NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF SCIENCES AND TECHNOLOGY

COURSE CODE: EHS 205

COURSE TITLE: INTRODUCTION TO ENVIRONMENTAL HEALTH

COURSE GUIDE

EHS 205

INTRODUCTION TO ENVIRONMENTAL HEALTH

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INTRODUCTION

EHS 205: Introduction to Environmental Health is a 2-credit unit course. It is broken down into 5 modules and 14 units. It presents an in-depth chronicle of historical development of environmental health in Nigeria and an overview of environmental health and public health careers. Specifically, what you will learn in this course include definitions, concepts, components and determinants of environmental health.

At the end of this course, it is expected that you should be able to understand and explain issues relating to the evolution of environmental health and the pioneering roles of the father of environmental health in Nigeria.

This Course Guide therefore tells you briefly what the course: EHS 205 is all about, the type of course materials to be used, what you are expected to know in each unit, and how to work through the course material. It suggests the general guidelines and emphasises the need for Self-Assessment and Tutor-Marked Assignments (TMAs). There are also tutorial classes that are linked to this course and you are encouraged to attend.

WHAT YOU WILL LEARN IN THIS COURSE

The course content consist of a unit of the Course Guide which explains to you briefly what the course is about, what course materials you need and how to work with such materials. It also gives you some guidelines on the time you are expected to spend on each unit in order to complete it successfully.

It guides you concerning your Tutor-Marked Assignments which will be placed in the assignment file. Regular tutorial classes related to the course will be conducted and it is advisable for you to attend these sessions. It is expected that the course will prepare you for challenges you are likely to meet in the field of Environmental Health.

COURSE AIMS

This course aims to give you an in-depth understanding of environmental health. It is hoped that this background information will buffer your interest in environmental health practice and equip you with the necessary skills to excel in your examination and beyond.

COURSE OBJECTIVES

Note that each unit has specific objectives. You should read them carefully before going through the unit. You may want to refer to them during your study to check on your progress. You should always look at the unit objectives after completing a unit. In this way, you can be sure that you have done what is required of you by the unit.

However, below are overall objectives of this course. On successful completion of this course, you should be able to define and differentiate between the following terms:

- Environmental Health

- Sanitation
- Hygiene
- Basic sanitation
- On Site Sanitation
- Housing Sanitation
- Environmental Sanitation
- Ecological sanitation and related terminologies
- Explain the development of hygiene and sanitation both in the ancient and modern periods
- List a few discoveries by scientists in the 19th centuries
- Explain the history of environmental health Practice in Nigeria
- Mention key founding fathers of Environmental Health in Nigeria
- Enumerate the various nomenclatures of Environmental Health Officers from the beginning to today
- Mention the father of public health in Nigeria
- Narrate briefly the life history of Dr. Isaac Ladipo Oluwole
- List five of the prominent achievements of Dr. Isaac Ladipo Oluwole in public health practice in Nigeria
- Discuss evolution of RSH, WAHEB etc
- Mention 4 Pioneer Training Institutions for environmental health programmes in Nigeria
- Explain roles of Environmental Health association and Environmental Health Officers Registration Council of Nigeria
- List and explain the various determinants of health
- Describe a few evidence-based of health determinants
- Explain our interaction with the environment and possible environmental hazards
- Identify various Environmental risk factors and their related diseases and conditions
- Describe how humans can affect the environment
- Explain how the environment can affect humans
- Explain how both humans and the environment can co-exist
- Define waste pickers and their attributes
- Mention 5 benefits of waste picking to the economy
- Explain the health risks of waste picking
- List the systematic description of a work-plan
- Prepare and present a typical annual work- plan of action for improvement of environmental health activities to the head of your unit
- List the core components of public health as a profession
- Discuss the roles of environmental health in public health
- List 10 oversight functions of an Environmental Health Officer

- List 5 areas of specialisations in environmental health practice.

WORKING THROUGH THIS COURSE

To complete this course, you are required to read the units, the recommended text books, websites and other relevant materials. Each unit contains self-assessment exercises and tutor-marked assignments. There is also a final examination at the end of this course. Stated below are the components of this course and what you have to do.

COURSE MATERIALS

The major components of the course are:

1. Course Guide
2. Study Units
3. Text Books
4. Assignment File
5. Presentation Schedule

STUDY UNITS

There are 14 study units and 5 modules in this course. They are:

Module 1 Origin Environmental Health

Unit 1 Concepts and Definitions

RECOMMENDED TEXTS

These texts will be of immense benefit to this course.

Biographical Publication of the Society of Health, Nigeria. (1971). Ibadan: Abiodun Printing Press.

Colborn, T.; Dumanoski, D.; & Petersen, M. J. (1996). *Our Stolen Future*. New York: Dutton.

eNotes.com

Huntington, E. (1915). *Civilisation and climate*. New Haven, Conn: Yale University Press.

Independent Commission on International Development Issues. (1980) *North South a Programme for Survival*. London: Pan.

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Last, J. M. (1995). *A Dictionary of Epidemiology*, (3rd ed.) New York: Oxford University.

Mabogunje, A.L. (1980). *The Development Process: A Spatial Perspective*. London: Hutchinson.

Morrison, D.E. (1886). “How and Why Environmental Consciousness has Trickled Down”. Schnaiberg, N. Watts & Zummerman, K. (Eds). *Distributional Conflicts in Environmental Resource Policy*. Aldershot: Gower.

University Press. (1997). *Public Health and Human Ecology*. (2nd ed.). Stamford, CT: Appleton & Lange.

Soskolne, C. L. (1998). "The Generation and Transport of Hazardous Wastes: Social and Ethical Issues." *Encyclopaedia of Occupational Health and Safety*. (Ed). J. M. Stellman. Geneva: International Labour Office.

ASSIGNMENT FILE

The assignment file will be given to you in due course. In this file, you will find all the details of the work you must submit to your tutor for marking. The marks you obtain for these assignments will count towards the final mark for the course. Altogether, there are 14 Tutor-Marked Assignments (TMAs) for this course.

PRESENTATION SCHEDULE

The presentation schedule included in this Course Guide provides important dates for completion of each unit and Tutor-Marked Assignment. You should therefore try to meet the deadlines.

ASSESSMENT

There are two aspects to the assessment of this course. There are Tutor-Marked Assignments and the written examination.

You are expected to apply knowledge, comprehension, information and problem solving gathered during the course. Your final TMA will be presented in e-format and this account for 30% of your exam score. At the end of the course, you will need to sit for a final written examination. This examination will account for 70% of your total score.

TUTOR-MARKED ASSIGNMENTS (TMAs)

You are expected to attempt all the TMAs in your study material. However, 4 TMAs will be uploaded in your portal. The best 3 will count towards your final exam grade.

FINAL EXAMINATION AND GRADING

The final examination for EHS 205 will be of 2 hours and have a value of 70%. The examination will consist of questions which reflect the self-assessment exercises and tutor-marked assignments that you have previously encountered. Furthermore, all areas of the course will be examined. It is also better to use the time between finishing the last unit and sitting for the examination, to revise the entire course. You might find it useful to review your TMAs and comment on them before the examination. The final examination covers information from all parts of the course.

COURSE MARKING SCHEME

The following table include the course marking scheme.

Table 1:Course Marking Scheme

Assessment	**Marks**
TMAs	30 %
Final Examination	70%
Total	100%

COURSE OVERVIEW

This table indicates the units, the number of weeks required to complete them and the assignments.

Table 2: Course Organiser

Unit	Title of Work	Weeks Activity	Assessment (End of Unit)
MODULE 1	**ORIGIN OF ENVIRONMENTAL HEALTH**		
Unit 1	Concepts and definitions.	Week 1	Assignment 1
Unit 2	Historical perspectives of Hygiene and Environmental Health.	Week 2	Assignment 2
Unit 3	Historical background of environmental health in Nigeria	Week 3	Assignment 3
MODULE 2	**FOUNDING FATHERS, INSTITUTIONS AND REGULATORY BODY.**		
Unit 1	The Father of Public Health in Nigeria	Week 4	Assignment 4
Unit 2	Pioneer Training Institutions for Environmental Health, Association and Professional Regulatory Body.	Week 5	Assignment 5
MODULE 3	**HEALTH DETERMINANTS AND ENVIRONMENTAL HEALTH COMPONENT**		
Unit 1	Concepts and Principles in Hygiene and	Week 6	Assignment 6

	Environmental Health		
Unit 2	The Determinants of Health	Week 7	Assignment 7
Unit 3	Components of Environmental Health.	Week 8	Assignment 8
MODULE 4	**COMMUNITY ENVIRONMENTAL HEALTH**		
Unit 1	Environmental Health In The Community	Week 9	Assignment 9
Unit 2	Human Interaction with the Environment	Week 10	Assignment 10
Unit 3	Global Waste Picking	Week 11	Assignment 11
MODULE 5	**WORK PLAN & CAREER IN ENVIRONMENTAL HEALTH**		
Unit 1	Environmental Health Work Plan	Week 12	Assignment 12
Unit 2	Environmental Health in Public Health	Week 13	Assignment 13
Unit 3	Career in Environmental Health	Week 14	Assignment 14

HOW TO GET THE MOST OUT OF THIS COURSE

In distance learning, the study units replace the University Lecturer. This is one of the huge advantages of distance learning mode; you can read and work through specially designed study materials at your own pace and at a time and place that suit you best. Think of it as reading from the teacher, the study guide tells you what to read, when to read

and the relevant texts to consult. You are provided exercises at appropriate points, just as a lecturer might give you an in-class exercise.

Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit and how a particular unit is integrated with the other units and the course as a whole. Next to this is a set of learning objectives. These learning objectives are meant to guide your studies. The moment a unit is finished, you must go back and check whether you have achieved the objectives. If this is made a habit, then you will significantly improve your chances of passing the course. The main body of the units also guides you through the required readings from other sources. This will usually be either from a recommended text book or from other sources.

Self-Assessment Exercises are provided throughout the unit, to aid personal studies. Working through these self tests will help you to achieve the objectives of the unit and also prepare you for tutor-marked assignments and examinations. You should attempt each self test as you encounter them in the units.

The following are practical strategies for working through this course.

1. Read the Course Guide thoroughly.
2. Organise a study schedule. Refer to the course overview for more details. Note the time you are expected to spend on each unit and how the assignment relates to the units. Important details, e.g. details of your tutorials and the date of the first day of the semester are available at your study centre. You need to gather together all these information in one place such as a diary, a wall chart calendar or an organiser. Whatever method you choose, do endeavour to adhere to it.
3. Once you have created your own study schedule, do everything you can to stick to it. The major reason that students fail is that they get behind with their course works. If you get into difficulties with your schedule, please let your tutor know before it is too late for help.

4. Turn to Unit 1 and read the introduction and the objectives for the unit.
5. Assemble the study materials. Information about what you need for a unit is given in the table of content at the beginning of each unit. You will almost always need both the study unit you are working on and one of the materials recommended for further readings, on your desk at the same time.
6. Work through the unit, the content of the unit itself has been arranged to provide a sequence for you to follow. As you work through the unit, you will be encouraged to read from your set books.
7. Keep in mind that you will learn a lot by doing all your assignments carefully. They have been designed to help you meet the objectives of the course and will help you pass the examination.
8. Review the objectives of each study unit to confirm that you have achieved them. If you are not certain about any of the objectives, review the study material and consult your facilitator.
9. When you are confident that you have achieved a unit's objectives, you can start on the next unit. Proceed unit by unit through the course and try to pace your study so that you can keep yourself on schedule.
10. When you have submitted an assignment to your tutor for marking, do not wait for its return before starting on the next unit. Keep to your schedule. When the assignment is returned, pay particular attention to your tutor's comments, both on the tutor marked assignment form and also written on the assignment. Consult you tutor as soon as possible if you have any questions or problems.
11. After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit objectives (listed at the beginning of each unit) and the course objectives (listed in this course guide).

TUTORS AND TUTORIALS

There are 16 hours of tutorial provided in support of this course. You will be notified of the dates, time and location together with the name and phone number of your tutor as soon as you are allocated a tutorial group.

Do not hesitate to contact your tutor by telephone, e-mail or discussion board if you need help. The following might be circumstances in which you would find help necessary: contact your tutor if:

- You do not understand any part of the study units or the assigned readings
- You have difficulty with the self test or exercise
- You have questions or problems with an assignment, with your tutor's comments on an assignment or with the grading of an assignment.

You should try your best to attend the tutorials. This is the only chance to have face to face contact with your tutor and ask questions which are answered instantly. You can raise any problem encountered in the course of your study. To gain the maximum benefit from the course tutorials, prepare a question list before attending them. You will learn a lot from participating in discussion actively. BEST of LUCK!

MAIN COURSE

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MODULE 1 ORIGIN OF ENVIRONMENTAL HEALTH

UNIT 1 CONCEPTS AND DEFINITIONS

CONTENTS

1.0 INTRODUCTION

In the field of environmental health, there are many concepts and terminologies in use, just like any other profession. You will learn about some of these concepts and terminologies in this unit as an introduction to environmental health practice. However, the list of concepts provided in this unit is not exhaustive. You will learn more in other courses as you progress in the programme. It is important to take note of the different definitions and in particular the differences between the various terms. For example, there are differences between hygiene, sanitation and environmental health. While hygiene focuses on individual personal hygiene/cleanliness, sanitation often refers to waste management, and environmental health has a broader meaning beyond hygiene and sanitation, referring to where we live, work and play. The focus of environmental health is on how environmental risk factors affect human health. Now read on.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- environmental Health
- sanitation
- hygiene
- basic sanitation
- on Site Sanitation
- housing Sanitation
- environmental Sanitation
- ecological sanitation and related terminologies.

3.0 MAIN CONTENT

3.1 Environmental Health

Environmental health is broader than hygiene and sanitation; it encompasses hygiene, sanitation and many other aspects of the environment such as global warming, climate change, radiation, gene technology, flooding and natural disasters. It also involves studying the environmental factors that affect health. The World Health Organisation's definition is as follows:

> Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors influencing behaviours. It encompasses the assessment and

control of those environmental factors that can potentially affect health.

3.2 Hygiene

The term hygiene on the other hand refers to the set of practices associated with the preservation of health and healthy living. The focus is mainly on personal hygiene that looks at cleanliness of the hair, body, hands, fingers, feet and clothing, and menstrual hygiene.

Improvements in personal knowledge, skill and practice that modify an individual's behaviour towards healthy practice are the focus of hygiene promotion. Safe hygiene practice includes a broad range of healthy behaviours, such as hand washing before eating and after cleaning a child's bottom, and safe faeces disposal. When you carry out hygiene education and promotion the aim is to transfer knowledge and understanding of hygiene and associated health risks in order to help people change their behaviour to use better hygiene practices.

3.3 Sanitation

Sanitation means the prevention of human contact with wastes, for hygienic purposes. It also means promoting health through the prevention of human contact with the hazards associated with the lack of healthy food, clean water and healthful housing, the control of vectors (living organisms that transmit diseases), and a clean environment. It focuses on management of waste produced by human activities. There are different types of sanitation relating to particular situations, such as:

3.3.1 Basic Sanitation

This refers to the management of human faeces at the household level. It means access to a toilet or latrine.

3.3.2 Onsite Sanitation

This term is used to describe the collection and treatment of waste at the place where it is deposited.

3.3.3 Food Sanitation

This term is used to refer to the hygienic measures for ensuring food safety. Food hygiene is similar to food sanitation.

3.3.4 Housing Sanitation

Housing sanitation refers to safeguarding the home environment (the dwelling and its immediate environment).

3.3.5 Environmental Sanitation

This is the control of environmental factors that form links in disease transmission. This category includes solid waste management, water and wastewater treatment, industrial waste treatment, noise and pollution control.

3.4 Ecological Sanitation

The concept of recycling the nutrients from human and animal wastes to the environment is called ecological sanitation.

3.4.1 Excreta

Waste matter from the body such as urine and faeces.

3.4.2 Urine

Is a typically stole liquid by product of the body secreted by the kidneys through a processes called urination.

3.4.3 Faeces

Waste product from digestive tract expelled through the anus.

3.4.4 Toilet

Facility for urinating and defecation including the housing required for such facility.

3.4.5 Susceptible Host

A person who has no immunity against disease attack.

3.4.6 Pathogens

Disease- causing micro-organism.

3.4.7 Urine Diversion

Separation of urine from faeces and water at the point of production.

3.4.8 Ecology

This connotes with the environment.

3.4.9 Ecosan

Another term used in place of ecological sanitation.

3.4.10 Grey Water

Grey water is domestic waste water other than that which comes from the toilet. It results from food preparation, washing of cooking utensils, cloths and body.

3.4.11 Black Water

This is wastewater that contains excreta (urine and fecal matter).

3.4.12 Yellow Water

Urine

3.4.13 Night Soil

This connotes with faeces.

3.4.14 Vault

A watertight container that receives excreta from toilets.

4.0 CONCLUSION

In this unit, you learnt some definitions and terms relating to environmental health and sanitation. In the next unit, we will examine the historical perspectives of hygiene and Environmental health.

5.0 SUMMARY

In this unit, we have being able to define Environmental Health, Sanitation, Hygiene, Basic sanitation, On Site Sanitation, Housing Sanitation, Environmental Sanitation, Ecological Sanitation and related

terminologies. Most of these terms are similar, but they are technically different in terms of focus. For example, there are differences between hygiene, sanitation and environmental health. While hygiene focuses on individual personal hygiene/cleanliness, sanitation often refers to waste management, and environmental health has a broader meaning beyond hygiene and sanitation, referring to where we live, work and play. The focus of environmental health is on how environmental risk factors affect human health.

6.0 TUTOR-MARKED ASSIGNMENT

1. Define the following terms in your own words:
   a) Onsite Sanitation
   b) Housing Sanitation
   c) Environmental Sanitation
   d) Ecological Sanitation.

2. Differentiate between environmental health and environmental sanitation.

7.0 REFERENCES/FURTHER READING

Colborn, T.; Dumanoski, D.; & Petersen, M. J. (1996). *Our Stolen Future.* New York: Dutton.

Last, J. M. (1995). *A Dictionary of Epidemiology.* (3rd ed.). New York: Oxford University Press.

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UNIT 2 HISTORICAL PERSPECTIVES OF HYGIENE AND ENVIRONMENTAL HEALTH

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt some definitions and terms that you may likely come across in this course. Now, let us look at the historical development of hygiene and sanitation. Let us find out about why, where and how it started.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the development of hygiene and sanitation both in the ancient and modern periods
- list a few discoveries by scientists in the 19^{th} centuries
- explain the word "our Environment".

3.0 MAIN CONTENT

3.1 Historical Development of Hygiene and Sanitation

Hygiene and sanitation have a long history at various levels of human civilisation. We can roughly divide the historical events into two periods: the **Ancient** and the **Modern**.

3.1.1 Prehistoric and Ancient Civilisation

Religious laws, such as Moses' Law, writings in the Old and New Testaments and laws in the Quran, played major roles in the lives of

ancient peoples. These laws mainly concentrated on the provision of personal hygiene. For instance, dead bodies and contaminated surfaces were known to be unclean or unhygienic to touch. The importance of burying human faeces was also strongly indicated. The importance of body cleanliness before praying was a motive for maintaining the integrity of hygiene with a religious practice.

The importance of hygiene and sanitation flourished at the times of Greek, Roman and Egyptian civilisation. The use of private and public baths and latrines, cleaning of the body, shaving the head for protection from lice infestation, and the construction of water pipelines and sewage ditches were widely observed. The transmission of schistosomiasis (bilharzia) was linked to bathing and swimming in the Nile River. In these civilisations, the focus was on personal hygiene (hygiene) and human waste management (sanitation).

3.1.2 Modern Times

A number of discoveries in the 19th century were important events for the understanding of communicable diseases. For example, the link between contaminated water and cholera was discovered by John Snow in 1854; the importance of hygienic hand washing before attending delivery of a baby was noted by Dr. Semmelweis in 1845; and the discovery that micro-organisms (very small organisms only visible under a microscope) cause disease was made by Louis Pasteur around this time.

The period following the Industrial Revolution in Europe in the 19th century showed that improvements in sanitation, water supply and housing significantly reduced the occurrence of communicable diseases. The term ‘environmental health’ is used to describe human health in relation to environmental factors such as these. Environmental health can be defined as the control of all the factors in a person’s physical environment that have, or can have, a damaging effect on their physical, mental or social wellbeing. The issue of environmental health is now a global matter under the guidance of the United Nations (UN) through the World Health Organisation (WHO).

Although hygiene and infection are vital factors in environmental health, it is also good to be aware of emerging issues such as global warming and the links between medical conditions such as cardio-vascular disease and our environment and lifestyles. Our environment is everything that surrounds us. It includes all the external influences and conditions that can affect our health, life and growth. These influences are constantly changing and the effects on our health may not be easily foreseen.

4.0 CONCLUSION

In this unit, you learnt about the historical evolution of hygiene and sanitation. These historical events were divided into two periods, i.e, the ancient and the modern.

5.0 SUMMARY

The historical perspectives showed that hygiene and sanitation have a deep-rooted origin in religion and science. The practice of hygiene and sanitation is part of our daily life.

6.0 TUTOR-MARKED ASSIGNMENT

1. Outline the differences and similarities in hygiene theory and practices in ancient and modern times.

7.0 REFERENCES/FURTHER READING

Colborn, T.; Dumanoski, D. & Petersen, M. J. (1996). *Our Stolen Future.* New York: Dutton.

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Last, J. M. (1995). *A Dictionary of Epidemiology.* (3rd ed.) New York: Oxford.

University Press. (1997). *Public Health and Human Ecology*. (2nd ed.) Stamford, CT: Appleton & Lange.

Soskolne, C. L. (1998). "The Generation and Transport of Hazardous Wastes: Social and Ethical Issues." *Encyclopaedia of Occupational Health and Safety* (Ed.).

J. M. Stellman (nd). Geneva: International Labour Office.

Steenland, K. & Savitz, D. A. (1997). *Topics in Environmental Epidemiology.* New York: Oxford University Press.

UNIT 3 HISTORICAL BACKGROUND OF ENVIRONMENTAL HEALTH IN NIGERIA

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt about historical development of hygiene and sanitation. This unit will take you through the historical path of Environmental Health in Nigeria. It will make you acknowledge and appreciate the roles and commitment of the founding fathers of this noble profession.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the history of environmental health Practice in Nigeria
- identify key founding fathers of Environmental Health in Nigeria
- mention the various nomenclatures of Environmental Health Officers from the beginning until today.

3.0 MAIN CONTENTS

3.1 History of Environmental Health in Nigeria

In Nigeria, the development of environmental health had a more challenging beginning. As far back as the 18th century, the colonial government took the issue of preventive health services serious because of the need to prevent the breeding of mosquitoes that was a major killer of the colonial settlers.

Sanitary reforms commenced in Lagos in 1877 with the appointment of the 1st Inspector of Nuisances. Subsequently, by 1897 Lagos had both a medical and sanitary department with Dr. H. Strachan as the Chief Medical Officer, W.W. Mackinson as Sanitary Engineer and W.F.

Lumpkin as Inspector of Nuisances. Sir William Macgregor, the first Governor in 1899 also contributed immensely to the development of environmental health in Nigeria. (Sridhar, 1999).

The cadre of Public health workers came into existence during the colonial era. Their statutory function then was purely sanitary inspection of premises as *sanitary assistants* to the colonial masters (sanitary inspectors).

At this time, the colonial masters who carried out sanitary duties of the environment in Nigeria were known as *sanitary inspectors* headed by an Inspector of Nuisances while the African/Nigerians attached to them were known as *sanitary attendants.* These attendants acted as aides to their masters to discharge various sanitary inspection activities like marking of tall trees, service of abatement notice etc under their masters' directives and close supervision. The sanitary attendants also acted as guides and interpreters to the white men.

As time went on, the *sanitary attendants* were given more responsibilities such as routine sanitary inspection of premises, collection of water samples from domestic pots or any receptacles to determine the presence of mosquitoes' larvae and breeding places of mosquitoes. This later gave rise to the name *mosquito scouts* instead of sanitary attendants.

In the early 20th century, with improved educational background, these *mosquito scouts* gathered enough experiences from their colonial masters. They were assigned more duties such as cutting down tall trees that were close to residential buildings, identification of infectious disease cases, disinfection and disinfestations, liaison between the colonial masters and villagers, verification of notices issued by their colonial masters [sanitary inspectors], collection of daily, weekly and monthly returns. They were also trained on how to handle and operate Speedo jet machine used for mass inoculation in villages, schools and markets during disease outbreaks. Thus, *mosquito scouts* were the first heath workers to be trained on immunisation.

In 1920, when Dr Isaac Ladipo Oluwole (first African Medical Officer of Health MOH in the Lagos Colony) returned from Britain as public health physician, he brought about significant changes to the status of Nigeria health workers.

He pioneered with vigour, school health services using the mosquito scouts for inspection of schools and vaccination of schoolchildren. He thought about the need to retrain the Mosquito scouts on the Job thus, he established the first Nigerian School of Hygiene at Yaba, Lagos.

Graduate of this School were later called *Sanitary Inspectors* with a Diploma of the Royal Institute of Health (RIH) London, which was later, changed to Royal Society of Health (RSH) Diploma.

In 1924, there was an outbreak of Bubonic Plague in Nigeria. The sanitary professionals were actively involved in the control of the plague epidemic. Dr. Oluwole revamped Port Health Duties and made Sanitary Inspection a vital instrument for the control of communicable diseases using entirely the Nigerian Sanitary Inspectors. These brought recognition to the Sanitary Inspectors among other cadres of health workers in Nigeria. They were referred to as "Wole-wole" among the Yorubas, "Nwaole-ala" among the Igbos and "Duba-Gari" among the Hausas. This special breed of cadre was a force to be reckoned with in the area of preventive health services in Nigeria.

By 1930s, the educational qualification and training of Sanitary Inspectors had greatly improved. Thus, the colonial government assigned them further statutory functions among which are:

- Routine sanitary inspection of houses, markets, schools and communities.
- Waste disposal and environmental sanitation, pollution control and industrial sanitation.
- Water sampling and sanitation.
- Port health duties (air, land and seaports).
- Control of communicable disease (infectious diseases).
- Building and urban planning control.
- Vector and pest control e.g. Malaria control.
- Prosecution of public health offenders in the Court.
- Meat and food inspection.
- The disposal of (paupers) the dead (corpses).
- Occupational health and factory inspection.
- Vaccination/inoculation of both school children and adults.
- Health education on personal and public hygiene was also included.

The establishment of the World Health Organisation (WHO) in 1948, brought about changes in the profession, thus many people with higher educational qualification were recruited into the profession and enhanced curriculum to accommodate the need of the society.

This was evidenced in their immense role in the eradication of Yaws and Smallpox in the late 1940s and early 1970s respectively. This led to the change of name again to Public Health Inspectors.

In 1975, the name was changed to Public Health Superintendent and later to Public Health Inspectors. By 1988, the name was changed again to Environmental Health Officers in line with the internationally accepted name of practitioners of the profession to accommodate members of the profession who graduated from the University with a degree in Public Health, Environmental Health and Epidemiology.

4.0 CONCLUSION

From this unit, the history of Environmental Health practice started in Nigeria during the Colonial era. The present day environmental health services in Nigeria started in 1920s, when Dr. Isaac Oladipo Oluwole came back from Britain as a Public Health Physician.

He was the first African Medical Officer of Health (MOH) in the Lagos Colony, who also pioneered the establishment of School Health Services using the then Sanitary Attendants. He also started the first Nigerian School of Hygiene at Yaba, Lagos in 1920 (now School of Health Technology), where qualified persons from all over Nigeria then were trained as Sanitary Inspectors.

5.0 SUMMARY

The profession started with the name Sanitary Attendant. Later it was known as Mosquito Scouts and then Sanitary Inspectors. However, in 1977 the name was changed to Public Health Superintendent and later to Public Health Inspectors. By 1988, the name was changed again to Environmental Health Officers until date in line with the internationally accepted name.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain the history of Environmental Health practice in Nigeria.
2. In a chronological order, list the names for which Environmental Health Officers had been called.

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MODULE 2 FOUNDING FATHERS, INSTITUTIONS AND REGULATORY BODY

UNIT 1 THE FATHER OF PUBLIC HEALTH IN NIGERIA

CONTENTS

1.0 INTRODUCTION

There is a common aphorism which says: “Memory forgets, but Records/History remembers”. This unit will take you through the historical path of an indigenous founding father of Public Health in Nigeria. It will make you acknowledge and appreciate his roles and commitment to the service of motherland. It is hoped that this information will serve as a platform for making decisions in your career so that the efforts of our hero past shall not be in vain.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- identify the father of public health in Nigeria
- describe briefly the life history of the icon of Public Health
- list five of his prominent achievements in public health practice in Nigeria.

3.0 MAIN CONTENT

3.1 Profile of the Father of Public Health in Nigeria

It is the absence of African footprints on the sands of time that led to the saying 'Africa has no past'. This, however, does not mean that Africa has not produced great men, although their eminence, unfortunately, has not been spotlighted on the pages of history and their achievements have hitherto been shrouded with silence. The era of silence is over and no better testimony of this could be found than in recording, in permanent form, the lives of the outstanding and famous personalities the mother Africa has produced.

One of them is Dr. Isaac Ladipo Oluwole, a pioneer in the field of Public Health at a time when it was regarded as the 'cesspool of Medicine'. Such indeed was his sense of mission, his dedication to work, his tireless energy in the service of humanity and his selflessness that he has been immortalised as the 'Father of Public Health in Nigeria'.

Dr. Isaac Ladipo Oluwole
O.B.E., M.B., Ch.B., D.P.H.
Source*:* Society of Health

Born in Lagos on 26th March 1892, he was the only son, in a family of six, of Rev. (afterwards Bishop) Isaac Oluwole, who at the time of his birth was the second Principal of the oldest secondary educational institution in Nigeria, the Church Missionary Society Grammar School (CMS), Lagos. His mother, formerly Miss Abigail Johnson, belonged to a wealthy and talented family and besides being one of the most accomplished ladies of her time, was a devoted music teacher and a popular seamstress.

Young Ladipo grew up in a Christian atmosphere with the restraint and discipline typical of the upper stratum of the society to which he belonged and, in those days, Lagos was very much dominated by Victorian standards, outlook and way of life. He attended the Church Missionary Society Grammar School and had the privilege of further secondary education at King's College where he was one of the foundation scholars in 1909. Here, he much to the delight of his parents, distinguished himself and was sent abroad for further studies which was the only way a young man could realise his ambition in those days. The profession he chose was Medicine and the place of study was Glasgow University in Scotland. This was in 1913.

In the minimum time required he qualified as a doctor but stayed on to acquire postgraduate experience in various hospitals in Glasgow, after which he went for a three months course in Tropical Medicine at the Liverpool School of Tropical Medicine and Hygiene; then he returned home in 1920 much the better for his contact with different types of people. His experience during his training and afterwards gave him a greater breadth of vision and a deeper understanding of human nature than was usual. To him the medical profession was a calling, an opportunity to serve ailing humanity.

3.1.1 Appointment as Assistant Medical Officer of Health, Lagos

The circumstances of his return to Lagos started as far back as the early 1900. Then and only then did the government realise that a separate body must be created to supervise the improvement and proper development of the Town of Lagos.

Consequently, on 1st December 1908, a Municipal Board of Health was established, independent of the Public Works Department and the Medical Department. Its sole responsibility was the control and supervision, so far as Lagos and Ebute Metta were concerned, of all matters relating to sanitation and public health. This was a formidable task, for the conditions prevailing in Lagos at that time were very grim and deplorable.

The Board strived to provide solutions for problems in a Lagos which was yet to enjoy the modern amenities of good drainage systems, pipe borne water and good sanitary living conditions for the individual; a Lagos that was prone to outbreaks of diseases and epidemics. Responsibility for tackling these problems was for the next twelve years in the hands of European Doctors who, though aware of the immensity of the problems and gave of their best, were handicapped by ignorance of the sociological problems involved, the culture and the traditions of the people with whom they had to deal.

However, in 1919, the Lagos Town Council, as the Board was then known, was invigorated by the introduction of elected members into the Council while retaining some of the nominated members. This led to Africans having more say at Council meetings and by 1922, the question of having an African Assistant Medical Officer of Health was raised, on the grounds that since the primary role of the Public Health Department was to educate the African population, it was important that the Medical Officer of Health should be an African able to speak the local language – Yoruba. This was solidly opposed by the European members who were decidedly convinced that no suitable African Doctor could be found. They backed this up pointing out that none of the local doctors had training in Public Health and proceeded to put every conceivable obstacle in the path of the future Assistant Medical Officer of Health. Underlying this strong opposition was colour prejudice and the fear of African Doctors treating and carrying out physical examination on their European masters. As things turned out, the Council decided to appoint an African Assistant Medical Officer of Health and advertise the post.

Fully aware from his experience in Abeokuta of the great need for public health education and of closer administration of this aspect of Medicine by the government so as to improve the sanitation of Nigerian town and villages as well as the living conditions of the people, Dr. Oluwole applied for the job and was the successful one of three applicants. He was appointed the Assistant Medical Officer of Health in 1924, the first African to hold the office. It was a challenging appointment for a man imbued with deep sympathy for suffering and the desire to serve humanity as Doctor Oluwole was.

Undaunted, he proceeded again to Britain in 1924. Within a year, he had successfully completed the course which took some of his predecessors two years, thereby confounding his detractors. On the 15th of October 1925 he resumed work.

3.1.2 Appointment as Medical Officer of Health, Lagos

By 1936, Dr. Oluwole's contribution to Public Health in all its aspects was generally recognised and in that year he was appointed to the substantive post of Medical Officer of Health with the full approval of the Director of Medical Services. At the same time Dr. Ajose was appointed Assistant Medical Officer of Health. This was a good partnership as Dr. Ajose was a public health expert and sympathised with the aims and objectives of Dr. Oluwole.

In their offices at 43 Broad Street which had been the headquarters of the Public Health Department of the Lagos Town Council since 1929, they devised new schemes for the improvement of public health to the advantage of schools in particular. An immediate advantage was that the problem of staff shortage was reduced. Dr. Ajose did his share in visiting and inspecting schools and was the medical officer in charge of Igbobi and Yaba Higher Colleges. He thus relieved Dr. Oluwole whose interest in the two institutions did not wane. Indeed, he was a governor of Igbobi College for years.

Public Health Offices, 43 Broad Street, Lagos, where the Late Dr. Isaac Ladipo Oluwole worked.
(Source: Society of Health Journal)

3.2 His Challenges

The problems facing Dr. Oluwole were immense. Hitherto little attention had been paid to sanitation and health hygiene. Outbreaks of epidemics were common occurrences and even worse, the menace of the plague which had broken out the previous year and which had not been completely eradicated still confronted the community since the conditions favourable to the outbreak of such an epidemic continued to exist. Other infectious diseases like dysentery, smallpox and tuberculosis were allowed to spread virtually unchecked and

uncontrolled within the community. The incidence of Yellow Fever was frequent claiming an increasing number of lives.

What Dr. Oluwole's predecessors had found the major insurmountable obstacle consisted of; ignorance about the conditions which must be maintained for good health and also prejudice against change whatever the merits of it. Diseases and high mortality rate are not due entirely to neglect, poverty and lack of care but to ignorance of the necessary preventive measures.
Furthermore, the Public Health Department itself was not well organised to deal effectively with these problems. Although the Township Ordinance to enforce the observance of health regulations had been passed as far back as 1917 there was no trained staff to give it practical effect and there was no training programme to make good the deficiency.

Dr. Oluwole brought to this immense and formidable task a new concept of public health as a gigantic project with manifold divisions working together to ensure the good health of the whole country. This was a departure from the prevailing concept of public health as a minor arm of Medicine, for though remarkable and outstanding achievements have flowed from Curative Medicine, it is in the preventive aspect, largely in the field of public health that hope for a healthy development lies, particularly in the conditions that existed in Lagos of 1920s. He, therefore, set about tackling the problems from four main angles: First, the training of Public Health Officials, secondly, Public Health education and Provision of the right amenities for good health, thirdly, extermination of the major diseases and fourthly, sanitation and mosquito eradication.

3.3 Prominent Achievements with his Team

Apart from plague, the most prevalent and fatal disease among both infants and adults was Malaria. In 1929, for example, over one hundred children died of malaria attack alone. 95% of the children examined in the Infant Welfare Clinics were found to harbour malaria parasites in their blood. (*Malaria is an insect borne disease, and the most important malaria carrying mosquito was the anopheles gambiae. It is also the most adaptable in its habits. Its larvae can be found in any fresh water containing about 60% of salt and in almost any natural collection of water exposed to the sun).*

Observations also showed that the anopheles gambiae can disperse more than a mile away from its breeding ground. Lagos was undoubtedly a good breeding ground for these mosquitoes for large areas of the town were swampy and under sea level, particularly, Obalende, Ikoyi,

Onikan, Apapa, Okesuna, Victoria beach, Elesin, Igbo Road and Abule nla were often under water. Moreover, all over the town there were outcrops of unwanted bushes which provided good breeding ground for these mosquitoes.

Dr. Oluwole's plan was to detect and eliminate all conditions for breeding such mosquitoes. The areas under water demanded his immediate attention. Many drainage schemes were devised for them resulting in many being transformed into habitable places that have now become low-density estates.

Drainage and reclamation schemes require the assistance of a good engineering section in the Public Health Department; but for the effective eradication of mosquitoes other officials of the Department had an important role to play. In particular the Sanitary Inspectors trained by Dr. Oluwole had a major part to play in the prevention of mosquito breeding.

Regular house –to- house inspection was carried out by them to ensure that there were no discarded tins, containers or objects likely to retain water and unclear bushes where mosquitoes could breed. Moreover, like the Health Visitors, they were encouraged to take advantage of their visits to explain to households the principles of good health. They also helped with laboratory work connected with the eradication of mosquitoes. A squad of collectors among them carried out a weekly collection of adult mosquitoes in certain zones.

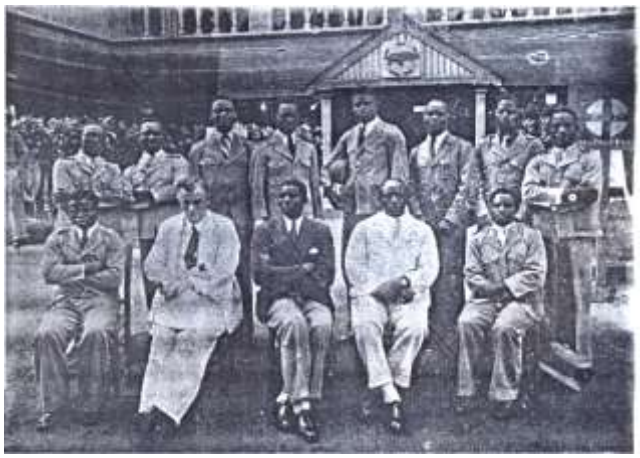
Children's Clinic, Oroyinyin, Lagos
(Source: Society of Health Journal)

These mosquitoes were dissected to measure the percentage of room infestation generated by them. In addition, they took part in the experiments which were carried out to assess the value of sub-oil drainage for mosquito eradication. They also discharged some practical duties one of which was fumigation with larvicides. The introduction in

1945 of D.D.T. by Dr. Oluwole at the Railway Reservation was a great success and the insecticide was quickly put to general use in Nigeria..

3.3.1 Training of Public Health Officers

Dr. Oluwole's first preoccupation was the implementation of a training programme for all arms of the Public Health Department so as to provide the personnel for educating the public in health matters and enforcing sanitary regulations. In this respect, the Sanitary Inspectors were most important because they would bear the brunt of any health programme be initiated.



1st set of trained Sanitary Inspector from School of Hygiene, Lagos (1925-1928). (Source: Society of Health Journal)

His aim was to improve their educational standard and give them the type of training that would enable them to discharge their duties efficiently. He himself supervised the recruitment of entrants and selected those with a higher educational background than those in the service in 1925. In this way he had promising young men, some of whom came with him from Abeokuta. He ran the training programme which lasted three years single-handed. It was a combined training in the theoretical and practical sides of public health. First of its kind in the whole of West Africa the course was so successful in terms of practical returns to public health that local authorities all over Nigeria and the Cameroons sent their newly recruited Sanitary Inspectors to the Public Health Department of the Lagos Town Council for training. To ensure that high standards were maintained, Dr. Oluwole encouraged the establishment of the West African Board of the Royal Society of Health. This body sets standards and issues the only professional certificate to Sanitary Inspectors after three years training in an approved school of hygiene. Through this body Dr. Oluwole succeeded in setting up the standards and practice of public health in Lagos and other parts of Nigeria.

Simultaneously with the training of Sanitary Inspectors, he started the training of Health Visitors who became an asset in the development of maternity and infant welfare work in Lagos. Here again success depended on his initiative, personal interest and enthusiasm, none of which was lacking. To assist him in this programme were a trained Health Sister and a woman Medical Officer.

3.3.2 Campaign against Major Diseases

By virtue of his appointment Dr. Oluwole was also in charge of the Infectious Diseases Hospital, the Tuberculosis Hospital at Yaba and the treatment of infectious diseases such as smallpox, tuberculosis and rabies. One of his contributions here was in moving the Infectious Diseases Hospital from its old and inadequate buildings at Ikoyi to new premises at Yaba in 1930. In the treatment and prevention of these diseases he encountered a great deal of prejudice and ignorance. In particular, the treatment and prevention of smallpox which were associated with the traditional worship of "Sopono", the god of smallpox. Relatives were not prepared to expose or report anyone having this terrible disease for medical treatment. The people often resort to all kinds of traditional measures to conceal and manage the illness. It was the belief of the general public then, that vaccination against the disease was fatal.

Dr. Oluwole's patience was severely put to test and his resourcefulness made him tried new methods of treatment. He invited the prominent herbalists who are been patronized to the hospitals to see how new patients are treated and to compare results. Due to his persistence and untiring efforts, vaccination was accepted. It was then made compulsory for all children about months old.

Prevention of *rabies* was also organised by him very successfully. With well-planned anti-rabies campaigns, articles in the newspapers, short broadcast talks in English and Yoruba alerted the public to the dangers, of the disease. This he backed with restrictions on the movement of dogs, penalties for dog-owners who failed to keep their dogs confined especially during any outbreak of rabies and he established dog and rat catchers to seize stray animals and those found infected with rabies humanely killed.

3.3.3 Anti-Plague Operation

Between 1924 and 1931 Dr. Oluwole had to deal with the outbreak of plague in Lagos. The first thing he did was to put into operation all health regulations so as to prevent further contamination and spread of the plague. Anti-plague inoculations were introduced. Action was taken

against owners of dangerous and insanitary buildings in close cooperation with the Town Engineer. There was house-to-house inspection for the sick and provision made for them and those in contact with them to be taken to the isolation hospital. Post-mortem examinations were carried out on the dead who were buried in isolated places. Huts and houses infected with the plague were sprayed with petroleum emulsion by sanitary inspectors.

Extensive publicity was given to anti-plague campaigns by public notices in newspapers, lantern lectures, bill posting, public lectures, house to house visits and circulars to government departments, trading and shipping companies, churches, mosques and schools. Extensive search was mounted for rodents for their destruction and possible extermination. Grossly overcrowded and insanitary houses such as those at Oko Awo where the outbreak started were destroyed, thus providing an opportunity for planning Lagos on modern sanitary lines. In order to put this into effect the Lagos Executive Development Board was created in 1929.

Late Dr. Isaac Ladipo Oluwole's house, 111, Griffith Street, Ebute-Metta, Lagos (Source: Society of Health Journal)

By this time, the anti-plague measures had been integrated with the routine work of Sanitary Inspectors. A special anti-plague labour team, each consisting of two self-contained units with equipment, was allocated to each of the five inspection districts in the township. A senior African Sanitary Inspector under a European Inspector in each district closely supervised all the sanitary and anti-plague operations in his district. In this way, intensive scavenging, de-ratting, disinfection and enforcement of all regulations and byelaws affecting sanitation were ensured.

By 1931, these activities have begun to bear fruit. The incidence of human and rat plague decreased and by 1932, cases of plague were no more reported in Nigeria.

3.4 State Honours

A significant and practical expression of appreciation of his valuable services took the form of the honour conferred on him by His Majesty King George VI who graciously appointed him an "Officer of the Distinguished Order of the British Empire" (O.B.E.) in January, 1940. The volume of the congratulations he received on the appointment clearly indicated the high esteem with which all classes of members of the Nigerian community held him. He is therefore called the father of public health in Nigeria.

4.0 CONCLUSION

There is no doubt you have enjoyed this unit. It is well loaded with historical facts. You learnt about the life history of Dr. Isaac Ladipo Oluwole (father of public health in Nigeria). You also learnt about his prominent achievements in public health practice in Nigeria.

5.0 SUMMARY

Dr. Isaac Ladipo Oluwole is the father of public health in Nigeria. He contributed immensely to the development and growth of Public health in Nigeria. We equally learnt that:

- Sanitary reforms commenced from Lagos in 1877 from where it spread to other parts of the country.
- Dr. Isaac Ladipo Oluwole, although a Medical Doctor by profession, was highly instrumental to the development of environmental health in Nigeria.
- The training of Sanitary Inspectors (EHOs) started in Lagos in 1925.
- Sanitary Inspectors (EHOs) were in the forefront in the eradication of yaws, plague and smallpox in Nigeria.

6.0 TUTOR-MARKED ASSIGNMENT

1. State **2** reasons why sanitary reforms actually started in Lagos in 1877.
2. Mention **5** achievements of Dr. Isaac Ladipo Oluwole that qualified him to be the "Father of Public Health in Nigeria".

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UNIT 2 PIONEER TRAINING INSTITUTIONS FOR ENVIRONMENTAL HEALTH, ASSOCIATION AND PROFESSIONAL REGULATORY BODY

CONTENTS

1.0 INTRODUCTION

This unit will take you through the evolutionary stages of the training institutions for environmental health in Nigeria as well as the association and professional regulatory body. Among these institutions are; the Royal Sanitary Institute of West Africa (RSIW), the West Africa Health Examinations Board (WAHEB) and the Environmental Health Officers Association of Nigeria (EHOAN). You will also learn about the pioneer training institutions and the foundation members of EHOAN.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- describe the evolution of RSH and WAHEB
- explain what EHOAN is and its leadership structure
- list 5 oversight functions of the EHORECON.

3.0 MAIN CONTENT

3.1 The Royal Sanitary Institute of West Africa (RSIW)

As the British government acquired colonies in the 19th century and the empire expanded, the activities of the institute extended to other colonies and dominions, e.g. India, Canada, South Africa, West Africa, etc. The British influence spread to a flourishing area now known as Nigeria by the British traders and Missionaries.

In order to retain the area for the British Traders and Missionaries, treaties of friendship, which later was translated to *Governorship*, were signed by the British with Obas, Chiefs, Obis and Emirs in Nigeria.

However, the activities of the traders and missionaries were hampered by the spread of diseases mainly malaria and yellow fever spread by the mosquito. Therefore, in self-preservation, the Royal Niger Company and the Missionaries provided hospitals for the treatment of their staff. As the activities of these bodies expanded the need for more hospitals and health services arose. Hence, Governor Lord Lugard (then a Colonel) built more hospitals and appointed medical officers and European Sanitary Inspectors. On the discovery of **quinine** as treatment of malaria, he advised the settlers to take 5mg of quinine daily and use mosquito nets.

However, because of sociological problems arising from language, culture and traditions of the Nigerians, the European Health Officers were unable to achieve much progress on the health status of the community. It was decided then, to have an African Assistant Medical Officer of Health for Lagos, whose preoccupation would be to make the African comply with Health Regulations.

Thus, Dr. Isaac Ladipo Oluwole was appointed an Assistant Medical Officer of Health for Lagos in 1924. From his practical experience in Abeokuta in Nigeria and Britain, he recognised that the bulk of any health programme is usually borne by the sanitary inspectors who are responsible for educating the public on health matters and enforcing regulations. He therefore decided to train Sanitary Inspectors as a first step to achieving the objectives of the white men. With this, he established the first School of Hygiene in Lagos in 1925.

The desire to be in close connection with Britain and its institutions appeared to be paramount in the mind of the British administrators. The evident desire by the Africans to emulate the health and social advancement of Britain must have led the Secretary of States for the Colonies to advise that the Royal Sanitary Institute establish a branch in

West Africa for the certification of Sanitary Inspectors who were being trained. This was recorded in the Royal Sanitary Institute Annual Report for 1928 under the heading: "British West Africa."

During the year, a Board of Examiners was appointed for British West Africa. Representatives of the Public Health Service of Nigeria, Gold Post (now Ghana), Sierra-Leone and Gambia have approved the symbols of subjects and training regulations, and a special certificate for "Sanitary Inspectors, West Africa" will be awarded at these examinations.

The first examination of the Board was held in Lagos in July 1930. Thirty four (34) candidates were examined and Six (6) received certificates. By 1954, Sierra-Leone joined the Board, three schools in Nigeria and one each in the other three member countries of the Board: Gambia, Ghana and Sierra-Leone, were presenting candidates for the Board Examinations. The members of the Board as recorded by the Annual Report of the Royal Sanitary Institute 1930 were as follows:

- The Director of Medical and Sanitary Service, Nigeria
- The Deputy Director of Sanitary Services, Nigeria
- The Town Engineer, Lagos
- The Medical Officers of Health, Lagos
- The Pathologist, Lagos
- The Chief European Sanitary Inspector, Lagos
- The Senior Medical Officers, Gambia
- The Medical Officers of Health, Gambia
- The Director of Public Works, Gambia
- The Deputy Director of Sanitary Service, Gold Coast,
- The Senior Superintendent Sanitary Inspector, Gold Coast
- Hon. Local Secretary Dr. J.D. Horsburgh
- Offices of the Board: Located at Government Public Health Department, Medical Office, Lagos, Nigeria.

In 1954, representatives from Sierra-Leone joined the Board and the Board continued to meet annually to plan for subsequent examinations and review the training syllabus. At each annual meeting, in line with the pattern of the Royal Sanitary Institute, Public health papers were delivered by eminent scholars. The papers were discussed and recommendations made at the end of the meetings to the various governments.

In 1955, Queen Elizabeth II granted that the name of the Royal Sanitary Institute be changed to 'Royal Society for the Promotion of Health' because the word 'sanitary' had become so narrow in meaning that it

was no longer applicable to the wide field covered by the society's work. Today the outside world has shortened this name for brevity to the "Royal Society of Health" (RSH).

The Board is composed mainly of Medical Officers with a few Public Health Inspectors, for not until 1974, did Public Health Inspectors take part in the activities of the Board, when the member countries became independent and the European Health Inspectors were replaced by Africans. In 1974, the Health Inspectors who are subject matter of the Board's activities were accepted only as observers in the Board.

By 1981, though the Health Inspectors that attended Board meetings were no longer mere observers but participants. Only two of them attended solely because they are Health Inspectors; the other four attended on the nomination of their country as Principals of Schools. For Nigeria, only Heads of either Schools of Hygiene or Health Technology who are Medical Officers were permitted to attend Board meetings. Hence, the majority of those taking decisions at Board meetings are Medical Officers. Thus, the practicing Public Health Inspectors/Teachers do not take part in decision-making.

These observations led to the agitation for the formation of an independent examination board. Consequently, all member Countries representative in the meeting in Freetown, Sierra Leone in 1981 agreed that the board called: West Africa Health Examinations Board (WAHEB). Representatives of member Countries confirmed the decision in 1983; hence the new board started operation in 1983.

Altogether, eighteen (18) schools training Public Health Inspectors in Nigeria, one each in the four other member countries and 9 schools in Nigeria training Public Health Nurses were approved to present

candidates for the Board Examinations as at March 1981. However, examinations were planned, conducted, marked by the West Africa Examination Board, but validation of results and certification were still handled in conjunction with Royal Society of Health, London.

Presently, the Honorary Secretary of the Board is a Public Health Inspector (Environmental Health Officer), matters placed before the Board for discussion requires the approval of the Chairman who is a Medical Officer. Hence, if there is a disagreement, the view of the Medical Officer (Physician) prevails since he is superior in the administrative hierarchy in the Health Ministry but his view may be prejudicial to the Health Inspectors.

3.2 Profile of the West Africa Health Examinations Board (WAHEB)

The first Secretary Registrar of WAHEB was Mr. M.A. Omolola 1983-1989. He was succeeded by Mr. J. Olu Soetan 1989-2001, followed by Mr. Emmanuel Asooto 2001-2004, after which Mr. Akin Olupona came on board between 2004-2008. The current Secretary/Registrar is Mr. U.K. Osuala 2008 till date2013).

During the tenure of Mr. J. Olu Soetan, the Certificate of Environmental Health Officer was graded as OND & HND respectively in continuum. Thus, the training began to be co-regulated by the National Board of Technical Education (NBTE), Nigeria.

3.3 Pioneer Training Institutions

After the establishment of the School of Hygiene, Yaba, Lagos in 1925, other Schools of Hygiene established include – School of Hygiene, Kano in 1932, School of Hygiene Eleyele, Ibadan in 1933 and School of Hygiene, Aba in 1943. Presently, the number of training institutions has

increased tremendously and all the 36 States in Nigeria have at least one School of Hygiene/ School of Health Technology/ College of Health Sciences as the case may be.

The Federal Training Centre for Teachers of Health Sciences University College Hospital, UCH, Ibadan was established in 1976. The objective of the training centre was to train and empower environmental health Teachers/ Tutors who are engaged in teaching environmental health students at Schools of Hygiene/Health Technology.

The first set was admitted in 1976 and were trained for 12 months. The centre had its catchment areas in Liberia, Sierra-Leone, Ghana, Gambia including the host country – Nigeria.

The pioneer Course Coordinator was Late Pa Aaron Aderibigbe Akinbola (April 1976-1988) followed by Late Mr. Olusegun Abiola Amosu (May, 1988-1996) who was succeeded by Dr. Adebayo Mudah Arinola (1996-2007) followed by Mr. Olusesan Samuel Olubode who was the HOD 2007 till 2013.

The Centre has been upgraded to award postgraduate diploma (PGD) in Environmental Tutor Science having reviewed its curriculum by the University College Hospital Board of Management, College of Medicine, University of Ibadan and Institute of Education, University of Ibadan, Ibadan to which the training centre is affiliated.

3.4 Environmental Health Officers Association of Nigeria (EHOAN)

The Corporate Affairs Commission (CAC) duly registered the Association of Health Inspectors of Nigeria. When the name of the association was changed to Environmental Health Officers Association of Nigeria (EHOAN), the new name was also registered with the CAC in Abuja. The Association has its constitutions guiding its conducts.

3.4.1 Leadership Profile in EHOAN

(a) 60s to early 70s

In the early 60s to early 70s, Pa Osiberu was Pioneer National President while Mr. J.G. Akinloye was the National Secretary. Pa Aaron Aderibigbe Akinbola followed Pa Osiberu and Mr. Sunday Ogungbire was the secretary. During this period, the following major achievements were recorded:

(i) Agitation for EHORECON
(ii) Won level GL. 07 for Health Superintendent
(iii) B.Sc. Env. Health of Unife (OAU) established.

(b) 1986 - 1992

Between 1986 to early 1990, Alhaji Muhammed Kazaure took over the mantle of leadership and the Secretary then was Dr. Patrick Emeharole. The Association was been strengthened and agitation for a professional Council continued.

(c) 1993-1995

Shortly after, Professor Patrick Emeharole became the President between 1993-1995. The National secretary then was Mr. Isaac Olasupo Ayoade. This team recorded a lot of achievements within the shortest time in office. These include:

- Agitation for a professional Council continued
- The University of Nigeria Nsuka(UNN) was sensitised to commence the B.Sc. Health Education programme with a view to enhance the capacity of qualified Environmental Health Officers in higher institution
- A new Official uniform was launched.

(d) 1996-2007

Late Dr. Peter Abiodun Bamigboye took over the mantle of leadership between 1996-2007 and the National Secretary was P. Waba Ayuba during this period.

- New nomenclature as Environmental Health Officer Association of Nigeria (EHOAN) registered with CAC
- Headquarters of the Association moved to Abuja
- Women's wing launched
- Environmental Health Officers Registration Council of Nigeria (EHORECON) established by Act No 11 of 2002.
- Official uniform reviewed and re-launched.

(e) 2007 till 2012.

The incumbent national President is Alhaji Zakariyau 2007 (till date 2012) while the National Secretary is Om'ba Femi Daini.

- Association sustained
- Partners with EHORECON to achieve the commencement/floating of Environmental Health degree programmes in Nigeria, some conventional as well as in Open & Distance Learning (ODL) Universities.

3.5 Environmental Health Officers Registration Council of Nigeria (EHORECON)

The Environmental Health Registration Council of Nigeria (EHORECON) was established by Act 11 of 2002. It is the umbrella body regulating environmental health profession and the practitioners in Nigeria. The clamor for the council took almost 32 years before it could materialise during the regime of President Olusegun Aremu Obasanjo who signed the bill into Act. Thus, Act 11 of 2002 recognises Environmental Health as a profession in Nigeria. The bill was sponsored by Senator Tafida – one time Minister of Health and presently Nigerian Ambassador to Britain. He is a renowned Medical Doctor.

Among the functions of the Council is to regulate environmental health profession, register the practitioners, regulate and determine which qualifications environmental health practitioners in Nigeria should possess. The Council has power to discipline its members.

The then Honourable Minister of Environment, Rtd. Col. Mande in whose Ministry the Council is domiciled inaugurated the foundation members of the Council in 2004. The first Chairman of the Council was HRH Alhaji Yunusa Muhammadu Danyaya (OOU), The Emir of Ningi, Bauchi State.

The Hon. Minister of Environment, Chief (Mrs.) Helen Esuene, being welcomed to a Conference by the Chairman of the Council.

3.5.1 Foundations Members

1. Professor O.A. Afolabi — Rep. the Hon. Minister of Health
   Chief A. Ezekesili — Rep. South East geopolitical zone
2. Mr. Mathew Idowu — Rep. North Central
3. Alhaji Ibrahim Malami — Rep. North West
4. Mr. Pius Dawa —Rep. North East
5. Dr. Sunday A. Ojewale — Rep. South West
6. Mr. Aniofik Moses — Rep. South South
7. Mr. N. Mbong — Rep. Federal Ministry of Health
8. Mr. Lanre Talabi — Rep. Public Interest
9. Dr. Abiodun Bamgboye — Rep. EHOAN.

Sanitarian Augustine A. Ebisike
(1st Registrar of the Council)

3.5.2 Some Accomplished Goals of the Council

a) Registration of its members
b) Publicity and advocacy
c) Education, capacity building & development of its members
d) Examination and registration
e) Quality control and uniformity of training of members
f) Mandatory Continuous Education Programme (MCEP)
g) Collaborating with some Universities to Commence training in Environmental Health degree programme (e.g National Open University of Nigeria (NOUN), Federal University of Technology, Owerri (FUTO), Kwara State University (KWSU))
h) Curriculum design
i) Currently, EHORECON is collaborating with the West African Health Organisation (WAHO) in Burkina Faso to facilitate the uniform training of EHOs in Anglo and Francophone countries.

4.0 CONCLUSION

I hope you enriched your knowledge on the evolution and history of environmental health. You could now see that public health or environmental health problems have been with us for a long time even before the time of Dr. Isaac Ladipo Oluwole who was fundamentally instrumental to solving environmental health problems in the olden days in Nigeria.

Dr. Oluwole, a Medical Director by profession realised the relevance of EHOs in solving environmental health problems especially when they are properly trained. This underscores the commencement of training of health inspectors in 1925 in Lagos.

You are now very conversant with the respective, collective and collaborative roles of WAHEB, FTCTHSc, EHOAN and EHORECON. With your knowledge of this unit, you have more facts of history to guide you on how you can contribute to the progress of your profession.

5.0 SUMMARY

- Sanitary reforms commenced from Lagos in 1877 from where it spread to other parts of the country.
- Dr. Isaac Ladipo Oluwole, although a Medical Doctor by profession, was highly instrumental to the development of environmental health in Nigeria.
- The training of Sanitary Inspectors (EHOs) started in Lagos in 1925.
- Sanitary Inspectors (EHOs) were in the forefront in the eradication of Yaws, Plague and Smallpox in Nigeria.
- Due to the dynamic nature of the environment, the nomenclature of EHO was not stable for sometimes.
- Agencies like: WAHEB, FTCTHSc. EHOAN and EHORECON were and are the live wire of environmental health in Nigeria.

6.0 TUTOR-MARKED ASSIGNMENT

1. State **2** reasons why Sanitary Reforms actually started in Lagos in 1877.
2. Mention **5** achievements of Dr. Isaac Ladipo Oluwole that qualified him to be the "Father of Public Health in Nigeria".
3. State the years when the training of Sanitary Inspectors started in:
   (a) Lagos
   (b) Ibadan
   (c) Aba

(d) Kano

4. List **3** functions of EHORECON.
5. Enumerate **2** functions of WAHEB.

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MODULE 3 HEALTH DETERMINANTS AND ENVIRONMENTAL HEALTH COMPONENT

UNIT 1 CONCEPTS AND PRINCIPLES IN HYGIENE AND ENVIRONMENTAL HEALTH

CONTENTS

1.0 INTRODUCTION

In this unit, we shall consider diarrhoea, which is a symptom of many common diseases, as a means to understand the concept of disease transmission, the role of environmental health and the framework for hygienic improvements. Read on.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the concept of disease transmission
- enumerate the different pathways of disease transmission through the environment,

3.0 MAIN CONTENT

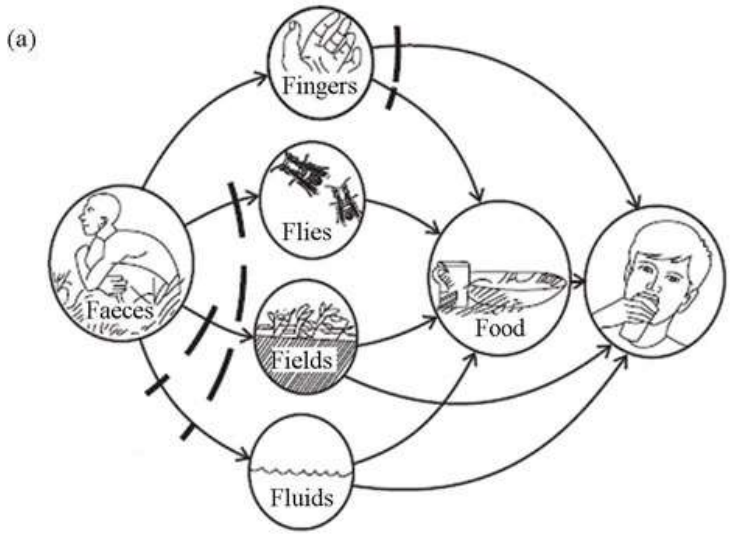
3.1 Environmental Health and Disease Transmission

Now, let us consider diarrhoea, which is a symptom of many common diseases, as a means to understand the concept of disease transmission,

the role of environmental health and the framework for hygienic improvements.

The description of diarrhoea transmission represents a good way to understand the pathways of disease through the environment and how environmental health and hygiene can help prevent disease transmission. Figure 1 shows the factors that are essential for diarrhoea transmission. (This diagram is widely used to represent these important links in disease transmission. We have included two versions of it here to help you identify it if you see it again.

Look first at Figure 1 (a). On the left is a person defecating, representing the source of diarrhoea. The infectious agent or disease agent is actively discharged by a patient or carrier of the disease. On the right is the **host**, who is the person that could be affected by the disease. Between the two, there is the part of the environment that links the two; in other words, the pathway that the disease travels between the source and the host. Now compare Figure 1(a) with Figure 1(b); you will see they represent the same thing.



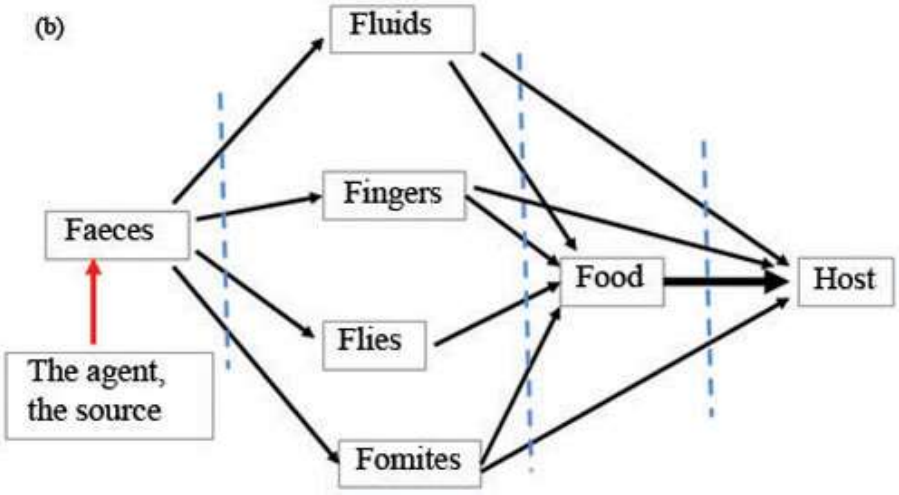


Figure 1 (a) and (b) Pathways of diarrhoea transmission. (Source of 1(a): adapted from WHO, 1998, *PHAST step-by-step guide*) Figure 1(b) similarly shows the different pathways of transmission through the environment. The *source* of diarrhoea is the *agent* or carrier who discharges infected faeces to the environment. To remember the possible pathways we can use the six 'F's:

1. Feaces: resulting from defecation.
2. Fluids: through contaminated water and other contaminated liquids.
3. Fingers: contaminated fingers transmit diseases.
4. Flies: all sorts of animals such as flies can carry and transmit diseases.
5. Fomites or fields: fomites are inanimate objects that carry the infectious agent (e.g. dishes, cups and other contaminated surfaces in contact with food or water).
6. Food: infected by fluids, flies, fingers or fomites and then eaten.

If you understand the pathway of the disease, then you can design an **intervention** for the disease that targets the source, environment or the host. An intervention is a way of stopping the disease from being transmitted. The broken lines, in Figure 1, indicate the possible interventions for the prevention and control of diarrhoea. Some of these interventions are described in Table 1.

Table 1: Possible Environmental Health Interventions for Diarrhoea

Intervention strategies	Activities
Intervention at the source (where the diarrhoea infection comes from)	• Avoid open defecation • Install a latrine • Always use a latrine to bury faeces and urine
Intervention in the environment (how the diarrhoea infection is transmitted)	• Use safe drinking water • Hand washing • Vector control and management • Proper refuse and liquid waste management • Provision of food safety • Healthful housing
Intervention at the host (the person who might become infected)	• Hygiene promotion through hygiene education and community mobilisation • Vaccination (if available) • Healthy living

4.0 CONCLUSION

In this unit, you have learnt the pathways of disease transmission through the environment and how environmental health and hygiene can help prevent disease transmission.

5.0 SUMMARY

We have so far, discussed six pathways (6 “F”s) of disease transmission in the environment, as well as intervention strategies and preventive measures for diarrhea.

6.0 TUTOR-MARKED ASSIGNMENT

Now that you have completed this unit, you can assess how well you have achieved its learning outcomes by answering these questions.

1. With the aid of a suitable diagram, describe disease transmission pathways.
2. What best strategies can you adopt to interrupt the chain of transmission?

7.0 REFERENCES/FURTHER READING

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UNIT 2 THE DETERMINANTS OF HEALTH

CONTENTS

1.0 INTRODUCTION

In the last unit, we discussed the various pathways of disease transmission. In this unit, we shall be looking at many factors that combine to affect the health of individuals and communities.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- list and explain the various determinants of health
- describe a few evidence base of health determinants.

3.0 MAIN CONTENT

3.1 The Determinants of Health

Many factors combine to affect the health of individuals and communities. Whether people are healthy or not, is determined by their circumstances and environment. To a large extent, factors such as where we live, the state of our environment, genetics, our income and education level, and our relationships with friends and family all have considerable impacts on health, whereas the more commonly considered

factors such as access and use of health care services often have less of an impact. The determinants of health include**:**

- the social and economic environment
- the physical environment and
- the person's individual characteristics and behaviours.

The context of people's lives determines their health, so blaming individuals for having poor health or crediting them for good health is inappropriate. Individuals are unlikely to be able to directly control many of the determinants of health. These determinants—or things that make people healthy or not—include the above factors, and many others:

- Income and social status - higher income and social status are linked to better health. The greater the gap between the richest and poorest people, the greater the differences in health.
- Education – low education levels are linked with poor health, more stress and lower self-confidence.
- Physical environment – safe water and clean air, healthy workplaces, safe houses, communities and roads all contribute to good health. Employment and working conditions – people in employment are healthier, particularly those who have more control over their working conditions
- Social support networks – greater support from families, friends and communities is linked to better health. Culture - customs and traditions, and the beliefs of the family and community all affect health.
- Genetics - inheritance plays a part in determining lifespan, healthiness and the likelihood of developing certain illnesses. Personal behaviour and coping skills – balanced eating, keeping active, smoking, drinking, and how we deal with life's stresses and challenges all affect health.
- Health services - access and use of services that prevent and treat disease influences health
- Gender - Men and women suffer from different types of diseases at different ages.

3.2 Evidence Base of Health Determinants

An evidence base about the impact that projects, programmes and policies have had on health is required to carry out Health Impact Assessment (HIA). The best available evidence is used within the appraisal stage of HIA to determine what impacts may occur (both positive and negative), the size of the impact (if possible) and the distribution of that impact in different population groups. It is generally

assumed that the evidence for health impacts exists, and that searching and collating will provide the necessary evidence. Unfortunately, this is not often the case, and the evidence of health impacts is often not available. This is because of the long causal pathway between the implementation of a project/programme/policy and any potential impact on population health, and the many confounding factors that make the determination of a link difficult. Within the HIA it is important therefore to be explicit about sources of evidence and to identify missing or incomplete information.

Providing a comprehensive review of the evidence base is not simple. It needs to draw on the best available evidence – that from reviews and research papers, and including qualitative and quantitative evidence. This information must be supplemented with local and expert knowledge, policy information, and proposal specific information.

However, there are examples where the best available evidence has been documented, and in some cases summarised. These are presented below:

- Transport
- Food and Agriculture
- Housing
- Waste
- Energy
- Industry
- Urbanisation

3.2.1 Transport

Evidence of health impact focus on:

- Accidents between motor vehicles, bicycles and pedestrians (particularly children and young people)
- Pollution from burning fossil fuels such as particulates and ozone
- Noise from transportation.
- Psychosocial effects such as severance of communities by large roads and the restriction of children's movement.
- Climate change due to CO2 emission
- Loss of land
- Improved physical activity from cycling or walking
- Increased access to employment, shops and support services
- Recreational uses of road spaces
- Contributes to economic development
- Vector borne diseases.

3.2.2 Food and Agriculture

- Tobacco farming and its impact on heart disease, stroke, certain cancers and chronic respiratory disease. Including passive smoking and impact of foetal development. Pesticide policies on tobacco crops require consideration.
- Changes in land use, soil quality, choice of crop, use of agricultural labour and occupational health.
- Mechanisation of work previously done by hand, and plantation agriculture.
- Fisheries – biotoxins, pollution, chemical use, wastewater, processing, and occupational health
- Forestry – vector borne diseases, occupational health, and food security.
- Livestock use – vector borne diseases, drug residues, animal feed, waste, and food security.
- Sustainable farming including chemical and energy use, biodiversity, organic production methods, and diversity of foods produced.
- Fertiliser use – nitrate levels in food, pollution of waterways, re-use of agricultural waste.
- Water – irrigation use and its impact on river/water-table levels and production outputs.
- Pesticide usage and veterinary drugs– legal requirements, best practice, consumer issues.
- Food packaging, preservation and safety, and avoidance of long storage and travel.

(i) Access to, and distribution of food

- Household food security – appropriate food being available, with adequate access and being affordable (location of markets, supermarkets and closure of small suppliers creating food deserts in cities).
- Food supplies, including national and regional food security, and regional production.
- National food security – able to provide adequate nutrition within a country without relying heavily on imported products
- Cold-chain reliability – the safety of transporting products that deteriorate microbiologically in the heat.

(ii) Dietary patterns, diversity of food available and home production, particularly

- Fruit and vegetable consumption on reduced stroke, heart disease and risk of certain cancers.
- Total, saturated and polyunsaturated fat, carbohydrates and sugars consumption on obesity, heart disease, stroke and other vascular diseases.
- Alcohol consumption and impact on social effects related to behaviour (traffic accidents, work/home accidents, violence, social relations, unwanted pregnancy and STDs), and toxic effects (all-cause mortality, alcoholism, certain cancers, liver cirrhosis, psychosis, poisoning, gastritis, stroke, foetal alcohol syndrome and others).
- Micronutrients such as iron, vitamin A, zinc and iodine and their impact on deficiency syndromes.

(iii) Food safety and food- borne illness hazards

Food and water are the major sources of exposure to both chemical and biological hazards. They impose a substantial health risk to consumers and economic burdens on individuals, communities and nations:

- Microorganisms such as salmonella, campylobacter, E. coli O157, listeria, cholera.
- Viruses such as hepatitis A, and parasites such as trichomonosis in pigs and cattle.
- Naturally occurring toxins such as mycotoxins, marine biotoxins and glycosides.
- Unconventional agents such as the agent causing bovine spongiform encephalopathy (BSE, or "mad cow disease"),
- Persistent organic pollutants such as dioxins and PCBs. Metals such as lead and mercury.
- New foods developed from biotechnology such as crops modified to resist pests, changes in animal husbandry, antibiotic use and new food additives.

3.2.3 Housing

Evidence of health impacts focus on:

- Improvements in housing and improved mental health and general health
- The possibility of improved housing leading to rent rises, impacting negatively on health

- Movement of original tenants after housing improvement and therefore not benefiting from the improvements
- Housing tenure, outdoor temperature, indoor air quality, dampness, housing design, rent subsidies, relocation, allergens and dust mites, home accident prevention, and fire prevention
- Homelessness.

3.2.4 Waste

Evidence of health impacts focuses on environmental and social determinants related to:

- the transmission of agents of infectious disease from human and animal excreta (sanitation, hygiene and water-related)
- exposure to toxic chemicals in human and animal excreta; and in industrial wastes discharged into the environment
- environmental degradation, direct and indirect impacts on health
- exposure to radioactive wastes
- exposure to health-care wastes
- exposure to solid wastes and involvement in informal waste recycling; and
- breeding of disease vectors.

3.2.5 Energy

Evidence of health impacts focus on health hazards such as:

- Fossil fuels
- Biomass fuels
- Hydropower and their impact on vector borne diseases, and pollution
- Electricity generation and transmission
- Nuclear power
- Other energy sources
- Occupational health effects of energy workers
- Impacts on ecosystems, agriculture, forests, fisheries and building materials
- Noise
- Visual impact
- Global warming.

3.2.6 Industry

Evidence of health impacts focus on industrial sectors such as:

- Asbestos and man-made fibres
- Basic chemicals
- Cement, glass and ceramics
- Electronics
- Iron and steel
- Manufacture of rubber and plastic products
- Metal products
- Mining
- Pesticides, paints and pharmaceuticals
- Petroleum products
- Pulp and paper
- Service industries
- Textiles and leather
- Wood and furniture.

3.2.7 Urbanisation

Evidence of health impacts focus on topics such as:

- Urban housing problems
- City environment and non-communicable diseases
- Communicable diseases
- Road trauma
- Psychosocial disorders
- Sustainable urban development
- Urban wastes
- Health services.

3.3 Other Perspectives to Environmental Determinants of Health

An environmental determinant of health is, in general, any external agent (biological, chemical, physical, social, or cultural) that can be causally linked to a change in health status. However, since virtually everything that is not genetically determined could be considered "environmental," this general definition is too all-encompassing to be useful. Rather, environmental epidemiologists have narrowed the term to include only those environmental influences that are involuntary. For example, breathing secondhand tobacco smoke would be an environmental hazard, whereas active tobacco smoking would be considered a behavioral determinant.

In the developed world, environmental epidemiologists are concerned about such things as gene-environment interactions, environment-environment interactions, particulate air pollution, nitrogen dioxide, ground-level ozone, environmental tobacco smoke, radiation, lead, video display terminals, cellular telephones, and persistent organic pollutants (POPs) that act as endocrine disruptors. Exposures to these types of environmental vectors are known as downstream, or proximate, determinants of health (that is, the exposures are closely related in time and space to the ill effects they produce), and they impact both health and well-being.

In the developing world, the primary environmental determinants of health are biological agents in the air, water, and soil that account for most deaths and for most deaths in the world. Four million children die annually from diarrheal diseases acquired from contaminated food or water. Over one million people die from malaria each year. Hundreds of millions of people suffer from debilitating intestinal parasitic infestations. Hundreds of millions of people suffer from respiratory diseases caused by biological and chemical agents in the air, both indoors and outdoors. According to the World Health Organisation (WHO), over one billion people are unable to meet their basic needs (i.e., adequate food, clean water, and shelter) because they lack the necessary income or land. These are environmental hazards that take a far greater toll on human life and suffering in absolute terms compared to those environmental determinants of concern in the developed world.
To understand approaches needed to address environmental health concerns, a distinction is made between infectious and chronic causes of disease. A distinction also is made between short-term, acute exposures resulting in epidemic outbreaks of illness, and long-term, low-dose exposures resulting in chronic diseases. Such classifications are necessary to ensure appropriate methods for researching and understanding the extent of health problems in the world. The workplace often serves as a laboratory for understanding the relationship between environmental exposures and health. It serves as a laboratory because, in their occupational environment, workers tend to be exposed to measurable amounts of pollution. This fact allows occupational health researchers and epidemiologists to link adverse health outcomes to these environmental factors. If no link between a workplace pollutant and worker ill-health can be demonstrated, then that pollutant is unlikely to have measurable consequences for human health beyond the work environment owing to comparative lack of frequency and concentration of exposure experienced by those not working in that specific environment. One notable exception, however, is that class of people who are more susceptible to ill-effects even from low levels of exposure. An emerging concern with great potential impact on public health relates to upstream, or distant, determinants of health (the exposures are

far apart in time or space from the witnessed ill-effects) including as policies that drive current levels of population growth, consumption and waste issues, and the uses of technology. For example, the environmental, trans-boundary transport of contaminants through the food chain has resulted in global chemical contamination. Other trans-boundary issues include acid precipitation, ozone, greenhouse gasses, and hazardous wastes. Global ecological integrity (i.e., the ability of life-support systems to sustain them in the presence of polluting forces) and global change (including concerns about climate change from global warming, ozone depletion, and the loss of biodiversity) have given people reason to adopt the WHO maxim: "Think globally, act locally." Reducing wastes and consumption at the local level can have positive effects on the entire earth's ecosystems.

4.0 CONCLUSION

In this unit, we understood that the context of people's lives determine their health, and so blaming individuals for having poor health or crediting them for good health is inappropriate. Individuals are unlikely to control many of the determinants of health. These determinants or things that make people healthy or not, include the social and economic, physical environment and the person's individual characteristics and behaviours.

5.0 SUMMARY

What we learnt in this unit generally is that the health status of everyone depends largely on so many factors among which are; income and social status, education, physical environment, social support networks, genetics, health services and gender. Besides, the interaction between humans and the environment has various forms of implication on individual health. Urbanisation, industrialisation and development are the major forms of interaction. We should remember and try to control the disadvantages of development and not focus only on the benefits.

6.0 TUTOR-MARKED ASSIGNMENT

1. List the various determinants of individual's health.
2. Explain how five of these factors can be reduced or controlled.

7.0 REFERENCES/ FURTHER READING

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UNIT 3 COMPONENTS OF ENVIRONMENTAL HEALTH

CONTENTS

1.0 INTRODUCTION

In this unit, we shall be looking at the various components of environmental health.

3.2 OBJECTIVES

At the end of this unit, you should be able to:

- list the various components of environmental health
- explain the focus or concerns of each of the components you have named.

3.0 MAIN CONTENT

3.1 Components of Environmental Health

Table 1 below describes the areas of environmental health and hygiene that will be of importance to you as a health worker and that you will learn about in the rest of this course.

Table 1: Components of Environmental Health

Description	Concerns
Personal hygiene	Hygiene of body and clothing
Water supply	Adequacy, safety (chemical, bacteriological, physical) of water for domestic, drinking and recreational use
Human waste disposal	Proper excreta disposal and liquid waste management
Solid waste management	Proper application of storage, collection, disposal of waste. Waste production and recycling
Vector control	Control of mammals (such as rats) and

	arthropods (insects such as flies and other creatures such as mites) that transmit disease
Food hygiene	Food safety and wholesomeness in its production, storage, preparation, distribution and sale, until consumption
Healthful housing	Physiological needs, protection against disease and accidents, psychological and social comforts in residential and recreational areas
Institutional hygiene	Communal hygiene in schools, prisons, health facilities, refugee camps, detention homes and settlement areas
Water pollution	Sources, characteristics, impact and mitigation
Occupational hygiene	Hygiene and safety in the workplace

Fig.1: Components of Hygiene and Environmental Health

SELF-ASSESSMENT EXERCISE

The figure above illustrates the various aspects of hygiene and environmental health that are described in Table 1. Look at the separate

drawings within the figure and match each of them to one of the descriptions.

4.0 CONCLUSION

In this unit, we learnt about the various components of environmental health and the concerns of each of these components, namely personal hygiene, water supply, human waste disposal, solid waste management, vector control, food hygiene, healthful housing, institutional hygiene, water pollution and occupational hygiene.

5.0 SUMMARY

The components of environmental health are:

- Personal hygiene
- Water supply
- Human waste disposal
- Solid waste management
- Vector control
- Food hygiene
- Healthful housing
- Institutional hygiene
- Water pollution and
- Occupational hygiene.

6.0 TUTOR-MARKED ASSIGNMENT

1. List 10 components of environmental health.
2. Explain the focus or concerns of each of the components you have named.

7.0 REFERENCES/FURTHER READING

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MODULE 4 COMMUNITY ENVIRONMENTAL HEALTH

UNIT 1 ENVIRONMENTAL HEALTH IN THE COMMUNITY

CONTENTS

1.0 INTRODUCTION

We will look at the interaction between human activities and the environment and how these results in various types of hazards that may adversely affect human health.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain our interaction with the environment and possible environmental hazards
- identify various environmental risk factors and their related diseases and conditions.

3.0 MAIN CONTENT

3.1 The Place of Environmental Health in the Community

Our living environment is composed of home, work and recreational centres where people spend their time. Water, air and food are our concern. The provision of environmental health services extends to all these aspects of our lives.

The interaction between these environments and human activities results in various types of hazards that may adversely affect human health. The interaction of the environment and possible environmental hazards are shown below.

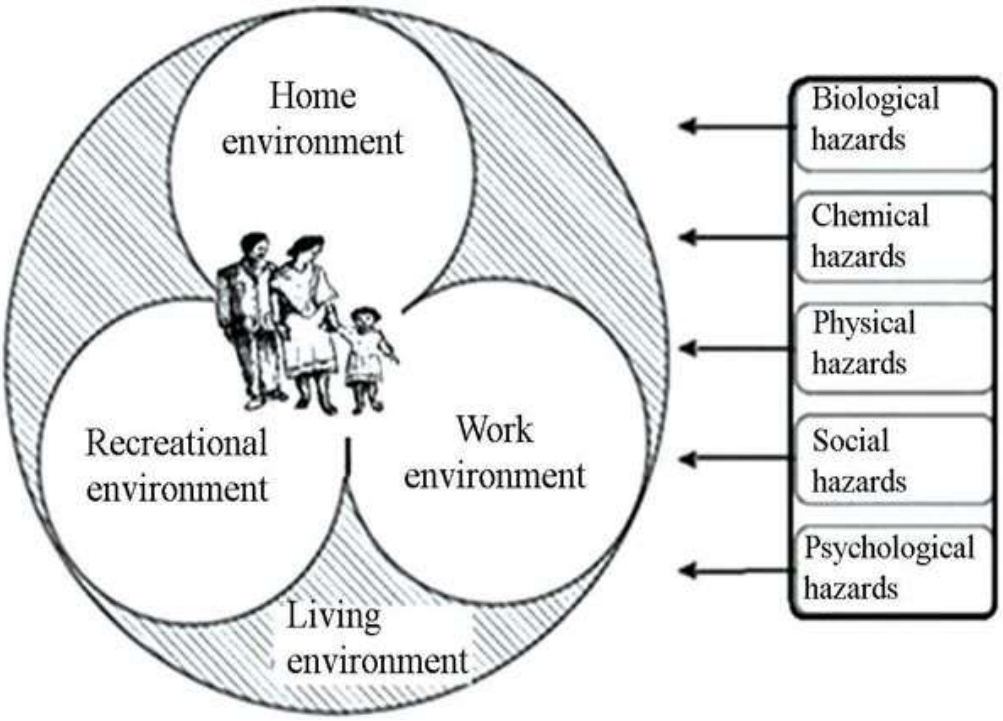

Fig. 1: The System of Environmental Health (Source: Adapted from Bassett,2004)

3.2 Environmental Risk Factors

You have learned in previous Modules that infectious agents play a part in the transmission of disease. Infectious agents are pathogenic (disease-causing) bacteria, viruses, fungi, protozoa and parasites. To cause a disease, they must be introduced into our bodies in sufficient quantities. The environmental conditions and practices that facilitate the carrying of such infectious agents into our bodies are termed environmental risk factors. A good example is drinking water, which can be contaminated by human feacal matter that contains these infectious agents. When this water is consumed, we are likely to get diarrhoeal diseases.

There are other ways that infectious agents can get into our bodies; for example, the air we breathe can be contaminated by droplets that come out of a patient's lungs when they breathe or cough. TB and pneumonia are droplet-related infections that are transmitted in this way. There are also diseases and conditions that are not caused by pathogenic organisms, but are caused by other environmental risk factors, which

may be due to chemicals or physical hazards such as noise. Major environmental risks and examples of the diseases and conditions that are related to these risks are indicated in Table 1 below.

Table 1: Major Environmental Risk Factors with Related Diseases and Conditions

Environmental Risk Factors	Related Diseases and Conditions
Contaminated water, lack of latrines, poor hand washing, inappropriate solid waste management, open defecation, vector infestation	Diarrhoeal diseases, trachoma, schistosomiasis, ascariasis, trichuriasis, hookworm, typhoid fever, relapsing fever
Indoor air pollution	Chronic obstructive pulmonary disease, lower respiratory infections, lung cancer
Outdoor/ambient air pollution	Respiratory infections, cardiovascular diseases, lung cancer
General environmental hazards (climate, mosquitoes, nutrition)	Diarrhoeal diseases, malnutrition, malaria and other vector-borne diseases; heat exhaustion
Environmental hazards in workplaces (excess noise, heat, dust, chemicals)	Injuries, hearing loss, cancer, asthma, back pain, chronic obstructive pulmonary disease

4.0 CONCLUSION

In this unit, you learnt that interaction between the environments and human activities results in various types of hazards that may adversely affect human health. These hazards vary with the type of environment that an individual interacts.

5.0 SUMMARY

Our living environment is composed of home, work and recreational centres where people spend their time. Water, air and food are our concern. The interaction between these environments and human activities results in various types of hazards that may adversely affect human health.

6.0 TUTOR-MARKED ASSIGNMENT

1. List 5 possible areas of human interaction with the environment and possible environmental hazards.
2. Identify five environmental risk factors and their related disease conditions

7.0 REFERENCES/FURTHER READING

Colborn, T., Dumanoski, D. & Petersen, M. J. (1996). *Our Stolen Future*. New York: Dutton.

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UNIT 2 HUMAN INTERACTION WITH THE ENVIRONMENT

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt about environmental health and the community where we live. In this unit, you will learn about human-environment interaction model in the course development, urbanisation and industrialisation.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- describe how humans can affect the environment
- explain how the environment can affect humans, and
- how both humans and the environment can co-exist
- depict these relationships with the aid of a diagram.

3.0 MAIN CONTENT

3.1 Urbanisation and Industrialisation

Urbanisation and industrialisation bring rural people into urban centres that may not be ready to handle the additional sanitary needs. The need to improve and expand social infrastructures such as water supply, waste management and health services is obvious in order to handle the needs of the growing urban centres. As a health worker you need to understand that these developments have environmental health risks due to overcrowding, inappropriate waste management and a shortage of safe drinking water.

3.2 Development as a Means of Interaction

Assume for a minute that a textile factory is planned to operate in your community. Now, think of what benefits and disadvantages that may arise from the introduction of this factory.

Figure 1shows diagrammatically the relationship between development and the environment. In this diagram, the two arrows lying between 'human activities' and 'ambient environment' indicate the relationship between them, i.e. that development requires resources from the environment (forward arrow) and, as a result, waste could be generated as a by-product (backward arrow).

In fact, there are three possible types of interaction: humans can affect the environment, the environment can affect humans, and humans and the environment can co-exist (where they sustain each other). The red arrows in Figure 1 indicate the negative effect if the generated waste is not properly handled. This affects the environment in the form of pollution of air, water, etc., and can have a negative influence on development.

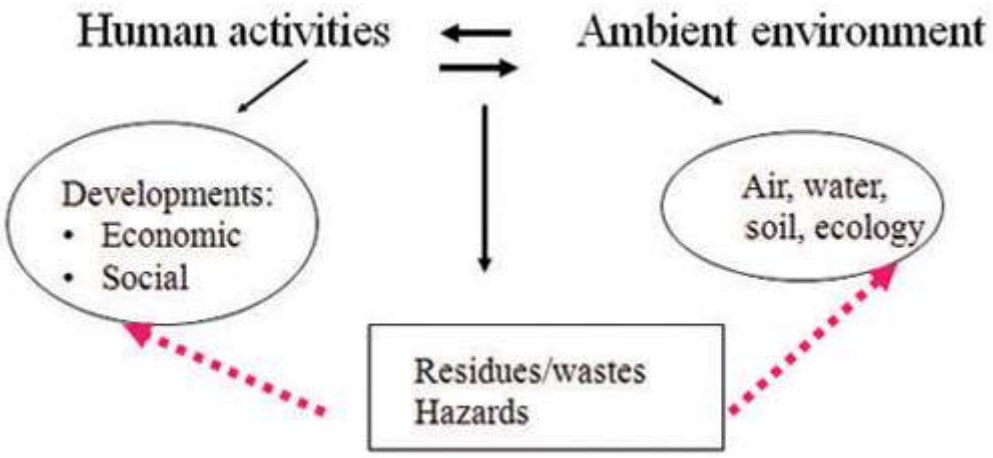
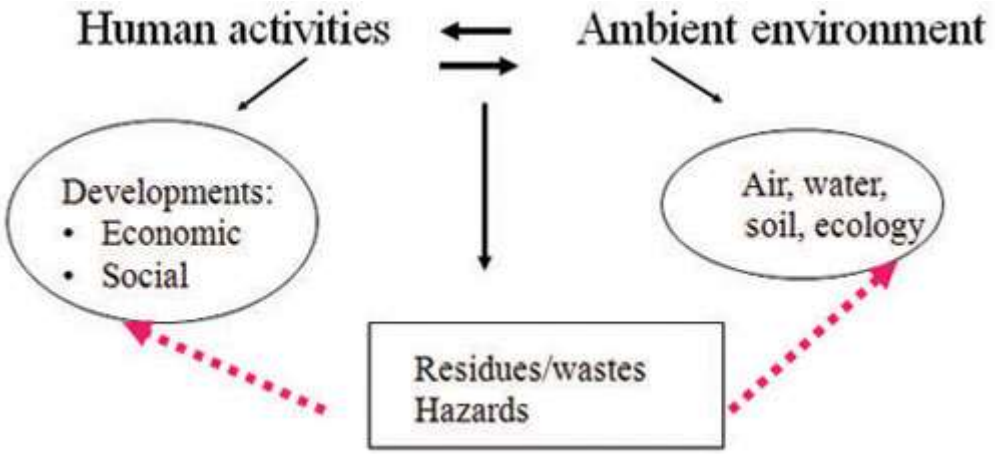


Fig. 1: Human–Environment Interaction Model

Matters of development and health have been on the agenda in UN international conferences and meetings. The issue of sustainable development is a key message for the friendly coexistence between development and the environment. The World Commission on Environment and Development defined sustainable development as:

- development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

- Referring to Figure 1, think of different examples of the three types of interaction between human activities and the environment.



4.0 CONCLUSION

In this unit, we learnt that there are three possible types of interaction:

- humans can affect the environment,
- the environment can affect humans, and
- humans and the environment can co-exist

5.0 SUMMARY

There are various environmental health risks that affect our health. These include water and air pollution, food contamination and the disposal of wastes into our environment. The interaction between humans and the environment has various forms.

6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the three possible types of human interaction with the environment.

7.0 REFERENCES/ FURTHER READING

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UNIT 3 GLOBAL WASTE- PICKING

CONTENTS

1.0 INTRODUCTION

Millions of people worldwide make a living collecting, sorting, recycling, and selling materials that someone else has thrown away. Vital actors in the informal economy, waste pickers provide widespread benefits to their communities, their municipalities and the environment. In this Unit, you we learn about waste picking and the more reason why the practice is becoming a global trend. You will also learn about this subject under waste management and control.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- define waste pickers
- describe 3 attributes of waste pickers
- mention 5 benefits of waste picking to the economy
- explain the health risks of waste picking
- list a few advantages of Waste Pickers Union.

3.0 MAIN CONTENT

3.1 Waste Pickers

The term waste pickers can be broadly defined as people who reclaim "reusable and recyclable materials from what others have cast aside as waste". Waste pickers can range from poor people rummaging through garbage in search of necessities such as food to informal private collectors of recyclables who sell to middlemen or businesses, as well as organised pickers/sorters linked to unions, cooperatives or associations. Waste pickers may collect household waste from the curbside, commercial and industrial waste from dumpsters, or litter from streets and urban waterways. Some live and work on municipal dumps.

Other waste pickers work as sorters in recycling warehouses or as processors in recycling plants owned by Membership-Based Organisations (MBOs). Some are involved in cross-border activities, such as the Mexican waste pickers who work on both sides the US border.

At the First World Conference of Waste Pickers in 2008, the term "waste pickers" was adopted for use in English to facilitate global networking. It is preferred to such derogatory terms as "scavengers." Other languages have their own terms: *catadores* in Portuguese, *recicladores* in Spanish.

Across different categories, countries and regions worldwide, waste picking shares common aspects:

- Workers are subject to social stigma, face poor working conditions, and are frequently harassed.
- Waste picking is highly responsive to market-driven conditions for recyclables.
- Waste picking is often a family enterprise. It offers flexible working hours (inclusive to women) and a high level of adaptability.
- Waste picking appears to be chaotic work but is very organised.
- Numbers of waste pickers fluctuate due to economic conditions and urban processes.
- Waste pickers are often not part of public solid waste management systems; they are socially invisible and seldom reported in official statistics.
- Waste picking is easily learned and usually does not require literacy. However, when working in a collective endeavour, some activities (for example, administrative tasks) do require literacy.
- Non-organised waste pickers are often recruited by middlemen.

A Cross Section of Waste Pickers, Young and Old at Ojota, Lagos Nigeria (2000)

There are millions of waste pickers worldwide, but little reliable socio-economic or statistical information exists. Most studies are qualitative (ethnographies or social profiles of workers for particular cities or sites). Where quantitative studies exist, they frequently use a very small sample, making generalisations difficult. Since waste pickers are mobile

and their population can fluctuate by season, estimation of a total population is difficult. In addition, they may avoid researchers, as waste pickers may fear information will be passed on to public officials, making it harder to collect sound data.

A 1988 World Bank study estimated that waste pickers comprised 1-2 per cent of the world's population (Bartone, 1988). A more recent study in India estimated waste pickers in that country numbered 1.5 million people, primarily women and those from socially marginalised groups (Chaturvedi 2010). There are an estimated 18,000 *recicladores* in Bogota, Colombia; 15,000 *clasificadores* in Montevideo, Uruguay; and 9,000 *cartoneros* in Buenos Aires, Argentina (Schamber et al. 2007). Brazil is the only nation that systematically captures and reports official statistical data on waste pickers. Read more about Brazil's official statistics on waste pickers.

3.2 Waste Picker Contributions

The value of waste picking is increasingly important to global environmental efforts and the development of cities. There is growing recognition that waste pickers contribute to local economies, to public health and safety, and to environmental sustainability. Unfortunately, these contributions are rarely acknowledged by authorities.

- Public health and sanitation improve when waste pickers remove waste from urban areas not served by municipal garbage collection.
- Municipal expenses are reduced through the informal subsidisation of solid waste management systems. In many cities, waste pickers supply the *only* form of waste collection. A 2010 UN Habitat publication says waste pickers perform between 50-100 per cent of all ongoing waste collection in most cities in developing countries – at no cost to the city budget. For more on the cost savings to cities, see Waste Pickers and Solid Waste Management.
- The environment benefits when waste pickers divert a significant quantity of materials from the waste stream. A 2007 study by the GTZ/CWG found that waste pickers recovered approximately 20 per cent of all waste material in three of the six cities studied. In one city, the rate was even higher due to the collection of organic matter for pig feeding (GTZ/CWG 2010).
- Reuse and recycling decreases the virgin materials needed for production, thus contributing to the conservation of natural resources and energy while reducing air and water pollution. Recovery of recyclable materials and organic matter contributes

to the reduction of greenhouse gases (GHG) and to the mitigation of climate change.

- Livelihoods are created for waste pickers and those who recycle materials – usually very poor people who may not have other job opportunities. A significant number are women, and some are children. Penalising this activity has a negative impact on poverty alleviation measures.

3.3 Driving Forces and Working Conditions

For many people in developing countries, especially those with limited education or opportunity, waste picking offers a livelihood. Flexible hours make it inclusive for women who have other care responsibilities. The job of waste pickers is taking on particularly new importance as an employment opportunity for persons with limited education and skills in the current economic downturn.

3.4 Earnings

Waste pickers' earnings vary widely between regions by the type of work they do, and for women and men. For example, in Belgrade, waste pickers may earn US $100 monthly on average (Simpson-Hebert et al. 2006), while in Cambodia, the earnings can be as little as one dollar a day (ILO/IPEC 2004). In Santa Cruz, Bolivia, about 59 per cent of waste pickers earn below the minimum wage. However, although waste picking is the lowest paid part of the recycling chain in many places, these workers can earn more than the minimum wage; in Brazil and Mexico, some earn many times the minimum wage. In Brazil, RAIS database shows that a third (34%) of waste pickers earn 1.01 – 1.50 times the minimum wage, 29 per cent between 1.51 to 2.00 times minimum wage; 18 per cent between 2.01 to 3.00 times minimum wage;

7 per cent between 3.01 to 4.00 times minimum wage (Crivellari et al., 2008).

A gender analysis of RAIS data concluded that men earn much more than women in all age groups (Crivellari et al., 2008). In age groups with higher earnings, those receiving between 3 and 4 times the minimum wage, 98 per cent are men while only 2 per cent are women. That disparity is also found in the groups that receive between 4 and 5 times the minimum wage (5% women), between 5 and 7 times the minimum wage (3% women) and between 7 and 10 times the minimum wage (6% women). No women are found in the highest income groups, those that earn between 10 and 15 times and above 20 times the minimum wages.

3.5 Health Risks

Handling waste poses many health risks to workers. These are even greater for informal workers due to their daily unprotected exposure to contaminants and hazardous materials. Risks include contact with fecal matter, paper saturated by toxic materials, bottles and containers with chemical residues, health residues, contaminated needles, and heavy metals from batteries (Cointreau 2006). A lack of worker protection and poor access to health care aggravate these risks.

3.5.1 Risk of Injuries

Waste pickers face great risks of injury, especially those who work at open dumps and may be run over by trucks or become the victims of surface subsidence, slides and fires. They are also exposed to great quantities of toxic fumes.

Waste pickers also endure ergonomic hazards such as heavy lifting, static posture and repetition, and may have high incidences of low back and lower extremity pain. Some studies indicate a higher prevalence of minor psychiatric disorders amongst waste pickers, likely the result of stressful conditions (Da Silva *et al*., 2006).

Through the Social Protection Programme, WIEGO has undertaken a three year research project about occupational health and safety (OHS) for informal workers, including waste pickers. This involves working with membership-based organisations and partners to find out how to develop OHS in a way that can better meet the needs of informal workers.

3.5.2 Harassment, Disrespect and Violence

Treated as nuisances by authorities and with disdain by the public, waste pickers are usually ignored within public policy processes and frequently suffer low social status and self-esteem. They are particularly susceptible to violence by the police. They may face exploitation and intimidation by middlemen, which can affect their earnings. The significant numbers of women engaged in this occupation are particularly affected by exclusionary policies towards waste picking.

Recent trends-such as privatisation of municipal solid waste management services, global approaches to climate change mitigation, and the global recession – have exacerbated the situation for some waste pickers:

- Privatisation of municipal solid waste management services threatens the zabaleen community of waste pickers in Cairo, Egypt and waste pickers in Delhi, India. For more on this topic, read Chapter 6 of *Refusing to be Cast Aside: Waste Pickers Organising around the World* by Melanie Samson.
- Global approaches to climate change mitigation, such as funding for incinerators and waste-to-energy plants that burn materials waste pickers could otherwise recycle, threaten rather than reward the work of waste pickers.
- The global recession has hit waste pickers hard. Research conducted by WIEGO and its partners in the Inclusive Cities Project found the economic crisis caused a marked drop in the demand for and price of waste. For more information on this topic, see the Informal Economy/Links with Economic Crisis page.

In spite of the significant benefits waste pickers make to public health, the environment and the economy, they continue to suffer poor working conditions without recognition. In addition, the majority of waste pickers worldwide do not have access to any kind of state-sponsored social protection schemes. However, change is on its way. Membership-based organisations of waste pickers and other progressive entities are helping cities recognise the vital role waste pickers play, and encouraging authorities to design more progressive policies. Cities like Belo Horizonte in Brazil, Lima in Peru and Pune in India are developing policies that integrate waste pickers into selective waste collection.

Replacement of repressive policies with inclusive policies that focus on legal backing, redistributive measures, social recognition and the strengthening of waste picker organisations is crucial. In a November 2012 *Global Urbanist* article, Sonia Dias argues for a holistic approach

to solid waste management that recognises the economic and environmental benefits of including informal waste pickers in waste management and planning.

WIEGO's Urban Policies Programme generates research, policy analysis and good practice documentation on how urban policies affect waste pickers for the global Inclusive Cities project. For more information, see Legislation and Policies Beneficial to Waste Pickers.

There are also growing opportunities in the private sector. For example, in Mumbai and other cities in India, helping corporations deal with post-consumer waste is providing a niche to informal workers. Waste pickers are involved with companies such as Tetra Pak in the recovery and sorting of paper and plastic-aluminum into separate commodities, and with Coca Cola for shredding PET units.

3.6 Organisation and Voice

Waste pickers, known for their independence and individualism, are increasingly motivated to organise and fight for recognition and a place within formal waste management systems. They are organising in many different ways – cooperatives, associations, companies, unions, micro-enterprises. Some are even forming "women only" organisations in order to better confront gender inequalities. Research suggests women are more likely to belong to these organisations - a small-scale study in Brazil found that 56 per cent of the members of waste picker organisations, cooperatives and associations are women, while 44 per cent are men.[1]

3.6.1 Benefits of Waste Pickers Organisation

Organising or formation of a union benefits waste pickers by:

- raising social status and self-esteem
- improving members' incomes and their quality of life, in part by circumventing middlemen
- improving working conditions and contributing to better health quality
- facilitating the development of networks
- providing institutional frameworks for hiring of waste pickers for local bodies/ firms
- preventing harassment and violence
- eliminating child labour in waste picking.

Forging solidarity links across continents is an important strategy. Waste pickers have increased their global networking since the First World Conference of Waste Pickers in 2008 in Bogota, Colombia. Networking showcases successes and inspires nascent movements, helping develop organisations. At the Bogota conference, Bernardo Toro made a presentation on the importance of organising for waste pickers.

4.0 CONCLUSION

The job of waste pickers is taking on particularly new importance as an employment opportunity for persons with limited education and skills in the current economic downturn. Waste picking has many health risks but then it has its own benefits to the poor. The actors in this sector may not be recognised, but if they form a union, the government would probably recognise their potential contribution to the economy of a nation.

5.0 SUMMARY

In this unit, you learn about waste picking, merits and its demerits. We also learn about the significance of organisation towards the recognition of the actors in this economic sector.

6.0 TUTOR-MARKED ASSIGNMENT

1. Define waste picking.
2. Describe 3 attributes of a waste picker.
3. Mention 5 benefits of waste picking to the economy.
4. Explain the health risks involved in waste picking.

7.0 REFERENCES/FURTHER READING

Cataunidos (2007). *A Commercial Network of Nine Cooperative Enterprises in Belo Horizonte Metropolitan Area and Published in INSEA – Instituto Nenucia De DeSenvolvimento Sustentavel. Perfil sócio-econômico dos catadores da rede Cataunidos. Belo Horizonte: INSEA/UFMG/FELC, 2007. 31 p. Relatório.*

Women in Informal Employment (2013).*Globalising and Organising.* (WIEGO).

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MODULE 5 WORK PLAN AND CAREER IN ENVIRONMENTAL HEALTH

UNIT 1 ENVIRONMENTAL HEALTH WORK PLAN

CONTENTS

1.0 INTRODUCTION

As an environmental health officer, you may be required to prepare an annual work plan (AWP) for a particular activity or programme. You will learn how to develop such work plan in this unit.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- list the systematic description of a work-plan
- prepare and present a typical annual work- plan of action for improvement of environmental health activities to the head of your unit.

3.0 MAIN CONTENT

3.1 Environmental Health Planning

Environmental health planning refers to a systematic process by which goals are established, facts are gathered and analysed, alternative proposals and programmes are considered and compared. It also allows resources to be measured and priorities established. Strategies and activities are also designed to meet the established goals or objectives within a specified period of time. As an environmental health officer, you may be requested to prepare an environmental health plan for a particular activity or programme. The following planning steps are suggested.

3.2 Identifying the Needs and Gaps

This is essentially an inventory (or list) of problems related to environmental health in your local context. You can use various tools in order to identify these problems.

- **Environmental health survey:** This is a systematic survey using a questionnaire. The questionnaire contains basic indicators of environmental health such as latrine availability, source of drinking water, waste disposal systems, cleanliness of the community, etc. You will need to do some statistical analysis (proportions and averages) to refine basic indicators of environmental health for your local context. You must be careful when designing a survey as it requires time, expertise and resources.
- **Rapid/quick assessment:** This is the usual method that helps you gain a quick overview of the range of problems. The usual data collection tools that you can use for this are focused or group discussion, physical observation with checklists and interviewing people.

3.3 Priority- Setting

It is difficult to handle all identified problems due to resource limitations. You need to know in advance the available resources in your establishment. Resources can be mobilised from government, community, private organisations and NGOs. Do not rely too much on governmental resources as there are always limitations. Mobilising community resources is the best option that could be sustained. Priorities are then made on the basis of the depth and severity of the problem, the feasibility and the degree of community concern and willingness to be involved in the resource mobilisation.

3.4 Writing a Planning Report

This is a systematic description of the planning functions. The recommended sub-titles are:

1. Title of the plan
2. Introduction or background
3. Objectives
4. Strategies and activities
5. Indicators
6. Resources (i.e. budget, human resource and materials)
7. Plan of action (i.e. activities by time and responsible person).

Sample1

Short-term Objectives	Activities	Indicator (what type of data you will need)	Data (where you will get the data)	Time-frame for Assessing Progress	Staff Responsible
1. By 9/29/2009, assist Addams Elementary School in providing the state requirement of 150 minutes per week of health education & physical activity for children grades K-5, utilizing CATCH curriculum and experiential learning activities.	1. Provide 30 minutes per week of health education & physical activities for children K-5 at Addams Elementary School. 2. Provide after school program for up to 40 youth grades 1 – 5, including 60 minutes per day of MVPA. Includes weekly nutrition & fitness lessons, including CATCH curriculum & experiential learning activities.	• Number of classes • Number of students • Number of afterschool participants • Amount of time in health education & MVPA	• Attendance sheets • Lesson records	9/30/2008 - 9/29/2009	Jennie Howard, Kevin Heeney Sherry Surrell Alison Arrington

Sample 2

Work Plan for School Health Services Programme

S/N	Strategy	Objectives	Activities	Time frame	Budget	Source	Responsible person	Indicator
1	Advocacy	Sensitize school heads on school sanitation and personal hygiene among pupils.	(1). Meeting with stakeholders (head Masters and Secretary	Jan-Feb.	N20,000	MOH	Task force on School health Services	No of schools visited

You may be required to prepare and present an annual plan of action for improvement of hygiene and environmental health to the head of your unit. The plan of action needs careful consideration of your work in your area of jurisdiction. The activities in the plan should include

identifying problems, inspection services (households, food establishments, public utilities such as water sources, health facilities), hygiene promotion, monitoring selected indicators, sanitation promotion, training of local partners, sanitation campaigns and commemorating sanitation and water days.

3.5 Implementing the Plan

Once the plan has been approved by the head of your department it can be implemented. Environmental health activities are put into practice on the ground at this stage.

3.6 Monitoring and Evaluating the Planned Performance

Daily, weekly or monthly monitoring will help you check the progress of the implementation, while evaluating performance at the end of the year is useful to help you see the overall progress.

3.7 Learning by Doing

You will be able to learn lessons from the experience of the previous year's implementation and the achievements and failures.

4.0 CONCLUSION

Environmental health planning requires you to gain knowledge of problems in your area and to identify needs and gaps, to set priorities and find resources to solve the problems.

5.0 SUMMARY

In this unit, you learnt about the systematic description of work-plan sub-titles and how to present an annual work-plan of action for environmental health activities.

6.0 TUTOR-MARKED ASSIGNMENT

1. In a tabular form, present a typical work-plan for the control of Malaria in a named community of your Local Government Authority.

7.0 REFERENCES/FURTHER READING

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eNotes.com.

Colborn, T. Dumanoski, D. & Petersen, M. J. (1996). *Our Stolen Future.* New York: Dutton.

UNIT 2 ENVIRONMENTAL HEALTH IN PUBLIC HEALTH

CONTENTS

1.0 INTRODUCTION

In this unit, you will learn about the scope of public health. You will also learn about the roles of environmental health in public health. The next unit will equally introduce you to what environmental health is as a career.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- list the core components of public health as a profession
- explain and describe each of the components of public health
- discuss the roles of environmental health in public health.

3.0 MAIN CONTENT

3.1 Components of Public Health

Public health is the science of protecting and improving the health of communities through education, promotion of healthy lifestyles, and

research for disease and injury prevention. Public health professionals analyse the effect on health of genetics, personal choice and the environment in order to develop programs that protect the health of your family and community.

Overall, public health is concerned with protecting the health of entire populations. These populations can be as small as a local neighborhood, or as big as an entire country.

Public health professionals try to prevent problems from happening or re-occurring through implementing educational programs, developing policies, administering services, regulating health systems and some health professions, and conducting research. This is in contrast to clinical professionals, such as doctors and nurses, who focus primarily on treating individuals after they become sick or injured. It is also a field that is concerned with limiting health disparities and a large part of public health **is** the fight for health care equity, quality, and accessibility. The field of public health is highly varied and encompasses many academic disciplines. However, public health is mainly composed of the following core areas:

- Behavioral Science/Health Education
- Biostatistics
- Emergency Medical Services
- Environmental Health
- Epidemiology
- Health Services Administration/Management
- International/Global Health
- Maternal and Child Health
- Nutrition
- Public Health Laboratory Practice
- Public Health Policy
- Public Health Practice.

3.1.1 Behavioral Science/Health Education

Stopping the spread of sexually transmitted diseases, such as herpes and HIV/AIDS; helping youth recognise the dangers of binge drinking; and promoting seatbelt use. Behavioral Science/Health Education focuses on ways that encourage people to make healthy choices. This includes the development of community-wide education programs that range from promoting healthy lifestyles in order to prevent disease and injury, to researching complex health issues.

Specialists encourage people to make healthy choices and develop educational programs that promote healthy lifestyles and prevent disease and injury. They also promote more efficient uses of health services,

adopt self-care practices, and participate actively in the design and implementation of health programs. Some examples of concentrations include mental health, aging, health promotion and disease prevention, public health practice, health education and behavior change, disability and health, and social research.

3.1.2 Biostatistics

Estimating the number of deaths from gun violence or looking at trends in drunk driving injuries by using math and science is the study of biostatistics. Using biostatistics, one can identify health trends that lead to life-saving measures through the application of statistical procedures, techniques, and methodology. Forecasting scenarios, identifying health trends within the community, explaining biological phenomena, as well as determining the causes of disease and injury, biostatistics are an integral part of public health. Biostatistics are often utilised in tandem with epidemiology.

3.1.3 Emergency Medical Services (EMS)

Emergency medical services ensure that communities have trained emergency medical responders always available to respond to emergencies. Emergency medical services focus on ensuring a functioning emergency care system. This includes licensing paramedics and emergency medical technicians, approving the training curriculum and licensing EMS instructors, ensuring ambulances are safe and well-equipped, and ensuring that every community has access to emergency care-from first responders through to a sophisticated trauma center.

State or regional public health specialists may focus on training, licensing, quality control, access, research, or disaster preparedness. While the actual emergency care may be provided by a hospital, a fire department, a private company, or a non-profit organisation, EMS public health professionals ensure a coordinated EMS system that works seamlessly to provide rapid, competent, emergency care to all citizens.

3.1.4 Environmental Health

The air we breathe, the water we drink, the complex interactions between human genetics and our surroundings. How do the built and natural environments influence our health and how can we reduce risk factors? These environmental risk factors can cause diseases such as asthma, cancer, and food poisoning. Specialists from chemistry, toxicology, engineering, and other disciplines combine their expertise to answer these important questions. Environmental health studies the impact of our surroundings on our health.

Because environmental health is so broad in scope, it is often broken down in academic and professional settings in areas of contact and medians. These areas are:

- air quality
- food protection
- radiation protection
- solid waste management
- hazardous waste management
- water quality
- noise control
- environmental control of recreational areas
- housing quality
- vector control.

3.1.5 Epidemiology

When food poisoning or an influenza outbreak attacks a community, the "disease detectives" or epidemiologists are asked to investigate the cause of disease and control its spread. Epidemiologists do fieldwork to determine what causes disease or injury, what the risks are, who is at risk, and how to prevent further incidences. They spot and understand the demographic and social trends that influence disease and injury and evaluate new treatments. The initial discovery and containment of an outbreak, such as West Nile virus, often comes from epidemiologists. Some of the most important health-related discoveries in history are associated with epidemiology including the landmark 1964 Surgeon General's report on smoking tobacco stating its harmful effects. **Biostatistics** is often used in tandem with epidemiology.

3.1.6 Health Services Administration/Management

Managing the database at a school clinic; developing budgets for a health department; creating polices for health insurance companies; and directing hospital services all depend on health administrators. The field of health services administration combines politics, business, and science in managing the human and fiscal resources needed to deliver effective public health services. Specialisation can be in planning, organisation, policy formulation and analysis, finance, economics, or marketing.

3.1.7 International / Global Health

International/Global health addresses health concerns from a global perspective and encompassing all areas of public health (e.g., biostatistics, epidemiology, nutrition, maternal and child health, etc.).

International health professionals address health concerns among different cultures in countries worldwide.

Globalisation has linked our health more closely to one another than ever before. The rapid movement of people and food across borders means that a disease can travel from a remote village to an urban hub at breakneck speed. Global public health meets the rising health challenges that transcend national boundaries. This international field encompasses virtually all specialisations in public health.

Every school offers slightly different tracks or areas of interest. Here are examples from various schools:

- Health-Care Finance and Economics
- Population Policy and Demography
- Maternal and Child Health/Primary Health Care/Health Services
- Communication and Behavioral Science
- Coping with Complex Emergencies
- Mental Health and Medical Anthropology
- Program Evaluation/Information Systems
- Public Nutrition and Food Security
- International Health Policy and Management
- Infectious Disease Epidemiology and Control
- Research and Evaluation Methods
- Health Promotion.

3.1.8 Maternal and Child Health

Public health is an interdisciplinary field and professionals in many disciplines such as nursing, medicine, veterinary medicine, dentistry, and pharmacy routinely deal with public health issues. A degree in public health practice enables clinicians to apply public health principles to improve their practice.

Maternal and child health provides information and access to birth control; promoting the health of a pregnant woman and an unborn child; and dispensing vaccinations to children are part of maternal and child health. Professionals in maternal and child health improve the public health delivery systems specifically for women, children, and their families through advocacy, education, and research.

3.1.9 Nutrition

Promoting healthy eating and regular exercise; researching the effect of diet on the elderly; teaching the dangers of overeating and over dieting are the responsibilities of public health nutritionists. In short supply in both public and private sectors, this field examines how food and

nutrients affect the wellness and lifestyle of population. Nutrition encompasses the combination of education and science to promote health and disease prevention.

3.1.10 Public Health Laboratory Practice

Public health laboratory professionals such as bacteriologists, microbiologists, and biochemists test biological and environmental samples in order to diagnose, prevent, treat, and control infectious diseases in communities. In order to ensure the safety of our food and water, to screen for the presence of certain diseases within communities, and to respond to public health emergencies, such as bioterrorism, public health laboratory practice is essential.

3.1.11 Public Health Policy

Public health policy analyses the impact of seat belt laws on traffic deaths, monitoring legislative activity on a bill that limits malpractice settlements, and advocating for funding for a teen anti-smoking campaign. Professionals in public health policy work to improve the public's health through legislative action at the local, state, and federal levels.

3.2 The Role of Environmental Health in Public Health

Environmental health is a part of public health where the primary goal is preventing disease and promoting people's health. Environmental health is associated with recognising, assessing, understanding and controlling the impacts of people on their environment and the impacts of the environment on the public. The role of the environmental health worker, therefore, includes the following:

1. Improving human health and protecting it from environmental hazards
2. Developing liaison between the community and the local authority, and between the local and higher levels of administration
3. Acting independently to provide advice on environmental health matters; designing and developing plans of action for environmental health
4. Initiating and implementing health/hygiene, sanitation and environmental programmes to promote understanding of environmental health principles.
5. Enforcing environmental legislation
6. Monitoring and evaluating environmental health activities, programmes and projects.

4.0 CONCLUSION

In this unit, you learnt about the core components of public health as a profession. You also learnt about the descriptions of the various components of public health. Public health was described as the science of protecting and improving the health of communities through education, promotion of healthy lifestyles, and research for disease and injury prevention. Environmental health on the other hand, is associated with recognising, assessing, understanding and controlling the impacts of people on their environment and the impacts of the environment on the public.

5.0 SUMMARY

In this unit, we understood that public health is an interdisciplinary field and professionals in many disciplines such as nursing, medicine, veterinary medicine, dentistry, and pharmacy routinely deal with public health issues. Environmental health is also associated with recognising, assessing, understanding and controlling the impacts of people on their environment and the impacts of the environment on the public. It has several roles to play in public health.

6.0 TUTOR-MARKED ASSIGNMENT

1. List 6 components of public health as a profession.
2. Describe 3 of these components.
3. Discuss the roles of environment health in the public health.

7.0 REFERENCES/FURTHER READING

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UNIT 3 CAREER IN ENVIRONMENTAL HEALTH

CONTENTS

1.0 INTRODUCTION

This unit explains holistically, environmental health as a career. It also delves with the prominent roles of environmental health practitioners as well as their placement in the economic sector and the labour market.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- define environmental health
- list 10 oversight functions of an environmental health officer
- list 5 areas of specialisations in environmental health practice.

3.0 MAIN CONTENT

3.1 Is a Career in Environmental Health for You?

Environmental health is the branch of public health that ensures the health and safety of life's necessities - food, water, air, and shelter - through the enforcement of local, state, and federal regulations. Environmental health specialists are best known for their work within local government to protect and ensure the public's health at many levels. They may monitor air quality, water and noise pollution, handle hazardous and infectious waste, control for toxic substances and pesticides, conduct restaurant inspections, promote healthy land use, and ensure that public housing and institutions meet health and safety standards, and much more. In addition, the increasing environmental health threats (E. coli outbreaks), the emergence of new diseases (SARS), and the human impact of environmental catastrophes

(Hurricane Katrina) show that the need for environmental health professionals is expanding. Despite the important role that environmental health professionals play in keeping our community healthy and safe, the number of job openings is far more than the supply of qualified individuals to fill them.

3.2 What do Trained Environmental Health Professionals Do?

- Sanitary inspection of premises
- Workplace health and safety
- Restaurant inspection
- Noise abatement
- School health services
- Retail food facilities
- Toxic site cleanup
- Solid waste handling and disposal
- Wells and water systems monitoring
- Industrial health and safety
- Market sanitation
- Food protection and safety
- Wildlife health/management
- Drinking water quality
- Air quality
- Environmental health education
- Toxicology
- Radiation protection
- Housing safety and lead monitoring
- Wastewater treatment
- Public pool health and safety
- Vector control
- Hazardous materials handling and incident response
- Enforcement of environmental/sanitation laws.

3.3 Job Titles

- Environmental health officer
- Environmental health specialist
- Drinking and groundwater specialist
- Solid waste specialist
- Food safety specialist
- Emergency management specialist
- Hazardous-waste management specialist
- Emergency response specialist
- Toxicologist
- Air pollution specialist

- Surface water specialist
- Environmental policy maker
- Environmental advocate
- Food and drug inspector
- Compliance officer
- Environmental health educator
- Epidemiologist
- Industrial hygienist
- Occupational safety officer
- Energy auditor.

3.4 Where Do Environmental Health Professionals Work?

- Federal government agencies
- Federal, State, and Local government Health Service
- Private corporations (e.g. food retailers, shipping companies, airlines, hospitals, aerospace and manufacturing services)
- Public utility companies
- Environmental consulting firms
- Environmental research corporations
- Industry
- International health organisations
- Non-profit environmental organisations
- Environmental monitoring companies
- Colleges and universities
- Wildlife parks
- Insurance companies
- Energy monitoring organisations
- Toxic waste removal firms

If you want a career that offers:

- Adventure
- Job stability
- Independence
- Diverse job tasks
- Opportunities to travel
- A flexible work schedule
- Excellent pay and benefits
- Flexibility in the job market
- Many types of job opportunities
- A challenging and fulfilling career
- The ability to be a “disease detective”
- An opportunity to work in the field, not at a desk
- Experience in working with diverse groups of people
- The ability to help people solve environmental problems

- Satisfaction that you have reduced the spread of disease
- Satisfaction that you are contributing to a healthier community
- An opportunity to be part of the environmental sustainability movement.

Then Environmental Health is for you!

4.0 CONCLUSION

Environmental health is the branch of public health that ensures the health and safety of life's necessities (food, water, air, and shelter) through the enforcement of local, state, and federal regulations. Environmental health specialists are best known for their work within local government to protect and ensure the public's health at many levels. A qualified environmental health officer could be a specialist in so many areas and work in many organisations, be it private or governmental.

5.0 SUMMARY

In this unit, you have learnt about the relationship between environmental health and public health. We also learnt about oversight functions, career opportunities and placements of environmental health officers in the labour market.

6.0 TUTOR-MARKED ASSIGNMENT

1. Define environmental health.
2. List 10 oversight functions of an environmental health officer.
3. List 5 areas of specialisations in environmental health practice.

7.0 REFERENCE/FURTHER READING

http://www.csuchico.edu/hcsv/career_info/environmental_health.shtml.
http://www.ccdeh.com/jobs/default.htm.