International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

Environmental Assessment of The Impacts of Waste Dumpsites and The Potency of Its Health Hazards In the South-South Region of Nigeria

JEGEDE, Amen Osamede
Department of Tourism and Hospitality Management, Faculty of the Social Sciences, Ekiti State University, Ado-Ekiti, Nigeria

AWOSUSI, Ajoke Olukemi
Department of Human Kinetics and Health Education, Faculty of Education, Ekiti State University, Ado Ekiti, Nigeria

Date of Submission: 11-10-2025 Date of Acceptance: 24-10-2025

Abstract
This research work examined the environmental impacts of waste dumpsites and the potency of its health hazards in the South-South Region of Nigeria. Data for this study were collected from primary and secondary sources, through the administration of one thousand, seven hundred and twenty eight (1,728) copies of questionnaire using the random sampling method on respondents. Simple percentages, charts, student's t-test, anova, and correlation statistical techniques were used in the analysis of the data collected. The results of the analysis revealed that there is significant relationship between waste dumpsites in the study area and the impacts of their health hazards on the immediate environment. *The study therefore recommended that, there is need for the provision of* adequate controlled dumpsites in the study area, so as to discourage the dumping of refuse on drainage channels and also to prevent the indiscriminate disposal of waste materials on the environment, which often liter the area. Government's role is therefore to set policy and provide regulatory framework for sound development in order to avoid wholesale destruction of the earth and its resources.

KEYWORDS: Assessment, Consequences, Environment, Nigeria and Waste- Dumpsites

I. INTRODUCTION

Since the beginning of the 19th century, international law has played a significant role in the protection of the environment. Among the fields of law, the evolution of international environmental law stands out as fast-paced with chequered and tumultuous history, experiencing dramatic changes in emphasis and contents (Oludayo, 2004). He further noted that the idea on environmental laws began on a cautious bilateral note and was directed at conservation and protection of few species that were initially considered as valuable resources to humans or at the brink of extinction. Thus, the sources of international environmental law could be gleaned from Article 38 (1) of the Statute of the International Court of Justice. It provides:

The Court, whose function is to decide in accordance with international law, such disputes as are submitted to it, shall apply:

i. International conventions, whether general or particular , establishing rules expressly recognized by the contesting States;
ii. International custom, as evidence of a general practice accepted as law;
iii The general principles of law recognized by civilized nations;
iv. Judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of the rules of law.

Oludayo (2004) defined environmental law as the body of rules, both from the national and international perspectives, for the sustainable utilization of resources, for the social and economic development of the society. He further said that, although environmental protection proceeded from a simple premise; a moral, ethical belief that we should protect those things we all share, the air, water and land. Environmental law is the transformation of those moral principles into legally enforceable norms. It may also be defined as the law governing the control of the effects of human activity on the physical environment in the overall interest of the public. It embraces the subject matter of several important international agreements and

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

municipal laws, regulations, standards and institutional framework for the equitable and sustainable use of the natural resources (Oludayo, 2004). The primary consideration of environmental law is the provision of the legal platform upon which the environment could be protected and natural resources conserved through the sustainable use of natural resources, pollution control measures and the integration of environment considerations into development process.

In Nigeria, an environment is by statute defined to include water, air, land and all plants and human beings or animals living therein and the interrelationships which exist among these or any of them (Federal Environmental Protection Agency, 2004). Ajomo (1989) tends to agree with this definition, as according to him, Nigerian environment is composite in nature. This means that, an environment is the aggregate of social and cultural condition that influence the life of an individual or community. In view of the fact that the environment is the most formidable source of national and international development; it must be protected from damage, destruction, or annihilation. Since an abuse of the environment could result in its decay which will ultimately affect meaningful development, there is therefore the need to preserve the ecosystem.

II. STATEMENT OF THE PROBLEM

The conservation and protection of environmental resources in poor nations like Nigeria result from inadequate political commitments, inadequate financial support, inadequate administrative and scientific capacities, and inadequate popular constituencies for the protection of nature (Environmental Watch, 2008). These problems persist because the conventional means for obtaining conservation, international environmental law, national environmental law, and environmental education have very seldom been able to overcome the high priority placed on environmental development in virtually all the developing countries. These generally accepted conservation measures have clearly failed to inspire effective conservation on a broad scale in developing nations and we believe they cannot succeed in comparison with the current pace of global ecological degradation (Hogan, 2010).

The country urgently needs infrastructural, institutional, legal and attitudinal reforms to tame the waste monster, and adopt Environmentally Sound Management (ESM) of waste (including Waste Minimization, focusing on the promotion of the "3Rs" Reduce, Reuse and Recycle), Waste to Wealth initiatives towards poverty reduction and alleviation; Corporate Social Responsibility by producers of wastes; and, not the least involvement of multi-stakeholders e.g. under the New Partnership for Africa Development (NEPAD) initiative (Osibanjo, 2009).

Industries are the single largest group of polluters of any nation's environment and gobblers of the national resources used as raw materials (Abegunde, et al, 2007). As energy consumption increases with increase in industrialization, it is essential to ensure a balanced mix of various energy, which will be compatible with sound environmental practice and the reduction of the negative impact of energy production and use on the environment.

III. AIM AND OBJECTIVES OF THE STUDY

The main aim of this study was to assess the environmental impacts of waste dumpsites and the potency of its health hazards in the South-South Region of Nigeria

The specific objectives of this study were to:

i. identify the challenges of waste dumpsites in the study area
ii. investigate the causes of indiscriminate sitting of uncontrolled waste dumpsites in the study area.
iii. assess the relationship between waste dumpsites in the study area and the impacts of their health hazards on the immediate environment.
iv. recommend possible remedial measures to the problems identified

IV. HYPOTHESES OF THE STUDY

For the purpose of this study, the following working hypotheses have been developed in line with the objectives of the study stated earlier.

i. There are no significant challenges of waste dumpsites in the study area
ii. There are no significant causesof uncontrolled waste dumpsites in the study area
iii. There is no significant relationship between waste dumpsites in the study area and the impacts of their health hazards on the immediate environment.

V. THE STUDY AREA

A. *Components and Location*

The South-South Geo-political Zone of Nigeria is made up of six states; these are Edo, Delta, Bayelsa, Rivers, Akwa-Ibom and Cross River States (Figs 1 and 2).

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

B. *Climate*

South-South Geo-political Zone of Nigeria has two seasons. These are the dry season and wet season. The dry season is accompanied by a dust laden air mass, while the wet season is heavily influenced by an air mass originating from the South Atlantic Ocean.

C. *Drainage*

The South-South Geo-political Zone of Nigeria is a low-lying region through which the waters of the Niger River drain into the Gulf of Guinea. Characteristics landforms in this region include ox-bow lakes, river meander belts (Niger Delta, 2011) and prominent levees. Large fresh water swamps give way to brackish mangrove thickets near the sea-coast. River Ethiope and Ikpoba River are important rivers in the area known for fishing and water transportation activities. The South-South Region of Nigeria stretches for nearly 177 km (110 miles) from North to South and spread along the coast for about 257.4km (160 miles) (Rosenberg, 2011). Within the Delta, River Ethiope breaks up into an intricate network of channels called rivers. The Nun River is regarded as the direct continuation of River Ethiope and Ikpoba River (www.zodml.org, 2013).

D. *Vegetation*

The vegetation in the South-South Geo-political Zone of Nigeria, consist mainly of forest swamps. The forests are of two types, nearest the sea is a belt of saline/brackish mangrove swamp separated from the sea by sand beach ridges within the mangrove swamp. Numerous sandy islands occur with fresh water vegetation. Fresh water swamps gradually supersede the mangrove on the landward side (Rosenberg, 2011).

E. *Natural Resources*

Nigeria is regarded as the sixth largest oil producing country in the world today, due to the large volume of crude oil deposit in the South-South Region of Nigeria. Other solid mineral deposits in the South-South Region of Nigeria are industrial clay, silica, lignite, kaolin, tar, sand, decorative rocks, limestone etc. (Park, 2004). These are raw materials for industries such as brick making ceramics, bottle manufacturing, sanitary wares and gas produces about 70% of Nigeria's income.

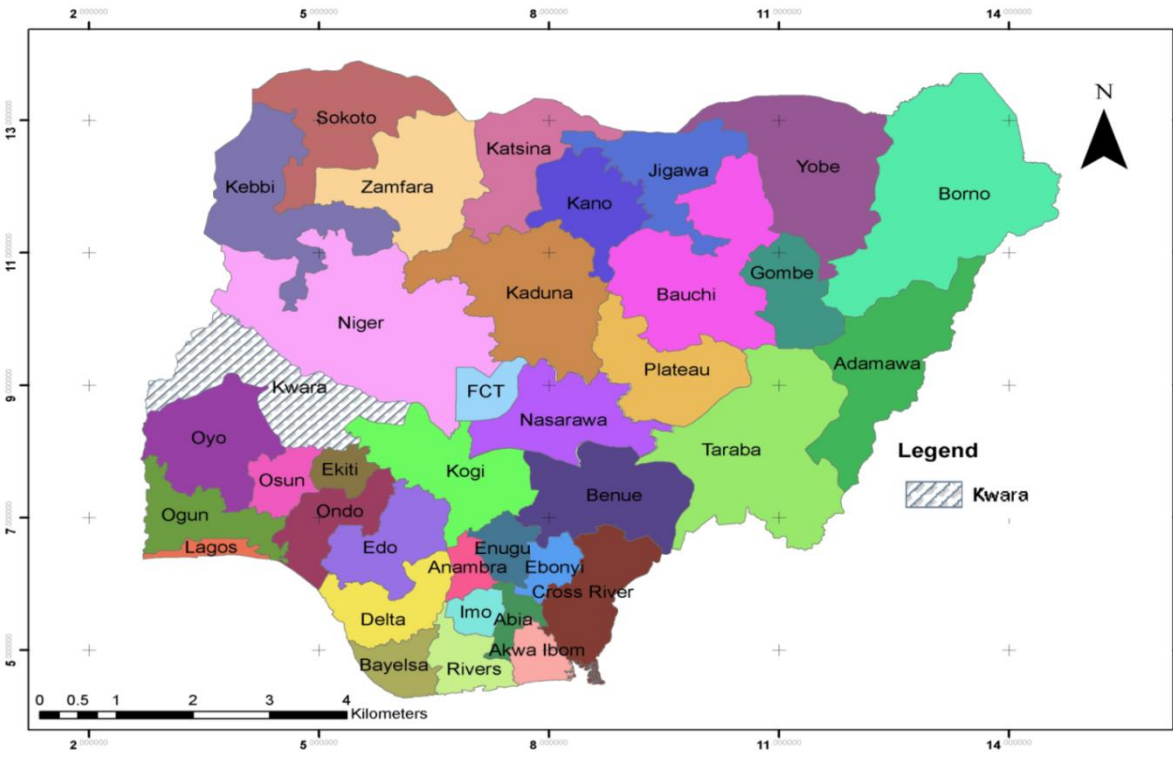

Figure 1.1: Map of Nigeria

Source: Kwara State Office of the Surveyor General, 2018

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

Figure 1.2: Map of Nigeria numerically showing states in the Niger Delta and The South-South Region of Nigeria

Source: Author's Fieldwork, 2020

VI. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Osawe and Ibebunjo (2010) defined environment as the entirety of the factors that surround and affect a living entity within their natural habitats in an interaction process. These factors may be living organisms (biotic factors) especially man or non-living elements (abiotic factors). Osawe and Ibebunjo (2010) further sub-divided the non-living factors into physical-sub-factor, such as temperature, natural resources, rainfall, edaphic (soil), ocean currents, etc., and man-made sub-factors such as economic, socio-political, greed, scientific inventions etc. They further noted that in most cases, a combination of the two set of factors will determine the ever-changing environment. Osawe and Ibebunjo's (2010) assertion focused majorly on factors in the environment that enhances human living without emphasis on the challenges of environmental problems that faces man and propels man to take steps in solving the problems and make the environment a better place to live.

The Concept of Environmental Regulation by United States Environmental Protection Agency (USEPA) (2000) was applied to this study. The concept states that environmental regulations are rules and requirements that generally spelt-out, the ethics and ethos, principles, practices and procedures that guide the actions of man in our environment. Thus, environmental regulations cover two things:

a. Pollution control: regulating how much pollution (chemicals or other undesirable materials such as "heat", "suspended particulates") a facility releases.

b. Conservation management: maintaining health of ecosystems, protecting land, and assuring diversity of species etc.

Pollution refers to undesirable outputs or byproducts being released into the environment. Chemical compounds are a common form of pollution, but pollution also includes things like: waste heat (e.g., discharging heated water into a river), or suspended particulates (e.g., creating a lot of air-borne dust). Even harmless compounds like $C0_2$ can be considered pollution, depending on the effect on the environment (e.g. $C0_2$ contributes to global warming).

Pollution Control Cover

It is important to understand that pollution control covers both actual releases and potential releases of pollution to the environment. That is, you may be regulated based on what you actually release up on air stacks, and for what you might potentially release (i.e., if you don't handle the materials properly). Here is what is covered:

Regulation of actual release of environmental pollution covers what have occurred through:

i. Direct releases, e.g., an air stack or waste water pipe.

ii. Waste disposal, e.g. solid or hazardous waste being taken to a landfill or treatment plant.

iii. General escape, e.g. "fugitive" emissions into air, water-runoff from your parking lot, or spills or leaks of chemical products or waste regulation of potential releases is focused on materials that would

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

cause a problem if accidentally released. In this case, regulations can cover:

i. What materials you have on site
ii. How you store them
iii. How you handle and manage them
iv. How workers are protected from them

VII. RESEARCH METHODS

A. Research Design

The research design for this study was based on the careful gathering, analysis and application of facts in order to achieve the stated objectives and to test the acceptability or otherwise of the hypotheses stated in this study.

B. Data Type and Sources

i. Primary Data

The first stage was the procurement of the maps of the six states in the South-South Geo-political Region of Nigeria (Akwa-Ibom, Bayelsa, Cross River, Delta, Edo and Rivers States) which is the coverage area for this study. From the six states in the South-South Region, one Local Government Area was selected from each of the eighteen Senatorial Districts using stratified sampling technique (See Table 1.).

Remotely Sensed Imagery combined with scientific visualization and digital cartography was applied in the mapping and assessment of erosion and flood prone areas within the study area.

A 49-item Questionnaire was administered to elicit useful information from categories of respondents on environmental problems which emanate from the building of houses on erosion and flood prone areas, extraction of crude oil by oil companies, existing road transportation land use pattern, as well as health hazards which emanates from waste dumpsites in the study area. A total number of one thousand, eight hundred (1,800) copies of questionnaire were administered in this research; one hundred (100) copies of the questionnaire were administered to each of the randomly selected 18 Local Government Areas in the six states in the South-South Region of Nigeria. The one thousand eight hundred (1,800) copies of questionnaires were administered within the space of two (2) months in the 18 randomly selected Local Government Areas in the South-South Region of Nigeria. The questionnaires were administered by the researcher and 18 research assistants domiciled in the randomly selected 18 Local Government Areas. Copies of the questionnaires were administered during working days from Mondays to Thursdays and retrieved every Friday from civil servants and public servants in their offices in the study area. Copies of questionnaires administered on market men and women were administered daily and retrieved the following day. Why copies of questionnaires administered on members of the National Union of Road Transport Workers (NURTW) were done on daily basis from Monday to Friday and collected on Saturday, with the assistance and co-operation of the Union Chairmen. Out of which, one thousand seven hundred and twenty eight (1,728) copies of the questionnaires were retrieved from the field, making it 96% retrieval rate. Seventy-eight (78) copies of the questionnaire; which is 4% of the questionnaire were either mis-placed or mistakenly torn by the respondents.

Table 1. States Surveyed

	Frequency	Percentage
Akwa-Ibom	280	16.2
Bayelsa	287	16.6
Cross River	294	17.0
Delta	291	16.8
Edo	292	16.9
Rivers	284	16.4
Total	1728	100.0

Table 1.shows that 16.2% of the respondents were from Akwa-Ibom State, 16.6% of the respondents were from Bayelsa State, 17.0% of the respondents were from Cross River State, 16.8% of the respondents were from Delta State, 16.9% of the respondents from Edo State and16.4% of the respondents were from Rivers State. This indicates that the response of the respondents were considerably very high and reliable, since the total returned rate of the questionnaires administered was 96.0%. This tells us that the data generated from this research work is reliable.

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

Secondary Data
The secondary source of data collected in the study area was from the Waste Management Board in the study area.

Methods of Data Analysis
The data, which were obtained in the study area were subjected to statistical analysis using descriptive and inferential statistical tools and these were the use of maps, tables, charts, and graphs, while the Student's t-test, Spearman Rank Correlation Co-efficient and the Pearson's Product Moment Correlation Co-efficientwere used as inferential statistical tools to test the stated hypotheses.

The formular for Pearson's Product Moment Correlation Co-efficient is;

$$R_{XY=\ N} \sum \frac{(XY) - (\sum X)\ (\sum Y)}{\sqrt{[n(\sum x^2) - (\sum x)^2.(n\sum y^2 - (\sum y)^2]}}$$

Decision Rule
The null hypothesis (Ho) will be rejected, if the "t" calculated value is greater than the "t" table value at (alpha level of 0.05). If otherwise, the alternative hypothesis (Hi) will be accepted.

VIII. RESULTS AND DISCUSSIONS

There is no significant relationship between waste dumpsites in the study area and the impacts of their health hazards on the immediate environment.

Table 2. Testing of Hypothesis

Paired groups	N	Mean	Standard deviation	Degree of freedom	Tcal	Ttab
Waste dump sites in the study area.	1728	36.28	1.896			
The impacts of waste dump sites health hazards on the immediate environment.	1728	14.13	1.077	1727	11.37	0.195

P<0.05 (Significant)

In Table 2, the't' calculated value (11.37) is greater than the't' table value (0.195). We therefore rejected the null hypothesis and concluded that, there is a significant relationship between waste dumpsites in the study area and the impacts of their health hazards on the immediate environment. Thus, the indiscriminate disposal of waste materials, poor maintenance as well as waste dumpsites in the study area brought about negative impacts of health hazards on the immediate environment. This corroborates the findings of Friends of the Earth in (2006), a study carried out on 'Waste Management Method'. It was discovered that solid waste generation in metropolitan cities has increased prodigiously, adding that open dumping of waste materials attracts flies, vermin and scavengers; coupled with offensive odours, diseases, cholera and other health hazards.

The result also corroborates the findings of Adegoke (1990) on 'Waste Management within the Context of Sustainable Development. He found out that waste materials are substances which are disposed of, or required to be disposed of, according to the provision of national environmental laws and when this is violated or neglected, it would result to serious public health hazards; chamber of bacteria, pests and diseases, unsightly site and environmental degradation.

Table 3. Evaluation of Waste Management Practices and Dumpsites in the Study Area and the Potency of their Health Hazards on the Immediate Environment.

States	Frequency	Frequency of Compliance	Percentage of Compliance	Frequency of Non-Compliance	Percentage of Non-Compliance	Total

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

Akwa-Ibom	280	124	44.28	156	55.72	100.0
Bayelsa	287	130	45.29	157	54.71	100.0
Cross River	294	156	53.06	138	46.94	100.0
Delta State	291	127	43.64	164	56.36	100.0
Edo	292	98	33.56	194	66.44	100.0
Rivers	284	134	47.18	150	52.82	100.0
Total	1728	769	44.50	959	55.50	100.0

Table 3, revealed that indiscriminate waste deposits in the study area, results into health hazards on the immediate environment. In Akwa-Ibom State 44. 28% of the waste dumpsites are in compliance with environmental laws, while 55.72% of the waste dumpsites were not in compliance. In Bayelsa State, 45.29% are in compliance, while 54.71% were not in compliance. In Cross River State 53.06% were found to be in-compliance, while 46.94% of the waste dumpsites were not in compliance. In Delta State 43.64% are in compliance, while 56.36% of the waste dumpsites were not in compliance. In Edo State 33.56% of the waste deposits were found to be in compliance, while 66.44% are not in compliance. In Rivers State 47.18% of the deposits are in compliance, while 52.82% were not in compliance. In totality 44.50 % of the waste dumpsites in the South-South Region of Nigeria were in compliance with environmental laws, while 55.50% of the waste dumpsites were not in-compliance with environmental laws. Thus, the non-compliance of environmental laws in the illegal dumping of waste in the study area is considerably very high with negative impact of health hazards; such as cholera, air borne diseases, dysentery, typhoid fever and the attraction of mosquitoes and house flies causing malaria on the immediate environment.

SURVEY ON ILLEGAL WASTE DUMPSITES

It was discovered during the physical survey of the study area, that waste materials were dumped illegally inside the bushes, drainage channels, along route courses and road networks. Some of the illegally dumped waste materials were discovered very close to residential buildings, this of course resulted into environmental health hazards such as malaria, dysentery, cholera and air borne diseases on residents living close by. And again, the waste products dumped into the drainage channels prevented free flow of water run-off and as such, consequently results into flooding and erosion problems. The waste materials illegally dumped along the road networks truncate free flow of road traffic and capable of causing traffic jam, traffic congestion and increasing accident rate in the area.*See plates i, ii &iii.*

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

Plate: i: Illegal waste dumpsite on road side

Plate: ii: Illegal waste dumpsite inside the bush.

International Journal of Engineering, Management and Humanities (IJEMH)
Volume 6, Issue 5, Sep.-Oct., 2025 pp: 286-295 ISSN: 2584-2145 www.ijemh.com

Plate: iii: Road transport network degraded by the problems of indiscriminate dumping of waste materials, thereby providing habitation for the breeding of mosquitoes and bacterium in the study area.

IX. RECOMMENDATIONS

In view of the findings in this study, it will be of great benefits, if the following recommendations are given serious attention and consideration.In our pursuit of a new mechanism for environmental protection, we must strive towards achieving a balance in the benefits we derive from activities that cause environmental pollution and the resultant harm.

Our long range plans must encompass other areas of our national life, such as policy formulations, enforcement of regulations, the reversal of pollution activities, the response to emergencies, the import of machineries for the operation of our industries and the regulation of all such actions. Moreover, there is need for the application of integrated measures to embrace technological improvements, appropriate operating procedures, and proper organization of enforceable regulations and control mechanisms to avoid environmental hazards.

Agents of pollution should bear the cost and consequences of their pollution. Domestic garbage and toxic industrial waste should be a concern in national legislations, in a way that stringent unambiguous pronouncements are embedded regarding agents of pollution or other environmental damages, liabilities and possible compensation. In addition, there should be a safe, timely, effective and appropriate response to major or disastrous oil pollution activities in the area.

It is imperative to identify high-risk and priority areas for environmental protection and clean-up. The establishment of environmental mechanism to monitor and assist or, where expedient, direct the response, including mobilizing the necessary resources to save lives, protect threatened environment and clean up to the best practical extent of the impacted areas should be of utmost concern to Government at all levels in the study area.

Community participation in the collection of waste, selection of waste dumpsites and design of facilities is inherently essential for sustainability. There is need to strengthen the work force by recruiting more personnel in the Waste Management Authority.

Government should provide adequate funds for waste management personnel for the purchase of more evacuating vehicles and waste disposal containers. It is necessary to carry-out periodic environmental and public health education exercise on the danger of indiscriminate waste disposal in the study area.

The waste management personnel should be well remunerated to motivate them to be more dedicated to their duty.

Adequate controlled dumpsites should be provided by the Town Planning Authority, so as to discourage the dumping of refuse on drainage channels. Vegetated open space should be allowed to flourish in the study area, and the urban water course channelized to improve the drainage systems.

X. CONCLUSION

A healthy environment is critical to the effective implementation of environmental strategies.Although, it is important to make laws, it is more important for the laws to be respected and enforced. It is therefore our collective duty, to us and to future generations to ensure that all regulations and laws regarding the environment are respected. A clean and safe environment is our desire, let us therefore join hands to minimize environmental degradation and halt further damage or totally reverse the processes that lead to environmental degradation, to ensure that Nigeria is clean, safe and pollution free.

REFERENCES

[1]. Abegunde, B., Adebayo, W. O., and Ogunlade, F. (2007): *Environmental Law and Development*. Ado-Ekiti, Petoa Educational Publishers.
[2]. Adegoke, O.S. (1990): *Waste Management within the Context of Sustainable Development.* Department of Geography, Obafemi Awolowo University, Ile-Ife.
[3]. Ajomo, A. O. and Adewale, O. (1994) *Environmental Law and Sustainable Development in Nigeria.* Lagos, Nigeria Institute of Advance Legal Studies Publication. Pp. 71-72.
[4]. Ajomo, M. A. (1989):"Judicial Response to the Protection of the Nigerian Environment and its Citizenry" *Paper Presented at the River State Law Conference, 25-27, Page 4.*
[5]. Akinbode, A. (2002):*Introductory Environmental Resources Management*. Ibadan, Daybis Limited.
[6]. Environmental Watch, 25/03/2008
[7]. Environmental Protection Agency Act (2004) Retrieved from www.onlingenigeria.com(2011)
[8]. Hogan, C. M. (2010): Encyclopedia of Earth and Environmental. *American Kestrel.* Vol., 2, No. 3, Pp. 741-781.
[9]. Jegede, A.O. (2020)Assessment of the Spatial Compliance and Negligence of Environmental Laws on Waste Management Practices and Consequences in the South-South Region of Nigeria. *American Journal of Sciences and Engineering Research.*3 (3): 44-63.
[10]. Niger Delta (2011) In Encyclopedia Britannica. Retrieved from www.britannica.com.may,2011.
[11]. Oludayo, A.G. (2004) Environmental Law and Practice in Nigeria. Akoka, Lagos, University of Lagos Press.
[12]. Osawe, A. I. and Ibebunjo, B. O. (2010): The Impact of Environmental Security Threats in the Niger Delta Region of Nigeria. *In Akpotor et al (ed): Sustainable Environmental Peace and Security in the Niger Delta,* Abraka, *Delta State University Press.*
[13]. Osibanjo, O.O. (2009) The Importance of Effective Compliance and Enforcement of Environmental Regulations and Standards. National Environmental Standards and Regulatory Enforcement Agency (NESREA) Quarterly Magazine (2009) Report. Page 17 & 21.
[14]. Park, M. D. (2004):*Earth Observation: Researchers Seeing Double on African Monsoons.* New York, Space Media Network Promotions.
[15]. Rosenberg, M. (2011): "Geography Guide". Accessed June, 2011- www.wikipedia.org/wiki/geography-of-nigeria.
[16]. USEPA (2008) United States Environmental Protection Agency; (USEPA) Report (2008). A Science-Based Report That Answers Questions about Recent Trends in Human Health and Environment. *Retrieved from www.epa.gov/ncea/roe (2013).*
[17]. www.zodml.org.(2013)Discourse/Nigeria/FactsaboutNigeria/ Geography of States in Nigeria.