

**PERCEPTION AND PRACTICE OF ENVIRONMENTAL HEALTH
OFFICERS RELATING TO COMPONENTS OF THE NATIONAL
ENVIRONMENTAL SANITATION POLICY IN OGUN STATE, NIGERIA**

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DEDICATION

With the glory and permission of Almighty Allah, this work is dedicated to my late Mother, Mrs. Amudatu Agbeke Onifade, and my Father Alhaji. Onifade Abdul Rafiu Adio (Balogun Adini Aibo Ayetoro) and also to my dearest wife Awawu Bolanle and children for their understanding, patience and endurance through my stay in Ibadan for this programme.

It is also dedicated to all Nigerian Environmental Health Officers for being such an impressive professional group to reckon with.

CERTIFICATION

I certify that this work was carried out by Mr. Isiaka Alani Onifade in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria under my supervision.

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ABSTRACT

The National Environmental Sanitation Policy (NESP) which constitutes the main thrust of the national environmental sanitation programme was formulated to ensure health-related practices that promote public health and good quality of life. Field experiences suggest that many Environmental Health Officers (EHOs), who ought to be stakeholders in the implementation of the policy; do not practice its provision. The study was therefore conducted to assess EHOs' knowledge, and determine their perception and practices relating to the policy in Ogun state, Nigeria.

All the 252 EHOs in the 20 Local Government Areas of Ogun state participated in the survey. A pre-tested semi-structured self-administered questionnaire which included a 19-point knowledge scale was used for data collection. The focus of the instrument included demographic characteristics, knowledge, perception and suggestions for improving NESP. Descriptive statistics and Chi-Square were used to analyze the data at p value ≤ 0.05 .

The respondents' mean age was 50.4 ± 26.4 years, 58.3% were males, 52.4% had university degrees and 44.4% had Higher National Diploma (HND). Respondents mean a year of service was 12.9 ± 9.4 years. Fifty-five percent were aware of the existence of the policy. Respondents' awareness of the policy varied with level of education: HND (35.7%), Bachelor's degree (61.4%) and postgraduate (0.7%). Out of the 56.0% of the respondents who had seen the NESP, 38.1% had a copy and 44.4% had ever read it. Slightly above half (53.6%), were able to list all the ten components of NESP. Respondents' mean knowledge score on NESP was 8.9 ± 5.1 implying a low level of knowledge among them. Respondents' experience in terms of years of service was not significantly associated with their knowledge of the components of the policy. Mean knowledge score of the males (8.9 ± 5.2) was not significantly higher than females (8.8 ± 5.0). Respondents with bachelor's degree had significantly higher knowledge score (9.5 ± 5.0) than HND holders (8.3 ± 5.2 p.. value). Results on the practice of components of NESP among respondents showed that male (44.8%) had good practice more than female (28.6%). Moreover, respondents with bachelor degree had good practice than HND and postgraduate degree holders (39.3%, 33.7% and 0.4% respectively). Sixty percent of respondents were of the opinion that the policy on environmental sanitation is comprehensive enough to be able to improve the

nation's environment. The opinion of 61.9% was that EHOs was the most appropriate professionals that could implement the provisions of the policy. Majority (70.2%) of respondents were however of the perception that NESP is good enough for combating environmental health-related problems in Nigeria. Some respondents (33.7%) were of the view that the discussion of the theoretical issues related to the policy was more than the initiation of practical steps aimed at implementing its provisions.

Many environmental health officers were aware of the national environmental sanitation policy; however, their knowledge of its components and the implementation was low. Health education strategies such as training and advocacy are needed to promote the policy in addressing these shortcomings.

Keywords: Environmental health officers, National environmental sanitation policy, Environmental health practices,

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ACRONYMS

AIDS	-	Acquired Immuno-Deficiency Syndrome
CBO's	-	Community Base Organisations
CFCs	-	Chlorofluoro Carbons
EHO	-	Environmental Health Officer
ESAS	-	External Support Agencies
ESC	-	Environmental Sanitation Commission
FCT	-	Federal Capital Territory
FEPA	-	Federal Environmental Protection Agency
FMH	-	Federal Ministry of Health
FMOE	-	Federal Ministry of Environment
FMOH	-	Federal Ministry of Health
GHG	-	Green House Gases
HIV/	-	Human Immunodeficiency Virus
HND	-	Higher National Diploma
LGA	-	Local Government Authority
LTCES	-	Local Government Technical Committee on Environmental Sanitation
MDG	-	Millennium Development Goals
NDHS	-	Nigeria Demographical Health Survey
NEEDS	-	National Economic Empowerment Development Strategy
NEPAD	-	New Partnership for African Development
NESP	-	National Environmental Sanitation Policy
NGO	-	Non – Governmental Organisation
NHSP	-	National Health Sector Policy
NPC	-	National Planning Commission
NPHDA	-	National Project Health Care Development Agency
NTCES	-	National Technical Committee on Environmental Sanitation
PCB	-	Polychlorinated Bipheux
STCES	-	State Technical Committee on Environmental Sanitation
UV	-	Ultraviolet
WHO	-	World Health Organisation
WSSD	-	World Summit and Suitability Development

CHAPTER ONE

INTRODUCTION

Background information

The government of Nigeria is committed to protecting and ensuring quality environment that is adequate for good health and the well-being of the present and future generations of Nigerians. The Nigerian environment is richly endowed with abundant and diverse resources that are vital for the survival of the nation (Abayomi and Salami, 2005) However, limited success has been achieved because of the absence of an appropriate policy instrument to provide focus and direction for planning and implementation of environmental sanitation programmes in the country. (Abayomi and Salami, 2005) This and other challenges have necessitated the call for a National Environmental Sanitation Policy that will adequately address the sanitation problems of the nation.

The Nigerian National Environment Sanitation Policy (NESP) was launched by the federal government on 27th November, 1989 and revised in 1990 (FEPA, 1991). This contained specific guidelines for achieving sustainable development in seventeen vital sectors of the nation's economy, namely: human population, land use and soil conservation; water resources management, forestry, wildlife and protected natural areas, marine and coastal area resources, sanitation and waste management, toxic and hazardous substance, mining and mineral resources, agricultural chemicals, energy production, air pollution, noise free working environment, settlements, recreational space, green belts, monuments and cultural property. In response to this need, the Nigerian government developed the NESP collaboratively with all stakeholders in order to promote an accelerated sound environmental sanitation in the country. (Aibor and Olorunda, 2006). While the National policy recognises the need to provide technical support and infrastructure necessary to all tiers of government, it enjoins all stakeholders to make provisions for implementing relevant programmes on environmental sanitation and to disseminate the contents of the National Environmental Sanitation Policy to ensure sustainable environment and poverty reduction.(Aibor and Olorunda, 2007).

The Environmental Health profession locally called "*Wole-Wole*" (in Yoruba) *Dubagari* (in Hausa), and *Nwaole-ala* (in Igbo) has been neglected immediately the British rule ended in Nigeria in 1960. During the colonial era, environmental health is of great importance, in fact, the position of sanitary officer was a very top position then, which was why the Senior Municipal Sanitary officer was made a member of the legislative council on the amalgamation of northern and southern protectorate in 1913 (Peter, 2003).

The nomenclature for EHOs has experienced many changes. In Nigeria, 'Wole-Wole' was first known as sanitary attendant in the 1915s to Sanitary Inspectors of 1930s, to Health Superintendents of 1970s, and Environmental Health Officers (EHOs) in 1988 in line with the international recognized and accepted name for the practitioners (Aniefiok, 2009).

Notwithstanding that 70% of Nigeria's health problems are environmental health related, Effort directed at improving environmental health services are challenged by structural and political problems including weak governmental policy and legislation, high level of ignorance, poor political will and commitment and poor funding; other challenges are environmental and technological problems and attitudinal and psychological problems. (Anderson, 1957)

Structurally, the Nigerian National Health Policy is skewed in favour of curative health services. According to Aniefiok (2009), "although the health policy emphasized primary health care as its corner stone, budgetary provision has been deliberately made to strengthen and sustain expensive medical care at the expense of preventive health services at the ratio of 5:1"(Aniefiok, 2009). Even the former Nigerian president, Olusegun Obasanjo, was quoted at the launching of the NESP and programme 2005 as saying that "The huge cost of decadent environmental sanitation to the nation cannot be over emphasized (Aniefiok, 2009).

Apart from huge curative health costs, which constitute a major drain on local and national resources, there is massive loss in human capital due to high mortality and morbidity rates, decreasing productivity, as well as impoverishment and poor living standards. In addition, a dirty environment with its attendant's health consequences

prevailing in our towns and cities can discourage tourist and investors" (Abayomi and Salami, 2005).

Technologically, the environment in which the environmental health practitioners operate is hostile. Beside inadequate basic infrastructure like good roads, clean water supply and other amenities which ought to facilitate environmental health services; people's awareness about environmental health matters is still low. It is still very difficult to show the relationship between environmental health factors like filth, poor ventilation, poor food hygiene practice and the health of the community. With such low awareness, it is sometime very difficult to prescribe any form of strategy to abate environmental nuisances that impact negatively on public health (Abayomi and Salami, 2005).

Attitudinally and psychologically, environmental health practice and services are both human focused. It is one of the most difficult profession to practice, for it deals with people's behaviours, perception, attitude, People develop resistance to, for instance, housing inspection, because it involves 'probing' into people's privacy and challenging their way of life (Aniefiok, 2009).

The major aim of the National Environmental Sanitation Policy on community sanitation is to improve the health and quality of life of the whole population. Improved sanitation facilities will reduce the incidence of disease, but only if there is improved hygiene practice and behaviour as well. EHOs at local level play an important part in the promotion and education activities that are essential for success. The sanitation programme should check that health is really being improved and modify health education approaches if necessary (Alabi, 1989). The purpose of the Environmental Health Service is to protect and enhance public health through the promotion of a healthy environment and by enforcement of Environmental Health legislation. The objectives of the Environmental Health Service are to protect public health and to promote a healthy environment by ensuring the safety of food, water, air, housing, sanitation and places of work and leisure (FEPA, 1992).

The main responsibility for providing household sanitation rests with the family or household. The role of local government is to help make this possible, or to carry out those functions which can be done more efficiently at community level instruments of

NESP which should be implemented both at the national, state and local government levels.

Policy on environmental sanitation is based on the premise that laws, regulations and operational policies and the guidelines, plans, and financial mechanisms through which those laws, regulations, and operational policies are implemented, should promote access to high quality environmental sanitation information and services and enable men and women to make informed choices about their health and well-being. This premise basically requires support for sound environmental sanitation from various sectors of the population, from policy makers and leaders to civil society and local communities (Aniefiok, 2010)

Statement of the Problem

Poor environment sanitation is a major cause of morbidity and mortality in Nigeria, and a huge burden on the health sector. Diarrhoea, parasitic diseases and malaria present the greatest health burden on the country and individual households. The leading cause of under-five mortality is diarrhoea, which comprises 21%, followed by malaria at 8% (NDHS, 2008; NPHDA, 2007). The main effects of parasitic diseases are weakening of the body thus creating a window for nutritional disorders. Other infectious diseases are acute respiratory infections, pneumonia, scabies, conjunctivitis and oral infections, all of which can largely be prevented through improved environmental health services. The governments at all levels in Nigeria have implemented several programmes to address the problem and consequence of poor environment like national immunisation programme, national and environmental sanitation day, Roll Back malaria programme among others but it has little or no effects on the public (Akinyerni, 2001)

The main contributing factors to environmental health related diseases in Nigeria are inadequate and unsanitary facilities for excreta disposal, poor management of liquid and solid wastes, and inadequate practices of hand washing with soap that leads to contamination of food and water in both rural and urban areas (Nigerian Compass, 2010). This is mainly due to a population, which lacks awareness, inadequate participatory hygiene education and environmental health promotion approaches in school and communities as well as uncoordinated delivery of effective environmental health services. This is further compounded by lack of or inability to implement

environmental sanitation policy which serves as framework for actualising its objectives. The question one need to ask is that are EHOs adequately informed on the provision of the policy? One may assume that majority of EHOs might not have seen the policy to understand their role in ensuring a cleaner and healthier environment (Akindutire, 1998).

One of the recent initiatives of solving the problem of poor environment is the development and adoption of the NESP which was launched in 1989. The constraint to the effective implementation of the NESP is lack of awareness of the NESP and its components and the enforcement of existing environmental rules and regulations and the inadequacy of monitoring and enforcement mechanisms. Environmental Health officers have important role to play in ensuring the successful implementation of NESP. Anecdotal evidence suggests that EHOs are not aware of and consequently do not implement the policy. Few studies have assessed EHOs knowledge and practice relating to the NESP. This study was designed to address this problem (Akinsola, 1993).

Justification

This study is significant for three reasons. First, the NESP is a tool for both articulating the need and identifying the importance of that need. They can also be mechanisms to stimulate action at national and local levels, helping to define priorities and objectives that lead to action. Without a supportive policy framework, successful activities cannot be readily scaled-up to meet the much broader needs in the country as a whole.

Secondly, EHOs provide strategies by which hazards to health may be controlled. They are responsible for planning, coordinating and implementing control strategies designed to minimise the adverse health impact of the environment and the workplace on personnel. EHOs are normally employed in the health support environment. In most cases, they are required to carry out their duties with minimum supervision. EHOs with prerequisite operational skills and knowledge may be employed in an operational role. Their duties would normally be carried out in the field at the community level.

Thirdly, the EHO is responsible for minimising the adverse health impact of the environment on field personnel by ensuring environmental health and sanitation are of a high standard as much as possible in the operational context. The operational role of EHOs will require them to develop the specialised skills and knowledge of national environmental sanitation policy needed to perform their duties in an operational environment. Lack of sound institutional frameworks is the root cause of many failures in service delivery – and a major cause of failed sanitation provision. Such institutional weakness often results from the lack of a clear institutional “home” for planning and management, together with limited capacity within institutions to coordinate and manage initiatives. Lack of capacity in understanding and implementing the contents of the policy may turn out to be one of the largest stumbling blocks in the way of achieving the Millennium Development Goal for sanitation.

Broad objective

The broad objective of this study is to assess the perception and practice of EHOs on national environmental sanitation policy.

Specific objectives

The specific objectives are to:

1. Assess the of EHOs’ perception on environmental sanitation policy
2. Document the knowledge that EHOs have on the policy.
3. Describe attitudes of EHOs towards the implementation of relevant aspect of the national environmental sanitation policy.
4. Document factors affecting EHOs in implementing the National Environmental Sanitation Policy.

Research questions

1. What are levels of awareness of EHOs’ on environmental sanitation policy?
2. What knowledge do EHOs on the policy about the national environmental sanitation policy?
3. What are the attitudes of EHOs towards the implementation of relevant aspect of the national environmental sanitation policy?
4. What are factors affecting EHOs in implementing the NESP?

Hypotheses

- H₀1: There is no significant association between EHOs level of education and their knowledge on the policy about the national environmental sanitation and its possession.
- H₀2: There is no significant association between EHOs sex and their knowledge on the policy about the national environmental sanitation.
- H₀3: There is significant association between the EHOs status and their practice of the policy about the national environmental sanitation.
- H₀4: There is no significant association between EHOs years of experience and their knowledge on the policy about the national environmental sanitation and its possession.

CHAPTER TWO

LITERATURE REVIEW

Concept of the environment

Environment is defined in The Chambers Dictionary as a surrounding or conditions influencing development or growth (Margaret, 1988) It can be defined as a system which includes air, water, soil, vegetation, flora and fauna. Man is a slave to environment. Environment starts influencing the child from the stage of embryo. This influence has been called 'Social Heredity' by western scholars.(Salami, 2007)

The child, when it comes to its world finds itself surrounded by innumerable objects and circumstances which influence it. All this and circumstances, except the child, form the environment. Genta (1987). Says 'Environment is anything immediately surrounding an object and exerting a direct influence on it '(Mink, 1993) defines environment 'as the field of effective stimulation and interaction for any unit of living matter' (Reutlinger et al, (1986). Reutlinger, 1986 says, 'Environment is an external force which influences us.' Environment can be classified into three types:

Natural Environment: It includes the natural things that are never influenced by man's intelligence and powers, e.g., air, water, mountains, moon, sun, etc.

Social Environment: Man is always surrounded by society because he is a social being. This society remains with him from birth to death (Alternative Medicine, 2000), *Cultural Environment:* It includes social rules and regulations, traditions, customs, etc.

Man and environment

Generally, people are indifferent to their environment. Newton's third law states that 'every action has an equal and opposite reaction'. Sandack, (1986) this will equally apply to man's relationship with nature as it relates to application of force on inanimate objects. While man sought domination over nature in 5,000 years of recorded history, he has, in the last 50 years, begun to realise that his welfare and his very existence are deeply intertwined with the natural cycles and systems (Adetokunbo and Gilles, 2004).

Man is unique in many ways and one of these is his ability to subordinate nature and natural resources. So long as the requirements of his economic activities were small in relation to global stocks of critical natural resources, he could count on improving his welfare. However, his economic activities have increased at an exponential rate during the past several decades with the result that the Earth's resource base and life support systems have become vastly depleted. The principal manifestations of these impacts are on the global climate, the intricate web of forests, ecology and diversity of living beings and increased transparency of the earth's atmospheric protective shield to harmful ultraviolet radiation. All these are related directly and indirectly with man's economic activities and with each other. They all have serious implications for his future well-being (Dan-Edwards, et al., 2004).

Environmental awareness

The importance of environmental awareness cannot be overemphasised. We must understand that to improve the environment is to improve the quality of life. It is not only a question of air and water pollution. It includes- elimination of disease, hunger, malnutrition and poverty, destruction of forests, extermination of wildlife, erosion of soil and accumulation of waste. Hence, there is an urgent need for proper management of the environment (Panneerselvam & Ramakrishnan, 2005).

Concept of environment health

Environmental health is the branch of public health that is concerned with all aspects of the natural and built environment that may affect human health. Other terms that refer to the discipline of environmental health include environmental public health and environmental health and protection.

Environmental health is defined by the World Health Organisation (2003) as:

“Those aspects of human health and disease that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health”. (Davidson and Wibberley, 1989)

Environmental health as used by the WHO Regional Office for Europe, includes both the direct pathological effects of chemicals, radiation and some biological agents, and the effects (often indirect) on health and wellbeing of the broad physical,

psychological, social and aesthetic environment which includes housing, urban development, land use and transport (WHO, 2003).

Components of environmental health services

Environmental health services are defined by the World Health Organisation (WHO, 2003) as:

Those services “which implement environmental health policies through monitoring and control activities. They also carry out that role by promoting the improvement of environmental parameters and by encouraging the use of environmentally friendly and healthy technologies and behaviours. They also have a leading role in developing and suggesting new policy areas” (Eric, 1998)

The components of environmental health which are critical for improving the environmental health situation were identified and prioritized as follows: (Skolimowski, 1995).

1. Environmental health education: It emphasise the need for creating awareness to the public on all factors affecting health which of-course, with intervention can be eradicated. It is a lifelong process of improving health and prolonging life.
2. Food and water safety: These two resources are basic to the survival of Man and can make or mar Man. With balanced diet the health of Man is improved and food borne-diseases are avoided while safe water enhances good health and freedom from water-borne infections.
3. Personal and domestic hygiene: Maintenance of personal hygiene is antidote and sine-guenon to communal hygiene and Environmental sanitation
4. Liquid and solid waste management: Defilement of the Environment is principally caused by poor liquid and solid waste management which can affect the natural carrying capacity of the Earth and its aesthetical value.
5. Occupational health and safety: Protection of workers at work from hazards ensures maximum out-put and healthy living.
6. Diseases vectors and vermin control: Disinfection and Disinfestations (Fumigations) of disease vectors and vermin’s ensures communicable diseases are not transmissible.

7. Environmental pollution: pollution of the environment by human activities e.g. emission of green house gases CO², NO² etc disagreeable provision of carbon store (forest) contributes to usurping of the Earth translates to discomforts on natural disaster.
8. Port health: Port health services ensure adherence to International sanitary Regulations with the ultimate aim of preventing importing and exporting international diseases e.g. Yellow Fever, Cholera, Plague.
9. Disposal of the dead: Improper disposal of the dead could portend serious health implication if the dead are left unattended.
10. Proper housing and settlement: Minimum basic requirement of health standards vis-à-vis lighting, Ventilation, Sanitary Conveniences, etc should be ensured to improve living conditions.
11. Disaster and emergency preparedness:-Mitigating measures to control natural and man-made disasters.

Problems associated with environmental health services

The National Environmental Sanitation Policy is based on a situational analysis study conducted to assess the environmental health situation in Nigeria (Federal Ministry of Environment, {FMOE}, 2005). There are various problems associated with environmental health services among which are disease burden and impact of global warming (Ebisike, O.2005)

a. The burden of environmental health related diseases

Study conducted in Rwanda for instance observed that some 85% of existing water sources are believed to contain coliform contamination levels beyond the recommended limits, while only about 0.8% of the population use hygienic latrines, a factor that contributes to coliform contamination. It was further noted that only 40% of the Rwandan rural population had access to safe water compared to 60% of the urban population. (The Guardian Editorial of 17 September, 2009.)

Study on the promotion of school health, noted limited awareness of the importance of promotion of hygiene as a means to the control of hygiene and sanitation related diseases. It recommended improving hygiene education in schools. Intensification of

environmental health education was recommended as the best means to improve the impact of water and sanitation programmes at community and household levels (Nwaka, (2005).

Environmental health related diseases are the major causes of morbidity and mortality amongst the under fives. The National Health Sector Policy (2005) reports high infant mortality rate (107 deaths per 1000 live births), largely as a result of environmental health related diseases. Acute respiratory infections, pneumonia and other preventable diseases are among the top ten causes of morbidity and mortality while high levels of malnutrition and parasitic diseases such as amoebic dysentery are frequently reported amongst infants and children. Epidemics of cholera, meningitis, bacillary dysentery and typhus regularly confront Rwanda for instance, which is similar to what happens in Nigeria also (Verden et al 2003)

The underlying causes of majority of these diseases are related to poor hygiene and sanitation at personal, household and community levels, contaminated food and water, lack of occupational health and safety at work, inadequate control of health related matters at ports of entry, lack of control of disease vectors and vermin, poor housing and settlement, inadequate handling of disaster and emergencies, a contaminated environment as a result of inadequate liquid and solid waste management, and poor methods of disposal of the dead. For purposes of this policy, environmental health will be defined in terms of the above underlying causes of a poor environmental health situation (Erookes, 1997)

Environmental health problems

The state of environmental health influences the disease burden, which in turn contributes to poverty. More specifically the impact of a poor environmental health situation is best illustrated by demonstrating the main causes of morbidity and mortality amongst infants. According to WHO (1989), children are exposed to serious health risks from environmental hazards. Over 40% of the global burden of disease attributed to environmental factors falls on children below five years of age, who account for only about 10% of the world's population. The leading causes of death amongst children under the age of five are:

1. Respiratory infections which kill almost two million children each year; 60% of respiratory infections are related to environmental conditions.

2. Diarrhoea diseases that claim the lives of nearly two million children every year; 80 – 90% of these diarrhoea cases are related to environmental conditions, in particular contaminated food, water and inadequate sanitation.

3. Malaria which killed nearly one million children under the age of five in 1998; 90 percent of malaria cases are attributed to environmental factors (NGEHPN, 2007).

In most Nigerian towns and cities water supply and sanitation are grossly inadequate for domestic and personal hygiene, in spite of the gains of the International Drinking Water and Sanitation Decade campaign of the 1980s. In many informal settlements water-borne and filth-related diseases, especially diarrhoea and cholera are common. Less than half of urban households in most Nigerian cities have piped water and flush toilets. The rest depend on crowded and sometimes distant communal water taps, or draw water from wells, streams, or from itinerant water vendors. Pit latrines and buckets are still in use, often shared by many families. People commonly defecate and urinate in the open or in nearby bushes, so that food and water can be easily contaminated from exposure to human waste. Questions are beginning to be raised about simpler and more hygienic methods, and how best to distribute more efficiently and equitably the facilities and amenities that do exist (Dele Ogunwo, 2001).

b. Global environmental issues

Apart from the major national problems catalogued above, Nigeria also has to contend with such global environmental problems as climate change, ozone layer depletion, drought and desertification

(Gandy, 1994)

Global Warming

In the Encarta encyclopaedia (Microsoft Encarta, 2008), the question was asked: Do you like warm weather? Do you wish it could be warmer still? Be careful what you wish for. The Earth may be moving in that direction. The trend is called global warming. Not all scientists agree that global warming is happening. Some say it is impossible to know if the climate is changing overall. After all, temperatures vary from day to day and year to year. Most scientists, however, say the trend is up. The warmest days are warmer, the coldest days not as cold. They point out that the ten warmest years of the last century happened after 1980. The three hottest came after 1990. The hottest year on record was 1998. These scientists say the Earth has warmed

up about 1° Fahrenheit (0.6° Celsius) in the last 100 years. The rate of change, they say, is speeding up. A hundred years from now, the Earth may well be as much as ten degrees hotter (Books, et.al., 1995)

Causes of global warming

Sunlight brings energy to the Earth. This light turns to heat when it hits the ground. The heat in turn seeps away from the Earth, but the atmosphere slows the heat's escape. The atmosphere is a layer of air around the planet. It holds in some of the warmth. The atmosphere is a mixture of many gases. In the last 250 years, this mixture has been changing. The amounts of gases such as methane and carbon dioxide have been rising. These gases trap heat more effectively than other gases. They make the Earth's atmosphere act like the glass in a greenhouse. It lets sunlight in, but it doesn't let heat out. As a result, heat is building up close to the surface. (Lucas and Gilles, 2003)



Plate 2.I: Evidence of pollution

Source: Microsoft ® Encarta ® 2008. © 1993-2007 Microsoft Corporation. Picture by Ricardo Teles/D. Donne Bryant Stock

The term *global warming* refers to earth's slowly rising temperature, especially in the last 20 years or so. A major cause of global warming is air pollution from both cars and factories. The picture Plate 2.1 shows air pollution in Brazil.



Plate 2.2: Evidence of pollution burning and cutting

Source: Microsoft ® Encarta ® 2008. © 1993-2007 Microsoft Corporation. Anne LaBastille/Bruce Coleman, Inc.

Burning and cutting down forests, like the area of the Amazon rain forest Plate 2.2, contributes to global warming. Burning trees and fossil fuel produce a gas called carbon dioxide that traps heat within Earth's atmosphere. Cutting down trees leaves fewer trees to absorb carbon dioxide from the air.



Plate 2.3: Evidence of Air Pollution

Source: Microsoft ® Encarta ® 2008. © 1993-2007 Microsoft Corporation. Picture by Lester Lefkowitz/Corbis

Burning Coal

The burning of coal is a major contributor to global warming. This plate 2.3 shows a giant pile of coal used to fuel the power plant in the background.



Plate 2.4: Evidence of Water Pollution

Source: Microsoft ® Encarta ® 2008. © 1993-2007 Microsoft Corporation. Picture by Bruce Brander/Photo Researchers, Inc. *Flooding in Bangladesh*

Countries close to sea level, like Bangladesh, could experience huge floods and even be drowned as global warming causes ocean levels to rise. In plate 2, 4, floodwaters turn parts of the Bangladesh countryside into islands.

Climate Change or Global Warming is caused by increasing concentrations of atmospheric warming gases or Green House Gases (GHG) especially carbon dioxide whose concentrations have increased from 280 ppm in 1800s to about 370 ppm now. (Obaaro, 2006). These gases warm the atmosphere by their capacity to trap heat and cause changes in the weather pattern of the earth. The increase in temperature causes the polar ice caps to melt and ocean waters to expand. These in turn result in sea level rise leading to submergence of many low-lying areas of the world. An area that is highly prone to this sea level rise is the 29,000 sq km of Nigerian coastline, which houses prime real estate and one of the largest mangrove forests in the world. The area is also very rich in biodiversity (Mink, 1993).

Changes in the atmosphere

People are changing the atmosphere. The changes started hundreds of years ago when people began cutting down forests and burning the wood. The invention of cars and other machines greatly increased the amount of greenhouse gases released into the atmosphere. Such machines burn fuels like wood, coal, oil, and natural gas. When these fuels burn, they add carbon dioxide to the atmosphere. Methane comes from producing coal. Today, the air contains almost one-third more carbon dioxide than it did in 1750 (Omobolaji, (1994), The amount of methane has doubled.

Dangers associated with global warming

Global warming could melt the ice at the poles. This would raise the level of the oceans. Water would then cover all the flat coastal lands. People would have less land on which to live and grow food. Plants and animals are adapted to their climates. If the climate changes rapidly, many may not be able to adapt. Some species will simply die out. Others may spread to cooler climates. There, however, they will be struggling with species already in place.

Ways of preventing global warming

Burning less wood, coal, oil, and natural gas will help stop global warming. Scientists recommend that people get more energy from sunlight, wind, tides, nuclear energy, and other sources that don't burn fuel. Energy sources like these put little or no greenhouse gases into the air. Scientists say trees can help prevent global warming. All growing plants take carbon dioxide out of the air. Trees do this especially well. They turn the carbon part of carbon dioxide into wood. They release the oxygen. In recent years, people have been cutting down forests all over the world. Scientists say vast new forests must be planted (The International Comparative, 2007)

Ozone Layer Depletion

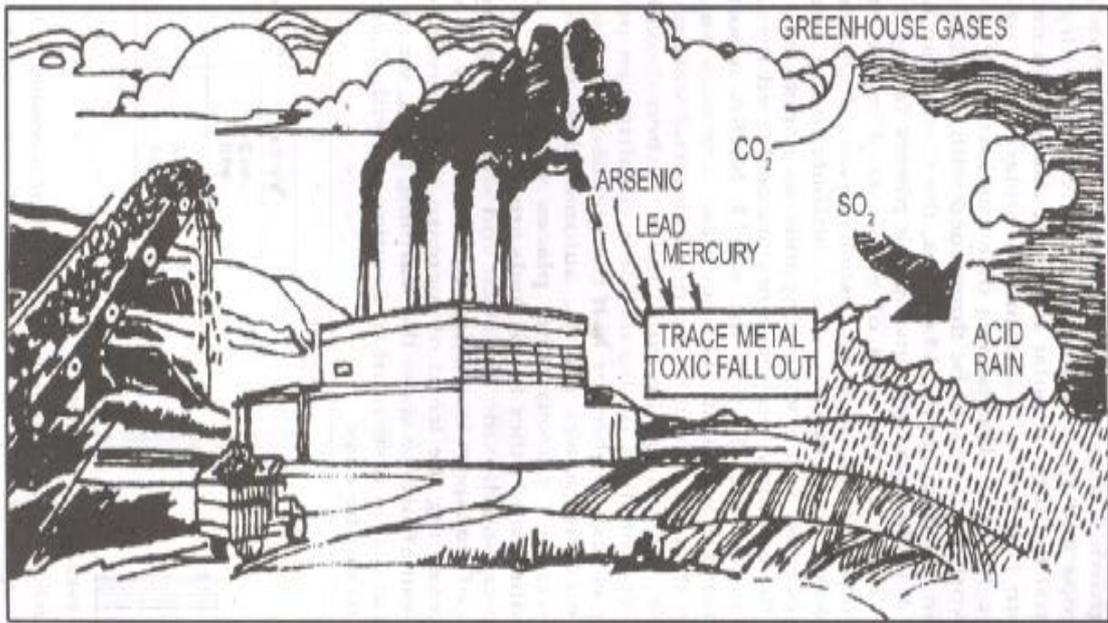
Ozone Layer Depletion is linked with certain "miracle" chemicals of yesteryears, namely Chlorofluorocarbons (CFCs), Halons and Carbon Tetrachloride which destroy the ozone layer. (Okorodudu, 1989) This is nature's shield which filters off ultraviolet B radiation in the stratosphere, protects human beings, animals and plants from the harmful effects of these ultraviolet (UV) rays which could cause skin cancer, eye cataracts, loss of body immune systems etc. Chlorofluorocarbons, Halons and Carbon Tetrachloride are used as freezants, sterilants, solvents, propellants and active

ingredients in the pharmaceutical industries, hospitals, electronic, refrigeration, air conditioning, foam and aerosol industries (Otoezie, 2003).

Trans-boundary Movement of Hazardous Wastes and Toxic Chemicals

Another important environmental problem is the non-natural but trade-related environmental problem of trans-boundary movement of toxic chemical wastes, expired and contraband chemicals and pesticides. Over 11 million chemical substances are known of which about 60,000 to 70,000 are in regular use (Baba, 1994). Only 3,000 chemicals account for 90% by mass of the world's total chemical usage. Booth et al., (2001). Adequate toxicological data have been produced for only a small fraction of these chemicals, and data on their environmental and ecotoxicological effects are sparse. Every year, with increasing knowledge, chemicals with grave ecotoxicological and environmental effects are withdrawn and banned from international trade. In addition to this, - obsolete chemicals and other radioactive wastes are expected to be disposed of carefully in an environmentally-sound manner (WHO, 1972).

Over the past decade, unscrupulous foreign businessmen acting in collaboration with local links have found a new way of making money through illegal trade thriving on these cargoes of death from the developed countries to the poor, helpless and largely illiterate developing countries. Cairn cross (1987) Ninety-four percent of all hazardous waste trade originate from the OECD (Organization for Economic Co-operation and Development) countries (Ball, 1965). The sole aim is to avoid the strict environment and health safety regulatory requirements and public opposition of the host developed countries which are deeply rooted in economic calculations. For example, the treatment and disposal of Polychlorinated biphenyl (PCB, a highly toxic chemical), costs 3000 US Dollars per tonne in the U.S. compared to a mere 2 Dollars 50 cents including shipment cost and disposal in a developing country, where it is simply buried in dug out pits in the backyard or farms of the helpless citizens (Gandy, 1994). As Nigerians, we cannot forget the Koko Saga involving 3,780 tonnes of toxic wastes from Italy in 5 shipments. That incident was nearly a national embarrassment but for the swift and decisive response of our government. (Glady, 2008)



Source: Panneerselvam and Ramakrishan, 2005.

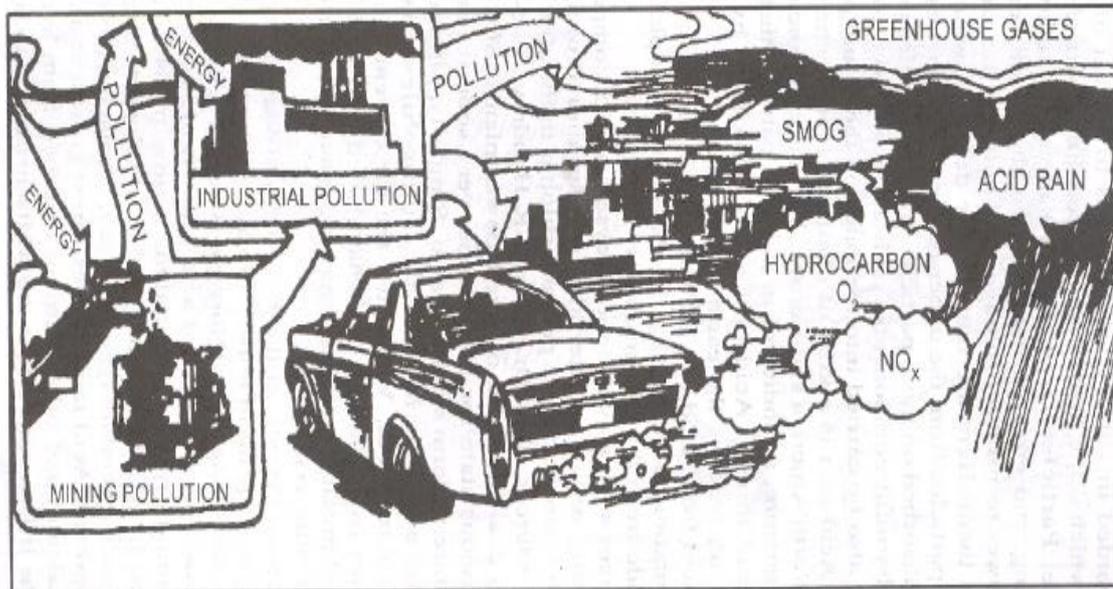


Plate 2.5.1: Pollution and Greenhouse effect

Source: Panneerselvam and Ramakrishan, 2005

Sanitation

It is necessary to perceive, and conceptually express, that sanitation is different from water supply, and that to quantify need and monitor its progress, one needs to differentiate data and information gathering in the areas of safe water, excreta and solid waste disposal, health and environment. Interaction among these factors produces a social good, which is health protection.

Sanitation can encompass a wide range of activities, many of which require government policy guidance. In order to make an immediate contribution, this document concentrates on the most pressing of issues, namely the safe disposal of human waste and domestic waste water in conjunction with appropriate health and hygiene practices. There are a number of related issues that require policy and direction, in particular the management and disposal of domestic and other solid wastes. Recognising that there are constraints on the rate of progress that can be made, this document is intended as one more step on the long road of improving the quality of life of the people of our country (Olorunda and Aibor, 2006)

The National Environmental Sanitation Policy (NESP)

Nigeria lies on the west coast of Africa between 4 and 14 degrees north latitude and between 2 and 15 degrees east longitude. It occupies approximately 923,768 square kilometres of land stretching from the Gulf of Guinea on the Atlantic coast in the south, to the fringes of the Sahara Desert in the north. The territorial boundaries are defined by the Republic of Niger and Chad in the north, the Cameroon Republic in the east, and the Republic of Benin in the west. The Gulf of Guinea delimits the southern boundary. By virtue of its regional extent, Nigeria encompasses multiple climatic regimes and various ecological zones that influence the intensity of human activities and this has implications on waste generation patterns, environmental degradation and pollution (FMOE, 2005).

With an estimated population of about 120 million people, Nigeria has had a great leap in human population that has virtually doubled within 40 years. This rapid population growth without commensurate provision of infrastructure and services has led to poor Environmental Sanitation characterised by increased urban slums, overstretched sanitary facilities, the generation of enormous waste, and general reduction in the quality of life of the people (Muthu, 2006).

Over the years, the poor Environmental Sanitation condition has contributed significantly to the high prevalence of communicable diseases in the country. Most of these diseases, which include, malaria, cholera, typhoid, diarrhoea, acute respiratory infections, tuberculosis and helminthic infections account for a significant percentage of morbidity and mortality. Consequently, despite increased efforts by various successive Governments at improving public health and quality of life, basic health indicators have remained poor since this sanitation related diseases still play a large role in creating ill health and poverty (Michael, et.al., 1994).

Nigeria is committed to protecting and ensuring quality environment that is adequate for good health and well being for present and future generations. The Nigerian environment is richly endowed with abundant and diverse resources that are vital for the survival, health and quality of life of the populace. However, the efforts of past governments have achieved minimal success because of absence of an appropriate policy instrument to provide focus and direction for the planning and implementation of Environmental Sanitation programmes in the country. (FMOE, 2005) This and other gaps have necessitated the call for a National Environmental Sanitation Policy that will adequately address the sanitation problems of the Nation (Martin, et al., 2004).

Culturally, certain norms guide the maintenance of adequate sanitation in the communities. For instance, women and children, particularly the girls, sweep the homes/surroundings and empty refuse bins. There are also cultural festivals that emphasize cleanliness in various communities and many such festivals still persist till today (Jordan, et al., 1969)

During the pre-independence era (1900 1960), several legislative controls were put in place to address the problem of Environmental Sanitation. Among these were:

Cantonment Proclamation of 1904 on the Layout and Sanitation of GRA; Public Health Act of 1909 on Environmental Sanitation; Township Ordinance No. 29 of 1917 on Sanitation and Environmental Management; Lagos Colony Ordinance of 1928 Outbreak of Bubonic Plague;"Mineral Act of 1945 Trench and Drainage Pollution, etc;

Town and Country Planning Ordinance of 1946 cap 123 (West), cap 130 (North) and cap 15 5 (East); Building Lines Regulation of 1948;Local Government Ordinance 1950/54-58;Public Health Laws of 1957 to Combat Overcrowding, Diseases and Squalor (Akikn, 1996.)

During this era, adequate sanitation was maintained by enforcement of Public Health Laws through routine house to house inspection. The benefits of the legislative and other measures at this time were however not universal because they were restricted to privileged areas (Lowe, et al., 1978)

In the immediate post-independence era (1961 – 1980), legislation and authority on Environmental Sanitation were derived from the Nigerian Constitution as stated in the concurrent, exclusive and residual lists (Booth et al., 2001) Nonetheless, routine house to house inspection was still effective in the maintenance of Environmental Sanitation. However, political interference with the statutory role of Sanitary Inspectors led to the collapse of the house to house inspection programme and contributed to the poor sanitary conditions in the country (Dele, 2001).

In the current dispensation (1981 to date), all tiers of Government have developed legislative/regulatory instruments to further address the issue of sanitation. These include (FEPA, 1991)

Harmful (Toxic) Waste Criminal Provision Decree 42 of 1988;

Federal Environmental Protection Agency (FEPA) Decree No. 58 of 1988 and No.59 of 1992 as amended;

National Policy on Environment (1989) & (1999) as amended;

National Environmental Protection (Effluent Limitations) Regulations S.I.8 of 1991 mandatory for industries to install anti-pollution equipment and for effluent treatment;

National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations S.1.9 of 1991;

National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations S.1.15 of 1991;

Environmental Impact Assessment (EIA) Decree No. 86 of 1992;

Nigerian Urban and Regional Planning Decree No. 88 of 1992;

National Urban Development Policy, 1992;

Guidelines on Hazardous Chemical Management 2001;

Guidelines on Pesticides Management and Handbook on Safe and Effective Use of Pesticides 2001;

Blueprint on Municipal Solid Waste Management in Nigeria 2001;

The Blueprint on Handbook on Waste Management 200 I; xiv) The Blueprint on Environmental Enforcement 2001;

Promulgation of State Edicts/Laws and Local Government Bye-laws.

Further efforts include the creation at various times of several State and Local Government Agencies responsible for sanitation and lately, the creation of the Federal Ministry of Environment in 1999.

Despite all these efforts, Infant Mortality and Child Mortality Rates have remained high at one hundred (100) and two hundred and one (201) per thousand (1,000) live births respectively, mainly due to diseases such as malaria, diarrhoea and acute respiratory infections, (Green, et.al., 2006). In addition, about 50% of Nigerians suffer at least one acute episode of malaria every year with grave socio-economic implications in terms of productivity and cost of medications. (Otoezie, I.E.)

Definition of NESP

The policy defines environmental sanitation as the principles and practice of effecting healthful and hygienic conditions in the environment to promote public health and welfare improve quality of life and ensure a sustainable environment (FMOE, 2005).

The essential components of environmental sanitation include: Solid waste management; Medical waste management; Excreta and sewage management; Food sanitation; Sanitary inspection of premises; Market and abattoir sanitation; Adequate potable water supply; School sanitation; Pest and vector control; Management of urban drainage; Control of reared and stray animals; Disposal of the dead (man and animals);

Constraints

There are many constraints and problems, ranging from socio-cultural, economic and management problems hinder effective Environmental Sanitation practices in Nigeria. Some of these constraints include: (Serageldin, 1994)

Lack of clear policy assigning responsibilities for Environmental Sanitation within the levels of Government;

Poor perception of Environmental Sanitation as an essential service and a major determinant of health and good standard of living;

Inappropriate institutional framework;

Duplication of responsibility by many Stakeholders in the sector;

Weak and poorly enforced Public Health Laws, State Laws and Bye-laws;

Lack of adequate professional manpower especially at the State and LGA levels;

Inadequate research activities;

Inadequate Environmental Sanitation education and awareness;

Inadequate allocation of resources for Environmental Sanitation services;

Inadequate sensitisation and mobilisation of communities in planning, designing and decision-making on Environmental Sanitation matters;

Inadequate sensitisation and mobilisation of the private sector in the delivery of Environmental Sanitation services;

Inadequate participation of Stakeholders in project planning and implementation;

Low literacy level.

I. Rationale

The goal of the NESP is to ensure a clean and healthy environment by adopting efficient, sustainable and cost-effective strategies, so as to safe guard public health and well being in line with the national development objectives. (Federal Ministry of Environment (2003)

The specific objectives are (Federal Ministry of Environment (2003)

To coordinate the activities of all stake holders involved in environmental sanitation and streamline their roles;

To strengthen the capacity of all institutions and agencies involved in environmental sanitation programmes;

To develop healthy human habitation and reduce the incidence of environment sanitation –related diseases;

To achieve positive attitudinal changes in people towards sound environment sanitation;

To encourage research and development, define local standards and establish database on environmental sanitation;

To identify local funding mechanisms for environmental sanitation in Nigeria.

According to the NESP, a pleasant environment, which is hazard free and promotes healthful living, is a fundamental right of all Nigerians, There is an increasing national consciousness on the need for judicious management .of the Nigerian environment in a sustainable manner. Therefore, ensuring improved Environmental Sanitation standards has become high on the political agenda of Government in the current democratic dispensation. This is demonstrated in the creation of the Federal Ministry of Environment to address amongst other things, the problems of poor Environmental Sanitation and is expected to engender improved productivity and foster equitable share of the E.H.OS job and joy of national economic development (FMOE, 2005).

There cannot be a healthy nation without a healthy environment. Scientists have warned over the years that an unhealthy population and a degraded environment will hinder progress towards development goals. In Nigeria, there is now a greater understanding of the principal threats to the environment and public health. These are associated with a varieties' of factors, including those related to poor Environmental Sanitation (Leitmann, 1998).

The Environmental Sanitation related diseases exacerbate poverty by diminishing productivity and household income. In addition, the national cost of lost productivity, reduced educational potential and huge curative health costs constitute a major drain on the local and national economy. Besides, a dirty environment with its attendant health consequences, prevailing in most of our cities, can discourage tourists/investors and undermine the economic benefit of tourism to the country. Consequently, wide-ranging actions are required to solve environmental sanitation problems in order to reduce and avert their adverse health, economic and developmental effects.

The National Council on Environment reiterated at its meetings in Kano and Ilorin in years 2000 and 2003 respectively that the House to House Sanitary Inspection should be re-introduced to detect nuisances and proffer solutions for their abatement. The House to .House Sanitary 'Inspection (Sanitary Inspection of Premises) is the bedrock of Environmental Sanitation as it covers most of its facets (James et al., 1997).

This National Environmental Sanitation Policy is developed in accordance with the National Policy on Environment (1989), Millennium Development Goals (MDG), World Summit on Sustainable Development (WSSD) targets and the aims of the New Partnership for African Development (NEPAD) initiatives (FEPA, 1992) The Policy is also in line with the goals of the National Economic Empowerment and Development Strategy (NEEDS) in the creation of wealth, employment and poverty alleviation (FEPA, 1992) The National Policy aims at providing sound Environmental Sanitation, which shall assure sustainable environment and protection of human health. The consequent programmes shall improve public health and optimise the impacts of the huge investments in the health sector (Bain, 2001).

The failure of numerous efforts to address the problem of Environmental Sanitation has been attributed to various factors. Prominent among these are: unhealthy socio-cultural practices; poor Environmental Sanitation education and awareness; low literacy level; bad governance over the years; disregard for the rule of law and other forms of indiscipline (FMOE, 2005).

Solid waste management

Waste management is at the lowest ebb in most towns and communities. Most parts of the city centres do not benefit from public waste disposal services and therefore, have to bury or burn their waste or dispose it haphazardly. In most cities and peri-urban centres, refuse heaps are left unattended and where the Local Government Authorities do the collection, it is often irregular and sporadic. The recycling of waste is negligible while methods of storage, collection, transportation, compaction and final disposal are very unsatisfactory.

The alarming rate at which heaps of solid waste continue to occupy our cities, coupled with the fact that 87% of Nigerians use disposal methods adjudged as insanitary. Has not only constituted visual blight and odour nuisance, but also encouraged the breeding of rodents, mosquitoes and other pests of public health importance, with attendant disease outbreaks (Forbes, 1990)

Furthermore, some of the waste materials are toxic; others are either non-bio gradable or not readily degradable such as "pure water" sachets and polythene shopping bags.

Also included are various types of industrial/chemical waste that can contaminate soil and ground water sources if not properly disposed. Another major concern is the generation of waste from health care institutions/facilities, which contain infectious/hazardous materials that pose potential hazards to human and environmental health when improperly disposed. The improper handling and disposal of medical waste is a major threat to refuse collectors and scavengers and can result in infections such as HIV/AIDS, hepatitis, tetanus, etc (Kuttan, 1991)

Excreta and sewage management

Access to basic sanitary facilities is particularly poor. It has been observed that, in urban centres, some households with water carriage system, pipe the raw sewage and sullage .into the public drains. According to the Nigeria Demographic and Health Survey, overall, 32 percent of households in Nigeria have no toilet facilities. This problem is more common in rural areas (42 percent) than in urban areas (14 percent) (Jordan, et. al., 1969) many households in the rural area have no toilet facilities at all and as a result, make use of bushes and rivers. Open defaecation and urination are common practices in Nigeria. In the semi-urban centres, children as well as adults defaecate indiscriminately at dump-sites, gutters or any available open space in the late hours of the night and early hours of the morning. 'These insanitary methods of excreta and sewage management have tremendous untoward effects on the health of the public and the environment.

Food sanitation

It is sad to note that a large percentage of the poor go hungry and for the percentage of those that have food, its wholesomeness is questionable. Oftentimes, food meant for sale and human consumption are displayed in open containers, thereby exposing the food to the ever-ready opportunity of contamination by dust, flies, bacteria, viruses and other microorganisms (Hion, 2003)

Most food handlers are not aware of the sound public health advice of routinely washing, their hands before handling food and after using the toilet. Most are also not routinely screened for certain serious communicable infections, which can be easily transmitted through contamination of the food they prepare for sale and human consumption. The public is totally unaware of the risks that the consumption of

contaminated food poses to their health and wellbeing. The activities of the municipal food vendors contribute significantly to the filthy environment as they discard wastes indiscriminately.

The poor state of food sanitation in the country has been shown to play a significant role in the aetiology of food borne diseases. Records from the Federal Ministry of Health shows that every year, about six hundred thousand (600,000) of diarrhoea occur in children under the age of five in Nigeria. Erookes (1997) similarly, there have been increasing numbers of cases of food-borne diseases over the years. In 1994, there were 3,173; 12,716; and 22,525 cases of Cholera; (Verden et al., 2003). Food Poisoning and Typhoid/Paratyphoid fevers respectively (Verden et al., 2003). In 1998, the cases were 9,254; 32,411 and 68,846 respectively and by 2001, Cholera and Typhoid cases have further increased to 10,294 and 73,949 cases respectively (Verden and Betterworths, 2003).

Market and abattoir sanitation

Markets and abattoirs are built without proper layouts, and where such layouts exist, they have been distorted. Besides, provision of adequate water supply, proper drainage, and waste disposal facilities are lacking. Transportation of animal meat from the abattoirs in passenger vehicles or motorcycles is a common practice in most towns and cities. Contamination can occur during transportation especially while using passenger vehicles. It is also a common practice to see animal meat hawked on the streets. These practices expose the animal meat to contaminants such as dust, flies and other pathogens in the environment.

Housing and urbanization

The Environmental Sanitation problems are made more acute by rapid urbanization and uncontrolled population growth, without commensurate expansion in sanitary facilities. Consequently, slums/shanties have emerged in' a city fringes where the water and sanitation problems are more pressing. These slums with poor housing are prominent features in our environment, particularly in cities and large towns due to poor implementation of town planning laws, poor land use control, rapid spatial expansion of settlements and inadequate provision of infrastructure and services. For example, our inability to adhere to the Federal Capital Territory (FCT) development

plan has created the upsurge of slums and shanty towns in the immediate environs of the city.

Spontaneous squatter settlement continues to provide shelter for immigrants in environment of great overcrowding and appalling squalor. The characteristics life in these slums/squatter areas makes the provision of sanitary services particularly difficult. In many cases, the poor live in neighbourhoods without tenure of land or in areas that authorities have deemed unfit for habitation. These peril-urban neighbourhoods often remain officially invisible. Their illegal status means that they are often not taken into account in municipal programmes to improve or extend services such as water supply, basic sanitation, garbage collection, flood protection, health care, etc.

This scenario results in poor housing sanitation characterized by overcrowded/ poor ventilation and indoor air pollution, thereby increasing the disease burden within the population. This also affects productivity, thus perpetuating the cycle of poverty. Children under the age of five living in poorly ventilated houses have been shown to suffer more from upper respiratory problems than those from well ventilated houses. WHO, et al (2006) these children are also more likely to underachieve in school when compared with those from improved areas and this often limits their ability and character in life.

Management of the urban drainage system

The poor surface drainage in urban areas leads to stagnant pools where mosquitoes and other disease carrying vectors breed. The high prevalence of diseases such as malaria in many towns and cities partly results from the poor drainage maintenance system. Often in towns and cities, public drains are used as substitutes for toilets and waste disposal facilities. This causes blockage of the drains and is usually responsible for environmental problems such as 'flooding, erosion and landslides which destroy homes built on marginal land, and causes major damage to public infrastructure and private property

School sanitation

The standard of school sanitation is very poor. Most schools are overcrowded with a dirty environment. Majority of public schools lack toilet facilities. Toilets when

available in schools are not functional due to lack of water to flush and this often leads to defecation in classroom corners by pupils. In other instances, where sanitary facilities are provided, pupils sometimes vandalize them.

Oftentimes, the poor design and material used for building schools sometimes do render the environment UN conducive for learning, especially during extreme weather conditions. These factors have serious health implications with attendant social and economic consequences including school absenteeism.

Pest and vector control

Vector-borne diseases constitute major health problems in Nigeria. Malaria, a highly endemic vector borne disease, remains one of the five leading causes of morbidity and mortality among children below the age of five years and pregnant women. It also accounts for remarkable economic loss thus contributing significantly to poverty and underdevelopment. An estimated 50% of the 120million population experience at least one acute episode each year (FMOE, 2003).

Malaria along with other important endemic vector-borne diseases such as Onchocerciasis (River Blindness), Filariasis, Schistosomiasis, Yellow Fever and Trypanosomiasis have remarkable social, economic and political implications.

Other pests, such as venomous snakes - *Echis carinatus accelatus*, contribute to significant morbidity and mortality in the Niger-Benue valley of Nigeria. At the peak of the farming and harvesting seasons, it is not uncommon to find beds in hospitals almost completely taken over by snakebite victims in these areas (World Health Statistics Report, 2005).

Adequate potable water supply

Water is an essential ingredient for the sustenance of life. Water in poor quality and inadequate quantity continues to pose a major threat to human health. Conversely human development and population growth exert many and diverse pressures on the quality and quantity of water resources and on access to it. Nowhere are the pressures felt so strongly as at the interface of water and human health, especially with indiscriminate dumping of sewage sludge into rivers, non-treatment of effluents from

industries and paving of surfaces which prevent recharge of underground water (Sridhar, et al., 1984).

The coverage of water supply facilities to the populace is still inadequate. It is a common phenomenon to see long queues of jerry cans and buckets in the cities especially during the dry season. According to the Nigeria Demographic and Health Survey {NDHS}, (2008) 79.7% of the urban population have access to safe sources of drinking water while about 70% of the rural population depend mainly on unsafe sources such as open wells, rivers, streams, etc., for drinking. In areas, which are served by public water supply, the wholesomeness of the water is sometimes not guaranteed because of poor maintenance of pipes, which are prone to constant leakages, with slippages of contaminants. Unwholesome water plays a significant role in the aetiology of water borne diseases such as cholera, typhoid and paratyphoid fevers (Ekblad, 1993)

An inverse relationship has been observed to exist between hand washing and diarrhoea. Increased frequency of hand washing after using the toilet and before handling food substantially decreases the occurrence of diarrhoea especially in young children. The proximity of water also plays an important role in maintaining good personal hygiene and reducing the incidence of diarrhoea and skin diseases.

In the words of Kofi Annan, the former United Nations Secretary-General, "Access to safe water is a fundamental human need and, therefore, a basic human right. Contaminated water jeopardizes both the physical and social health of all people. It is an, affront to human dignity"(WHO, 2003):

Control of reared and strayed animals

Animals are part of man's biological environment. A variety of animals are raised in agricultural, domestic, commercial and other settings with little or no Government regulation. In most urban centres, occupants in multi- flat apartments rear all sorts of animals in violation of Public Health Laws (Public Health Laws of Western Region 1956). In most rural areas, animals are common-place, where they stroll in and out of dwelling homes; resulting in an immense interaction between man and animals, (Environmental Network Environmental Law foundation, 2003).

Most of the animals are reared in filthy, unhygienic conditions. Some of these animals are reservoir· hosts to a number of zoonotic diseases and aid the transmission of anthrax, brucellosis, rabies, leptosporosis, hydatid disease, bovine tuberculosis, etc.

Most animals seen around are supposedly reared. However; there is no proper supervision so they roam about littering the environment with their faecal matter and causing visual blight as well as being involved in massive destruction of farm lands/produce.

Disposal of the dead

This is a very important aspect of sanitation as it could be worrisome if not properly done. The disposal of the dead is usually hinged on a number of beliefs including religious and cultural. Improper disposal of the dead could portend serious health implications if the dead are left unattended. It is not uncommon to see animal carcasses and remains of destitute and accident victims left unattended on the streets for days and even weeks. Very often, delay in disposal of bodies has to do with role conflict between the Police and the Health Authorities.(Environment and pollution Newsletter of the UNO (1997). 16-23 pgs).

These animal carcasses and bodies when left unattended, often decompose and create odour nuisances, encourage the spread of diseases through vectors and other vermin and could also contaminate underground water (ESI Corporation, 1974)

The human dead are usually taken care of by loved ones. However, in times of disasters/crises, there may be a lot of the dead to be buried and this requires special care by the Sanitation Authority to avert untoward consequences. The burial of the dead in approved cemeteries should be encouraged while burial within human habitation should be discouraged, giving due respect to cultural and religious beliefs.

Weed and vegetation control

Weeds usually grow in unattended places especially in the surroundings of homes, public places, vacant plots and major highways. Their uncontrolled presence around homes provides harbourage for dangerous reptiles which may be harmful to man.

On the highways, overgrown weeds have been known to provide cover for armed robbers and this puts the life of the unsuspecting road users at risk. The weeds also reduce the width of the roads and often obstruct the vision of motorists, thus contributing to the high rate of motor accidents (Eshis, 1988).

The menace of overgrown weeds and wild vegetation needs the collective efforts of the Government especially the Federal Ministry of Works (Federal Road Maintenance Agency), State and LGA, as well as the community to regularly control their growth and spread.

Hygiene education and promotion

Hygiene education and promotion was well practiced in the past. But over the years, promotion of hygiene declined such that it is no longer given the attention it deserves. (Bradkey, et.al., 1992). This has culminated in erosion of the past gains and an emergence of unhygienic practices.

Hygiene education and promotion early in life remains pivotal to the success of sound Environmental Sanitation as it entrenches the doctrine of optimum hygienic practices from childhood, which can be sustained through life. Positive behavioural and attitudinal changes are the pillars on which sanitation practices can be built and the framework for this can only be achieved through sound hygiene education and promotion (Anthony et al., 1989)

III. Stakeholders in implementing policy

Environmental Sanitation is a public good and the responsibility of all. Therefore, all actors shall be involved in programme management to achieve the creation of a healthy living environment. This will require multi-sectoral and multidisciplinary approach involving the private and public sectors. The thrust of the institutional arrangement of this policy is based on creating both horizontal and vertical interactions amongst all tiers of government and public agencies through the establishment of technical committees (Brennan, 1999). It shall involve the experts and professional of the organized private sector, ESAs and NGOs in effective systems management, with a view to promoting effective stakeholders' participation in policy implementation. Government shall ensure adequate funding through relevant

ministries/agencies for effective operations of the technical committee at each tier. (Harper, et al., 1994)

Establishment of technical committees

For the purpose of implementing the policy, NTCES, STCES, LTCES, committees were established: The **composition of technical committees were as follows:**

National Technical Committee on Environmental Sanitation (NTCES) at the National level, State Technical Committee on Environmental Sanitation (STCES) at the State level, Local Government Technical Committee on Environmental Sanitation (LTCES) at the Local Government level.

NTCES

National Technical Committee on Environmental Sanitation are made up of the following government ministries

- Federal Director of Environmental Sanitation as chairman;
- Representative of Federal Ministry of Health;
- Representative of Federal Ministry of Housing and Urban Development;
- Representative of Federal Ministry of Water Resources;
- Representative of Federal Ministry of Agriculture and Rural Development;
- Representative of Federal Ministry of Culture and Tourism;
- Representative of Federal Ministry of Women Affairs;
- Representative of Ministry of Intergovernmental Affairs Youth Development and Special Duties (Youth Development);
- Representative of Federal Ministry of information and National Orientation (National Orientation Agency);
- Representative of Federal Ministry of Education ;
- Representative of Federal Ministry of industries;
- Representative of Federal Ministry of Science and Technology;
- Representative of Federal Ministry of Transport;
- National Planning Commission (NPC);
- Representative of the Office of the Vice President (Local Government Affairs);

State Technical Committee on Environmental Sanitation shall be as follows

- State Director of Environmental Sanitation or Officer in charge of Environmental Sanitation matters in the State as Chairman;

- Representative of Association of Community Health Physicians;
- Representative of Environmental Health Officers' Registration Council of Nigeria.
- Representative of Federal Ministry of Solid Minerals Development
- State Director of Environmental Sanitation or Officer in charge of Environmental Sanitation matters in the State as Chairman;
- Representatives of relevant State Ministries and Parastatals in charge of Environmental Sanitation related services such as Health, Agriculture, Water, Physical Planning, Education, Women Affairs, Youth Development as well as the Ministry/Department responsible, for LGA matters in the State, etc;
- Chairmen of Local Government Technical Committees;
- State Director of National Orientation Agency;
- Representative of sub-regional Federal bodies such as NDDC, etc;
- Representative of Faith-based Organisations (one Christian and one Muslim)
- Representative of Coalition of Non-Governmental Organisations (NGOs)
- Representative of the Coalition of the Police, Military and Paramilitary
- Local Government Technical Committee on Environmental Sanitation
- Local Government Officer in charge of Environmental Sanitation as Chairman;
- Representative of Ward Environmental Sanitation Committees;
- Representative of the Council of Traditional Rulers
- Representative of Market Association
- Representative of Coalition of Women's Group
- Representative of Faith-based Organisations
- Representative of Coalition of Non-Governmental Organisations (NGOs)
- Representative of Road Transport Workers' Union

Functions of the technical committees: The function of TC to National Technical Committee on Environmental Sanitation shall:

- Coordinate the implement strategies of national, state and local government areas
- Monitor and evaluate environmental sanitation activities at the national, state and local government areas

- Undertake periodic review of the national environmental sanitation policy and guidelines at state and local government areas and finally to
- Submit annual report on environmental sanitation to the national council on environment.

Institutional roles and responsibilities

These have been clearly delineated as follows (FMOE, 2005):

Federal Ministry of Environment (F M o E) shall

- Formulate, review and produce the National Environmental Sanitation Policy and Guidelines;
- Enact, review and harmonise existing Legislation on Environmental Sanitation;
- Develop and ensure the implementation of the National Environmental Sanitation Action Plan;
- Develop a master plan for urban solid waste management in Nigeria, and ensure its implementation;
- Develop master plan for biomedical waste and ensure its implementation; Collaborate with the Academia, Research Institutions, other relevant Ministries, Agencies, ESAs, NGOs and the private sector;
- Embark on capacity building and human resource development for managing Environmental Sanitation;
- Develop and strengthen institutional structures for compliance monitoring and enforcement of Environmental Sanitation laws;
- Mobilise resources both internally and externally for Environmental Sanitation programmes;
- Establish a National Data Bank on Environmental Sanitation for the purpose of planning and development;
- Conduct, promote and coordinate research on Environmental Sanitation technologies;
- Identify and disseminate cost effective, appropriate, affordable and environment friendly technologies;
- Provide technical assistance to State/LGA personnel to address current Environmental Sanitation challenges;

- Coordinate the annual National Environmental Sanitation Day exercise; Monitor and evaluate Environmental Sanitation activities/services;
- Submit annual report on Environmental Sanitation to the National Council on Environment.

Federal Ministry of Health (FMH) shall:

- Generate and disseminate data on Environmental Sanitation related diseases;
- Collaborate with Federal Ministry of Environment on vector borne disease control, especially in the environmental management control strategies for malaria, schistosomiasis, guinea worm, etc
- Collaborate with Federal Ministry of Environment in the promotion of sound food sanitation;
- Collaborate with the Federal Ministry of Environment on capacity building of Environmental Health Practitioners in sound environmental sanitation practices.

(b). State shall:

- (Ministry of Environment or any other organ that has responsibility for Environmental Sanitation matters).
- Provide technical assistance and logistic support to LGA on the implementation of the National Environmental Sanitation Policy and Guidelines:
- Encourage and support private sector participation in Environmental Sanitation service' delivery, through Legislation and provision of financial instruments;
- Support the implementation of the National Environmental Sanitation Action Plan;
- Adopt the master plan on solid waste management for implementation at the State level;
- Ensure implementation of the master plan on biomedical wastes;
- Ensure and coordinate the storage, regular collection, transportation and disposal of solid waste in the urban areas;
- Ensure proper siting of final disposal sites for waste management; Ensure adequate management of the sewerage system;

- Ensure the regular cleaning of streets and drainages in the State;
- Ensure compliance with Environmental Sanitation standards;
- Monitor and evaluate Environmental Sanitation activities;
- Coordinate the National Environmental Sanitation Day exercises and provide health education to the public through enlightenment campaigns;
- Conduct research on Environmental Sanitation technologies in line with local customs and practices;
- Provide funds to support Environmental Sanitation programmes;
- Forward biannual reports on Environmental Sanitation activities to The National Technical Committee.

c. LGA shall:

- Enact and enforce appropriate Legislation on Environmental Sanitation;
- Recruit adequate manpower for programme implementation;
- Conduct sanitary inspection of premises;
- Implement the National Environmental Sanitation Action Plan;
- Implement the master plan on solid waste management;
- Implement the master plan on biomedical waste management;
- Provide equitable Environmental Sanitation services in all settlements within its jurisdiction;
- Establish and strengthen local 'planning authority to prepare an appropriate local development plan on Environmental Sanitation;
- Mobilise and empower the community in the planning and implementation of Environmental Sanitation programmes;
- Inspect and register bakery, food and liquor premises and other regulated premises including milling machines;
- Ensure the cleaning of streets and drainages;
- Ensure provision of adequate functional public toilets and solid waste management facilities in strategic areas, public assemblies, parks and gardens, refugee camps and other notable places for transient populations within the

LGA;

- Encourage and monitor private sector participation in the provision of sanitary facilities and delivery of Environmental Sanitation services;

- Ensure prompt disposal of the dead found on the streets;
- Coordinate, support and supervise all Environmental Sanitation activities within the LGA;
- Create Environmental Sanitation awareness through education and public enlightenment campaigns and ensure effective community mobilization and participation;
- Sensitise and mobilise community members to participate in the National Environmental sanitation Day exercises;
- Sanction community members who fail to participate in the National Environmental Sanitation Day exercise;
- Control the rearing of animals and impound stray animals;
- Enforce compliance with Environmental Sanitation laws and standards;
- Collaborate with Road Transport Workers' Union to ensure sound Environmental
- Sanitation in commercial vehicles and motor parks;
- Monitor and evaluate Environmental Sanitation activities;
- Provide funds for the sustenance of Environmental Sanitation programmes at ward levels;
- Forward quarterly reports on Environmental Sanitation to the State Technical committee.

d. External support agencies (ESAs) shall:

- Support the implementation of National Environmental Sanitation activities within the context of the National Environmental Sanitation Action Plan;
- Collaborate with the Environment Sector at all tiers of Government on Environmental Sanitation matters;
- Provide assistance in the implementation of Environmental Sanitation Programmes within the context of the National Environmental Sanitation Action Plan.

e. Civil society organisations (*NGOs/CBOs*) shall:

- Support the implementation of National Environmental Sanitation activities within the context of the National Environmental Sanitation Action Plan;

- Collaborate with the Environment Sector at all tiers of Government on Environmental Sanitation matters;
- Mobilise communities through awareness campaigns to maintain a clean and healthy environment;
- Provide support in the development of Information Education Communication packages(I E C) on Environmental Sanitation;
- Monitor and evaluate Environmental Sanitation programmes at the grass root;
- Establish Environmental Sanitation Committees (ESC) to ensure active participation of the community on Environmental Sanitation issues;
- Support the control of reared animals and impound stray animals;
- Report unattended corpses and animal carcasses for prompt removal and disposal;
- Develop and promote appropriate Environmental Sanitation infrastructure such as public toilets and waste disposal sites;
- Mobilise community members to participate in the National Environmental Sanitation Day exercises;
- Sanction community members who fail to participate in the National Environmental Sanitation Day exercises;
- Develop community programmes that will support programme sustainability;
- Educate communities on the need to pay for Environmental Sanitation services.

f. Organised private sector shall:

- Support the implementation of National Environmental Sanitation activities within the context of the National Environmental Sanitation Action Plan;
- Collaborate with the Environment Sector at all tiers of Government on Environmental Sanitation activities;
- Participate in the provision of Environmental Sanitation facilities and services; Support research in Environmental Sanitation technologies

g. Academia and research institutions shall:

- Revise curricula to reflect Environmental Sanitation issues;
- Refocus on researches that address locally relevant Environmental Sanitation technologies and activities;

- Conduct training and manpower development of personnel involved in Environmental Sanitation;
- Provide technical assistance to all tiers of Government, the CSOs and the organised private sector;
- Collaborate with Federal Ministry of Environment in dissemination of research findings on Environmental Sanitation.

h. Individual shall:

- Clean within and immediate environs of the house including drains and access ways;
- Take measures to prevent the breeding of disease vectors within and in the immediate environs of the premises occupied;
- Ensure hygienic collection, source separation and segregation, storage and disposal of waste generated within the household;
- Report to the appropriate authorities unattended corpses and animal carcasses for prompt removal and disposal;
- Control reared animals;
- Participate in all communal Environmental Sanitation Day exercises including the National Environmental Sanitation Day;
- Support sustainability of programme by paying for Environmental Sanitation services.

IV. Role of EHO in implementation of NESP

The environmental health profession had its modern-day roots in the sanitary and public health movement of the United Kingdom. This was epitomized by Sir Edwin Chadwick, who was instrumental in the repeal of the poor laws and was the founding president of the Association of Public Sanitary Inspectors in 1884, which today is the Chartered Institute of Environmental Health (Omobolaji, 1994).

EHOs are usually employed by local government or state health authorities to advice on and enforce public health standards. However, many are employed in the private sector and in the military (Last Jifri, 1930).

EHOs or their equivalents can be found in most countries that have been part of the Commonwealth of Nations and the Republic of Ireland. Internationally EHOs are also referred to as Public Health Inspectors, Sanitarians, Health Protection Officers among others (Verden et al., 2003).

In Australia and the UK for instance, EHOs are also known as "Environmental Health Practitioners"(US Dept. of Health & Human Services, 2000). A term used to describe a collective group of professionals that work directly or indirectly in the Environmental Health profession, for example, food technology, microbiology, health promotion, immunization, environmental law, etc.

In July 2008 the peak body for EHOs, Environmental Health Australia launched the Certified Environmental Health Practitioner scheme, which was designed to enhance the career prospects of Environmental Health Practitioners in Australia (US Dept. of Health & Human Services, 2000).

Roles and responsibilities

The exact nature of an Environmental Health Officer's job may vary. Some EHOs will specialise whilst others will retain a generalist role.

Some typical areas of work include: (Augustin et al., 2009)

- Inspecting/auditing food businesses for food safety and suitability
- Licensing and inspecting premises on public health grounds
- Communicable disease investigation and control
- Enforcing environmental laws
- Investigating cases of environmental crime
- Tobacco control and education
- Grey water system installation and use
- Inspecting/auditing health related premises for public health safety
- Monitoring recreational and drinking water
- Environmental risk assessments
- Assessing housing fitness
- Discharge consents/monitoring
- Environmental pollution investigations

- Occupational health and safety
- Compliance & Enforcement (including prosecutions)
- Health promotion
- Inspection of childcare premises
- Port Health - galley inspections, food imports & ship sanitation certificates
- Food sampling for chemical and microbiological purposes; foods standards
- Food safety training
- Planning
- Pest control
- Emergency contingency planning and implementation
- Noise control

EHOs bring to the position an understanding of microbiology, risk assessment, environmental science and technology, food science, as well as skills and knowledge related to the tracking and control of communicable disease and the investigation and enforcement of legislation related to public health and the environment (Ball, 1965). Working in partnership with Government Ministries such as Health, Agriculture and the Environment, local municipalities, businesses, community groups and agencies as well as individual members of the community the EHO plays a major role in protecting public health (Okorodudu, 1989).

Role of the Environmental Health Officers in the implementation of NESP:
(Augustin, et al., 2009)

One of the strategies for the implementation of the national Environmental Sanitation Policy is the development of human resources. According to section 5.3 of the policy, it will embark on recruitment, training and re-training of EHOs and enforce the provisions of the Policy Guidelines on the employment of Environmental Health Practitioners for professional Environmental health services.

Part of the roles of EHOs in the implementation of the policy is highlighted in Section 5.5 of the policy which states that

Advocacy through sensitisation and mobilisation of all stakeholders at all tiers of governments;

- Review school curricula on hygiene education to include environmental sanitation

- Introduce and enforce the use of environmental-friendly packaging materials;
- Encourage the establishment of neighbourhood Environmental Sanitation Committees;
- Develop appropriate Information, Education and Communication (IEC) packages for target group;
- Institutionalise sound Environmental Sanitation consciousness as a lifestyle and
- Strict enforcement of Environmental Sanitation Laws and penalise defaulters so as to deter other citizens.

CONCEPTUAL FRAMEWORK

Conceptual framework describes the relationship of a problem to the concepts in a model and the conceptual framework relevant to this study are PRECEDE model and Diffusion of Innovations (Green L et al 1999).

PRECEDE-PROCEED: (PROCEED). The PRECEDE acronym stands for Predisposing, Reinforcing, Enabling Constructs in Educational/Environmental Diagnosis and Evaluation. Developed in the 1970s, this component of the model posits that an educational diagnosis is needed to design a health promotion intervention, just as a medical diagnosis is needed to design a treatment plan. PROCEED stands for Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development. This element was added to the framework later, in 1991, to take into account the impact of environmental factors on health. Together, these two components of the model help practitioners plan programs that exemplify an ecological perspective. are a planning model, not a theory. It does not predict or explain factors linked to the outcomes of interest, but offers a framework for identifying intervention strategies to address these factors. Developed by Green, Kreuter, and associates, (Green et al., 1999). PRECEDE-PROCEED provide a road map for designing health education and health promotion programmes.

It guides planners through a process that starts with desired outcomes and works backwards to identify a mix of strategies for achieving objectives. (Obaaro, 2006) Because the model views health behaviour as influenced by both individual and environmental forces, it has two distinct parts: an “educational diagnosis” (PRECEDE) and an “ecological diagnosis” (Green and Kreuter, 1999).

PRECEDE-PROCEED have nine steps. The first five steps are diagnostic, addressing both educational and environmental issues. These include: (1) social assessment, (2) epidemiological assessment, (3) behavioural and environmental assessment, (4) educational and ecological assessment, and (5) administrative and policy assessment. The last four comprise implementation and evaluation of health promotion intervention. These include: (6) implementation, (7) process evaluation, (8) impact evaluation and (9) outcome evaluation. (See Figure 2: 6.)

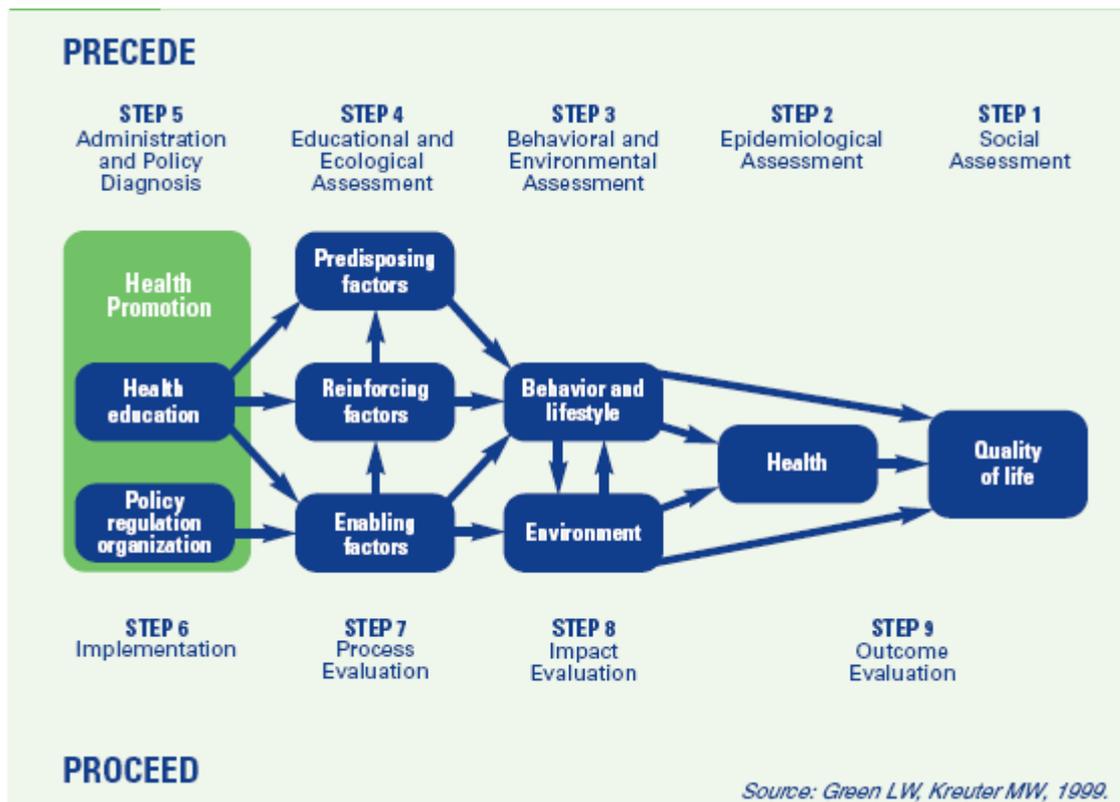


Figure 2.6: The PRECEDE-PROCEED Model

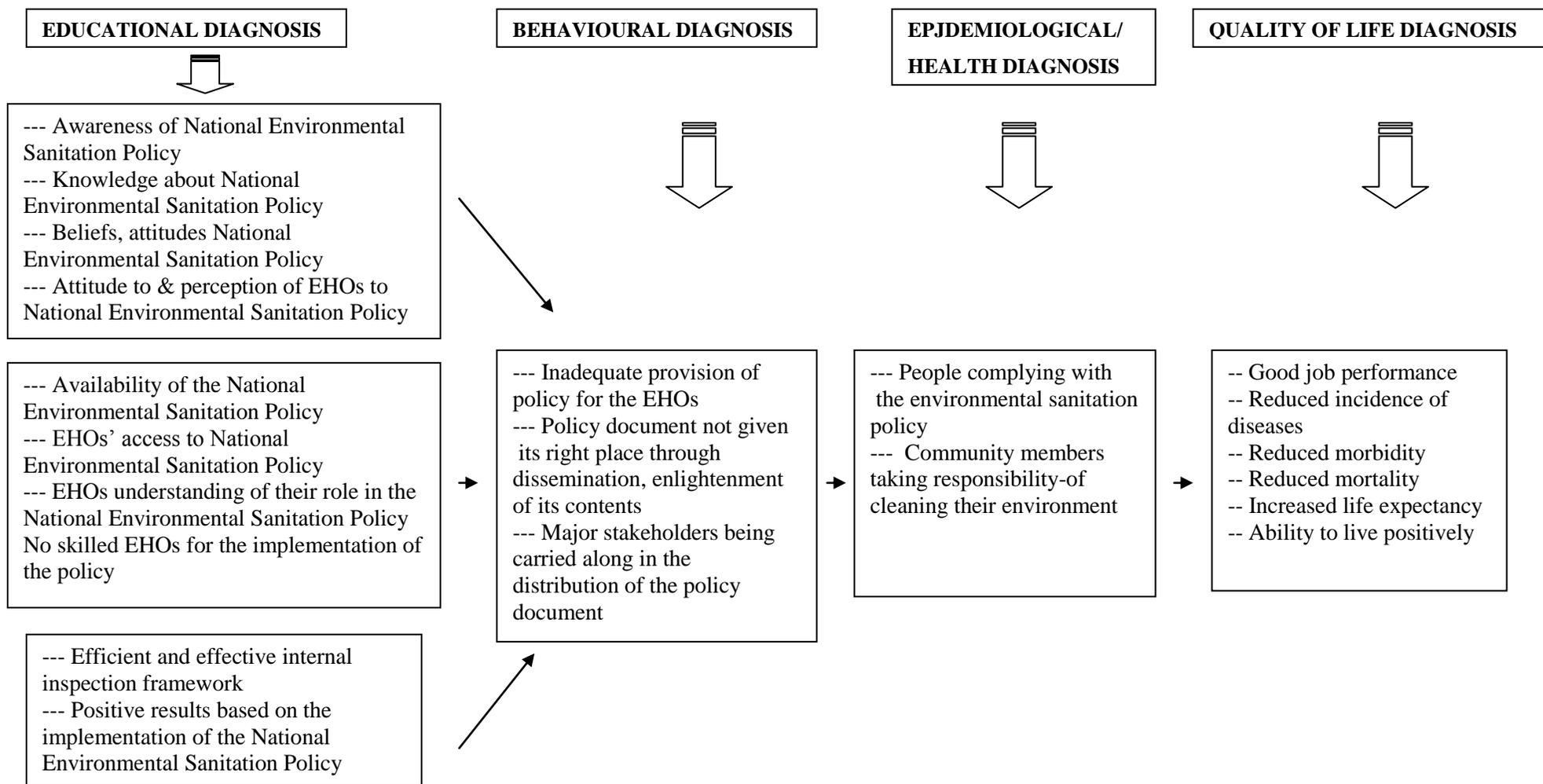


Figure 2.6.1: PRECEDE framework adapted to knowledge, attitude and practices of EHOs in Ogun state, Nigeria on National Environmental Sanitation Policy.

Source: Concept adapted from National Institute of Health (2005) Theory at a glance: A guide for health promotion practice. Institute of Health: U.S. Department of Health and Human Services.

During the diagnostic steps of the model, practitioners employ various methods to learn about the community's perceived and actual needs, as well as the regulatory context in which the intervention will operate. To conduct *social assessment*, the practitioner may use multiple data collection activities (e.g., key informant interviews, focus groups, participant observation, surveys) to understand the community's perceived needs. *Epidemiological assessment* may include secondary data analysis or original data collection to prioritize the community's health needs and establish programmes goals and objectives. *Behavioural and Environmental Assessment* identifies factors, both internal and external to the individual, that affect the health problem. Reviewing the literature and applying theory are two ways to map out these factors.

In *Educational and Ecological Assessment*, the practitioner identifies antecedent and reinforcing factors that must be in place to initiate and sustain change. Behaviour — such as reducing intake of dietary fat, engaging in routine physical activity, and obtaining annual mammograms—is shaped by predisposing, reinforcing, and enabling factors. Practitioners can use individual, interpersonal, or community-level change theories to classify determinants of behaviour into one of these three categories and rank their importance. Because each type of factor requires different intervention strategies, classifying them helps practitioners consider how to address community needs. The three types of influencing factors include:

- *Predisposing factors*, which motivate or provide a reason for behaviour; they include knowledge, attitudes, cultural beliefs, and readiness to change.
- *Enabling factors*, which enable persons to act on their predispositions; these factors include available resources, supportive policies, assistance, and services.
- *Reinforcing factors*, which come into play after a behaviour, has been initiated; they encourage repetition or persistence of behaviours by providing continuing rewards or incentives. Social support, praise, reassurance, and symptom relief might all be considered reinforcing factors.

In the final diagnostic step of PRECEDE/ PROCEED, *Administrative and Policy Assessment*, intervention strategies reflect information gathered in previous steps; the availability of needed resources; and organizational policies and regulations that could affect programmes implementation (Table 2.1.)

Table 2.1: Diagnostic Elements of PRECEDE-PROCEED

<i>Planning Step</i>	<i>Function</i>	<i>Examples of Relevant Theory</i>
1. Social Assessment	Assesses people's views of their own needs and quality of life	Community organization Community building
2. Epidemiological Assessment	Documents which health problems are most important for which groups in a community	Community-level theories (If the community helps to choose the health problem that will be addressed)
3. Behavioral/ Environmental Assessment	Identifies factors that contribute to the health problem of interest	Interpersonal theories - Social Cognitive Theory Theories of organizational change Community organization Diffusion of innovations
4. Educational/ Ecological Assessment	Identifies preceding and reinforcing factors that must be in place to initiate and sustain change	All three levels of change theories: - Individual - Interpersonal - Community
5. Administrative/ Policy Assessment	Identifies policies, resources, and circumstances in the program's context that may help or hinder implementation	Community-level theories: - Community organization - Organizational change

Source- Green. L.W, Kreuter.M.W (1999)

Using the framework in explaining the work the predisposing factors are awareness of National Environment Sanitation Policy, knowledge of National Environmental Sanitation Policy; beliefs, attitudes towards the National Environmental Sanitation Policy. This also includes attitude to an perception of EHOs to National Environmental Sanitation Policy.

The enabling factors are availability of the National Environmental Sanitation Policy to EHOs who are one of the implementers of the policy. Others include EHOs' access to NESP and their understanding of their role in the National Environmental Sanitation Policy.

Reinforcing factors for sustaining the positive behaviour include efficient and effective internal inspection framework and positive results based on the implementation of the NESP.

At the behavioural diagnosis level, inadequate provision of policy for the EHOs, policy document not given its right place through dissemination, enlightenment of its contents and major stakeholders being carried along in the distribution of the policy document could hinder the behaviour being exhibited.

Epidemiological/health diagnosis focuses on whether the people are complying with the environmental sanitation policy and or the community members taking responsibility of cleaning their environment.

Quality of life diagnosis focuses on the outcomes of all interventions; these are measured on the good job performance, reduced incidence of diseases, reduced morbidity, reduced mortality and increased life expectancy.

Diffusion of Innovations

In public health and health promotion, practitioners who want to make efficient use of resources. Diffusion expands the number of people who are exposed to and reached by successful interventions, strengthening their public health impact.

Diffusion of Innovations Theory addresses how ideas, products, and social practices that are perceived as “new” spread throughout a society or from one society to another. According to the late E.M. Rogers, diffusion of innovations is “the process by which an *innovation* is communicated through certain *channels* over *time* among the members of a *social system*” (Rogers, 1995). Diffusion Theory has been used to study the adoption of a wide range of health behaviours and programmes, including condom use, smoking cessation, and use of new tests and technologies by health practitioners. Table 2.2 defines concepts that are central to this theory.

Table 2.2: Concepts in Diffusion of Innovations

<i>Concept</i>	<i>Definition</i>
Innovation	An idea, object, or practice that is thought to be new by an individual, organization, or community
Communication channels	The means of transmitting the new idea from one person to another
Social system	A group of individuals who together adopt the innovation
Time	How long it takes to adopt the innovation

Source- Rogers, 1995.

Diffusion of innovations that prevent disease and promote health requires a multilevel change process that usually takes place in diverse settings, through different strategies. At the individual level, adopting a health behaviour innovation usually involves lifestyle change. At the organizational level, it may entail starting programs, changing regulations, or altering personnel roles. At a community level, diffusion can include using the media, advancing policies, or starting initiatives. According to Rogers, a number of factors determine how quickly, and to what extent, an innovation will be adopted and diffused. By considering the benefits of an innovation (see Table 2.3); practitioners can position it effectively, thereby maximizing its appeal. Specifically: Rogers, 1995.

The relative advantage of an innovation shows its superiority over whatever it replaces.

Compatibility is an appropriate fit with the intended audience.

Complexity has to do with how easy it is to implement the innovation.

Trialability pertains to whether it can be tried on an experimental basis.

Observability reflects whether the innovation will produce tangible results.

Table 2.3: Key Attributes Affecting the Speed and Extent of an Innovation’s Diffusion

<i>Attribute</i>	<i>Key Question</i>
Relative advantage	Is the innovation better than what it will replace?
Compatibility	Does the innovation fit with the intended audience?
Complexity	Is the innovation easy to use?
Trialability	Can the innovation be tried before making a decision to adopt?
Observability	Are the results of the innovation observable and easily measurable?

Sources- Rogers, 1995.

Effective diffusion requires practitioners to use both informal and formal communications channels and a spectrum of strategies for different settings. Disseminating an innovation in a variety of ways increases the likelihood that it will be adopted and *institutionalized*.

Communication usually should include both mass media and interpersonal interactions. Through the *two-step flow of communication*, information from the media moves in two stages. First, opinion leaders, who pay close attention to the media, receive the information. Second, they convey their own interpretations, as well as the media content, to others. This process highlights the value of social networks for influencing adoption decisions. Rogers described the process of adoption as a classic “bell curve,” with five categories of adopters: *innovators*, *early adopters*, *early majority adopters*, *late majority adopters*, and *laggards*. When an innovation is introduced, the majority of people will either be early majority adopters or late majority adopters; fewer will be early adopters or laggards; and very few will be innovators (the first people to use the innovation). By identifying the characteristics of people in each adopter category, practitioners can more effectively plan and implement strategies that are customized to their needs.

CHAPTER THREE

METHODOLOGY

Study Design

This study is a cross-sectional and descriptive in survey design. It was conducted in Ogun state to determine the perception and practice of EHOs relating to the component of national environmental sanitation policy. The questionnaire was developed from pre-test questionnaires which were used to measure the perception and practice of EHOs on national environmental sanitation policy

Description of Study Area

Ogun state also known as “the Gateway State”, the site for this study, is one of the 36 states in Nigeria. The state was carved out of the defunct Western Region on the 3rd of February, 1976, by the then military head of state, Major General Muritala Mohammed. The state lies within the tropical region of Africa. It is bounded on the west by the Benin Republic, on the south by Lagos state and the Atlantic Ocean, on the north by Oyo and Osun states. It covers a large land area of about 16, 409, 26 square kilometres. Part of the state extends to Riverine area of Ilaje, Ese Odo in Ondo state. The ancient town of Abeokuta is the capital of the state. At present the state has 20 local government areas (LGAs); the LGAs with their headquarters indicated in Table 3.1 below:

Table 3.1: List of local government areas, headquarters and population in Ogun state

S/No	Name of Local Government	Head quarters	Population
1	Abeokuta North	Akomoje	201,329
2	Abeokuta South	Ake	250,278
3	Ado-odo/ Ota	Ota	526,565
4	Ewekoro	Itori	55,156
5	Ifo	Ifo	524,837
6	Ijebu East	Ogbere	110,196
7	Ijebu-ode	Ijebu-ode	154,032
8	Ijebu North	Ijebu-Igbo	284,336
9	Ijebu North East	Atan	67,634
10	Ikenne	Ikenne	118,735
11	Imeko/Afon	Imeko	82,217
12	Ipokia	Ipokia	150,426
13	Obafemi/Owode	Owode	228,851
14	Odeda	Odeda	109,449
15	Odogbolu	Odogbolu	127,123
16	Ogun Water Side	Abigi	72,935
17	Remo North	Isara	59,911
18	Sagamu	Sagamu	253,412
19	Yewa North	Ayetoro	181,826
20	Yewa South	Ilaro	168,850
Total			3,728,098

Source: Federal Republic of Nigeria Official Gazette, 2009

By 2006 national census, the total population of the state stood at 3,728,098 million people. The state is purely a homogeneous comprising the Egba's, Ijebu's, Remo's, Yewa's, Awori's and Egun's. These people belong to the main Yoruba ethnic group and were predominantly farmers.

Study population

These are trained officers in environmental health employed by the Ogun state government who were either in the Local Government Service Commission or in the Ministry of Health or Ministry of Environment, who were active service in 2006 when the study was conducted. This comprised of all directors, unit heads and other EHOs in public departments in the state ministry of health and environment as well as all the LGAs.

Sample Size and Sampling procedures

Owing to fewer numbers of EHOs in Ogun state, purposive sampling was employed in selecting the sample size. Consequently, all EHOs, totalling 252, in all the ministries were used as study respondents. This was done by visiting all the local government areas where the EHOs were serving as well as the ministries of health and environment.

Instrument for data collection

The instrument for data collection was a 29 item semi – structured questionnaire (see Appendix A). The questionnaire was divided into sections A – D. Section A consisted of demographic information, section B focused on the knowledge of EHOs on the national environmental sanitation policy. Section C dealt with the perception of EHOs on the national environmental sanitation policy , while section D explored suggestions for innovations.

Training of research assistants

Four research assistants (RAs) were recruited for data collection; three (3) of these persons were female and the fourth was a male. They were holders of Nigerian Certificate in Education (NCE). The RAs were recruited from Ado Odo/Ota local government area being the domicile of the researcher. They were trained on the objectives of the study, understanding of the instrument for data collection, building rapport with study respondents, interviewing skills, and other ethical issues involved in research prior to the time of data collection. The training lasted for two days.

Method of data collection

The administration of the questionnaire was done by the researcher with the assistance of the four trained research assistants. The questionnaire was given to each study participant to fill personally since the wordings are straightforward and easy to comprehend. Assistance was rendered where necessary to guide respondents in case of any difficulties or where they had problems understanding a question item. The questionnaire was retrieved back from the respondents immediately on completion. Each copy of the questionnaire was checked for errors and rectified immediately before leaving the venue of the interview.

Data collection process

Data collection was carried out within a period of seven days; visits were made to all the LGAs in company of the research assistants that were trained before they were deployed to the field for data collection. Interviews were conducted at a place that ensured confidentiality within respondents' office premises. The data collection process involved the following steps:

1. Visit was made to the Ogun State Local Government Service Commission, Abeokuta to obtain permission
2. Visits were made to all the twenty local government headquarters in the state to intimate each of the Directors of Water Supply and Environmental Sanitation department about the research and to sort for approval for the conduct of the research.
3. Made contact with respondents in each local government area for the administration of the questionnaire to the respondents.
4. Retrieval of questionnaire from the respondents immediately after completion.

Validity

Several measures were taken to ensure that the instrument was valid and reliable. Experts – a sociologist, a linguist, a medical statistician and a health education specialist were consulted to review the instrument for face and content validity. The instrument was pre-tested among 40 EHOs in Ibadan South West local government area in Oyo state in order to check the psychometric properties of the instrument. Comments, difficult questions as well as observations made during the pre-test were used in modifying the instrument before the main data collection. For instance, in

section B (9) of the draft questionnaire, the draft was modified from “do EHOs carry out their duties” to “Are the enforcement officers carrying out their duties effectively”.

Reliability

Analysis of pre-tested questionnaire was done using Cronbach’s alpha coefficient of the Statistical Package for Social Sciences (SPSS) in order to ascertain the psychometric properties of the instrument. Results showing correlation coefficient greater than 0.05 are taken as being reliable and relevant corrections were made before using the instrument on the study population. The alpha coefficient for this instrument was 0.922.

Ethical considerations

The ethical considerations were observed in the conduct of this research, first, informed consent from the research respondents. Each copy of the questionnaire contained a consent form which respondents read, understood and indicated their willingness to participate in the study (see appendix 1), thus a written consent was obtained.

The respondents were informed that participation was voluntary and they were assured of the confidentiality of the information given by them and that they would be stored in a secured place where no person would have access to.

Data analysis and presentation

Data were checked in the field for completeness. A coding guide was developed to capture open-ended questions. Serial number was assigned to the questionnaire for easy identification and recall of any instrument with problems then administered questionnaires were edited and hand coded by the researcher. The data were then fed into computer. Lastly, the questionnaire was analyzed with the use of Statistical Package for Social Sciences (SPSS) version 12. Descriptive and Chi-square statistics were used for analysis. The questionnaire was stored in a place that is safe from destruction by water and where unauthorized persons will not have access to them.

Limitations of the study

Ascertaining the authenticity of responses provided by the study participants is a daunting challenge in survey research. This study however was no exception. It was assumed that since participation was voluntary, and necessary ethical issues were given consideration, then all the responses provided which formed the basis of the finding of this study were honestly made.

CHAPTER FOUR

RESULTS

Demographic characteristics

The socio-demographic characteristics of the respondents who participated in the study are presented in Table 4.1. A majority (58.3%) of the respondents were male (Figure 4.1). The mean age of the respondents was 29.6 ± 17.4 years with about 49.0% between ages 40 – 49 years age group followed by 50 – 59 years age group (24.3%). Christianity (79.5%) topped the list of religions professed by the participants. A majority of the respondents (89.0%) were married; a total of 12 (3.0%) were never married and seventy – six percent were more than 10 years old in their marriage. A very large proportion (94.3%) of the respondents was made up of Yorubas (for details see the table under reference). The mean year in service as EHOs was 12.8 ± 9.5 years and a large majority, (98.2%) were in the local government areas.

Table 4.1: Demographic information of EHOs in Ogun state (n = 252)

Variable	N_o	%
Ethnic Group		
Yoruba	206	81.7
Igbo	27	10.7
Hausa	12	4.8
Others	2	0.8
No response	5	2.0
Marital status		
Single	67	26.6
Married	179	71.0
Divorced	2	0.8
Widowed	3	1.2
No response	1	0.4
Religion		
Christianity	170	67.5
Islam	76	30.2
Traditional	4	1.6
No response	2	0.8
Job Status		
Chief Environmental Health Officer	10	4.0
Assistant Chief Environmental Health Officer	23	9.1
Principal Environmental Health Officer	42	16.7
Senior Environmental Health Officer	77	30.6
Environmental Health Officer	90	35.7
No response	10	4.0

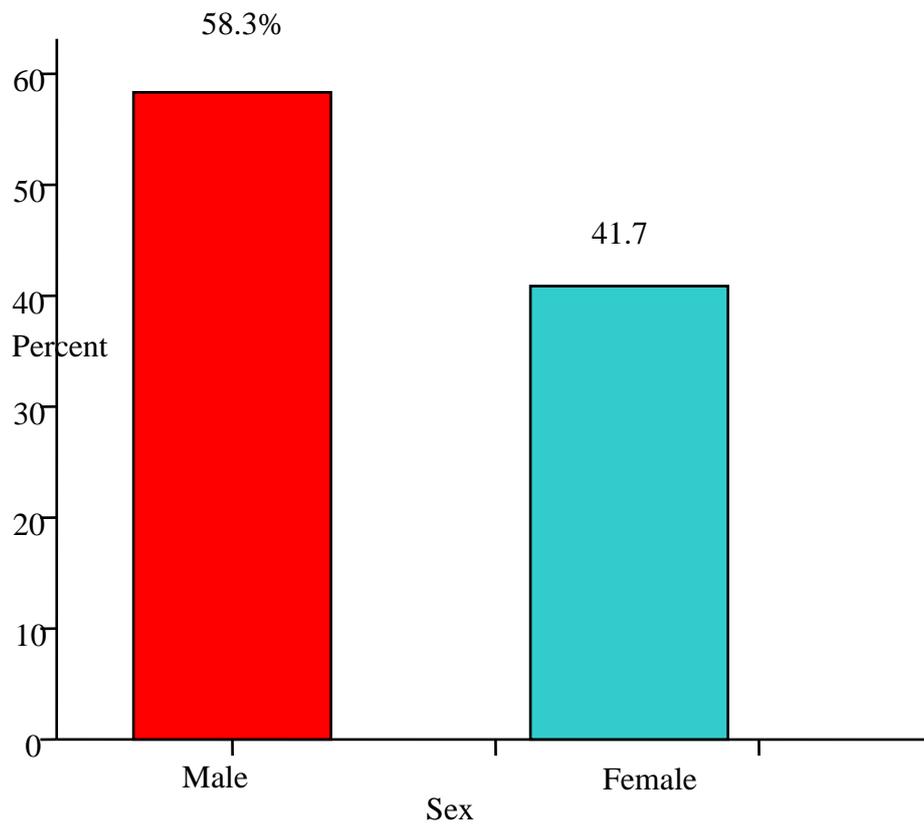
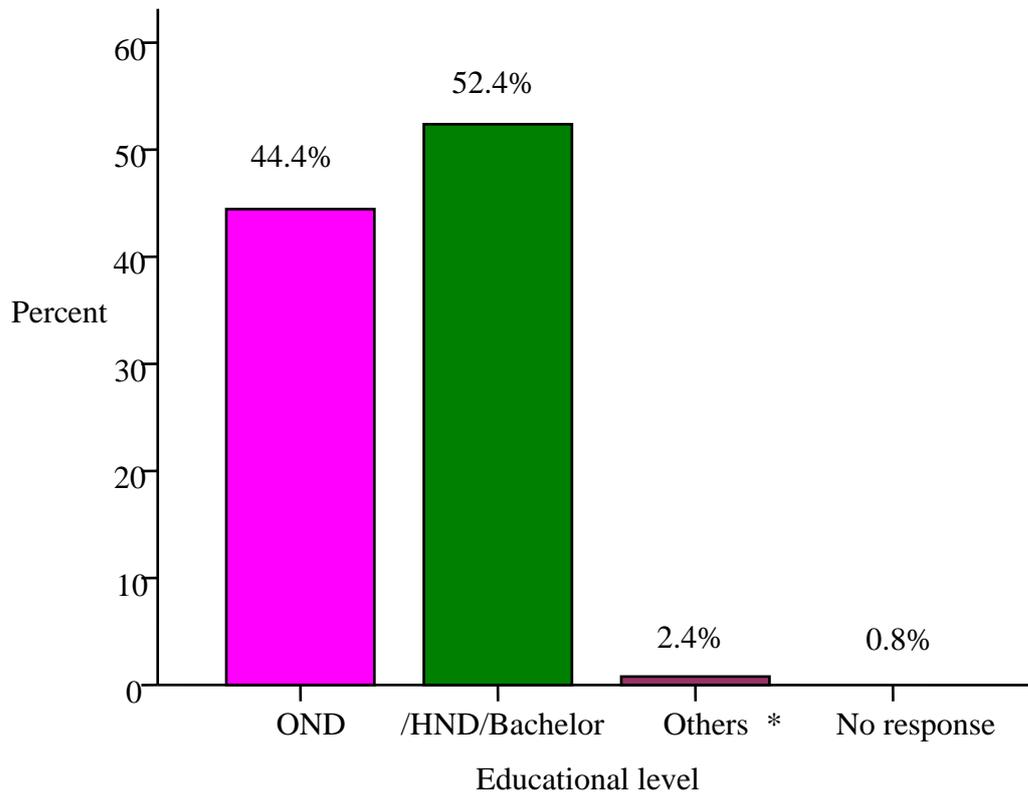


Figure 4.1: Respondents' gender distribution



*Others: MBA, MSc, MEd, PGD

Figure 4.2: Respondents' level of education

Practice of National Environmental Sanitation Policy

When asked on their awareness of the NESP, more than half, 140 (55.6%) respondents indicated ever seeing the policy before (Figure 4.3) and out of this number, 111 (79.3%) reported having a copy of the policy. About 96 (86.5%) respondents indicated ever read the policy prior to the interview period. Out of all the respondents, only a few, 35 (13.9%), knew correctly that the NESP was formulated in 2005, 87.1% did not. Similarly, only 39.0% knew that the policy was formulated by the Federal Ministry of Environment, Abuja.

About forty percent (40.5%) respondents indicated that the NESP was developed by the Ministry of Environment 40 (15.9%) believed that the policy was developed by the National Council on Health. a few others, 11 (4.4%) opined that the policy was formulated by the Federal Ministry of Health while 102 (40.5%) did not respond to this item.

Meat hygiene and inspection, 245 (97.2%), topped the list essential components of environmental sanitation that respondents indicated was outlined in the national policy on environmental sanitation closely followed by food hygiene and inspection, 234 (92.9%). School sanitation and inspection, 105 (41.7%), was the least mentioned components outlined in the policy. Only a few, 25 (9.9%), were able to mention correctly that the policy made provision for three (3) technical committees while a majority, 190 (75.4%) did not respond to this item. When asked to list the technical committees provided for in the policy, local technical committee, 162 (64.3%), was the most mentioned technical committee by respondents followed by the state technical committee, 146 (57.9%). Federal technical committee was the least mentioned by the respondents, 120 (47.6%).

A majority, 170 (67.7%) respondents indicated that proper implementation of the policy will improve the health status of the citizen. Moreover, 152 (60.3%), opined that the NESP is comprehensive enough and should thereby improve our environment. A majority, 156 (60.3%), respondents were of the opinion that EHOs are the most appropriate professional body that should implement the policy (See figures 4.3 – 4.5 and tables 4.2 – 4. for details).

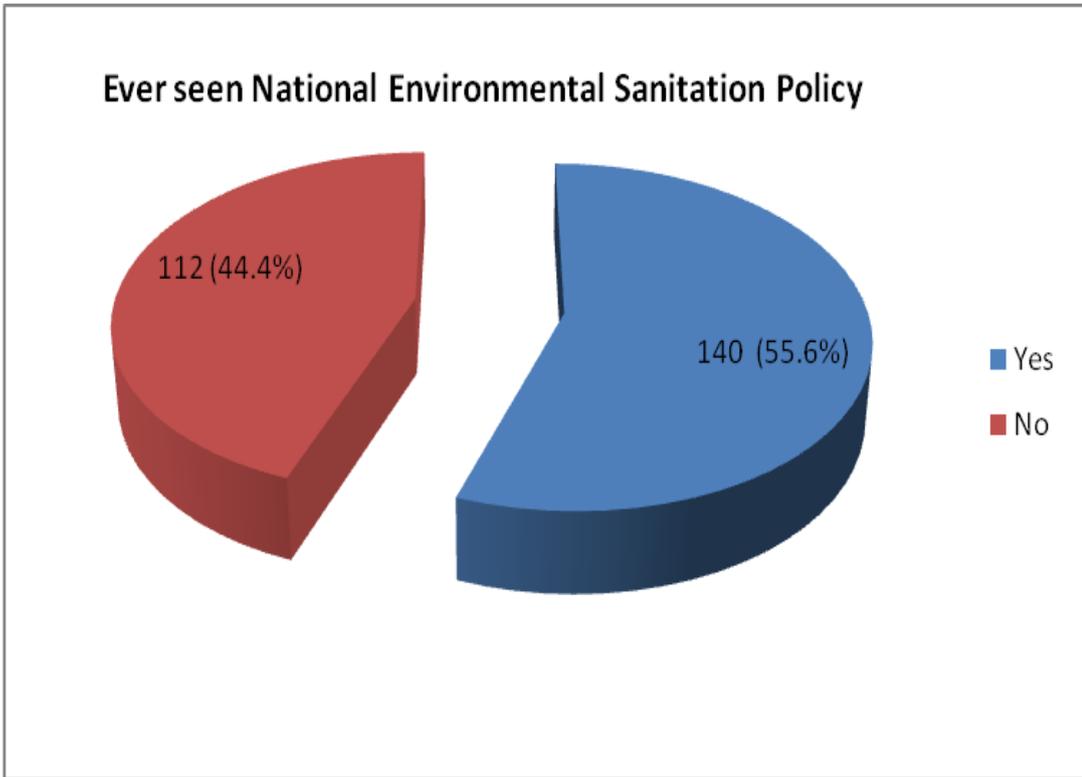


Figure 4.3: Respondents who had ever seen the National Environmental Sanitation Policy

Table 4.2: Awareness of essential components of the National Environmental Sanitation Policy (n = 252)

Variable	N_o	%
Essential components of environmental sanitation that was outlined in the national policy on environmental sanitation	234	92.9
Food hygiene and inspection		
Meat hygiene and inspection	245	97.2
House to house inspection	205	81.3
Disinfection and disinfestations	134	53.1
Refuse control and management	191	75.8
Factory inspection	124	49.2
School sanitation and inspection	105	41.7
Market sanitation and inspection	124	49.2
Control of insect and pest vectors	223	88.5
Solid waste management	209	82.9
Control of reared and stray animals	194	77.0
Disposal of dead (man and animal)	190	75.4

Table 4.3: Knowledge of components of the National Environmental Sanitation Policy (n = 252)

Knowledge statement	Nº	%
Number of technical committee the policy provided for		
2	33	13.1
3*	25	9.9
4	192	76.2
10	1	0.4
15	1	0.4
Proper implementation of the policy will improve the health status of citizen		
True*	170	67.7
False	82	32.3
The policy on environmental sanitation is comprehensive and should improve our environment		
True*	152	60.3
False	100	39.7
EHOs are the most appropriate professional body that should implement the policy		
True*	156	61.9
False	94	38.1

* Correct responses

Table 4.4a: Perception of EHOs on components of National Environmental Sanitation Policy (n = 252)

Statement	Agree № (%)	Disagree № (%)	Undecided № (%)
No need for National Environmental Sanitation Policy in Nigeria	61 (24.2)	157 (62.3)	34 (13.5)
The National Environment Sanitation Policy is more of theory than practical	85 (33.7)	94 (37.3)	73 (29.0)
The National Environmental Sanitation policy will be good in combating all environmental problems	177 (70.2)	19 (7.5)	56 (22.2)
Environmental sanitation issues should be taken more seriously by the Environmental Health Officers	210 (83.3)	7 (2.8)	35 (12.9)
Environmental Health Officers have lukewarm attitude towards the implementation of the policy	79 (31.3)	114 (45.2)	57 (22.6)
The Nigeria government should place more emphasis on enlightenment campaign programmes rather than enforcement of the policy	175 (69.4)	32 (12.7)	45 (17.9)

Perception of EHOs on National Environmental Sanitation Policy

There were divergent opinions regarding the NESP; a majority, 157 (62.3%) disagreed with the notion that there is no need for NESP in Nigeria. In addition to this, 94 (37.3%) disagreed with the notion that the National Environment Sanitation Policy is more of theory than practical.

A majority, 177 (70.2%), respondents were of the view that the National Environment Sanitation Policy will be good in combating all environmental health problems. Not only this, a large majority, 210 (83.3%), opined that environmental sanitation issues should be taken more seriously by the EHOs. However, about half of the respondents, 114 (45.2%), disagreed with the view that EHOs have lukewarm attitude towards the implementation of the policy. A majority, 175 (69.4%), respondents indicated that Nigeria government should place more emphasis on enlightenment campaign programmes rather than enforcement of the policy.

About forty-two percent respondents disagreed with the notion that Nigeria government should place more emphasis on enforcement rather than enlightenment campaign programme. A large majority, 187 (74.2%) respondents were of the view that EHOs should be fully involved in the National Environment Sanitation Policy formulation in the future. A large majority, 189 (75.0%), disagreed with the opinion that anybody should be allowed to enforce the NESP. Furthermore, a majority, 171 (67.9%), agreed with the view that the National Environmental Sanitation Policy should be made available to all stakeholders. However, a majority, 156 (61.9%), disagreed with the notion that the National Environmental Sanitation Policy should be kept in the shelf and should not be for the public consumption. About half, 117 (46.4%), respondents disagreed with the notion that since EHOs were not fully carried along in the formulation of the National Environmental Sanitation Policy, they should not participate in its implementation (Table 4.7a).

Table 4.4b: Perception of EHOs on components of National Environmental Sanitation Policy

Statement	Agree № (%)	Disagree № (%)	Undecided № (%)
The Nigeria government should place more emphasis on enforcement rather than enlightenment campaign programme	92 (36.5)	105 (41.7)	55 (21.9)
Environment Health Officers should be fully involved in the National Environment Sanitation Policy formulation	187 (74.2)	13 (5.2)	54 (20.7)
Anybody should be allowed to enforce the National Environmental Sanitation Policy	19 (7.5)	189 (75.0)	44 (27.5)
The National Environmental Sanitation Policy should be made available to all stakeholders	171 (67.9)	19 (7.5)	62 (24.6)
The National Environmental Sanitation Policy should be kept in the shelf and should not be for the public consumption	34 (13.5)	156 (61.9)	62 (24.6)
Since EHOs were not fully carried along in the formulation of the National Environmental Sanitation Policy, they should not participate in its implementation	70 (27.8)	117 (46.4)	65 (25.8)

Activities respondents carried out in the last one year

Parts of daily activities/schedule of duty carried out by respondents in the last one year prior to the time of the study were categorised into three: infection control related activities, health promoting activities and inspection of facilities. Routine house inspection and abatement of nuisance (219, 86.9%) topped the list of activities carried out within the period; disinfections and disinfestations activities, control of abattoir, control of insect vectors and other pests, undertake health education of public on matters on health and environment as well as social mobilisation officer and generally undertake integrated approach to waste management were listed by 196 (77.8%), 190 (75.4%), 187 (74.2%), 181 (71.8%) and 180 (71.4%) respondents respectively (See table 4.8 for details)

**Table 4.5: Activities respondents carried out during the year preceding the study
(practice of EHOs) n = 252**

Variable	N_o	%
Activities carried out in the last one year (Multiple responses included)		
<i>Infection control activities</i>		
Bacteriological and chemical senility and analysis	121	48.0
Air pollution control	157	62.3
Disinfections and disinfestations activities	196	77.8
Control of animal reservoirs of infection	161	64.7
Control of insect vectors and other pests	187	74.2
Control of abattoir	190	75.4
<i>Health promoting activities</i>		
Served as program officer for a number of health activities aimed at controlling disease such as onchocerciasis, schistosomalis, malaria etc	145	57.5
Acting as counsellor on environmental matters referred by local government and also a relief officer in emergencies	150	59.5
Generally undertake integrated approach to waste management	178	70.6
Undertake health education of public on matters on health and environment as well as social mobilisation officer	180	71.4
<i>Inspection of facilities</i>		
Routine house inspection and abatement of nuisance	219	86.9
Acting as law enforcing officer in matters of public and environmental health	181	71.8
Helping in the design, registration and inspection of aerated water factory and other regulated premises	175	69.4
Integrated waste management activities in the LGA	171	68.4
Periodic factory inspection for hygiene and environment sanitation	160	63.0

Hypotheses

Hypothesis One:

H0: There is no significant association between EHOs level of education and their knowledge on the policy about the national environmental sanitation and its possession.

The result from both frequencies presented in the table below shows that majority (59.0%) of EHOs had not gotten less than HNDs which is greater than minimum required of level of education for recruitment into the Environmental Health profession declared no knowledge of National Environmental Sanitation Policy. This was also reflected in among those who claimed higher educational attainment who had no knowledge of the policy document, such as Bachelor (57.4%) and 50.0% of post-graduate holder (p-value = 0.944(p>0.05). The chi-square result therefore shows that there was no significant association between EHOs type of higher education and their knowledge on the policy about the national environmental sanitation and its possession. Environmental health officers irrespective of their educational qualification are expected to be acquitted with the national environmental sanitation policy as this is the trust of their work; they are expected to be well versed in the contents of this policy. It is assumed that for them to effectively perform their roles as implementers of the policy they must understand the policy adequately and this can be achieved only through reading and understand the policy. Based on this result therefore, the null hypothesis was not rejected.

Table 4.6: Possession of the National Environmental Sanitation Policy by level of education

(n = 252)

Socio-Demographic Characteristics	Possession of NESP			X ²	Df	p-value
	Yes (%)	No (%)	Total (%)			
Education						
HND	43(41.0)	62 (59.0)	105 (100.0)	0.116	2	0.944
Bachelor	49 (42.6)	66 (57.4)	115 (100.0)			
Others *	1 (50.0)	5 (50.0)	2 (100.0)			

* Master, Post-graduate Diploma

Hypothesis two:

H0: There is no significant association between EHOs sex and their knowledge on the policy about the national environmental sanitation.

The result from the table 4.10: revealed that less than half of both male (44.2) and female (39.6%) respondents respectively claimed that they had knowledge of National Environmental Sanitation Policy while the more than half of both sexes had no knowledge and possession of the policy. This was shown in the chi-square result as p-value = 0.463 ($p > 0.05$). With this result, the null hypothesis which says there is no significant association between EHOs sex and their knowledge on the policy about the national environmental sanitation was accepted.

Table 4.7: Possession of the National Environmental Sanitation Policy by sex (n = 222)

Socio-Demographic Characteristics	Possession of NESP			X ²	df	p-value
	Yes (%)	No (%)	Total (%)			
Sex						
Male	57 (44.2)	74 (56.9)	130 (100.0)	0.538	1	0.463
Female	36 (39.6)	55 (60.4)	91 (100.0)			

Hypothesis three:

H0: There is significant association between the EHOs status and their practice of the policy about the national environmental sanitation

Comparism of association between the EHOs status and their practice of the policy about the national environmental sanitation

The result from the comparism of association between the EHOs status and their practice of the policy about the national environmental sanitation revealed that there is significant association between the EHOs status and their practice of the policy about the national environmental sanitation p-value 0.044 ($p < 0.05$). This was supported by the frequency shown in table 4. 11 as most (100.0%) of the respondents who had being in the practice for more than 15years and those claimed 11-15years of practice (56.1%) fall within senior management cadres which means as the respondents increases in cadre so their practicing of national environmental sanitation policy improving. Therefore the null hypothesis was not accepted as result of the outcome chi-square generated.

Table 4.8: Comparism of association between the EHOs status and their practice of the policy about the national environmental sanitation

Practicing of EHO	Position/Ranking			Chi-square
	Middle Management (%)	Senior Management (%)	Total (%)	
Years of practicing				Chi-square = 9.795 Df = 4 P-Value = 0.044
None	6 (42.9)	8 (57.1)	14 (100.0)	
1-5years	4 (57.1)	3 (42.9)	7 (100.0)	
6-10years	54 (63.5)	31 (36.5)	85 (100.0)	
11-15years	54 (43.8)	69 (56.1)	123 (100.0)	
16years and above	0 (0.0)	1 (100.0)	1 (100.0)	

Hypothesis four:

H0: There is no significant association between EHOs years of experience and their knowledge on the policy about the national environmental sanitation and its possession.

Relationship between number of years of service and accessibility to the National Environmental Sanitation Policy

The result generated below shows that majority (70.0) of those who had seen the policy before the commencement of this study among the EHOs that voluntarily responded had spent 30 years and above in service followed by those who have been in service between 20-29years in service (63.0%), 10–19 years (62.0%) and 50.0% fall within 1-9years of experience at work, p-value 0.224 ($p > 0.05$). (See table 4.9 for details). Chi-square result evidently shown that there is no significant relationship between the number of years of service and accessibility to the National Environmental Sanitation Policy at a glance.

Table 4.9: Number of years of service and access to the National Environmental Sanitation Policy n = 252

Ever seen the NESP before						
Years in service	Yes		No		Total	
	N _e	%	N _e	%	N _e	%
1-9 years	50	50.0	50	50.0	100	100.0
10-19 years	44	62.0	27	38.0	71	100.0
20-29 years	38	63.3	22	36.7	60	100.0
30 years and above	7	70.0	3	30.0	10	100.0

$$X^2 = 4.372; \quad df = 3; \quad p = 0.224$$

Suggestions for improvement on the policy

1. Some suggestions provided by the respondents for proper implementation and future improvement are: EHOs should be carried along in the implementation of the policy at all levels – federal, state and local – the technical committee should be adequately funded.
2. All the stakeholders need to be carried along, more education and enlightenment should be given priority attention and issues on environmental submission should not be politicised.
3. There is need for regular review by government and stakeholders in public health field.
4. There is the need to launch the policy at federal, state and local level. Environmental sanitation days should be observed at federal, state and local level throughout the federation.
5. All registered EHOs should be given copies of the policy and allowed to implement it in accordance with the provisions therein. Implementation and enforcement by EHOs is the best option for more effectiveness
6. The policy can be fully implemented if all the stakeholders involved are ready and willing to read and enlighten the general populace of the importance of this policy. Raising awareness and enlightenment campaign programme for health officers

CHAPTER FIVE

DISCUSSION

Socio demographic characteristics of the participants

Analyses yield findings that will be of use to authorities, policy makers, stakeholders as well as Environmental Health division of the ministry; those seeking to improve the condition of our environment. The researcher found that most EHOs were employed by the local governments in the state. This is consistent with the comments in Wikipedia where it was stated that EHOs are usually employed by local government or state health authorities to advise on and enforce public health standards. Majority had first degree or graduates of school of health technology. This is in line with what obtains from the Commonwealth of Nations and the Republic of Ireland where EHOs or their equivalents are referred to as Public Health Inspectors, Sanitarians, Health Protection Officers etc. In Australia and the United Kingdom EHOs are also known as "Environmental Health Practitioners", a term used to describe a collective group of professionals that work directly or indirectly in the Environmental Health profession, for example, food technology, microbiology, health promotion, immunization, environmental law, etc
(wikipedia /Environmental_health_officer retrieved on 14 Nov 2008).

Awareness of National Environmental Sanitation Policy

Findings showed that respondents had a poor understanding and knowledge on the Environmental Sanitation Policy. Although some have seen the National Environmental Sanitation Policy before, only a few respondents who are professional have a copy of it. Only a few have read the policy document.

The poor understanding of the policy document is evident in the responses on respondents' awareness of such document. For instance, there were differing opinion on the year the policy was developed with suggestions ranging between the year 2000 and 2005, some were of the opinion that the policy was developed by the Federal Ministry of Environment almost half of the respondents were non responsive on this.

A large majority do not know the number of technical committee provision was made for in the document.

About half (53.6 %) were able to list ten essential components of environmental sanitation outlined in the policy, which is similar to their day to day activities. Essentially, this is what they are expected to do on daily basis; the policy is to back up their activities thus giving them a framework of creating result in the real world. A majority opined that the policy on environmental sanitation is comprehensive and should be able to improve the nation's environment. This is in line with reports from other countries such as South Africa, Congo, Peru and Pakistan where policy on environmental sanitation is bringing improvement in their respective environment. The result also showed that a majority (67.5%) were of the opinion that if properly implemented, the policy will improve the health status of citizens. This is consistent with the objective of forming policy in that it is formulated to bring about positive result in the real world.

Many respondents affirmed that EHOs are the most appropriate professionals that should implement the policy, but there are other sectors or stakeholders who may be very important in the implementation of such a policy. It is about human beings, it is about our environment and for behaviour and attitudinal change and there will always be collaboration with other stakeholders. A few of the respondents agreed that the national environment sanitation policy is more of theory than practical. This may be true because of the similarities in respondents' daily routine and the components of the document. A majority (70.2%) agreed that the national environmental sanitation policy will be good in combating all problems in the environment and they also agreed that Nigerian government should lay emphasis on enlightenment campaign of the policy rather than enforcement.

Education is a prerequisite for efficiency and effectiveness in any endeavour; it is not strange therefore that education was associated with the level of awareness of the policy document. Year of service was not associated with the knowledge of the essentials components of the policy, this was not strange too because each EHO is acquitted with all these right from their training school.

Implications of the findings for Health Education

The findings from the discussions and dialogue acknowledged that there are needs to strengthening the capabilities of EHOs at the local, state and federal level on the overall aspect of environmental health and the policy document most especially in the area of its awareness and implementation as well as other intervention programmes at state and local level.

Advocacy and enlightenment campaign are necessary in order to enhance the performance of EHOs. The document should be made available to these officers so that they could understand what provision is made for them and the best way to achieve the desired outcomes.

Conclusion

It is evident that not many EHOs are adequately acquitted with the National Environmental Sanitation Policy as well as the provisions therein. Policy is designed to achieve meaningful results in the real world; therefore it is clear that EHOs need to be assisted to be more efficient and effective through better understanding of the policy document.

Recommendations

The recommendations based on the findings of this study are as follow:

1. There is a need to conduct a review of the country's environmental sanitation policies in view of the current effort to organize the sector.
2. Provision of the document for all stakeholders as well as the public too so that they could be acquitted with the provision therein.
3. There is need for enlightenment campaign on the importance of this document.
4. All the relevant agencies need be mobilised so that the document could be implemented as in accordance with the provision therein.
5. The implementation of meetings, dialogues, workshops and opportunities to share learning under the leadership of the Federal Ministry of Environment would be a demonstration of will and serve to fill the current vacuum.

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APPENDIX A:
PERCEPTION AND PRACTICE OF EHOS RELATING TO COMPONENT
OF THE NATIONAL ENVIRONMENTAL SANITATION POLICY IN OGUN
STATE, NIGERIA

Consent form for Survey Respondents

Name of Principal Investigator: Onifade Isiaka Alani

Name of Organization: University of Ibadan

Greeting: My name is Onifade Isiaka Alani and I am a graduate student of the department of Health Promotion & Education, College of Medicine, University of Ibadan. I am part of a team doing a research study on perception and practice of EHOs on national environmental sanitation policy in Ogun state. Based on the findings of the study, we also plan to educational programmes that will enable policy makers initiate implementable policy on environmental sanitation.

1. Purpose of the research:

We are planning to carry out a study to know the perception and practice of EHOs relating to the component of national environmental sanitation policy in Ogun state.

2. Duration of the research:

The duration of this research, which you are being requested to participate in is 1 month.

3. Procedures:

We invite you to take part in this research project and participate in the questionnaire. If you accept, you will be asked to participate in the filling of the questionnaire which will be given to you. If you do not wish to answer any of the questions posed in the questionnaire, you may say so and can move on to the next question. No one else but the researcher alone will be present. The information recorded is considered confidential, and no one else except Mr. Onifade Isiaka Alani and his colleagues will have access to the information documented during the research.

We will record your answers to these questions on this questionnaire. This is done so that we can remember everything that you have told us. Although it is important for the research that you answer all questions, if you do not wish to answer any of the

questions included in the survey, you may be asked to move on to the next question. Filling the questionnaire will last for approximately 25 minutes.

4. Risks and Discomforts:

There is a slight risk that you may feel uncomfortable talking about some of the topics. However, we do not wish this to happen, and you may refuse to answer any question or not take part in a portion of the interview if you feel the question(s) makes you uncomfortable.

5. Benefits:

There will be no direct benefit to you but the information obtained from this study will help in improving environmental standard in the nations, provide suggestions that will enable the researcher develop appropriate programme for policy makers, and other stakeholders in health sector, to develop policy on environmental sanitation for both public as well as workers. You will not be provided with any incentives to take part in the research.

6. Confidentiality:

We have taken the following steps to ensure that are safe and that the information you provide is confidential.

Filling of questionnaire will take place immediately it is given.

The information that we collect from this research project will be kept confidential.

Information collected from you will be stored in a file that will not have your name on it, but a number assigned to it instead.

The questionnaire containing the interview will be stored for the duration of 2 years after which it would be destroyed.

The name associated with the number assigned to each file will be kept under lock and key and will not be disclosed to any one except colleagues working on this study.

You may talk to the leader of the research team in case you have any concern or question.

7. Alternative to participation:

You do not have to take part in this research if you do not wish to do so. Even if you do not wish to answer these questions you may still benefit from the study. You may stop participating in the interview at any time that you wish, and there will be no negative consequences for you in any way.

8. Who to contact:

If you have any question you may ask those now or later. If you wish to ask questions later, you may contact any of the following:

1. Mr. Onifade Isiaka Alani

Address: Department of Health Promotion & Education, College of Medicine, University of Ibadan, Ibadan.

Tel No: 08034255492

e-mail: onifadeia@yahoo.com

or

2. Professor, Ademola J. Ajuwon

Address: Department of Health Promotion & Education, College of Medicine, University of Ibadan, Ibadan.

Tel No: 08034892561

e-mail: ajajuwon@yahoo.com

9. Certificate of Consent for Qualitative Study.

I have been invited to take part in the research on the perception and practice of EHOs relating to component of the national environmental sanitation policy in Ogun state I have read the foregoing information,. I have had the opportunity to ask questions I consent voluntarily to be a participant in this study and understand that I have the right to withdraw from the interview at any time without in any way affecting my medical care.

Print name of Participant

Date and Signature of Participant

.....

..... -----/ -----/ ----- (dd/mm/yy)

Print Name of Researcher/Moderator

Date & Signature of researcher/moderator

-----/ -----/ ----- (dd/mm/yy)

APPENDIX C
PERCEPTION AND PRACTICE OF EHOS RELATING TO COMPONENT
OF THE NATIONAL ENVIRONMENTAL SANITATION POLICY IN OGUN
STATE, NIGERIA.

QUESTIONNAIRE

My name is Onifade Isiaka Alani, a postgraduate student of the department of Health Promotion & Education, Faculty of Public Health, College of Medicine, University of Ibadan, carrying out a research work on Environmental Health Officers perception and practice relating to component of the National Environmental Sanitation Policy.

I wish to inform you that there are no right or wrong answers to the questions I will ask you. Please, be informed also that participation is voluntary. Your identity, responses and opinions will be kept confidential and no name is required in filling the questionnaire. Please try and give honest responses to the questions I will ask you as much as possible. You are free to ask questions as the interview progresses. Thank you for cooperation.

Section A: Demographic Data

Instruction: I would like to ask you some questions that are a bit personal, please do not be offended. Your answers to the questions will enable me to learn from you and better understand and appreciate the issue being investigated. Kindly respond correctly to the questions below without holding back any piece of information.

1. Sex: 1. Male 2. Female
2. Age (at your last birthday):
3. Ethnic group: 1. Yoruba 2. Igbo 3. Hausa 4. Other (please specify) _____
4. Marital status. 1. Single 2. Married 3. Divorced
4. Widowed
5. Religion 1. Christianity 2. Islam 3. Traditional
4. Others specify
6. Highest level of education (tick): 1. OND 2. HND/Bachelor
3. Postgraduate 4. Others (specify)
7. Settlement area 1. Rural 2. Urban
8. What is your current status in the job? _____
9. How long have you been practicing as an Environmental Health officer? _____
10. Where do you currently working?
1. Local Govt ()
2. State Govt ()

Section B: Knowledge about National Environmental Sanitation Policy

11. Have you seen the National environmental sanitation policy before?
1. Yes 2. No
12. If yes, do you have a copy of the policy?
1. Yes 2. No
13. Have you read the policy? 1. Yes 2. No

14. In which year was the policy formulated? _____
15. Who developed the national environmental sanitation policy?

16. List ten essential components of environmental sanitation that was outlined in the national policy on environmental sanitation.
1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____

Section C: Perceptions about the National Environmental Sanitation Policy

Instruction: The table below contains some perception on National Environmental Sanitation Policy Please let me know whether you **Agree [A], Disagreed [D] or Not Sure [NS]** with the perception.

	Statement	A	D	NS
17	All those involved in environmental sanitation policy from the local government state, and federal come together fore proper deliberation on the right approach to enforcement of relevant comes on environmental sanitation			
18	Proper health education be stepped up in all the local government areas			
19	Monthly nation environmental sanitation exercise must be compulsory in all the state			
20	The provision of infrastructures for all component or environmental sanitation control is given adequate attention in the local government			
21	That a term work approach be adopted by local government, state , and federal officer involved in environmental sanitation control			
22	Environmental pollution problems must be given a better attention by the government. In particular. The present practice of dimply refuse indiscriminately in our citizen must be discouraged be all means			
23	Environmental sanitation issues should be taken more seriously by the EHOs.			
24	More than ever before, government at both state and local government must mount appropriate health education programmed and enlightenment programmed on environmental sanitation			

Section D: Suggestions for improvement

In view of the above, kindly indicate whether you Agree or Disagreed with the following statements:

25. That all those invoked in environmental sanitation policy from the local government state and federal come together for proper deliberation on the right approach to enforcement of relevant comes on environmental sanitation. 1. Agree 2. Disagreed
26. Proper health education should be stepped up in all the local government areas. 1. Agree 2. Disagreed
27. Monthly nation environmental sanitation exercise must be compulsory in all the state 1. Agree 2. Disagreed
28. The provision of infrastructures for all component or environmental sanitation control is given adequate attention in the local government. 1. Agree 2. Disagreed
29. A team work approach be adopted by local government, state, and federal officer involved in environmental sanitation control 1. Agree 2. Disagreed
30. Environmental pollution problems must be given a better attention by the government in particular. The present practice of dimply refuse indiscriminately in our citizen must be discouraged be all means. 1. Agree 2. Disagreed
31. Environmental sanitation issues should be taken more seriously by the environmental health officers. 1. Agree 2. Disagreed
- 32.. More than ever before, government at both state and local government must mount appropriate health education programmed and enlightenment programmed on environmental sanitation 1. Agree 2. Disagreed

Practice of EHOS on NESP

Instruction: In the following statement, you might tick (☑) as many as apply to you

33. I perform the following duties:
- | | |
|---|--------------------------|
| Routine house inspection and abate mat of nuisance | <input type="checkbox"/> |
| Acting as law enforcing a pork in matter of public and environmental health | <input type="checkbox"/> |
| Helping in the design, registration and inspection of aerated water factory in charging regulated premises | <input type="checkbox"/> |
| Undertake integrated waste management activities in the LGA | <input type="checkbox"/> |
| Periodic factory inspection for health environmental aspect | <input type="checkbox"/> |
| Undertake bacteriological and chemical senility and analysis supply | <input type="checkbox"/> |
| Elimination of work place and environmental hazards | <input type="checkbox"/> |
| Air pollution control | <input type="checkbox"/> |
| Disinfections and disinfestations activities | <input type="checkbox"/> |
| Control of animal reservoirs of infection | <input type="checkbox"/> |
| Control of insect vectors and other nests | <input type="checkbox"/> |
| Control of abattoir and stupider houses in charge sanitation | <input type="checkbox"/> |
| Servile as program officer for a number of health activities aimed at centrally diseases such as onchocerciasis, schist Somalis malaria etc | <input type="checkbox"/> |
| Acting as a ‘‘counsellor ‘ on environmental matters referred by the local government and also a relief officer in emergencies / origin. | <input type="checkbox"/> |

- Generally undertake intergrades approach to waste management
- Undertake health education of public on matters on health.
- Also servile as social mobilization officer on some.

Thank you for your precious time and cooperation.