimated 16000 million injections are administered world wide but not all of the needles and syringes are properly disposed of afterwards. It is pertinent to note that health care waste contains potentially harmful microorganisms which can infect hospital patients, health care workers and the general public (Nkechi et al. (2013).

Health care activities are carried out to protect and restore health and save lives. But without adequately disposal of the byproducts can generate thus, solving a particular problem and creating a new problem. The major sources of health care waste includes – hospitals and other health care establishment, laboratories and research centers, mortuary and Autopsy centres, animal research and testing laboratories, blood banks and collection services and nursing homes for the elderly (WHO, 2013). In another development, it has been argued that treatment and disposal of health care waste reduces risks, indirect health risks may occur through the release of toxic pollutants into the environment through treatment or disposal (WHO, 2013) or through scavenging activities at dumpsite can create risks of infection.

2.2 Health Care Management

According to WHO, safe management of wastes from health care activities originated by WHO (1999). Health care waste management involves building a comprehensive system addressing responsibilities, resources allocation handling and disposal, secondly raising awareness of the risks related to health care waste and of safe and sound practices and finally selecting safe and environmental friendly management options to protect people from hazards when collecting, handling, transporting, treating, or disposal of waste. Studies done by Nkechi et al. reviewed that there are three improvement mentioned that should be adopted in proving safe health care waste management. These include:

- Building a comprehensive system addressing responsibilities, resources allocation handling and disposal which involves a long term process sustained by gradual improvement.
- Raising awareness of the risks related to health care waste and of safe and sound practices and lastly
- Selecting safe and environmentally friendly, management options, to protect people from hazards when collecting, handling, storing, transporting, treating, or disposing of waste.

However, cases related to health care waste management in Nigeria has failed and the reasons for failure includes lack of awareness about the health hazard related to health care waste, inadequate training in proper waste management, absence of training in proper waste management and disposal systems, insufficient financial and human resources and low priority given to the topic are the most common problems connected with health care waste.

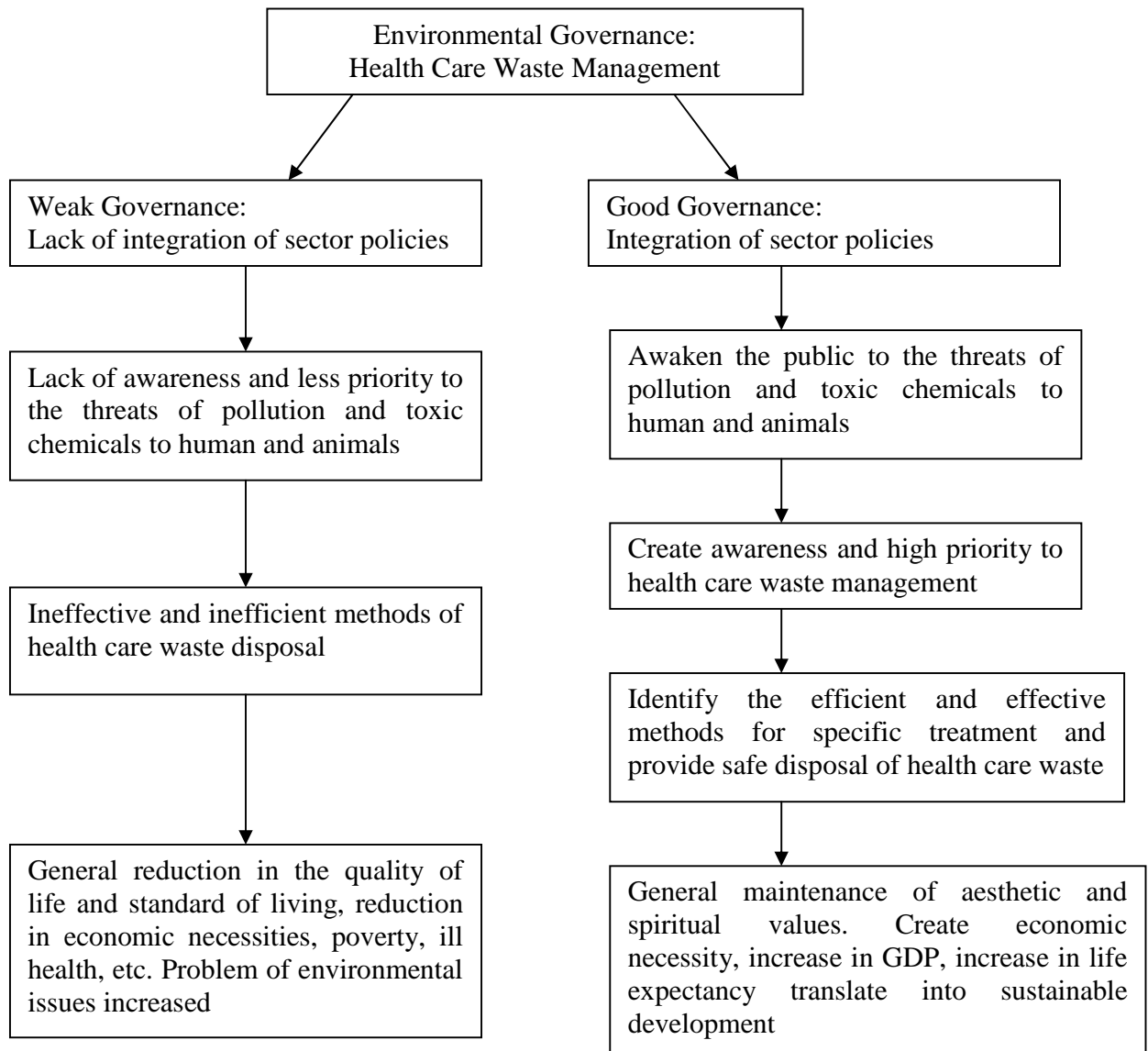
2.2.1 Dangers of Improper Disposal of Health Care Waste

Evidence have shown that health care waste generated that are not properly disposed can contain pathogenic and disease causing agents such as virus, bacteria, parasite and fungi. These can infect the health care workers, patients, cleaning staff, visitors, waste collectors and disposal staff, waste pickers among others (Akter, 2010; WHO, 1992). In another development, sharp objects that result from health care activities possess inherent physical hazards cuts and puncture which can accelerate infectious disease easily. Their contact can translate into disease causing agents such as virus (hepatitis, HIV/AIDS, candidacies; Fungi (filiarisis pathogenic among others) (Akter, 2010). Furthermore, infectious stool or body fluid that are not treated since sewage treatment is almost non-existent can cause contamination of water supply, this can extend the epidemics in the society (Akter, 2010, WHO, 1992; Ohiman, 2011, 2000; Alagoz & Kocasay, 2007). A study done by WHO 1992 stressed that during incineration of health care waste releases pollutants into air and ash residue especially those that contain heavy metals like lead and mercury and cadmium which can lead to spread of toxic metals in the environment. Also, the re-use of disposable syringes and needles not

treated for injection which is particularly common in Africa, Asia, Central and Eastern European countries. All of the above can constitute a threat risk of infection. In addition, studies revealed that in 2000, injections with contaminated syringes and needles caused 21 million hepatitis B virus (HBV), 2 million hepatitis C virus and 260000 HIV infections world wide (WHO, 2000). Many of these infections were avoidable if the syringes had been disposed of safely.

2.3 Relationship between Environmental Governance and Health Care Waste Management

Conceptual Framework of Environmental Governance: Health Care Waste Management



Good environmental governance which is proper management and orientation of sector policies could positively help people to understand the health hazard that are associated with improper disposal of health care waste generated from hospitals and other areas that are associated with health care treatments. The good environment governance is assessed by the

capacity to implement a country's governance principles, make frameworks for proper health care waste management and environmental sustainable development. Successful environmental governance is correlated with proper health care waste management through adequate institutions that adopt effective and efficient protective measures. For instance, it will generally maintain aesthetic and spiritual values, create increase in economic necessity increase life expectancy among others.

The improper health care waste management in Nigeria could be explained by a failure in governance and the components of good governance with lack of awareness about health hazards related to health care waste, inadequate training in proper health care waste management, absence of waste management and disposal systems, insufficient financing and human resource and low propriety given to the topic are the most common connected to with health care waste (Nwachukwu et al., 2013). The transition from improper health care waste management towards a proper health care waste management cannot operate in the absence of properly established good environmental governance. In essence, Nigeria would face an environmental governance failure because of lack of integration of sector policies and low priority given to the topics. This will translate into general reduction in the quality of life and standard of living, reduces economic necessities, poverty and ill health, etc.

3.0 Methodology

3.1 Study Area and Data Collection

The population of interest for this study are three federal universities drawn from South-east geopolitical zone which include University of Nigeria, Nsukka in Enugu State, Federal University of Technology Owerri in Imo State, Federal University of Agriculture Umudike in Abia State, Federal University Ndufu Alike Ikwo in Ebonyi State and Nnamdi Azikiwe University. The sample of 300 respondents for this study were drawn from students, non-academic staff and academic staff of the above six universities in Southeast geopolitical zone. The data for the study were collected with well structured questionnaire comprising the responses elucidated by the sample of the population. Thus purposive sampling technique was adopted for the data collection. The rationale for this is that the study sought to explain the opinion of the respondents to determine if the integration of sector policies such as enshrining

environmental protection measures in educational curriculum of tertiary institution as a general course of study for second year undergraduate students will help to create awareness of the hazards and risks of improper disposal and management of health care waste products in Nigeria. This is because environmental protection measures are embedded in a very complex system of which our understanding of the environmental governance: health care waste management studies. For instance, peace and conflict studies and entrepreneur development just to mention a few have been enshrined in tertiary institutions in Nigeria. These help in creating awareness of the above issues. Restructuring the sample to only three federal universities in Southeast will help to form a pilot scheme. It also ensure unit homogeneity and to create greater awareness of the public towards making strong contribution in environmental governance. This will also accelerate the integration of environmental protection measures and education policy with the goals of increasing awareness about the health hazards and risks related to health care waste and ensure adequate training to most common problems that connects with health care waste issues in Nigeria.

3.2 Estimation Techniques

The use of chi-square test was adopted in this study. The aim is to test for homogeneity responses from different categories. The procedure for the test is two way classification table or contingency table. A contingency table has two attributes; one classified as the rows and the other classified as the column. The observed frequencies occupy in r-row and c-columns which form the cells. In the same cell, the expected frequencies are computed. The contingency table used in this study is 3x3. Each person belong to the distinct classification called cell. From the 3x3 contingency table we adopted $O_{11}, O_{12}, O_{13} \dots O_{33}$ which has three attributes Yes, No and Indifferent from the contingency table we have nine cells. This formed the number of observation within each of the cells. Each row has total row and total column. Thus, subject to some hypothesis, according to rules of probability the cells are denoted as r_i and c_j which reads i row and j column. A_{ij} i.e. a is i row and j column.

Table 1: Analysis of responses from the three universities and the frequencies of their responses

	Yes	No	Indifference	Row total
Students	50	30	10	90
Non academic staff	15	10	25	50
Academic staff	135	20	5	160
Column total	200	60	40	300

$$\text{Grand total} = C_1 + C_2 + C_3 = R_1 + R_2 + R_3$$

To obtain the expected frequency we applied the Expected Frequency = $\frac{RixCj}{\text{Grand total}}$

$$\text{Chi-square formula we adopted is } X^2 = \sum \left(\frac{O_{ij} - E_{ij}}{E_{ij}} \right)^2$$

Where O_{ij} is the observed frequency.

From the table above, we computed the expected in i-row and j-column.

E_{ij} represent the expected frequencies. The null hypothesis test is that the classifications are not homogenous. While alternative hypothesis are that the classifications are homogenous.

4.0 Results

In order to obtain the critical value we used 5% level of significance, we divided by 2 to

obtain 0.025 i.e. $\frac{0.05}{2} = 0.025$ and the degrees of freedom we adopted $(r-1)(c-1)$

i.e. $(3-1)(3-1) = 2 \times 2 = 4$.

Critical value $X^2(4)(0.025)$ = if the calculated chi-square is greater than the chi-square table (critical value) we reject the null hypothesis; if otherwise, accept H_0 (Spiegel, 1980).

Our calculated chi-square $X^2 = 197.87$ and the tabulated is 0.848 i.e. $197.87 > 0.848$. Therefore, we reject our H_0 and accept the alternative. Thus, the responses from the study is homogenous indicated that the integration of environmental protection measures in the educational curriculum of the students in the tertiary institutions will increase the awareness of the hazard and risks exposed by improper health care waste management in Nigeria. This will translate into effective and efficient utilization of the environment for sustainable development.

5.0 Conclusion

Knowing that there is low awareness of the hazards and risks of improper health care waste disposal and the fact remains that there is lack of integration of sector policies. This has been the concern and is quite explored in this study. In order to seek the opinion, of stakeholders in the tertiary institutions, if it is possible to enshrine in environmental protection measures in the educational curriculum of tertiary institutions. The responses were homogenous which shows that to increase awareness of the hazards and risks generated by improper health care waste disposal in Nigeria through enshrining in the environmental protection measures in the curriculum of tertiary institutions will increase the decision making process among the public, civil society, business and government. This will also increase the priority given to environmental governance in Nigeria for sustainable development.

The finding of this study contributes to understanding of how government should enshrine environmental protection measures in educational curriculum in the tertiary institutions in Nigeria knowing that an active government policy is crucial in increasing the awareness of environmental governance. The integration of sector policies needs to be implemented with

care and these should be regulated, monitored and financed. This will foster the improvement of the government when making decision concerning environmental governance as regards to health care waste management in Nigeria.

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