NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: EHS 216

COURSE TITLE: URBAN PLANNING MANAGEMENT

COURSE GUIDE

EHS 216

URBAN PLANNING MANAGEMENT

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INTRODUCTION

Urban Planning and Management is a semester course of two credit units available to all Bachelor of Science (B.Sc.) Environmental Health (EH) programme.

Urban environment plays significant role in the biological, social and economic life of every society. How it is planned and managed do impact positively or negatively on the well-being of the urban population and indeed, the environment. The study of urban planning and management is therefore concerned with processes and efforts aimed at ensuring that the urban environment is organised and developed in an orderly manner to support robust health and sustainable development.

We often witnessed monumental decay of the built-up environment due to poor urban planning or no planning at all. The problem of poor housing, improper waste management practices, chaotic transport system, inefficient infrastructures and public utilities, environmental and urban chaos, etc., can be traced to poor urban planning and management. These problems are exacerbated by poor planning culture among policy makers, technocrats, professionals and developers; inadequate number of Town Planners; non-adherence to planning principles and planning guidelines as well as fragrant violation of town planning laws and regulations.

Urban planning focused on demarcating the urban space to thematic areas, zones/ sub-zones and layouts and the production of plans and maps to guide development along a well-determined framework and goal. The interest of the Town Planner like the Environmental Health Officer is to ensure that development proceeds along a well-planned pathway to limit hazard and promote public health. Basically, the study

of urban planning and management ensures that the urban environments are liveable and development is sustainable.

Urban planning, most often referred to as urban and regional planning or still – town and country planning is a branch of architecture that focuses on organising the urban areas and designing settlements, from the smallest towns to the largest cities. It deals with the growth and functioning of cities and towns, including environmental concerns, zoning, the infrastructure, etc. Urban planning is a technical and political process concerned with the control of the use of land and design of the urban environment, including transportation networks, to guide and ensure orderly development of settlement and communities. It concerns itself with research and analysis, strategic thinking/design, public consultation, policy recommendations, implementation and management. The output of urban planning is usually a spatial representation in a form of a map or diagram depicting what is to be found on the exact location. This appears to be the hallmark of urban planning, which seems to overshadow the concept, ideology and the goal of urban planning which is orderly and sustainable development.

Generally, planning is often viewed as a remedial process. While nearly all planning involves the formulation of corrective measure to alleviate mistakes of the past, the essence of urban planning is preventative rather than remedial. In this context, planning involves a continuous study of the urban environment as it is affected by growth and shifts in population, technological developments, changes in economic activities and their distributions, shifts in the preferences and value systems of various classes and social groups, and so forth. It is from this continuous, on-going activity that problems are identified and defined. Therefore in the context of Environmental Health, urban planning focuses on the need to ensure orderly development to eliminate nuisances to public health and to promote efficient and robust physical, mental and social wellbeing of individuals and the community in a sustainable manner.

WHAT YOU WILL LEARN IN THIS COURSE

The content of this course consist of two (2) credit units and this course guide tells you what to expect from reading the course material and other materials that will enable you understand the concept of the course and its application. The course guide also provides guidelines on the time you are expected to spend on each unit, your self-assessment exercises and your tutor-marked assignments. As Environmental Health Officer (EHO), the study of urban planning and management will enable you relate your professional duties with the things you find in the built-up environment. It will help you analyse what went wrong and what could be remedied as well as how to work with Town Planners to prevent urban decay which often impact on public health.

COURSE AIM

The aim of this course is to equip you with the skills and capacity to apply the knowledge of urban planning and management to ensure orderly development that will eliminate nuisances and the promotion of robust health in a sustainable manner within your area of jurisdiction.

COURSE OBJECTIVES

To achieve the aim of this course, the following objectives are set out. However, each unit of the course has specific objectives, stated at the beginning of the unit, which you are expected to refer to during your study. It is also advisable for you to check the unit objectives after completion of each unit to assess your level of accomplishment.

After going through this course, you should be able to:

- define and state the purpose of urban planning and management
- state the causes of poor urban planning and management
- describe the stages in planning the urban environment and list urban planning principles
- explain the evolution of urban planning theories and describe the usefulness of those theories to modern urban planning and management
- explain how urbanisation and poverty effect sustainable development of urban environment
- describe the application of GIS in urban planning and management
- state the purpose for planning built-up environment and layout
- explain the concept of environmental spatial quality
- explain how to predict and control the effects of flooding in urban environment, and describe scenario development
- describe environmental health features in urban planning
- describe the mechanism for collaboration between relevant professionals within the environment sector for sustainable living environment
- list and explain the effects of unplanned urban environment
- describe how to prevent and control the effects of unplanned environment.

WORKING THROUGH THIS COURSE

This course has been carefully put together bearing in mind that you might be new to the subject matter. However, efforts have been made to ensure that adequate explanation, examples and illustrations were made to enhance better understanding of the course. You are therefore, advised to spend quality time to study this course and ensure that you attend tutorial sessions where you can ask questions and compare your knowledge with that of your course-mates.

COURSE MATERIALS

The course materials include the following:

- Course guide
- Course material which contain study unit
- Reference materials
- Assignments and
- Presentation schedule.

In addition, this course comes with a list of recommended text books which are not compulsory for you to buy or read, but are essential to give you more insight into the various topics discussed.

STUDY UNITS

This course is divided into four modules with a total of 15 units. The following are the study units contained in this course:

Module 1 Definitions, Concepts and Theories

Unit 1 Definition and Concept of Urban Planning and Management

Unit 2 History of Urban Planning and Management

Unit 3 Theories of Urban Planning and Management

Unit 4 Social Factors Affecting Development of Society and Contemporary Human Geography

Module 2 Contemporary Issues in Urban Planning and Management

Unit 1 Earth and Ecological System

Unit 2 Urbanisation and Urban Poverty

Module 1

In this module, you will be taken through the definitions, concepts and theories of urban planning. Unit 1 will enable you to master the meaning and conceptual framework of the course. The second unit deals with historical perspectives of urban planning, in which you will learn about the evolutionary trend in urban planning from pre-industrial revolution to the modern urban planning practices in Nigeria. Unit 3 focuses on theoretical framework of urban planning where you will study the historical background of urban planning theories, different theories and models including the convergence and divergence theories, up to the application of theories in modern urban planning and management. The last unit in this module deals with social factors affecting the society and contemporary human geography. Here, you will learn about the development of society, cultural issues and family size as they relate to urban development and planning as well as contemporary human geography like transport, communication, housing, etc.

Module 2

This module focuses on contemporary issues in urban planning and management and there are three units in it. The first unit deals with the Earth and the ecological system under which, you will study the structure and topography of the earth. Here too, you will study the ecological system, ecosystem stability, and biodiversity. Urbanisation and urban poverty is the next unit, which focuses on the effects of urbanisation on human health and the environment. The last unit in this module focuses on the use of geographic information (GIS) in urban and planning and management. The unit presents the meaning of GIS, spatial data collection, analysis and presentation, satellite imaging and the use of maps.

Module 3

In Module 3, planning and management of urban environment is treated. The first unit focuses on planning and management of built environment designed to take you through the processes of land use planning, economic activities in the urban environment, etc. Unit 2 (layout planning and management) focuses on the planning of layout and its management, including the provision of utilities and their maintenance. Unit 3 presents the different components of environment, spatial quality and maintenance of environmental quality standard; while unit 4 focuses on flooding, types, causes and effects of flooding. You will also learn how to predict and manage flood including emergency management and remediation as well as flood prevention and control. The last unit in this module deals with scenario development and risk prediction, in which you will be introduced to risk prediction, characterisation, mapping and hazard control.

Module 4

This last module focuses on environmental health in urban planning and management. The first unit deals essentially with definition and components of environmental health, public utilities and their relationship with environmental health and urban planning with emphasises on mechanism for collaboration among professionals particularly the EHOs and the Town Planners. The next unit focuses on the effects of unplanned environment. In this unit you will study the effects of unplanned environment on the physical environment, biological environment and social environment. The last unit deals with prevention and control of the effects of unplanned environment. The unit presents the techniques for creating awareness on environmental issues, including information, education and training as well as environmental governance covering policy formulation, coordination, public participation and the establishment of Urban Planning Management Information System among others.

TEXTBOOKS AND REFERENCES

List of books and other materials are given at the end of each unit of the course material for you to consult. However, the following are list of textbooks, journals and website addresses that can be consulted for further reading:

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Rana, S.V.S. (2009). *Essentials of Ecology and Environmental Science,* (4th ed.). New Delhi: PHI Learning Private Ltd.

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www.geo.fu-berlin.de/fb/e-learning/geolearning/-

management/introduction

www.planning_models/transactive_planning/index.html

www.bethd.ca/pubs/mesthe/ch4.html

www.webref.org/sociology/c/concentric_zone_theory.htm

www.managementinnovations.wordpress.com/2008/12/03/define-

management-its-functions/

www.wisegeek.com/what-is-urban-planning.htm

PRESENTATION SCHEDULE

Your course materials have important dates for early and timely completion and submission of your TMAs and attending tutorials. You are expected to submit all your assignments by the stipulated time and date and guard against falling behind in your work.

ASSESSMENT

There are three parts to the course assessment and these include self-assessment exercises, tutor-marked assignments and the written examination. It is advisable that you do all the exercises provided and use the information, knowledge and skills gathered during the course in tackling your assignments. Note that the assignments must be submitted to your facilitator for formal assessment in line with the deadlines stated in the presentation schedule and assignment file. The work you submit to your tutor for assessment will count for 30% of your total course work. At the end of the course, you will sit for the final end of course examination of about three hours duration. This exam will count for 70% of your course mark.

TUTOR-MARKED ASSIGNMENT (TMA)

The TMA is a continuous assessment component of your course and count for 30% of the total score. You will be given four TMAs to answer, three of which must be answered before you are allowed to sit for the end of course examination. The TMAs would be given to you by your facilitator and returned after you have been assessed on the assignment. Assignment questions for the units in this course are contained in the assignment file. You will be able to complete your assignment from the information and materials contained in the course unit materials and references.

Importantly, make sure that each assignment reaches your facilitator on or before the deadline given in the presentation schedule and the assignment file. If for any reason, you cannot complete your work on time, contact your course facilitator before the assignment is due, to discuss the possibility of an extension. Note that extension will not be granted after the due date unless there are exceptional circumstances.

FINAL EXAMINATION AND GRADING

The examination concludes your assessment in this course and it constitutes 70% of the whole course. The examination will consist of questions, which will reflect the type of self-assessment exercises you have practiced and TMAs you have previously encountered. All areas of the course will be assessed. You might find it useful to review your self-assessment exercises, TMAs and comments on them before the examination. The end of course examination covers information from all parts of the course. You will be informed of the time for the examination from your study centre.

Table 1: Course Marking Scheme

Assignment	**Marks**
Assignment 1-4	Four assignments, best three marks of the four count 10% each of 30% course marks
End of course examination	70% of overall course marks
Total	**100% of course materials**

Table 2: Course Organiser

Unit	**Title of Work**	**Weeks Activity**	**Assessment (End of Unit)**
	Course Guide	Week 1	
Module 1	Definitions, concepts and theories		
Unit 1	Definition and Concept of Urban Planning and Management	Week 2	Assignment 1
Unit 2	History of Urban Planning and Management	Week 3	Assignment 2

Unit 3	Theories of Urban Planning and Management	Week 4	Assignment 3
Unit 4	Social Factors Affecting Development of Society and Contemporary Human Geography	Week 5	Assignment 4
Module 2	Contemporary issues in urban planning and management		
Unit 1	Earth and Ecological System	Week 5	Assignment 5
Unit 2	Urbanisation and Urban Poverty	Week 6	Assignment 6
Unit 3	The Use of GIS in Urban Planning and Management	Week 7	Assignment 7
Module 3	Planning and management of urban environment		
Unit 1	Planning and management of Built-up Environment, Land Use and Economy	Week 7	Assignment 8
Unit 2	Layout Planning and Management	Week 8	Assignment 9
Unit 3	Environment, Spatial Quality and Urban Planning and Management	Week 9	Assignment 10
Unit 4	Flood Protection, Rural and Coastal Infrastructure	Week 10	Assignment 11
Unit 5	Development of Scenario and Risk Management	Week 11	Assignment 12
Module 4	Environmental health in urban planning and management		
Unit 1	Environmental Health Features of Urban Planning and Management	Week 12	Assignment 13
Unit 2	Effects of Unplanned Environment on Health	Week 13	Assignment 14
Unit 3	Prevention and Control of the Effects of Unplanned Environment	Week 14	Assignment 15
Revision		Week 15	

FACILITATORS/TUTORS AND TUTORIALS

There are 15 hours of tutorials provided in support of this course. You will be notified of the dates, times and location of the tutorials as well

as the name and phone number of your facilitators as soon as you are allocated a tutorial group.

Your facilitator will mark and comment on your assignments, keep a close watch on your progress and any difficulties you might experience and provide assistance to you during the course. You are expected to mail your TMAs to your facilitator before the schedule date (at least two working days are required). They will be marked by your Tutor and returned to you as soon as possible. Do not delay to contact your facilitator by phone or e-mail if you need assistance. The following might be circumstances in which you would find assistance necessary, hence you may contact your facilitator if:

- You do not understand any part of the study unit or the assigned reading.
- You have difficulty with self assessment exercises.
- You have a question or problem with an assignment or with the grading of an assignment.

You should endeavour to attend the tutorials. This is the only chance to have face to face contact with your course-mates and course facilitator and to ask question which are answered instantly. You can raise any problem encountered in the course of your study. To gain more benefit from the course tutorials, prepare a list of questions before attending the tutorial classes. You will learn a lot from participating actively in discussions during the tutorials.

SUMMARY

This course intends to equip you with the capability to apply the knowledge and skill of urban planning and management to improve environmental health practice. You may have noticed some level of

environmental decay often caused by poor urban planning. Environmental Health Officers are daily confronted with challenges of taming the environment to protect and promote public health. However, they cannot succeed alone except there is collaboration among other professionals like the Town Planners whose duty is to ensure that development occur in an orderly manner to promote healthy living environment. The course focuses on the prevention and control of the effects of unplanned environment on human health as well as the promotion of aesthetic environment.

Upon completion of this course, you will be able to appreciate the relationship between urban planning and environmental health practice and able to explain the concept of planning in environmental management. You will also be able to describe the processes involve in effective urban planning and management, identify the stakeholders involved in effective urban planning and describe how development control can help promote sustainable development. Indeed, you will be able to understand the role of Town Planners in environmental health practice and therefore help in developing a robust mechanism for effective working collaboration between EHOs and the Town Planners.

In addition, you will definitely be able to answer such question as:

- What is the purpose of urban planning and management in contemporary society?
- List some urban planning principles and state their importance in the concept of sustainable development in Nigeria.
- Examine the history and theories of urban planning and management and discuss how they have helped shaping today's urban planning practices.
- List the stakeholders involve in urban planning and management and describe their roles.
- Identify environmental health features of urban planning and describe how urban planning could better focus on those features for sustainable healthy environment.

- Enumerate the effects of unplanned environment and describe how to prevent and control such effects.

The above are just a list of a few of the questions that will guide the course expectation and are by no means exhaustive. To gain most from this course, you are advised to consult relevant books to widen your knowledge on the subject.

I wish you success in this course and hope that you will apply the knowledge gained to improve health practice in your environment.

Good luck and best wishes!

MAIN COURSE

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MODULE 1 DEFINITIONS, CONCEPTS AND THEORIES

UNIT 1 DEFINITION AND CONCEPT OF URBAN PLANNING AND MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Every human being is involved in planning and management of one thing or the other. Therefore, the concept of planning and management though may not be well understood but is unconsciously practiced by everyone including you. Since human needs are varied and we are always faced with the challenge of scarce resources and choices, planning and management become necessary.

In this course, you will learn about the issues relating to unplanned environment, hence the need to plan and manage our urban area in a responsible way for the overall benefits of those living today and for future generation. But in this unit, you will learn about some concepts of urban planning and management, including some definitions, causes and effects of poor planning and management and the need to plan and manage our urban areas in a sustainable manner. I hope that at the end of this unit, you will gain some knowledge to enable you understand the various issues involved in urban planning and management presented in other units in this course.

2.0 OBJECTIVES

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

- define urban planning and management
- state the causes of poor urban planning and management
- state the purpose of urban planning and management
- describe the stages in planning urban areas.

3.0 MAIN CONTENT

3.1 Definition of Planning and Management

3.1.1 Definition of Planning

Various definitions of planning and management have been given by various authors and some of them are presented here. First of all, you should understand what planning is. Indeed, planning applied to every human endeavour and assumes the same meaning with different goals in different fields, practices and contexts. A plan to visit a town like Abuja is different from the street plan of Abuja or Abuja Master Plan. When we talk about educational planning, for instance, we refer to arrangement in terms of population expected to enter the school system, location of schools, number of classrooms and teachers required to achieve the country's educational goal. We plan the economy to experience boom and avoid slump. You have heard of housing plan,

social plan, agricultural plan, fiscal plan, etc. Planning can also be used in the production of physical object such as car or airplane or buildings or whole town.

In simple term, planning is deciding in advance what is to be done, when, where, how, what are needed to do it and by whom it is to be done. Planning bridges the gap from where we are to where we want to go. It includes the selection of objectives, policies, procedures and programmes from among alternatives. Green (1999) defined planning as *a systematic method of trying to attain explicit objectives for the future through the efficient and appropriate use of resources available now and in the future.*It is also defined as a proposed or tentative project or course of action. It is further described as a systematic arrangement of elements or important parts; a configuration or outline of activities to reach a pre-determined goal. Indeed Alexander (1992) described planning as a deliberate social or organisational activity of developing an optimal strategy of future action to achieve a desired set of goals, for solving problems in complex contexts, and intention to commit resources and to act as necessary to implement the chosen strategy towards achieving the set goals.

Planning as a general activity is the making of an orderly sequence of action that will lead to the achievement of a stated goal or goals. A plan is a predetermined course of action to achieve a specified goal. It is an intellectual process characterised by thinking before doing. It is an attempt on the part of manager to anticipate the future in order to achieve better performance and can be applied to every human endeavour, including the urban environment. Planning is the primary function of management.

3.1.2 Definition of Management

Management on the other hand, is defined as the process of reaching organisational goals by working with and through people and other organisational resources. Management according to Adeleke (2001) is *the process of designing and maintaining an environment in which individuals, working together in groups, accomplish efficiently, selected aims.* This definition focuses on individual working together to achieve determined goals. Hartzell (2006) defined management as *the process of organising, using, and controlling human activities and other resources towards specific end.* Osisioma and Osisioma (2002), described management as a social process, entailing responsibility for the effective planning or regulation of the operations of the enterprise in fulfillment of given purpose or task, such as responsibility involving people and resources. Green (1999), on the other hand, simply described

management as the overall decision-making process within an organisation.

From the above definitions, you would have noticed that planning is a subset of management. Nonetheless, planning must precede management to set out what is to be done and what is to be achieved in advance. Management on the other hand provides the structure for ensuring that what is planned achieved its set objectives and well maintained at all times for that purpose. Management as a social process deals with human beings, their behavioural complexities, divergent needs and aspirations. These needs, due to human propensities are sometimes sort and obtain in various ways unpredictable and in most cases fraudulently, (Osisioma, 2002). The trust of management process is planning and control of resources and operation of organisation or any entity. As already stated, this becomes necessary to maintain an orderly society and make efficient use of scarce resources. Planning and management of our urban space is not only necessary for aesthetic purposes, but also important for the equity and orderly distribution of the land as a scarce resource among the competing needs of the citizens of a geographic space called country. Therefore, these two terms are applied in this course to explain why the urban space should be regarded as vital resource that require proper organisation to enable it sustain today's population and that of the future generation.

3.1.3 Definition of Urban Planning

Urban planning, most often referred to as urban and regional planning or still – town and country planning is a branch of architecture that focuses on organising the metropolitan areas and designing settlements, from the smallest towns to the largest cities. It is also defined as the study or profession dealing with the growth and functioning of cities and towns, including environmental concerns, zoning, the infrastructure, etc. Taylor (2007), defined urban planning (city and town planning) as a technical and political process concerned with the control of the use of land and design of the urban environment, including transportation networks, to guide and ensure the orderly development of settlement and communities. It concerns itself with research and analysis, strategic thinking/design, public consultation, policy recommendations, implementation and management.

Hall (1975) viewed the term urban planning as something more limited, which refer to planning with spatial or geographical component in which the general objective is to provide a spatial structure of land uses, which in some way is better that the pattern existing without planning. In this context, urban planning simply refers to all activities undertaken to locate and organise the land space for various uses in orderly manner to

avoid the problems associated with unplanned environment. But planning goes beyond this. It is a much broader set of human activities, encompassing the physical world, and it is within the realm of public and social services meant to serve the overall sustainable human existence. The output of urban planning is usually a spatial representation in form of a map or diagram depicting what is to be found on the exact location. This appears to be the hallmark of urban planning, which seems to overshadow the concept, ideology and the goal of urban planning which is orderly development. Therefore in the context of Environmental Health, urban planning focuses on the need to ensure orderly development to eliminate nuisances to public health and to promote efficient and robust physical, mental and social wellbeing of individuals and the community in a sustainable manner.

Urban planning is a functional process meant to produce desired goal. For instance, Catanese and Steiss (1968) stated that planning regulates such issues as land and infrastructure development to support many aspects of modern life (housing, transportation, waste management, employment, and manufacturing, etc.). Without planning, there would have been confusion and chaos in the ecosystem. They noted that while it is often difficult to achieve agreement on an operational definition of planning, there is a certain amount of consensus on what the process entails, which basic components involves:

- identification and definition of problems and their interrelationships
- determination of goals and objectives associated with each problem situation and the problems in totality
- appraisal of existing policies and procedures designed to achieve goals and objectives
- formulation of available alternatives to reach agreed goals and objectives
- evaluation of alternatives
- identification of by-products and side-effects
- determination of approximate benefits and costs associated with each alternative
- recommendation of appropriate alternatives (Catanese & Steiss, 1968).

Urban planning is often anticipatory in its orientation, dealing with matters that are not imminent problems. It predicts and foresees the future environment and situate tomorrow in today contemporary position. While nearly all planning involves the formulation of corrective measure to alleviate mistakes of the past, the essence of planning is preventative rather than remedial, (Catanese & Steiss, 1968). When planners failed in this regard, the whole essence of planning is

defeated. Thus, planners must anticipate trends and needs, in advance, in order to adequately prepare to meet these changes in the urban environment.

Generally, planning involves a continuous study of the urban environment as it is affected by growth and shifts in population, technological developments, changes in economic activities and their distributions, shifts in the preferences and value systems of various classes and social groups, and so forth. It is from this continuous, on-going activity that problems are identified and defined. Friedmann (2003), saw planning as endless communication. According to him, planning is a process that will still continue even when the plan is completed and will only end when the civilisation is over.

Friedmann (2003) further described *Planning as the selling of ideas*. According to him, the presentation techniques have been learned by the planning practitioners from planning schools, but the planning practitioners also need to sell their ideas effectively to the policy makers, regulators, developers, stakeholders and the general public. Selling an idea is not always about the excellent presentation technique but more importantly also about the right attitude and thought, which may be expressed as concept proposal or input into an existing plan framework.

Friedmann (2003) presented planning as *constructing hopes and sharing beliefs*. According to him, planners often consider their plans as the best representation of the community's expectations. A good planner should be able to ply into people's mind and try to present their desire and aspiration in a logical way. In fact, the plans are mostly created within the context of different sense of priority and the background of the planners in relation to the need and aspiration of the general population.

Planners are expected to meet the expectations or the hopes of the community they serve. Their plans should reflect the past, present and future of the community for it to stand the test of time. Plan should be developed for today with the future in mind. On the other hand, planners must be trusted. It is in this regard, that planners can share their beliefs and concepts to the generality of the population. Planners must learn to build trust in their thinking and presentation. This is an important prerequisite in the planning process that is often neglected by the planners. Planners must always situate this behind their mind and ensure an effective mutual relationship with the general public to produce the expected results through sharing strong belief, technical expertise and possible available options with them.

3.1.4 Definition of Urban Management

No matter how superb the planning and provision of infrastructure within a given community may be, if effective management is not put in place, decay easily sets in. The management of urban plans and infrastructures provided entails enforcement of regulation and standards, monitoring of public utilities and putting in place effective maintenance mechanism.

According to Kayode (2008), urban management is *concerned with the policies, plans, program and practices that seek to ensure that population growth is matched by access to basic infrastructure, shelter and employment.* The urban environment is made up of concentration of many people, buildings and economic activities and their supporting infrastructure like roads, water, drains, and electricity and communication services. All these must be managed in a responsible manner to support healthy living. Although urban management is the responsibility of all individuals living in a defined geographical space in a particular time, it is largely dependent on the government to direct and drive the process for effective management with sound policies, regulation and enforcement of standards and efficient utilisation of available resources.

Urban management is very crucial to the survival of town and cities as dynamic living organisms and complex system. For this reason, there must be a robust management program in place to ensure that what is provided work to serve the purpose and is adequately maintained.

3.2 Causes of Poor Urban Planning and Management

3.2.1 Historical Development of Settlements

In Nigeria, like in most other places, history of the development of settlement is often linked with closeness to source of water, trade and occupation and access road. It is a known fact that one or two families may move to a virgin land in search of means for survival, and thereby form the nucleus of a settlement around such historical points from where other people join either as trade partners or seeking for services around the glowing settlement. Such obscure settlements in most cases have grown to become big towns or cities within a short time or gradually so.

Settlement, locality or populated place are general terms used in statistics, archaeology, geography, landscape history and other subjects for a permanent or temporary community in which people live or have lived, without being specific as to size, population or importance. A settlement can therefore range in size from a small number of dwellings

grouped together to the largest of cities with surrounding urbanised areas. Biswanath *et al.* (2011) said that the term settlement is used internationally in the field of geospatial modeling to describe hamlets, villages, towns, and cities or other agglomeration of buildings where people live and work.

3.2.2 Unplanned Development

The historical development of settlement as seen above has been known to be a major cause of unplanned development. It is obvious that as people moved to form new settlements, what is uppermost in their minds is not planning of how the place would be in the future; rather they are concerned with means of livelihood, security and annexation of any available resources for their survival. In attempt to fulfill their primary purpose and meet their basic needs, everyone that joined the new settlement will ostensibly be doing his own thing the way he deemed fit until the settlement grow into a big slum, where it becomes difficult to provide necessary infrastructure like roads and other services.

Some of the problems which frustrates our existence as Nigerians on a day to day basis - traffic congestion, human congestion, failure of drainages, flooding in our "cities", refuse lining our streets and gutters, non-delineation of residential and commercial areas and its attendant difficulties can all be said to be caused by unplanned development. It has also been noted that unplanned development impedes evacuation in time of emergency as there is no access road to enhance movement. Indeed, unplanned development impact negatively on public health. Where there is no plan to evacuate solid and liquid waste, diseases spread unhindered and the health of the population is constantly in jeopardy.

Unplanned development is such development that impedes orderliness in a settlement and hinders the provision of essential infrastructure and services that will support healthy living and sustainable development. Major causes of unplanned development include lack of knowledge of how to plan the settlement by earlier settlers; lack of sense of organisation; lack of awareness of the evils associated with it at the onset; greed and propensity to amass natural resources without recourse to the need of future generation; public complacency to controlled development, (Wang, 2008); inadequate number of planners and poor attitude of developers to the principles of proper planning and orderly development.

3.2.3 Attitude of Developers

Every developer is always interested in the size of the land mass he can acquire for his benefit. In essence, developer will want to build to and even beyond the boundaries of their plots. Therefore an entire neighbourhood will spring up with no plan for utilities and drainage. There are no areas set aside for commercial and residential purposes. Markets are not properly situated; banks, eateries and shopping plazas are allowed to spring up without proper parking space.

The study of environmental psychology has helped to highlight human behaviour and well-being in relation to the large-scale, socio-physical environment. The term large-scale environment refers to places such as homes, offices, neighbourhoods, and whole communities. It emphasises the interdependence between physical and social aspect of places. For instance, how are people affected by overcrowding, traffic congestion, and noise? Why do people litter or vandalised their environment? How do buildings affect their occupants? Does the architectural design of apartment buildings influence pattern of neighbouring and friendship formation? Can residential, work and neighbourhood setting be designed to reduce stress, increase productivity and promote physical activity? All these are the products of poor attitude of people to their environment as identified by Kayode (2008), which he adduced to the heterogeneous nature of the urban population.

The appalling attitude of developers to planning in most cases aided planners. In most cases, planners collude with developers; this attitude can be checked if there are systematic approach to creation of awareness and education of the public on the importance of urban planning and sustained enforcement of extant regulations as well as proactive government intervention in creating layouts with the provision of infrastructure before the entrance of developers. This will definitely reduce the problems associated with unplanned development to the barest minimum.

3.2.4 Regulation and Enforcement

You have noticed from our earlier discussions that human beings are always at the centre of unplanned development largely due to ignorant of the consequences of their action on development and health and partly due to poor attitude to planning principles and extant regulations. To overcome these and ensure orderly development, regulations are put in place and should be enforced.

The Nigeria Urban and Regional Planning Law, Decree88 of 1992 *(CAP 138 LFN, 2004)* as amended, provides for the establishment of *the National Urban and Regional Planning Commission* comprising various professionals and stakeholders to: a) formulate national policies for

urban and regional planning; b) initiate, prepare and implement the national physical plan, regional and subject plans; c) establish and maintain urban and regional planning standard; d) conduct research in urban and regional planning; e) promote co-ordination among State and LGAs in the preparation and implementation of urban and regional plans; f) supervise and monitor the implementation of National Physical Development Plan and development control (DC); g) provide technical and financial assistance to States in the preparation and implementation of physical development plans.

Within the urban planning institutional framework, the Law also provides similar functions to the State Urban Planning Board, while the Local Planning Authority within the Law is expected to i) prepare town, rural, local and subject plan; ii) prepare and submit to the State Urban Planning Board report on the implementation of the National Physical Development Plan and State Regional Plan and iii) undertake DC.

To date, information available at the Federal Ministry of Housing and Urban Development and Town Planners Registration Council indicate that less than 60% of the States of the Federation have domesticated the Nigerian Urban and Regional Planning Law.

The implication of this for those who have not domesticated the Law is either they are operating with the Federal Law or they not following any Law on urban and regional planning. Where there is no Law to guide human action, there is bound to be chaos. No wonder the haphazard nature of the state of planning in most of the States of the Federation.

Where the Law exists, enforcement has always been a major challenge. Weak enforcement of Urban Planning Law like any other law in Nigeria is faced with many internal and external problems. Most laws are unenforceable due to some inherent technical and procedural flaws. When this happens, the law is weakened with different interpretations. These are internal weaknesses of the law itself. Externally, most laws in Nigeria especially the Urban Planning Law is faced with political manipulation. Therefore, it become subject to the winks and caprices of the politicians who either use it to their advantage or suppress it so that it become un-implementable. Another thorny issue is inadequate public awareness of the existence of the law. When this is the situation, many people actions will offend the law without knowing. Again, inadequate law enforcement agents will weaken the operation and enforcement of any law. In this case, the major operators of the law are the Town Planners who are identified to be very few in number. The Town Planners are supposed to work with the Police to ensure sanity in the planning processes in Nigeria. When they are few in Number, they are unable to cover the entire land mass to monitor development and ensure

compliance to extant rules and regulations. Therefore, it pertinent that more Town Planners should be trained and engaged, while the Nigerian Urban and Regional Law should be further reviewed to reflect current planning realities, well publicised and mechanism put in place for its effective implementation and enforcement.

3.2.5 Inadequate Numbers of Planners

The number of Town Planners available to cover the entire Nigeria land space is very inadequate. As at July 2012, only 2,660 Town Planners were licensed to practice in Nigeria. With an estimated 167 million people and a total land mass of 710,771 square metres, it is obvious that the number of Town Planners in Nigeria is grossly inadequate.

Aside from the inadequacy, the number available is not evenly distributed as most of them are concentrated in the towns and cities. Furthermore, the uneven distribution cut across Geo-political zones and States. For example, there is a concentration of Town Planners in the Southwest zone (Lagos - 534, Oyo - 283, Osun - 170, Ogun - 111, Ondo - 110 and Ekiti - 39) with a total number of 1,247 or 46.88% of all the registered Town Planners in the country, while Northwest and Northeast have the least, with a combined figure of 305 or 11.47%. Lagos with 534 has the highest number, while Zamfara with two has the least number of Town Planners in Nigeria. With the current situation, therefore, there is an urgent need to train more Town Planners in the country as many settlements are expanding into towns and cities with the phenomenal population explosion.

3.2.6 Weak Urban Management System

Urban management is not just crucial to the existence of town and cities, but also serves as the oil that lubricates the smooth running of the urban environment. When there is no urban management system or when the existing system is weak, a lot of things can happen. Such situation will lead to create pool of slumps, and obviously, there will be heaps of uncollected solid waste and liters all over the place, there will be no electricity nor potable water, and other such appalling situation. When this happen, then urban decay sets in, the public health supporting system collapses, creating a situation for recurring epidemic of diseases with attendant high morbidity and mortality.

Some major challenges facing urban management in Nigeria as identified by Kayode (2008),include lack of effective mechanism for the coordination of relevant stakeholders; political instability and policy summersault due to personalised governance rather that effective institutions; lack of funds for effective management, adequate provision

infrastructure and maintenance; rapid population explosion; inadequate or absence of data for planning and management; and poor attitude of the people as earlier mentioned due to heterogeneous nature of urban population. As a result of these challenges, many plans and schemes are not properly managed or not understood by the wider community.

Plans often extend only to the urban edge of the local government boundaries and do not encompass the rapidly growing peri-urban areas. A preoccupation with day-to-day issues of land boundary and ownership disputes means that strategic urban planning and policy issues rarely make it to the local government agenda. All these issues can only be effectively tackled by putting in place a well-coordinated urban management system.

3.3 Effects of Poor Planning and Management of Urban Area

The effects of lack of, or poor urban planning has assumed national calamity in Nigeria today more so as efforts to address the problems often create more. It is obvious that poor urban planning or lack of it is responsible for most of our society's ills. Most cities evolved naturally without any strategic plan for their orderly development. In most cases, it is when the city is fully built that it becomes necessary to plan for the provision for road, water, sewage and solid waste collection, electricity, etc. On the other hand, when it is difficult to amend, a process called city renewal, town or the city exist without those basic infrastructure.

As we learnt earlier, lack of adequate planning is a major cause of urban traffic congestion, poor waste management, overcrowding and congestion in city centres, etc. The effects also include poor drainage which often leads to flooding, noise pollution from factories built within residential areas, and high emission of fumes, etc. All these impact on public health, causes stress, increases insecurity and disease outbreak, and reduces life expectancy. Therefore, every effort should be made to ensure proper urban planning in our society.

3.4 The Purpose of Planning and Management of Urban Environment

3.4.1 The Need to Plan and Manage the Urban Environment

In section 3.2.6 of this unit, you have learnt some of the effects of unplanned or poorly planned environment. These therefore emphasised the need for proper planning and management of our urban environment. It is important to put measures in place for orderly development of our society to ensure that: i) Land as a scarce and essential resource is well managed and equitable distributed. This entails

the demarcation of the land space into layouts – residential, industrial, commercial, hospitality/ tourism, sport, agricultural, military, etc. By so doing, it becomes very easy to allocate the land space for any purpose without jeopardising the need of the growing population and that of future generation. ii) Development progresses according to laid down procedure and maintain urban planning principles. This calls for observance and enforcement of extant rules and regulations. iii) Needed infrastructures road, water line, electricity, sewage and solid waste disposal facilities are put in their proper place or planned for before commencement of developmental projects. These will enhance even distribution of services like water supply, power supply, sewerage system and evacuation of waste as the area expand in the future and invariable promote good neighbourliness and sound health of the inhabitants.

It is equally important to note the benefits of planned environment. A well planned urban area will: a) promote good health and enhance life expectancy; b) enhance the aesthetic of the environment, which will in turn promote social interaction and tourism; c) promote economic prosperity of the nation; d) enhance security and evacuation in time of emergencies; e) promote investment as land is reserved for every purpose; f) stimulate economic growth and g) promote sustainable development and ensure that land as a fix and scarce resource is available for future generation. It is therefore essential for government at all levels to ensure that effective measures are put in place to encourage proper planning and efficient management of our urban areas, more so as it has been predicted by World Health Organisation (2012) that by 2030, more than 60% of the population will live in urban areas with emergence of mega cities; and that this proportion will increase to seven out of every 10 person by 2050.

3.4.2 Some Challenges in Planning and Management of Urban Environment

In section 3.2 of this unit, we discussed some of the causes of poor urban planning and management, which included historical development of settlement; unplanned development; poor attitude of developers; weak regulations and enforcement and inadequate number of planners. Now, you will learn some of the challenges encountered or likely to be encountered in planning and management of the urban environment in our society.

First and foremost is the scarcity of land as a principal resource in all human endeavours. As far as land remains a scarce resource, people will always scramble for any available land space. Such situation will enhance distortion of master plan of an area for the sake of trying to make land available for more users. You would have heard of some complaints by policy makers that the master plan of a particular area has been distorted by greedy urban planners and "shylock" landlords. Why these activities are not excusable, it is as a result of inadequate land space for development purposes.

Second, planners are often very greedy and would go to any length to thwart the efforts of policy makers in ensuring orderly development. A situation where master plans are distorted for selfish interest by planners and developers, leave much to be desired. In most cases, correcting such distortions always result into huge losses as government sometimes have to compensate those whose property are affected by demolition, while those who probable were issued with fake title deeds would have to lose such property without any compensation. It has been said that situation like this hamper development and causes great drain in our national domestic product.

Third, desperate developers will always want to acquire land at any cost even at the risk of losing their investment. When such desperation sets in, some careless persons may not mind acquiring land from any location even when the land has been earmarked for another purpose.

Fourth is an inadequate resource for government to demarcate layouts and put necessary infrastructures in place for orderly development. It has been noticed that government will watch as people start to move into a new area and start to settle there without any intervention. Sometimes layouts have been created and the land space allocated to developers without even access road. When frustrated developers make their way into the layout and start development, it becomes very difficult to provide needed infrastructures. It is essential that the provision of these

infrastructures should always precede individual development in an area.

Fifth, the numbers of trained Town Planners as mentioned before are inadequate to cover the entire country. Information available on the *Town Planners Registration Council* website *(www.toprecnig.org/register)* and the list of inducted members published in program of the 25th Induction Ceremony of 6th July 2012 shows that only 2,660 Town Planners were registered and licensed to practice in Nigeria as at July 2012 disaggregated by state in the Table below. This figure is indeed absolutely inadequate when considered along a population of strength of 167 million people (2011 estimation) and a total land mass 910,771km^2. Indeed, that translates into 1:62,782 ratio of Town Planners per the population and 1:342 ratio of Town Planners per the total land mass. This appalling situation may have accounted for the very dismal planning activities in Nigeria, which has clearly impacted on poor social interaction, collapse buildings, insecurity, increase disease burden and outbreaks of communicable diseases.

Last is lack of policy framework to drive urban planning and management. It is unfortunate the current policy on urban planning and management is fragmented and lack universal applicability. To this end, it is very difficult for incoming government to implement some of its provisions as most of such provisions were politically motivated. It is high time such policies were reviewed and be made more robust to address the challenges faced by urban planning and management in a sustainable manner.

3.5 The Stages in Urban Planning and Management

3.5.1 Institutional Arrangement for Urban Planning and Management

The administration of the entire territory of Nigeria is vested in the Federal Government under Section 2 of the 1999 Constitution as amended. However, as a Federation, the country is divided into 36 federating units called *States* and the Federal Capital Territory – Abuja. Each State is further sub-divided into Local Government Areas (LGAs), making a total of 774 such smaller units as contained in Section 3 of the said Constitution.

Table 1.1: Number of Town Planners on the Register of the Town Planners Registration Council of Nigeria as at July 2012

S/N	State	No. of RTP	S/N	State	No. of RTP
1	Abia	41	20	Kano	38
2	Adamawa	28	21	Katsina	8
3	Akwa Ibom	32	22	Kebbi	15
4	Anambra	32	23	Kogi	57
5	Bauchi	10	24	Kwara	52
6	Benue	17	25	Lagos	534
7	Beyelsa	17	26	Nasarawa	28
8	Borno	19	27	Niger	47
9	Cross River	29	28	Ogun	111
10	Delta	76	29	Ondo	110
11	Ebonyi	10	30	Osun	171
12	Edo	59	31	Oyo	283
13	Ekiti	39	32	Plateau	19
14	Enugu	96	33	Rivers	37
15	FCT (Abuja)	410	34	Sokoto	8
16	Gombe	13	35	Taraba	12
17	Imo	59	36	Yobe	9
18	Jigawa	7	37	Zamfara	2
19	Kaduna	117	38	Foreign	8
Total					**2,660**

Source: Town Planners Registration Council of Nigeria, 2013

Structurally, the Nigerian Urban and Regional Planning Law Decree 88 of 1992 (CAP N138 LFN 2004) as amended, provides for the creation of the National Urban and Regional Planning Commission at the Federal level, the State Urban and Regional Planning Board at the State level and the Local Planning Authority at the LGA level. Each of the body is composed of various professionals and other stakeholders. At the Federal level, the Commission was expected to: a) formulate national policies for urban and regional planning; b) initiate, prepare and implement the national physical plan, regional and subject plans; c) establish and maintain urban and regional planning standard; d) conduct research in urban and regional planning; e) promote coordination among State and LGAs in the preparation and implementation of urban and regional plans; f) supervise and monitor the implementation of National Physical Development Plan and DC; g) provide technical and financial assistance to States in the preparation and implementation of physical development plans.

The States Urban and Regional Planning Board according to the Law were expected to perform similar functions while the Local Planning Authorities were required to prepare and implement a town plan, a rural area plan, a local plan and a subject plan as well as control development within its area of jurisdiction, except for Federal or State lands. These bodies area created by the Law to ensure the orderly planning and development of the entire 910,771 km^2 land mass in Nigeria. However, as at 2012, the Federal Government has not established the National Urban and Regional Planning Commission. It has also been revealed that more than 50% of the States have not domesticated the Decree 88 for application within their jurisdiction. Therefore, it can be imagined what type of planning activities were going on in such States.

The planning and management of urban areas starts with demarcating of these LGAs into smaller areas (towns and villages) or rather, as it is usually the practice, through emergence of smaller towns and villages by natural/ historical settlement. Thereafter, planning and management as observed by Hall (1975), is applied to amend, correct and in some way make the situation better than the pattern existing without planning. Most States in Nigeria have enacted urban planning laws to guide the orderly development of their territories. But this laws most often than not failed to achieve the set objectives due to weak enforcement.

Creation of layout and provision of environmental infrastructures are key component of urban planning and management. For any planning objective to be met, the emphasis should be in provision of infrastructure preceding development projects.

3.5.2 Formulation of Land Use Policy and Application

Policy as a broad statement of intent is meant to direct the course of action in every human sphere of endeavour. Adeyeye (2010) observed that a National Urban and Regional Planning Policy will ensure uniformity of planning practice in the country. Such policy when in place will also enhance coordination and promote desirable development and control. This is currently lacking. The need to formulate a national urban planning policy is even more urgent now as more settlements are growing into and becoming town, vis-à-vis the WHO prediction of growing urbanisation.

The Nigerian Urban and Regional Planning Decree 88 of 1992 as amended in Section 2, empowered the Federal Government to formulate national policy for urban and regional planning and development. What is required to be done is for the relevant stakeholders including the Federal Ministry of Housing & Urban Development, Nigerian Institute

of Town Planners and indeed the Town Planners Registration Council, etc. to initiate the process and involve all other stakeholders.

3.5.3 Establishment and Functions of Development Control

Development control (DC) in the context of urban planning and management, is a function and body created by law/ regulations to enforce urban planning principles and regulations. In the Nigerian Urban and Regional Decree 88 of 1992, DC is the function of State Urban and Regional Planning Board and Local Planning Authority. Where it exists, DC is expected to establish control over land uses and procedure for approval of site plans and building plans. In the Lagos State Urban and Regional Planning Board and Town Planning Authority Edict, 1998, the DC Department is established to control physical development and implementation of physical development plans; with power to grant development permit to developers; approve building plans; while the Local Authority DC is empowered to grant permit to residential development not more than three floors.

The agency or department also ensures that land use guidelines are strictly adhered to so as to ensure orderly development of existing land space. In most cases, the agency also set standard for architectural designs for specific areas including deliberate control of construction of high-rise buildings. Importantly, the agency supervises the construction of building and ensures that developers keep to the approved plans and use recommended materials to ensure safety and health standard. When the procedures are not followed or the building is not constructed according to approved plan, the agency has the power to revoke the approval granted, directs the needed remedies on the structure or may demolish the structure in the interest of public safety.

Adeyeye (2010) reviewed Section 33 of the Edict, as not having a corresponding provision in the Nigerian Urban and Regional Decree 88 of 1992. He observed the limitation the Edict has put on the Local Authority DC, particularly that the Local Authority cannot grant permit to commercial, industrial, agricultural, recreational, institutional and civic or public uses as very limiting. Indeed, this Edict has put a caveat on the Local Authority not to control major development in its area of jurisdiction and this is contestable.

SELF-ASSESSMENT EXERCISE

i) List five benefits of urban planning.
ii) In your own words, define planning and urban planning.
iii) List the causes of poor urban planning in Nigeria.

4.0 CONCLUSION

Planning and management are very important human endeavour undertaken by everyone at one point or the other and in most cases unconsciously to achieve a purpose. The process of planning becomes very necessary to enable effective application of scare resources to achieve a goal. Therefore, urban planning and management are processes undertaken to control the use of land and design of the urban environment, including transportation networks, housing, etc. to guide and ensure the orderly development of settlement and communities. As human population increases, so is the need for land use for agriculture, industrial activities, for residential purposes, etc. It is therefore necessary to ensure that the available land space is planned in such a way as to meet the need of the present population and that of future generation in manner that promote good health, social interaction and environmental aesthetics. This process involve everyone, requires discipline in the part of the planner and developer and proper regulation and enforcement by government so as to achieve orderly development of the society.

5.0 SUMMARY

In this unit, you have learnt some concepts and definitions of planning, management and urban planning and management. You have also learnt some causes of poor urban planning and management, their effects and the benefits of efficient planning and management of the urban environment. You have been acquainted with the purpose of urban planning, some challenges faced in planning and managing the urban environment, the institutional framework needed for efficient urban planning and management including the need for regulation and enforcement of development control. You are now ready to explore other issues involved in urban planning and management. Therefore, in the next unit, you will learn about the history of urban planning and management.

6.0 TUTOR-MARKED ASSIGNMENT

1 Differentiate between planning and management and identify some factors militating against effective urban management in Nigeria.

2 Enumerate some functions of the State Urban and Regional Planning Board and give five reasons why it has been difficult to enforce the Nigerian Urban and Regional Planning Law.

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UNIT 2 HISTORY OF URBAN PLANNING AND MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Recall that in Unit 1, you were introduced to some definitions and concepts used in urban planning and management. In this unit, you will learn about history of urban planning and management. The purpose of history is to enable us learn from the successes and failures of the past and to apply the knowledge to effect some changes in the present and future activities.

We have seen that the world great towns and cities reflect the way the society has evolved over the past centuries. The nature and structure of the towns and cities, the architectural designs and city layouts depict the culture and history of the early settlers and how they managed to overcame the environmental challenges that existed in their time.

Tremlett (1979) observed that *many of the people are living each day with the problems of city life without pausing to think about the way these problems develop or when, how and where they had their origin.* History of urban planning will enable us to learn what were the objectives of past planning efforts and whether those objectives were met, vis-à-vis our desire to have a better today and an enduring future for generation yet unborn. Therefore, in this unit, you will learn about history of urban planning and management during the pre-industrial revolution era, the colonial urban planning and management strategies and the post-colonial urban planning and management in Nigeria including methods and tools used as well as the evolution of modern urban planning and management techniques and principles.

2.0 OBJECTIVES

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

- highlight the urban planning and management practices during the pre- industrial revolution era
- explain the purpose of urban planning and management during the colonial administration
- state the focus and methods of pre and post-colonial urban planning and management in Nigeria.

3.0 MAIN CONTENT

3.1 Pre-industrial Revolution History of Urban Planning

3.1.1 History of Urban Planning during the 1794 - 1918

From the introduction, you have learnt that the structure and layout of towns and cities including architectural designs depicted the culture and the way of life of the people that lived and worked in such places at certain time. The pre- industrial revolution history of urban planning therefore is meant to highlight the concept, motivation, the objective and type of plans developed and implemented during that period. Stubben (1893) presented the principles and ideas of city transit with its possible future development, with particular attention to what would be in large cities such as provision for vehicular and traction (footing) travel, recreation, heating, farming and other life supporting endeavours.

In Stubben opinion, in preparation of layout of any city, two main factors were taken into consideration: i) suitable location for dwellings and buildings, and ii) ease of access from and to these buildings for the general population. It therefore follows that, considering only the dwellings themselves, a rectilinear system is all that is required, making

all blocks square, and, of necessity, all buildings the same. As against this is the desire of the traveling public to get to its destination in the most direct line, and the rectilinear system does not, on the average, allow this. As a relief to the necessity of traveling two sides of a triangle, radiating streets are introduced, and, in many of the cities of the countries of the time like the city of Washington, a series of intersecting radial avenues from different nuclei were constructed. This, while thoroughly accommodating the traveling public, sacrifices the land for building purposes, leaving many goring lots and impairing their value.

In similar manner, Robert Owen in his proposal of 1817 for the design and arrangement of a cooperative community, collaboration with Stedman Whitwell, an English architect, who prepared a more detailed design with a display model of unique city with provision of amenities to support life, which model master plan was produced and the drawings reproduced in 1825. Although Owen's plans were thwarted when he attempted to create a model community at New Harmony, Indiana, he did not give up on the idea. Owen's work and proposal laid foundation for self-supporting homes and colonies for specific number of people, with necessary infrastructures to enhance healthy living.

Granville Sharp is reputed to be one of the early Town Planner in London whose work had laid the foundation for the development of the *general plan for laying out towns and townships, on the new-acquired lands in the East Indies, America, and Elsewhere.* Sharp (1735-1813), a native of Durham, England, the grandson of the archbishop of York was interested in the emancipation of slaves mostly from Africa. His first challenge was to create a colony for freed slaves of African extraction. Because of the sensitive nature of slavery and the campaign to end its practices, in 1783, Sharp broached the idea of founding a colony for freed slaves in Africa, and with his associates launched such project in 1787. This venture proved more difficult than anticipated, and in 1808, the Crown took over its affairs.

Sharp then drew on this experience in working out the details of the proposed community that he described and illustrated in a tract. In preparing his town plan, he relied on information about the town of Savannah, Georgia, which he may have had from its founder, James Oglethorpe, who probably passed on to Sharp his own ideas about town planning.

The planned town (darkest part in Figure 2.1 below) in a square of about four furlongs (805 m^2) with about 10 acres in the centre for public offices (viz. a church, town-hall, guard-house, separate penitentiary lots (or prisons) for males and females; also schools for each sex, and a

public shades for strangers and travelers, under the control of the constable on guard by rotation).

And even with this large reduction of the plan, space will be reserved for the families of 20 farmers or planters and of 68 artificers or labourers; and as the line of division in this latter mode will pass through the centre square of the present plan, six additional small town-lots may be formed in the space of half the square, and half of the public lots around it, which will enable the town, upon the whole, to contain 94 households.

Whenever only *one half* of the plan is adopted, the side where the central line of division is made must be placed next to the water (whether the sea or river, creek or canal), and care must be taken that a sufficient *strand*, or space of *common land*, be reserved between the town and the water, that all the inhabitants may have equal access to the water- side.

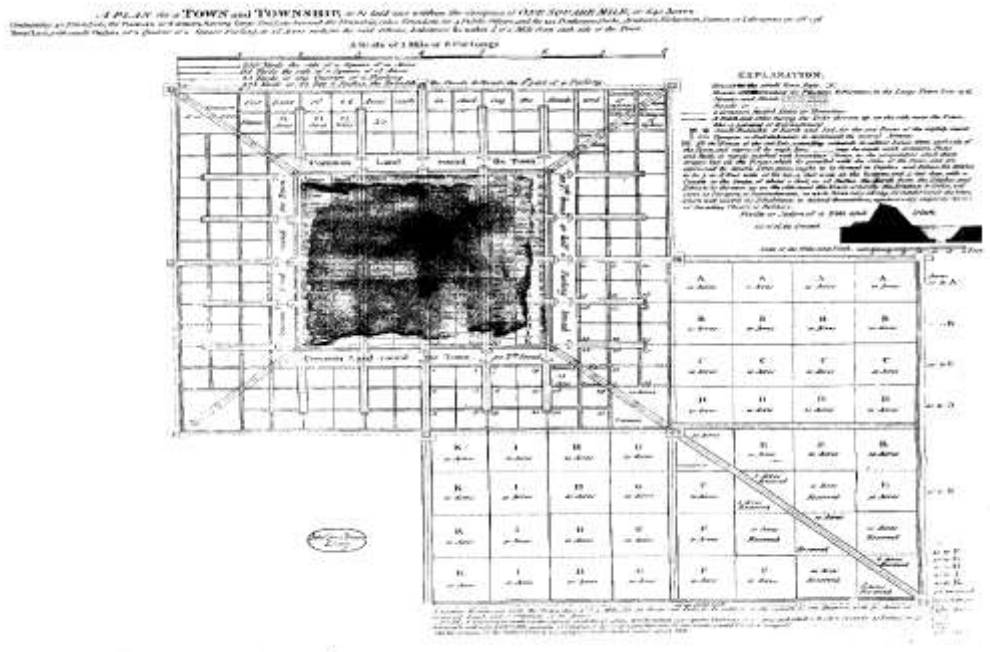


Fig. 2.1: A Plan of a Township Laid in Squares

Source: General Plan for Laying out Towns and Township by G. Sharp (1794)

Such details appear plausible and were meant to achieve the desire of the people of those days. Therefore the elaborate detail microcosmic plan was an attempt at ensuring the building of a society where human dignity and quality of life was given adequate consideration in town planning. We can rightly say that the pre-industrial revolution Town Planners were public health focused with a clear view of organisation and environmental aesthetics. It is obvious that modern planning

concepts draw inspiration from this early initiatives and sound planning models.

3.1.2 Purpose of Planning during the Pre-industrial Revolution Era

The main purpose of the pre-industrial revolution urban or town planning was to create and promote living cities. According to Tremlett (1979), the idea was to remove the frustration associated with the attempts to cure the decay of inner cities social problems. Tremlett has lamented that housing policy was not relating to issues of environmental planning - location of industries, shops, and offices. Unfortunately, as observed by Tremlett again, *the post-war British architects and planner for instance, have planned housing without regard for where the people who live there will work and shop or enjoy the leisure time available to them.* He further noted that in inner London, deterioration set in because architects have devastated parts of the city, persuading councils to build large high-density developments and in the process demolished communities that were there before. This revelation points to the antithesis of the dream of the fore-runner pre-industrial revolution Town Planners.

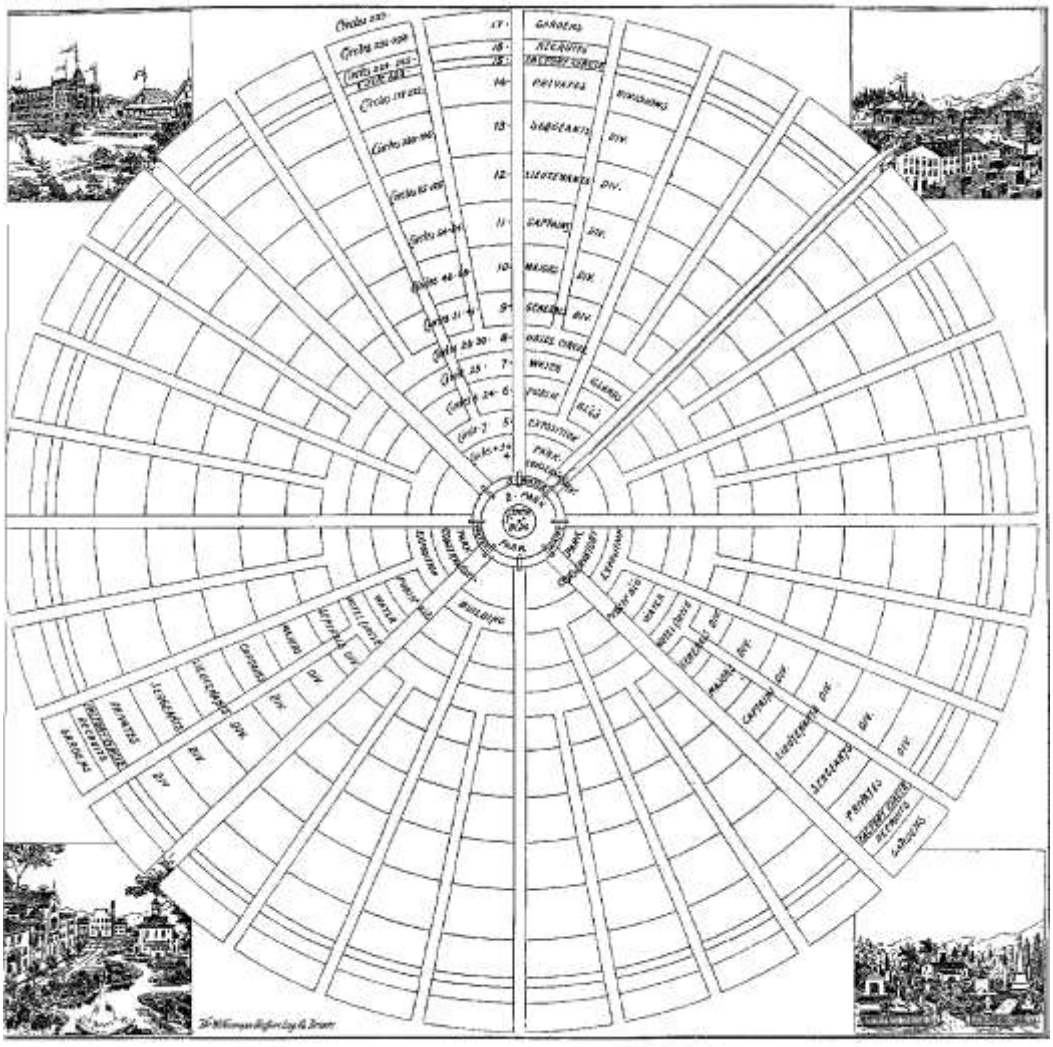
In effect, the purpose of urban planning from historical perspective has been defeated by greed on the part of planners and architects, population explosion and limited land space. What is depicted from London has extended to other part of the world up till date. What is needed is sincere change in policy and refocusing on real structure and components of *living cities*.

3.1.3 The Types of Plans Produced during Pre-industrial Revolution Era

You have earlier learnt that in laying out any city, two main factors must be taken into consideration, these factors are: a) suitable location for dwellings and buildings, and b) ease of access from and to these buildings for the general population to avoid a rectilinear system. Therefore, as a relief to the necessity of traveling two sides of a triangle, radiating streets are introduced, and, in many of the cities of this country, are in use, and in a few eases, like the city of Washington, a series of intersecting radial avenues from different nuclei were constructed. This, while thoroughly accommodating the traveling public, sacrifices the land for building purposes, leaving many goring lots/plots and impairing their value, (Caryl, 1897).

This idea illustrated in the hypothetical plan below (Figure 2.2), where the nucleus of the development and the town is the centre circle with

radiating units, each constituting cluster of structures/ building with highways, roads and streets in between. Therefore, the types of plans developed and implemented during the colonial era were such that would be described theoretical as *concentric plans.*



OUTLINE OF PLAN FOR NEW ERA MODEL CITY.

Fig.2.2: Theoretical Concentric Plans

Source*:* Presenting the Plan for the New Era Union by C.W. Cary (1897)

3.1.4 The Planners and the Planning Instrument during the Pre-industrial Revolution Era

The urban planners of the pre-industrial revolution era were people of diverse background with no basic training in urban planning and management but were very talented and focused in the planning techniques. Their methods were egocentric, revolving around their personal induced concepts and conviction backed up with experiences and oral presentation and written notes on scripts and tracts. Their tools were mostly rudimentary made up of pencil, rulers and papers. They were classical and oriental in their presentation and apt to adapt to environmental topography and natural land elevation as well as physical available resources like water, trees, rocks, etc.

3.1.5 Uses and Limitation of Plans Developed during the Pre-Industrial Revolution Era

It has been noted by Basham (1968) and Fagan (2003) that available archaeological evidence suggests that many *Harrapan* houses were laid out to protect from noise and enhance residential privacy; many also had their own water wells, probably for both sanitary and ritual purposes. These ancient cities, they pointed out, were unique in that they often had drainage systems, and seemingly tied to a well-developed ideal of urban sanitation. The streets are said to have been paved and laid out at right angles in grid pattern with hierarchy of streets from boulevards to residential alleys. This type of plan and health consideration paved way for modern urban plans which continues to promote robust health where it is applied.

The plans were implemented on a micro level based on available resources and the desire to satisfy human needs of those days. Importantly, implementation was limited to available technology and the skill of the architects of those days. Indeed, it is quite instructive to note that the plans developed during the pre-industrial revolution period have paved way for modern planning and management concepts and principles of urban environment. For instance, Stubben (1893) observed that the ideal street in the future must therefore consider all requirements much for foot travel, so much for vehicles standing, and so much for vehicles moving, and so much for cars that are propelled. All these go to confirm that plans of those days were meant to satisfy human need, comfort and for future expansion in tandem with increasing population.

Nonetheless, the plans of this era were restrictive, based on the imagination and experiences of the creator, hence lacking in wider applications. The planners have limited knowledge of the wider space and could not easily project into the future. It is obvious that the

sprawling urbanisation as noticed today is the product of sustained concentric planning principles applied by the early planners to the extent that development, provision of amenities and other life-supporting facilities were concentrated in few urban areas, forming a congregation of elite societies of seemingly opulence; while the rural areas remained undeveloped even up till today.

3.2 Urban Planning during the Colonial Administration

3.2.1 The Concentration of Development in City Centres

History of urban planning in Nigeria can be traced to the activities, desired and standards applied by the colonial masters in most urban towns to ensure their well-being during their rule in Nigeria. In fact it has been stated that urban planning concept originated from the need to tame the environment for optimal health and to preserve the integrity environment. Odumosu and Fagbohun (2010) in discussing the background of development control in Nigeria stated that what could be termed as modern urban planning today can be traced back to 1904 when the colonial government started showing serious concern about the deteriorating environmental condition of the Nigeria's urban centres. Odumosu and Fagbohun (2010) further stated that the root of development and indeed, development control can also be traced to the colonial period when the *Nigerian Town & Country Planning Law* was enacted with provision for re-planning, improvement and development.

Before 1904, there was no urban planning of any sort in Nigeria. Indeed, Odumosu and Fagbohun (2010) stated that from 1904 to 1931, there was no uniform planning administration in the country until 1932, when the *Nigeria Town and Country Planning Ordinance* for the Colony and the Protectorates was enacted. The Ordinance made provision for the establishment of planning authorities; preparation and approval of planning schemes; acquisition and disposal of land and for compensation for acquisition of land. According to them, the Cantonment Proclamation of 1904 was the first conscious attempt to effectively plan for any segment of Nigeria town. Accordingly, the 1908 Public Health Ordinance and the Incorporation Ordinance of 1909 established a cantonment for each Health Boards and charged them with the duty of regulating matters pertaining to urban planning.

In 1924, separate town planning committees were set up for the Northern and Southern Protectorates charged with the duty of considering planning schemes submitted by local authorities for approval and initiating schemes in any locality when deemed necessary. In 1927, the powers of the planning committees were transferred to the Health Board for lack of legal backing. The outbreak of *Bubonic plague*

in Lagos Colony as a result of unsanitary condition due to un-planned nature of the city led to the promulgation of the Lagos Town Planning Ordinance of 1928, with provision for the re-planning, improvement and development of Lagos.

Furthermore, the 1946 *Town and Country Planning Act* empowered the town planning authority to make planning schemes *with respect to any land whether there are or are not buildings there in with the general objective of controlling the development and use of land comprised in the area to which the scheme applies, of securing proper sanitary conditions, amenities and conveniences and presenting building or other objects of architectural, historical or aesthetical interest and places.* Today, the existing legal framework for development control under Decree No. 88 on *Urban & Regional Planning of 1994* (URPL, 2004), which replaced the 1946 Town and Country Planning law made provision for the control and orderly development of the country as aforementioned.

For obvious reasons, the emergence of Nigeria's major cities developed around the colonial administrative headquarters – the Lagos colony, Lokoja, Calabar, etc. Where the colonial master spread their activities quickly became urban centres as they were able to provide the needed infrastructures to enhance their operations. Consequently, towns and city centres emerged along this pattern of administrative convenience. Today, we can see that the development of towns and cities were concentrated around such administrative and business centres.

Along this pattern and within the same framework, other towns and cities emerged. Igah (2002) in reviewing the pattern of the development of towns in Nigeria, noted that Lagos, Ibadan, Benin, Port Harcourt and Enugu were retained in the southern part of Nigeria, while Jos, Kaduna, Kano, Maiduguri and Sokoto are located in the northern part and are Nigeria's leading urban centres. Their distribution, he noted takes the leader to the major types of geographical setting of urban development found in the country, as they present a blend between old traditional cities and relatively younger cities, which emerged under British administration.

3.2.2 The Merits and Demerits of Colonial Plans

It has been said that what is termed modern urban planning in Nigeria today according to Odumosu and Fagbohun (2010) dates back to 1904 when the colonial government started showing serious concern about the deteriorating environmental conditions of the country's urban centres. It is a truism that whatever planning techniques and modernisation that is achieved in today's urban planning and management came from the

British colonial masters. This laid the foundation for today's modern urban planning and development of infrastructure. However, the concentration of "over-development" in few places, which became sources of attraction, has been identified as the major source of urbanisation in Nigeria.

Abumere (2002) observed that Nigeria is the most urbanised country in Africa based on the percentage of urban population. By 2002, it was estimated that over 18 cities in Nigeria had population of over a million. According to him, an urban centre in Nigeria is a settlement with population of 20,000 or more.

Abumere noted that the immediate impact of British colonial administration in Nigeria was *the reinforcement of the advantages of southern towns* through: a) ordering of Nigerian cities, b) preoccupation with export and import trade which favoured coastal cities, and c) distribution of amenities and infrastructures. With these administrative instruments and with the Township Ordinance of 1917 categorised towns into first, second and third class and Lagos (the then capital of Nigeria) was the only first class town. There were also 18 second class (12 in the south and six in the north) and 50 third class towns out of which 38 were in the south.

The categorisation of towns also guided the colonial administration in the provision of amenities and infrastructures. Abumere pointed out that Lagos as the only first class town was the first to get electricity, while most of the second class towns like Port Harcourt, Enugu, Kaduna and Kano were linked by railway. The categorisation put some towns at advantage position over others, hence making development of the country to be lopsided, tilting more toward the coastal states where most of the colonial lords settled and carried out most of their commercial and administrative activities.

3.3 Post Colonial Urban Planning and Management in Nigeria

3.3.1 Planning the Lagos Colony

As already noted, Lagos which was categorised as a first class town received more attention from the colonial administration than any other town in Nigeria. Invariably, most parts of Lagos like Lagos Island, Lagos Mainland and Ikoyi were well planned in square or rectangular layouts with good network of road, depicting similarities with central London. Some part of Lagos, like Tinubu Square, Campos Square and the like still maintain similarities with places like Oxford Square, Euston

Square, Russell Square, Leicester Square, Parliament Square, etc. in London.

The plan made provision for bus stops, public conveniences at strategic places, residential areas, commercial areas and industrial areas. The focus was to ensure orderly development and to promote optimal health of the people. This was a fallback from the colonial era. Thereafter, there were conscious efforts to sustain the tempo. For instance, Olujimi (2011), observed that the 1960 political independence in Nigeria and the development activities of the political leaders in the three (3) regions created an improved welfare and living conditions for the people side-by-side significant increase in the population. Closely followed was the oil wealth that brought about tremendous development in the country with private and public building spring up in most towns. Olujimi stated that expanded development and increased population led to re-classification of urban centre in Nigeria to the extent that the population that made up urban area was increased from 5,000 to 20,000 during the 1963 census. That increased Nigeria's urban centres to 183 in 1963.

3.3.2 Planning the Three Regions

Nigeria was first amalgamated into southern and northern protectorates in 1914. Later, it was split into three main regions (north, south and east) along the natural divided line of rivers Niger, Benue and their stem. Each of the regions was autonomous with separate administrative structure. Each therefore set up her independent urban planning agency and adopted a planning model that best suited her developmental goals.

3.4 The Evolution of Modern Urban Planning and Management in Nigeria

The modern urban planning and management concepts have evolved along the need to build modern societies where “things” work. Nigerians are said to be the most widely traveled. Acculturation and outside influence based on interactions and experiences from other countries have informed the need to modernise our towns and cities through effective planning to make them more human friendly with structure and facilities to allow for orderly and sustainable development.

Today, most planned towns will provide for recreation, worship areas, commercial and industrial layouts, etc. Past experiences which have now lean to urban renewal programs has taught us to be more proactive and conscious of the type of urban plans that will guarantee sustainable development that support robust health. It is in this regard that it becomes necessary to recommend that planners should be upright and proactive in their approach while sentiments and political induced urban

planning policies should be reviewed to bring them in tandem with modern planning realities, planning principles and international best practice.

SELF-ASSESSMENT EXERCISE

i. List two main considerations of the pre-industrial revolution town planners.
ii. Mention two foremost urban planners of the pre-industrial revolution and state their contribution to urban planning.
iii. According to Abumere (2002), the immediate impact of British colonial administration in Nigeria was *the reinforcement of the advantages of southern towns* through:
a) _____, b) _____, and
c) _____

4.0 CONCLUSION

History of urban planning has helped to highlight the principles that guided the town and city planning in the past and how we can use the information and those experiences to improve urban planning today and enhance sustainable development. The early town planners drew planning inspiration from their imagination and experiences and were limited in the knowledge of planning. Their major considerations in developing plan were suitable location for dwellings and buildings, and ease of access from and to these buildings for the general population. You have learnt that each planning era in a particular place produced plans that depicted the history and culture of the people that lived in that era and how they managed to overcome environmental challenges that existed in their time. Indeed, it is gratifying to note that the early plans were unique in that they often had consideration for drainage systems, tied to a well-developed ideal of urban sanitation couple with provision of amenities and other of life-supporting facilities. Colonial town planning though established the principles and foundation of modern planning in Nigeria, also serve as a major motivation for urbanisation, which should be corrected by the present town planners.

5.0 SUMMARY

In this unit, you have learnt about the history of urban planning and what guided the early town and city planners. The purpose of planning during the pre-industrial revolution era has been highlighted as well as the uses and limitations of the plan developed then. You have also learnt about why development of towns was concentrated in certain part of Nigeria during the pre-colonial and colonial days, and why Lagos and the coastal towns developed faster than the town inter-land. The

evolution of modern urban planning has also being discussed. In the next unit, you will learn some theories of urban planning and management which will further enhance your conceptual knowledge of the course.

6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the focus and benefits of early planning principles and state what guided the development of plans of those eras.
2. a) What were the major disadvantages of the British colonial urban planning in Nigeria? b) How would town planners avoid such pitfall today?

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UNIT 3 THEORIES OF URBAN PLANNING AND MANAGEMENT

CONTENTS

1.0 INTRODUCTION

In the preceding unit, you learnt about the history of urban planning, which presented some experiences meant to serve as guide to the present and future urban planning processes. In this unit, you will learn about evolution of planning theories as well as some planning theories to enhance your conceptual knowledge of urban planning and management.

Urban planning theories are procedural guide through which planning occurs and validate whether or not that process is valid. Planning theories help to guide complex public decisions about society and the development of towns and cities. The theories establish some sets of principles and set up operational framework which every planner is expected to follow. They draw inferences from psychology, sociology, politics, economic, education and the planning sciences. Theories have been referred to as abstract ideologies meant to confuse the mind. However, planning theories have been identified as factual signposts meant to enhance the future of urban planning so as to enable it achieve

the desired objective. In this sense, planning is conceived as a general process, an activity that foresees the future goal, while theories direct the planners to that goal. It is therefore our hope that you will find some of these theories interesting to improve your understanding of urban planning and management.

2.0 OBJECTIVES

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

- explain the evolution of urban planning theories
- identify the characteristics of oriental and normative planning theories
- describe application of the knowledge of these theories in urban planning in Nigeria.

3.0 MAIN CONTENT

3.1 Evolution of Theories of Urban Planning

3.1.1 History of Urban Planning Theory

Over the years, theories have been propounded to guide inventions, activities and various human actions. According to Michael (2005), the first notable trend in urban planning started with the renaissance era of political authorities, most powerful princes of Europe, seeking to fortify or to 'perfect' their domain and the capital cities. They dreamt and nursed an ideal city to be such that will provide absolute protection for the people occupying the centre circle of the city. Hence, the *spoked-wheel* was deemed to be the most perfect city shape for the purpose of military and civil defense - to allow easy routes for the movement of troops to quell riots in the center of the city - or to move rapidly to defend the walls against external enemies. Therefore, such city like *Palmanova* in Italy, built between 1593 and1623 was seen as an almost perfectly preserved example of this type of radial beacon or starburst design with extensive fortifications and outworks (external walls).

Aside from the military and defense consideration of the circular design, artwork and beautification were also high on the minds of the early planners and architects. The city design provided room for small and bigger streets becoming grand avenues lined with trees and linking together key landmarks with well-placed sight-lines for optimal viewing pleasure and taking advantage of dramatic topography from natural land formation. The unique plan also allowed for the imposing structures and monuments like the Cathedrals, Government Buildings, Palaces or Museums to serve as focal points for these avenues and promenades –

providing aesthetic view of the seaside. This style of planning is often associated with neo-classical architecture, with a focus upon peculiarity like the Renaissance & Mussolini in Rome, the post-Haussmann in Paris, the Versailles in Washington D.C., and St. Petersburg being notable examples of this "Grand Manner" in urban design applied in practice, Michael explained.

From the above background, we can then appreciate that the neo-classics and medieval plans and designs laid foundation for the patterns and design applied in urban planning today. The concentric model, for instance draws inspiration from this security and aesthetic consideration of the early planners. As will be seen later, all the theories of urban planning derived their strength from historical and culture background, linking the past with the present and laying the foundation for the future of urban planning and management.

3.1.2 The Development and Growth of Urban Planning Theories

The development of urban planning theories has followed the historical pattern of urban planning and design indicating that the evolution of urban planning theories has a root in the history and culture of their proponent. Mantysalo (2005) stated that the development of rational-comprehensive planning theory can be traced back to Auguste Comte (1798-1857), often regarded as the "father of sociology". According to him, Comte sought to apply the methods of observation and experimentation, familiar to the classical science of his time, to a field that we now know as sociology. Comte, Mantysalo stated, believed that persistent social problems might be solved by the application of certain hierarchical rules and that mankind would progress toward a superior state of civilisation and to a level of perfection (divine). From the stand-point of Comte, primitive cultural state in every society was to give way for medieval - renaissance, then to modern day architectural master-piece of splendor in human development.

According to Mantysalo (2005), the rational comprehensive planning theory becomes so popular in the 1950s and 1960s to the extent that the ideas are still at the core of urban planning thought today. First and foremost, Comte's association of the methods of classical science with the study of societies and social phenomena is central to the theory of rational-comprehensive planning. The thought models of classical science involve the dissociation of the observer from the observed – the notion of the neutral observer seeking knowledge of the truth that is "out there" - somewhere beyond human comprehension and using such truth to plan, remedy or restructure human environment for a better society.

What can we find today? It is of great interest to planners, wherever they may be, that it is through the knowledge of these comprehensive planning theories with its root from classical science that we can solve human urban problems. For instance, Michael (2005), observed that in the face of growing problems associated with the early industrial cities, such as high-density urban slums, poor health and poor sanitary conditions, industrial pollution and smog; one of the first attempted solutions was a throwback to the now cherished medieval past. Medieval urban planning theories as would be noted have unveiled the basis for hierarchical planning and urban renewal program of today. Thus such idea like industrial village - patterned upon an old medieval village was born. The whole essence was to establish a blend and set up communities that best suit the inhabitants in term of income parity, occupation, and socio-economic status. The focus was the creation of 'suburbs' associated with the period in reaction against the ugliness of the industrial revolution and the absolutist of political character of the *Grand Manner* of the time.

3.2 The Medieval and Oriental Theories of Urban Planning

3.2.1 Medieval Theory of Urban Planning

Medieval or middle ages, a period recognised from the early 19th Century and referred to the time when there was great interest in art and history. It is also the period of European history covering the 5th to the 15th centuries, normally marked from the collapse of the Western Roman Empire (the end of classical antiquity) until the beginning of the renaissance and age of discovery, which also ushered in the modern era, (Lombard, 1999). Brian (2004) noted that the medieval era was disrespectfully treated by the Renaissance humanists, who saw it as a barbaric 'middle' period between the classical age of Greek and Roman culture, and the 'rebirth' or *renaissance* of classical culture. According to him, modern historians consider the medieval era to be one of philosophical development heavily influenced by Christian theologians like Thomas Aquinas whose philosophical thoughts and wisdom was founded in Christian revelation.

This trend or style also called Gothic Revival lifted human consciousness to higher level of critical thinking which seeks to recreate the natural organic street pattern of old medieval towns and villages. In many ways, this style or trend sought to escape from urban squalor of what the medieval era was known for by working with a smaller scale in the countryside, and taking advantage of modern forms of transportation such as canals and railroads - to link up with distant markets. This era also coincides with a revival of medieval-gothic styles of architecture in

residential as well as institutional buildings, which can still be found in many part of Europe and many British colonies (Michael, 2005).

3.2.2 Oriental Theory of Urban Planning

Oriental, according to Wikipedia (2009) means "eastern" or belonging to *orient* east. It is a traditional designation for anything that belongs to the eastern world and the Far East, in relation to Europe and western world. It indicates the eastern direction in arts, music, history and philosophical thinking and practices. Some modern planning and design have their origin from this oriental background. Therefore some planning theories are known as oriental theories of urban planning.

One of the oriental theories of urban planning is *Fengshui*. The central theme of this theory is environmental protection and sustainability. The theory according to Hong *et al.* (2006), originated from the oriental human consciousness, practices and attitude toward nature and natural landscapes. Hong and his colleagues noted that the cognitive and empirical topographical notion of *Fengshui* seems compatible with modern landscape ecological perspectives. For instance, according to them, the notion of ecological sustainability which depends on the combination of adaptability and change in ecological and human systems is consistent with the central tenet of *Fengshui* theory that has a major bearing on urban planning and landscape management in Asia. Many items are required to encapsulate ecological-environmental sustainability in risk impact assessment and environmental resource management. Protection of biological diversity and ecological integrity to maintain ecological process and systems are important items as other inter-disciplinary principles linked to socio-economical equity in landscape planning in relation to the ecological system. This theory supports the principle of sustainable development and environmental protection, which the western world seems to stand aloof.

Hong *et al.*(2006) observed that the spatial arrangement of urban landscapes results from cumulative interactions between human activities and the physical environment. Moses (2008) noted that man is entirely governed by the outcome of his interaction with the environment. This governance also dictates the style and shape of man dwelling, hence the spatial planning pattern that exist according to land topography and soil type, culture, occupation, trade, social interaction and acculturation/cross cultural linkage as well as businesses that strived in a particular geographical space within a specified period. In fact, traditional philosophies, historical records and consideration as well as cultural legacies have had important influences on urban development and planning in East Asia (Hong *et al.*, 2006). In Seoul for instance, traditional land uses and practices based on '*Fengshui'* have

significantly contributed to human-mediated patterns of landscape changes, in addition to the role of the socio-economic development and other human activities. Hong *et al.*, stated that the concept of *Fengshui* was originally founded upon people's empirical cognition of natural landscape patterns. Recently, however, advanced economic development, westernisation and urbanisation have been rapidly altering the old traditions of the holistic landscape systems through changing urban planning practices which have shifted the planning landscape in east.

Another oriental theory of urban planning is the ***Ancient Chinese urban planning theory,*** which is the application of the traditional principles of Chinese architecture to urban design, with its root from *fengshui* principles. The development of Chinese early planning concept originated from the *Longshan* culture. The earliest Chinese urban planning was synthesised from *Longshan* traditional of cosmology *(study of the universe and celestial bodies)*, geomancy *(earth divination from figure given by dots at random)*, astrology *(study of influence of star upon human affairs)* and numerology *(studying of numbering, computation or numeric expression)*. This synthesis generated a diagram of the cosmos - *universe*; which placed man, state, nature, and heaven in harmony.

This theory therefore emphasised the link between man and the natural planetary cosmic power and solar energy. The theory explain the medium of energy connecting man, the earth, and heaven with the political power shared between a military aristocracy and the educated advisers in three-tiered economic system under absolute state control of all resources - the root of socialism. Within this context, the city was planned with focus, perfect balance and harmony between nature and man (Wikipedia, 2010).

3.3 Normative Theories of Urban Planning

Normative theory simply means standard, rules and pattern of behaviour. These sets of theories established the standard and pattern of behaviour that must be followed in doing things and indeed in the planning processes. **Normative theories** are statements or stated principle about what is right and wrong, desirable or undesirable, just or unjust in the society, (Ness, 1994 & Watson, 2002). It compares what is present (reality) with what ought to be (ultimate expectation). Generically, normative means *relating to an ideal standard or model*. In practice, it has strong connotations of relating to a *typical* standard or model. N*ormative* statements affirm how things should or ought to be, how to value them, which things are good or bad, which actions are right or wrong with analysis of what should be. Positive statements are

factual statements that attempt to describe human behaviour with the intent to draw attention to generally acceptable norms and standard, which will enable the society to develop in a more responsible and productive manner (Watson, 2002). Therefore normative theory of planning deals with the connections between human values and settlement form from known standard of what a good city should be when one is seen.

Normative theories of planning present philosophical and anthropological views of town planning with concerns over the recognition of diversity, socio-economic and cultural difference. Such theories are of great interest to planners who continue to grapple with the problem of overcoming the extreme forms of inequity, division and social breakdown that persist in the cities of Africa. Some of the normative planning theories are discussed below.

3.3.1 Transactive Model

Transactive planning model explains the processes involving stakeholder's negotiation of ideal plan for their settlement or city. It is based on communicative rationality or the process of negotiating the content of plans before it is presented and implemented. This type of rationality is based on human communication and dialogue between policy makers, planners and the population affected by the planning process.

In this theory, interpersonal dialogue is the focus. This dialogue is intended to trigger a mutual learning process leading to an intensive communication about measures to be taken in a new plan or modification of old or existing plans. In this model, there is decentralisation of planning, hence planning is seems to be carried out in an open atmosphere with the expertise of the planner and the experimental knowledge of the population being combined and transformed into shared vision. Obviously, the planning process is characterised by interpersonal dialogue and mutual learning (Mitchell 2002). Planners are expected to play pivotal role in the systematic presentation, demonstrating in-depth and technical knowledge of the historical facts, the culture of the people, the political system, the social system, the topography of the area and the principles/ norms of planning process as well as the ability to apply group-psychology in dealing with diverging groups and all shades of opinions. They also mediate between different interests and communicate information between the actors/ stakeholder – regulators, indigenous groups and developer in a mutual manner in the planning process (Michel, 2002; Larsen, 2003 & Kinyashi, 2006).

In the Table below, a comparative analysis of transactive model and comprehensive model is presented.

Table 3.1: Comparative Analysis of Transactive and Comprehensive Models

Model Features	Comprehensive Rational Planning	Transactive Planning
Understandings of planning is considered	- Scientific-technical process.	• Face-to-face interaction between planner & population
Central assumptions	- A best solution to planning all issues exist, - The environment is controllable, - There is a common public interest, - Change has to come from top.	• Dialogue lead to a mutual learning process, • There exists various interests, • Change has to come from the people affected by plans.
Assumptions and role of the planner	- 'homo economicus', - External experts.	• Mediator, • Supporter & participants.
Role of the local people	- Play no role	•Disclose their needs & interest and contribute to consensus building about objectives and measures.
Planning process	- Centralistic, - Consists of fixed successive steps.	• Decentralised, • Mutual learning & decision process.

Source: Adapted from Mitchell (2002). www.geo.fu-berlin.de/fb/e-learning

This model presents a unique opportunity to highlight the importance of bottom-up approach in planning. It is obvious that if the people being planned for are involved in the planning process, there will be agreement among contending stakeholders and every issue will be put on the table for consideration. Participation is increasingly being recognised as a way that planning for sustainable development should focus. Therefore, its stands to reason that if the plan is for human development, the people should be allowed to make input into its design and implementation.

Many people have seen planning as a very technical process that requires scientific knowledge and skills. This to some extent may be true. However, planning in this model is considered less scientific and technical activity than in the comprehensive rational planning model as shown in Table 3.1. The comparative analysis of comprehensive rational planning model and transactive model in the Table above has shown that what is require for effective planning is consultation, consideration and involvement. In transactive model therefore, planning is considered as a '*face-to-face*' interaction between planners and the local population affected by plans. Thus, planning is more a subjective endeavour rather than an objective process (Larsen, 2003).

3.3.2 Gestalt Model

Gestalt means a unified or meaningful whole. It is a psychological ideology originated by Christian von Ehrenfels (1859-1932) and further developed into theory by Max Wertheimer and his two colleagues Kohler and Koffka (all Germans) in 1922. The theory was first used in learning to describe the perception of motion where there is nothing more than a rapid sequence of individual sensory events used to explain higher-order of cognitive processes in the midst of individual behaviour and mannerism, (Sahakian, 1976 & Boeree, 2000).

Gestalt theory focuses on interpreting a visual field or problem in a certain way and grouping such interpretation base on our position from the object. According to Boeree (2000), the primary factors that determine such grouping were: i) proximity - grouping elements according to their nearness, ii) similarity - grouping similar items together, iii) closure - grouping items that are complete entity, and iv) simplicity - grouping items into simple figures according to symmetry, regularity, and smoothness. These factors were called the laws of organisation and were explained in the context of perception and problem-solving. It is this law of organisation that endeared planners to apply Gestalt theory in urban planning.

Gunay (2007) explained that Gestalt theory has contributed to urban planning and design in two ways – through i) formulation of rules of visual perception and analysis of object patterns and groupings, and ii) formulation of principles for problem solving and creativity. In this context, Gestalt means shape, form, pattern or configuration perceive as a whole. The theory enables planning to be carried in an organised pattern, viewing every part of the plan as characteristic whole. From the stand-point of this theory, planners are able to look at every community holistically. The principle enables remedial process to be undertaken where problems are noticed in the planning process and also to restructure shanty settlements into living cities. The theory also enables

planners to create small settlements and stand-alone entity, forming part of a holistic community, which together become manifest integral part of larger society, city, country and that of the universe.

3.3.3 Concentric Model

Concentric theory of urban planning belongs to the group of theories of urban structure or land used. Popularised by Ernest W. Burgess from 1920, the theory explains that town tended to expand outward from the inner core (centre), giving way for gradual growth and development into concentric zones. It is a theory of urban land use according to which cities develop in rings around a core of business activity and where outer rings are higher in class than inner rings.

According to Burgess (1925), the aggregation of urban population and the growth of the city have been described in three emerging trajectory processes of: *a*) expansion, *b*) metabolism, and *c*) mobility. Obviously, the typical tendency of urban growth is the expansion emerging gradually from centre called the ***central business district*** by a series of concentric circles. As the city continues to expand, a series of rings formed around the core. Burgess identified the rings from the central point to outlier as: *a*) the central business district (CBD), *b*) a zone of deterioration/ transition, (*c*) a zone of working men's homes, *d*) a residential area, and (*e*) a commuters' zone as shown in Figure 3.1 below.

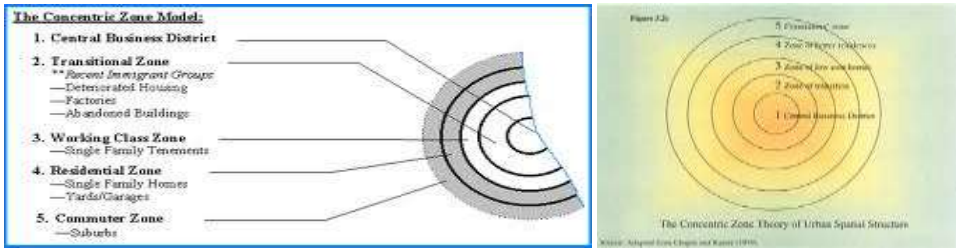

Fig. 3.1: Burgess' Concentric Model

Source**:** www.google.com.ng/concentric+zone+theory

Fig. 3.2: Concentric Model Showing Each Zone from Inner CBD to Outer Commuter Zones

Source**:** Burgess E. W. & R.E. Park (1921). *Introduction to Science of the Sociology*. www. knowledge.sagepub.com/view/urbanhistory/.

In the concentric model, the CDB is the focal point for civic, commercial, social, and cultural life of the city. It also housed many urban facilities and amenities like offices, banks, shops, hotel, etc. within this zone, there is congregation of diverse architectural design which give colour to the *landscape* and skyline of the city and create aesthetic environment.

The transitional zone encircled the CDB, and is characterised by deteriorated residential areas and urban slums, with other sundry structures including production/ factories with little or no infrastructure. It is mostly occupied by low income earners who service the CBD. On the other hand, the zone of independent working men is a creation the transitional zone, as many workers seem to be moving out of the transitional zone to find abode in new areas with less pollution. This zone is characterised by new layouts with near structures occupied mostly by immigrants from the other zones.
The residential zone is characterised by better residential structures in well-planned layouts and high class apartments, while the commuter

zone lies beyond the built-up area - city suburbs, villages and even virgin forest land, which are often referred to as suburban.

3.3.4 Hexagonal Model

Rudolf Muller, an engineer in Vienna, proposed the concept of a city organised in hexagonal and triangular blocks based on the idea and perception of honeycombs (made by bees, wasps, and hornets). His perception and the principles were constructed from the eyes of insects, which actually are placed together as a bundle of eyes when viewed from magnified glass or under a microscope.

Using the smallest surfaces the greatest number of elements can be brought together, Muller (1908) visualised. He explained that if one takes equal cross sections of a number of elements completely symmetrically in each cross sectional form, they become malleable in such a way that they can take on a new form, by joining themselves in bundles and giving themselves a symmetrical impression through their bundled circumference. Thus all of the elements take on a hexagonal cross sectional form, similar to the prism of *Basalt*, which most likely became pressed into this state through the pressure caused by the earth's rock structure, Muller posited.

The hexagonal building concept shown in Figure 3.3, presents building as parcels arranged in such a manner, that they themselves are placed together with the others at their corners, which means that a row of polygons can be arranged in a longitudinal axis; with parallel streets of the hexagon alternating and providing access in rows, so that straight passing streets from three directions, are cut at angles under 60 degrees, which allows the hexagonal building blocks to still form the boundaries of the equilateral triangles, with the blocks complete in a hexagonal star (Muller, 1908) as in the diagram below.

Though not quite popular in the contemporary urban planning today, for a period of almost 30 years, between 1904 and 1934, hexagonal theory guided urban planners, engineers and architects who saw in it as promising panacea for the city’s planning ills and a replacement for the uniform rectangular street grid (Joseph & Gordon, 2000). Some noticeable difficulties in its implementation made the theory unpopular. Joseph and Gordon (2000), stated that the communities created using hexagonal ideologies were often short-lived in their pure state, therefore exposed to distortion and abuse. Indeed, they stated that such communities and cities were overtaken by the reality of the way in which people behave under normal conditions and needed to use the open space for other economic ventures.

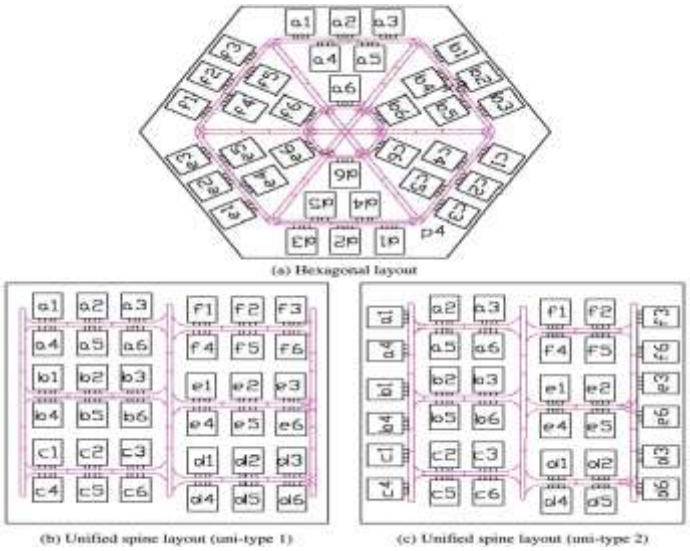

Fig.3.3: Unified Spine and Hexagonal Layouts

Source**:** Chung, J. & Tanchoco, J.M.A. (2010)

3.3.5 Incrementalism Model

Increment - a root word for increase in something, an addition to or increase in the amount or size of something, especially one of a series of small, often regular or planned increases (Microsoft Encarta, 2009). Incrementalism model in planning is a conceived idea that one need to start with immediate problem or a small matter and expand as more resources become available. In contrast to other systems of planning such as *top down*, *bottom up* and so on, incrementalism model states that you should concentrate on dealing with the immediate problems as they arrive and avoid trying to create an overall strategic plan which may appear cumbersome and beyond available resources for implementation.
The direct opposite of incrementalism is that work must be accomplished in one single push rather than through a process of continuous improvement. This is against the ethics of professionalism which often leads to chaos and waste of resources. The simple overview of this would be what if the steps taken are faulty and like to result in failure? Therefore, it makes economic and professional sense to start small and build on experiences and successes. In this model, all work must be planned, work in progress must be hidden and only presented when completed.

3.4 The Application of Theories in Modern Urban Planning

A great deal has been learnt from the theories that have shaped the modern planning thoughts and skills today. Indeed, it is obvious that whatever the planners create today, the idea must have originated from one of the theories. For instance, transactive model encourages stakeholder's consultation, participation and collaboration with the planner, the policy makers and the general public. The gestalt model on the other hand focuses on interpreting visual field or problem in a certain way and grouping such interpretation base on subject position from the object. Gestalt theory has contributed to urban planning and design by enabling the formulation of rules of visual perception and analysis of object patterns and formulation of principles for problem solving and creativity. It deals with forms and patterns which enables the planners to produce his conceived idea in a logical and presentable manner.

You have also learnt that concentric model presents development in circles and development can start with the concentration of resources and facilities in the inner circle. With this model, planners can set out to develop a new area like the Nigeria's Federal Capital Territory, Abuja, which started with the phase one made up of six districts, where development was concentrated, before moving out to other phases. This is also similar to the incrementalism model which emphasised the need to start with immediate problem or small area which resources can cope with. In essence, planning theories have enable the development of planning concepts, planning patterns and forms, which have influenced modern day planning and design of urban areas. Indeed, planning theory have helped to produce conditions in human consciousness for creativity towards the creation of better cities, e.g. what role conscious policy played in producing urban form and social structure; how the system of power relates to shaped policy; and the ways in which structures of power are malleable to urban growth and infrastructural development.

SELF-ASSESSMENT EXERCISE

i) Define theory.
ii) List the theories and models you have studied in this unit.
iii) Differentiate between comprehensive and transactive planning models.
iv) List the planning zones in the concentric model.

4.0 CONCLUSION

Planning theories have been described as procedural guidelines for planning processes. They help in forecasting future trends of urban centres, land use and changes in ecological system. The theoretical analysis provides guidelines for selecting planning methods currently available in complex contemporary environment. Friedmann (2008) has pointed out that planning theory can contribute to the advancement of planning practices through humanist philosophy by making the human being centre of the planning process, adapting planning practices to the real constraints and translating knowledge and ideas from other fields into the domain of planning.

Planning theories are sign-post to guide planners arrived at their intended destination. Proper application of these theories links the present to the past and provide a smooth sail into the future with creativity and innovation aiming at perfection. Basic planning principles are encapsulated in planning theories, and their understanding and application enhances the planning techniques and guides every planning procedure including legislation, initiation and design to public education, consultation, plan development, implementation and monitoring. There are basically two groups of urban planning theories - convergence (concentric model), and divergence (transactive, incrementalism). While some countries planned convergently, others planned divergently. It is hoped that you will apply these theories in your day-to-day planning activities.

5.0 SUMMARY

In this unit, you have learnt that planning theories are procedural guide to enable planning progress in a logical manner. You have also learnt about the history, development and growth of urban planning theories. You were introduced to medieval and oriental theories under which you learnt about planning practices during the medieval time and the oriental ideologies in urban planning from the Asia and Far East. You have also studied the normative urban planning theories including the transactive model, the comprehensive model, the gestalt model, the concentric model and the incrementalism model. Lastly, you have learnt how to apply the theories in modern urban planning. It is my belief that you use the knowledge gained from this unit to move smoothly through other part of this course starting with social factors affecting the development of society and contemporary human geography.

6.0 TUTOR-MARKED ASSIGNMENT

1. a) Define the term urban planning theory.
   b) What will you consider as the contribution of planning theories to modern day urban planning and management?
   c) What are the main principles derivable from the transactive model of urban planning?
2. Normative theories are generally regarded as those theories that help in the establishment of urban planning standards and rules.
   a) List the normative theories you have learned and discuss one of them in detail highlighting its historical development, main lesson, application and disadvantages if any.
   b) Enumerate the contribution of oriental planning theories to the development of modern societies.

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UNIT 4 SOCIAL FACTORS AFFECTING THE DEVELOPMENT OF SOCIETY AND CONTEMPORARY HUMAN GEOGRAPHY

CONTENTS

1.0 INTRODUCTION

In Unit 3, you learnt some theories that affect our planning concept. Whatever planning pattern that is adopted today is fitted into unified design which is guided by certain principles embodied in the planning theories. In this unit, you are going to learn about the society, the social factors that affect the development of society and some contemporary human geography.

You will in particular learn about the family as the foundation of every society and how this micro unit fits into the larger society, the growth of the society as well as the cultural issues that affect the growth and development of the society. You will also learn about some contemporary issues in human geography like transportation, communication, tourism, etc. that oil the working and the smooth running of the society, and why it is very necessary to plan for these social sectors in urban areas. I hope that you will reflect on your rich personal experiences to make your study of this unit more interesting and rewarding, while the materials provided here will only serve as guide.

2.0 OBJECTIVES

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

- explain the social factors affecting the development of society
- describe how to plan the contemporary human for orderly society.

3.0 MAIN CONTENT

3.1 Macro and Micro Social Environment

3.1.1 The Family and the Society

The family is the foundation of every society. In fact, Essoh and Ukwayi (2011) described the family as the bedrock and the building block of the society universally. The family forms the micro unit of the society. Every society is made up of several families that are uniquely fitted and held together by certain norms and ideologies. Each family is made up of human beings who by providence are meant to live together. Colman (2003) defined the family as the primary group, comprising of parents, their offspring, and in some societies other relatives sharing the same household or more generally any group of individuals related by blood from an identifiable common ancestor.

According to Wikipedia (2011), one of the primary functions of the family is to produce and reproduce persons, biologically and/or socially. This can occur through love and the sharing of material substances (such as semen, and food); the giving and receiving of care and nurture; jural ties of rights and obligations; and moral and sentimental ties and intimacy. The cradle of society is the individuals from various families. Families are necessary ingredient for the sustenance of the society.

Ramalingam (2006) defined society as a group of individuals of any species, living together in a community, in mental intercourse with one another, and cooperating in various activities of the community. It is further defined by Free Dictionary (2011) as group of humans broadly distinguished from other groups by mutual interests, participation in characteristic relationships, shared institutions, and a common culture. Ramalingam's definition is interested as it presents society from different perspective – could be society of humans, animals, or plant; the common denominator being that the individual live together and share common goal and the same aspiration. Individual therefore, is the basic component of society. The interaction among individuals in a specified geographic location gives birth to group. Several social groups interacting together form a society.

3.1.2 Development of Society and Community

Ramalingam viewed society as a group of individuals living together in a community. Then what is a community? Christopherson (2006) described community as a convenient biotic sub-division within the ecosystem, formed by interactions among populations of living things (animals and plants) at a particular given time. Dictionary.com (2012) defined Community as a social group of any size whose members reside in a specific locality, share government, and often have a common cultural and historical heritage. Wikipedia (2011), explains that the term **community** has two distinct meanings: i) community usually refer to a social unit larger than a small village that shares common values. The term can also refer to the national community or international community and, ii) in biological term, community is a group of interacting living organism sharing a populated environment. A community is a group or society, helping each other.

Having understood the meaning of society and community, you will now learn how the duo developed. As stated before, the basic foundation of the community is the family while the individuals are the building blocks of society. The individuals interacting together form the society, and group of societies make up community. But every community is known by the geographic space it occupied. No community hangs in the air. This geographic space exists in the environment. What makes a community is the quality of the individuals, the cohesiveness and the goals the community have set for herself. If members of a community decide as their goals to live and exploit environmental resources in a sustainable manner, then they will take steps to ensure its achievement. To achieve this, the community members must participate in the planning of the physical space they occupied. A community that will achieve orderly development is a community that is properly planned. Therefore planning is sine-quo-non for effective development of community.

3.2 Urban Population Explosion

3.2.1 Socio-cultural and Economic Consideration

The size of each family is determined by several factors. Ideally, each family is expected to comprise of the father, mother, and some offspring, whose number may range from one to as much as twelve in some cases or even more. First, the Constitution of the Federal Republic of Nigeria guarantees some basic right of self-determination and procreation, which is in consonance with other international treaties and convention, which Nigeria is signatory to. In this regard, the 2004 National Policy on Population for Sustainable Development reaffirmed the reproductive rights of individuals which rest on the recognition of

the basic right of all couples and individuals to decide freely and responsibly the number, spacing, and timing of their children, and have information and means to do so and the right to attain the highest standard of sexual and reproductive health. Such rights therefore support families and empowered them to decide the number of children they would have.

Socially, culturally and economically, polygamy and large family size are equally encouraged. In the olden day and may be even today, family size was largely determined by the need to have many hands to work on the farm. Onokerhoraye (2002), affirmed that population constitutes a vital component of the resource base and the development potential of any society. This economic consideration gave rise to polygamy, which was the order of the day as one man can marry as many as ten to twelve wives, and each of them expected to have a minimum of four children. More children, means more hands to work on the farm, hawk on the street, and help out in domestic chores. Oyewole (2010) noted that economic consideration extended to and included the benefit attached to female child through collection of bride price.

It was almost competitive as to which family was the largest. Then family size determined and indeed was used to measure how wealthy a man was. Culturally, it was a thing of pride to note the number of wives married to one man and to see a family with many handsome male and beautiful female children being "paraded" at any given time. Then a family with the smallest size was seen as incapable of feeding itself. Some families were meant to contribute men to the local army and security. Of course, only large family could proudly do that conveniently. All these gave rise to large family size which led to rapid population growth. FGN (2004) has stated that certain cultural practices over time are tended to contribute to growth of population of different areas of the country in ways militating against the interest of national development in contemporary times.

Early or child marriage is common in most societies in Nigeria. The practice is even supported by some religious doctrines. Female children were and are still being given out in marriage at the young age of 11 years or even younger. In a document published on the internet, the following lamentation of a young child was taken: *When I was 10, my parents arranged for me to marry in the forest. They pretended it was just a party. But it was a wedding and they sent me away. My mother never told me I was going to be married. They came and took me by force. I cried but it didn't make any difference* (FMU, 2006). Such is the agony some children go through and are forced into "baby factory" at very tender age.

Procreation becomes a major preoccupation of the young child; now wife as she is made to give birth as early and as much as would humanly be possible. Family planning concept is not very popular with many families in Nigeria. In most parts of Nigeria, it is culturally unacceptable to think of or control birth as children are seen as the gift from God. Fagbohunka (2008) observed that despite efforts made by government in propagating the ideals of family planning, those efforts were not achieving the desired goal, and called for more measures to be taken to ensure that our population growth will support sustainable development. The population growth is not evenly spread. The growth is more concentrated among the urban poor, where families live together in clusters in substandard accommodation. Communal living appears to be widespread in such areas and human contacts which encourage intimacy are very common. Obienusi (2008) observed that natural population increase was higher in the urban areas than rural areas. He noted that high concentration of potential mothers across urban areas ranges from 43.1 and 51.9 %. Of course, this situation gave rise to high fertility rate of 5.2 per woman (FGN, 2004), and the problems of high infant and maternal mortality rate still being grabbled with till today. Indeed, several families are able to live and grow together into communities, then the larger society. Therefore, it is my candid opinion that the planning of a society, indeed urban planning should start with family planning and planning for family.

3.2.2 Population Growth and Urban Planning

Population has been recognised by Onokerhoraye (2002) as a vital component of development of society. However, rapid population growth poses serious challenge to sustainable development (FGN, 2004). Indeed, Aledare (2008) noted that overpopulation of urban areas mount excessive pressure on available infrastructures and facilities. Every city according to him has its ecological limit, which is exceeded with influx of people, putting pressure on road, transportation, communication facilities, housing, electricity, markets, etc. Of course, it is obvious that each of these facilities have their design capacities. Town Planners would have had behind their mind the intention to plan for a certain number of people. When this number is exceeded, there is a break down in services as the capacity can no longer cope with the number of users.

Overpopulation of towns and other urban area leads to overexploitation of available land resources. The urban space, according to Aledare (2008) is fixed, and most development will want to be within the built-up area. This often led to high cost of land within the built-up areas. People want to maximise the available land space without recourse to proper plan for access and standards and regulations such as set back

requirements. Most of these places simple developed into slums. It was a situation like this that caused El- Rufai (2006) to lament that in spite of several town planning initiatives and compliance and government determination at building or renewing cities, it appears that our people are determined to transform our cities into slums. Squatter settlements and slums developed as a result of population pressure on urban land. This ugly situation led to demolition of several structures and preplanning of Abuja at greater cost. Situation like this poses serious challenge to regulators and planners.

Other problems of overpopulation of urban areas include unemployment and high cost of living. According to Aledare (2008), migrants always thought they would meet their employment expectation in the urban areas. But in most cases their expectations are often short-lived as there are limited employment opportunities in these areas. What such people are confronted with is high cost of living, especially high cost of residential accommodation and food items. Indeed, he noted that goods and services are very expensive in the urban areas compared with what is obtainable in the rural areas.

3.3 Contemporary Human Geography

3.3.1 Transport and Communication

Two basic requirements of urban area are access and mobility in terms of good transport infrastructure and effective transport system. Every urban area requires quick and efficient transport system for functional urban life. In fact, transport is described by Ogunbodele & Olurankinse (2008) (referring to Clark (1958), Elliot (1959) and Ogunsanya (2002)), as the maker and breaker of cities, capable of making cities to thrive and prosper with lots of benefits and at the same time able to induce traffic to make cities chaotic with lots of negative effects. Therefore effective transport system depends to a larger extent to available transport policy; a well-planned and integrated road, rail, water and air network; efficient transport management system and good-transportation-cultured citizens.

Road transport in all parts of Nigeria has been particularly chaotic and lamentable. Nigerian road network is poorly planned, narrow and not integrated with other mode of transportation. A city said to have been well-planned may have just one or two access for inflow of traffics in unidirectional into the city centre. Good examples are the inflow of traffic into Lagos Island using the Carter Bridge, Eko Bridge and the Third Mainland Bridge on one direct in the morning and the opposite direction in the evening. The same scenario exist when one moves further inter land: all the traffic coming from Seme bother, Badagry, Okokomaiko, Satelite Town, Festac Town, etc. use one single access

road – the Orile-Mile 2-Badagary Expressway. This ugly situation is repeated everywhere in Nigeria, including our "modern" Federal Capital Territory (FCT) – Abuja. There are three access roads into Abuja – the Keffi-A.Y.A for the North east; the Zuba-Kubwa-A.Y.A for the North west and the Airport-City Gate for the South east, South south and South west. The volume of traffic on these access roads at any point in time often create a chaotic situation where commuters spent up to two hours to get to their destination, morning and evening especially along the Keffi-A.Y.A road.

Traffic bottle-neck in most cities in Nigeria is compounded by our reliance on single mode – road vehicular transportation couple with poor or lack of efficient public transport system which has given rise to increase number of private cars on the road. Ogunbodele and Olurankinse (2008), quoting World Bank (2002), predicted that vehicle ownership was rising from 15 to 20 per cent annually in most developing countries due to increasing urban wealth. World Bank tried to present vehicle ownership in developing countries as luxury. Experience has indicated otherwise that the increase vehicle ownership is as a result of unmet need and more of necessity rather than luxury as earlier noted by Arosanyin (2000). Nonetheless, the growth in the number of vehicles on our road, Ogunbodele and Olurankinse noted, has not been matched with expansion of transportation infrastructure, improved public transport system and efficient traffic management techniques. Hence, perennial traffic congestion on the few poorly maintained available roads. The negative consequences of these situations are long waiting time, delay journey time, overcrowded vehicles and irregular stops (Ogunbodele and Olurankinse, 2008). Obviously, there are also the problems of increase road accidents, vehicular emission that pollute the environment and increase vehicular carcasses that littered the environment.

Most urban transportation problems have been traced to poor urban planning and inefficient land use and management (Mala, 2000; George, 2006 & Uwadiegwu, 2008). Uwadiegwu has observed that traffic normally originates from one land use and terminates at another land use. Indeed, good traffic management and efficient transport system in any city is the product of a painstaking design and planning of land uses. Obvious case studies are presented with the Lagos and Abuja experiences, where all government ministries, agencies (local & foreign), private and public companies and enterprises are all located in Lagos Island and Abuja Central Business District respectively. George (2006) observed that transport design in such situations permit the concentration of labour force and manufactured materials at specific points which allow people to live away from their place of work. In Abuja, the residential areas are mostly in the Satellite towns outside the

city centre. Therefore traffic often originates from this residential land use areas in the morning as people are going to works, and terminates at the city centre – another land use, and vice-versa in the evening. To reverse this trend, there should be proper review of land use in our urban areas.

Aside from mobility modal transportation, improved communication is also needed for efficient workings of the urban areas. Development of telecommunication in Nigeria is said to have started in 1886 when a cable connection was established between Lagos and London and the first commercial trunk telephone service was the Itu-Calabar link built in 1923, (Akpoghomeh, 2002). Tracing the history further, Akpoghomeh stated that the Nigerian Telecommunications (NITEL) was established in 1985 with 1.1 million lines, of which only 30% was put to use, resulting to 1:348 tele-density ratio in 2000. However, the telecommunication landscape was revolutionalised in 2000, with the introduction of global system of mobile communication (GSM) into the Nigerian market, which Ogunbodele (2008) said has increased telephone subscriber to over 60 million persons. He stated that the introduction of GSM has reduced traffic in Lagos during peak period. Other services that have enhanced communication and information sharing in urban areas include postal services, radio and television and newspapers. All these must be very taught and planned for urban cities.

3.3.2 Housing

Housing plays a significant role in urban development and in the maintenance of good physical, social, mental, psychological and spiritual health of individuals and community. It is the second most important essential human need, after food. Housing is defined in the *National Housing Policy* (2006) as the process of providing shelter in a proper setting in a neighbourhood supported by sustainable maintenances of built environment for the day-to-day living and activities of individuals and families within the community. World Health Organisation (WHO) (1961) defined housing as the residential environment, neighbourhood, micro-district or physical structure which mankind uses for shelter and the environs of that structure, including all necessary services/ facilities, equipment and the devices needed for physical health and social well-being of the family and individual. While commenting on this definition, Agbola and Omirin (2008) noted that housing is not merely the physical structure erected, but also include where it is erected, how it is erected and all the facilities and services related and ancillary to the house, which must equally be planned for and adequately provided to achieve the purpose of housing. From the health perspective, they noted that the role of housing and the environment where people reside were twin link-factors which

determine good health. Therefore, housing is a major driver of good health.

Residential houses are major determinant of land use and transport flow in the urban areas. The problem of urbanisation has exacerbated the housing problems in urban areas in terms of quality and quantity. Okoye and Ezenagu (2008) have observed that housing and urbanisation were directly related, as people migrate to the urban areas, more services and more houses are required. El- Rufai (2006) has lamented the increased number of slums and squatter settlements in FCT with attendant cost of demolition and excessive battle to maintain the Abuja master plan. This is as result of influx of people into the territory without correspondence increase in number of residential accommodation.

The shortfall in residential accommodation has engaged the attention of several governments at all levels but nothing to show for it. In the 80s, the Shehu Shagari government made frantic efforts at providing affordable houses to the masses. Though well-intended, the implementation was faulty as the people were not carried along in the choice of location, style and materials used in the construction of the houses. Most of the houses, even those completed could not be occupied for various reasons. Since then and up till now, the housing deficit has remained a major challenge to individuals and government. The housing problem is compounded with high cost of land and building materials. These have resulted into people trying to cut corners in various ways, thereby engaging in the construction of sub-standard houses, not fit for human habitation, which equally collapsed frequently. Such houses cannot support good health. There is need for planners to create more residential districts and layouts in urban areas, while urban renewal programs should target residential areas and structures to make them livable.

3.3.3 Tourism and Hospitality Industry

The urban areas are often places of attraction because of numerous opportunities, enhanced infrastructures and availability of places for relaxation, etc. For these reasons, there is always constant movement of people in and out of the cities for one thing or the other.

Deliberate attempts are always made to develop tourism infrastructure and resources to attract people into urban areas and in most cases, the existence of monument of significant importance has enhanced the development of a particular community into an urban area. Filani (2002) traced the development of tourism in Nigeria to 1962 when the Nigerian Tourist Association was established and the promulgation of the Nigeria Tourist Board Decree No. 54 of 1976. Since then, national parks, forest

reserves and historical sites and monuments have been developed into national and international tourist sites.

The development of the tourism sector is back up with the development of hospitality industry. Nigeria has witnessed a boom in this industry with the emergence of hotels of different size and standard in most urban areas. Indeed, it has been difficult to establish whether all the hotels in our urban areas are planned for or whether some of the regulators are aware of their existence. Be it as it be, there is need to plan for these hotels and to regularly monitor their standard.

SELF-ASSESSMENT EXERCISE

i. In your own words, define housing.
ii. What is community?
iii. List five ways that transport can be improved in Nigeria.

4.0 CONCLUSION

The growth of society is affected by cultural and social factors and largely determined by population dynamics in a given geographic space. Population growth in Nigeria is directly linked to historical human quest for economic prosperity and reliance on physical labour, hence many hands on the farm to produce wealth. This gave rise to large families' size and population explosion without recourse to planning for adequate housing and other social amenities and infrastructures to cater for the expanding population. Communities therefore developed into slums with several squatter settlements because of lack of planning and the limited number of housing to take care of the growing population.

Housing and transport play critical roles in the proper functioning of every society. Urban planning with proper land use in a given area is expected to highlight the importance of these sectors. In most urban areas, the obvious situation hardly reflects the need to provide for the growing population in terms of housing and transportation. These result into chaotic urban life and settlements with stress that affect human health. Therefore, it is important that adequate attention is paid to the control of population growth, provision of adequate housing and efficient transport system.

5.0 SUMMARY

In this unit, you learnt about how individuals unite into families as the foundation of every society, the growth of society into community and how the desire to create more wealth led to population explosion, which are socially and culturally determined. You also learnt that while

population was growing at a faster rate, adequate attention was not paid to the provision of supporting physical and social infrastructures like housing and transportation, which supposed to enhance living urban areas and robust health. Such negligence therefore resulted into squatter settlements and chaotic transport situation, which affect health. You again learnt about how improvement in communication and tourism has impacted on our social and economic life, hence the need to plan adequately for them in every urban area. In the next unit, you will learn how to situate urban planning in the larger context of the earth and ecological system.

6.0 TUTOR-MARKED ASSIGNMENT

1) a) What do you understand by the term society?
   b) Highlight some of the factors that determined the growth of society.
   c) Examine the family as a unit of the society and discuss how population growth is affected by family size.
2) Housing has been recognised as critical factor in orderly development of urban areas.
   a) Critical examine the role of housing in the promotion of good health in the urban areas.
   b) If you were invited to the Annual Conference of Nigeria Institute of Town Planners, enumerate the five areas you will want them to address in their professional practice to improve the housing situation in Nigeria.
   c) Discuss how you will work with them in any one of the areas you have mention in (b).
3) a) What is urban transportation?
   b) Explain how you will plan for efficient and integrated urban transportation in a new town being developed by your state government.

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MODULE 2 CONTEMPORARY ISSUES IN URBAN PLANNING AND MANAGEMENT

UNIT 1 EARTH AND ECOLOGICAL SYSTEM

CONTENTS

1.0 INTRODUCTION

You have just learnt some basic concepts in urban planning and management. In unit 4 of module 1, you learnt about some social factors affecting development of society and some issues in the contemporary human geography. I am sure that you have gotten some basis understanding of how and why we need to plan our environment base on those concepts. However, in this unit you are going to learn about the position of urban planning and management in the earth and ecological system.

The earth is the third planet of the universe. To date, science has shown that it is the only planet that supports life and living. Therefore every planning activity is aimed at making the earth more livable. Within the earth are various functional sub-systems that make up the ecological system, which support living in an interactive manner. Therefore, in this unit, you will learn about the earth topography, natural resources,

interaction within the ecosystem and how urban planning and management situate in this broad spectrum of complex system of living and non-living things constantly interacting in mutual beneficial relationship, but sometimes resulting in adverse consequences to some members within the system.

2.0 OBJECTIVES

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

- describe the earth as the foundation for planning
- explain the interactions that exist in the ecosystem
- explain how to integrate earth ecological system into urban planning management.

3.0 MAIN CONTENT

3.1 The Earth Topography, Natural Land Formations and Geographic Space

3.1.1 The Earth Structure and Life on Earth

The earth or the world is spherical in shape (Fig. 1.1), the third planet from the sun and the fifth-largest of the nine planets of the solar system. The other planets are Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. The earth crust according to Monkhouse (1975) consists of variety of rocks of different degree of hardness, coherent and permeability. Bellamy (2007) described the earth as fine dust particles with soft substances of mineral formed from decayed organic matters, chemicals and water in which plants can grow. Because of this, Dalrymple (1991) stated that the earth is densest among the planets of the solar system. Dalrymple noted that the earth was formed approximately 4.54 billion years ago by accretion from the solar nebula while life appeared on it within one billion years ago. The distance between the earth and the sun is said to be about 150 million kilometres and about 384,000 kilometres from the Moon, (FEP International, 1988).

Several species of plants and animals including man live on earth. The diversity of organisms, according to Christopherson (2006) is a response to the interaction of the atmosphere *(gaseous zone above the earths' surface)*, hydrosphere *(water portion of the earth)* and the lithosphere*(outer layer of the earth's solid surface)* with the solar energy – the sun; and this interaction produces a variety of conditions within which the biosphere*(part of earth with life)* exists. May (1988) observed that the physical properties of the earth, as well as its geological history

and orbit have allowed life to persist on earth. Indeed, FEP International (1988) stated that it is only the earth that scientists have so far been able to find life because it is neither too hot nor too cold. Although science has not been able to say how life began on earth, however, May said that it has been estimated that the earth will still continue to support life for as much as between 500 million years to probably 2.3 billion years more. Indeed the quest to know more about life and why only the earth is able to sustain it has led to creation of a branch of geography known as *biogeography* which according to Christopherson, is the study of the distribution of plants and animals, their diverse spatial patterns, and the physical and biological processes, past and present, that produce earth's species richness.

Earth's crust is made of layers of outer crust, mantle, outer core and inner core and is divided into several segments called tectonic plates that migrate across the surface over periods of many millions of years. FEP International (1988), noted that about 70% of the earth surface is covered with water while 30% is covered by land.

There are interactions between the earth and other objects in space, especially the sun and the moon. While orbiting around the sun, the earth rotates about its own axis 366.26 times, creating 365.26 solar days and producing seasonal variations on the planet's surface within a period of one tropical year.

Fig.1.1: Photograph of Earth, taken from Apollo 17
Source: www.google.com.ng/images, accessed 22 Sept 2012

The earth contains lot of resources that support life. Yoder (1995) observed that both the mineral resources of the earth and the products of the biosphere contribute enormous tapped and untapped resources that

are used to support the global human population. These resources include the surface and underground water, plants and animals, the minerals deposit, the rocks etc.

The earth is naturally divided into continents and the oceans formed the natural boundaries in-between each continents. The continents are politically and administratively divided into about 200 independent sovereign states. As at July 2011 when South Sudan became independent state, 193 of these countries were recognised by the United Nations. They interact through diplomacy, travel, trade, defense assistance and military action.

3.1.2 The Earth Topography and Natural Formation

Topography is the undulations and configurations including its relief *(elevations of local landscape)* that gives the earth surface its texture and shape, portrayed on topographic maps. Oxford Dictionary defined topography as detailed description and representation on maps, etc. Christopherson (2006) recognised three orders of relief and six topographic regions: plain, high tablelands, hills and low tableland, mountains, widely spaced mountains and depression (valleys).

The earth continental crust and landscape were formed from the combined effects of tectonic – *(rock structure formed by earth movement)*activity, driven by earth's internal energy and the exogenic *(geological process arising from external forces of denudation)* processs of weathering and erosion, powered by the sun through the actions of air, water, waves and ice (Christopherson, 2006). According to Christopherson, tectonic activity is generally slow and takes many years, while endogenic (internal) processes result in gradual uplift and new landforms. The tension, compression and shearing in the earth crust result to surface faults, folding and horizontal bending, which gives the earth its shapes and formation. These formations can be seen in major mountains building along plate boundaries such as residual mountains, tectonic mountains and volcanic mountains (Monkhouse, 1975& Christopherson, 2006). These processes have implication for urban planning and management as planners should be aware of the natural formation and landscape that exist in the area before embarking on any planning process.

3.2 The Ecosystem and Urban Planning and Management

3.2.1 The Ecological System

Ecology simply means the study of living homes or the environment. In essence, ecology is a branch of biology which deals with the study of the relationship of living organisms with each other and with their physical environments and among various ecosystems in the biosphere, (Christopherson, 2006 & Bellamy, 2007).These complex interactions that exist among various organisms within a community is called the ecosystem or ecological system. Eco means *place to live,* while *logos* means to study. The complex web-like manner of the interaction is what is known as ecosystem. Rana (2009) in the same vein described ecology as the total relations of animal to both its organic *(biotic)* and inorganic *(abiotic)* environment. The emphasis in these definitions is the interactions among both living and non-living members of the system.

The ecosystem according to Christopherson (2006) is the complex of many variables, all functioning independently yet in concert, with complicated flows of energy and matter in a web-like manner. The component of the ecosystem includes both biotic *(living)* and abiotic *(non-living)* matters. Indeed nearly all the ecosystem depend on the solar energy for their existence, while the few that exist in dark caves, wells or ocean floor depend on chemical reactions known as *chemosynthesis.*

Das and Behera (2008) described the ecosystem as an integrated unit formed by the interaction of co-acting organisms and their environment. According to them, the survival of the interacting plants and animals depends upon the maintenance of biotic and abiotic structures and functions. Christopherson (2006) explained that the ecosystems are divided into subsystems. The biotic portion according to him is made up of plants who are the producers, animals who are the consumers, and the worms, mites, bacteria, fungi, etc. who are detritus feeders. On the other hand, the abiotic flows in an ecosystem include gaseous, hydrologic and mineral cycle, which support the biotic subsystems. There is constant exchange of energy from the source to other members of the ecosystem in a very unique and dependable manner, such that heat energy is release at every stage of the processes, the solar energy serving as the main input that drives the biotic and the abiotic components.

The food web is a common illustration of the interaction within the ecosystem aptly presented in the quotation below adopted from the *Friends of the Earth, 1972.*

Life devours itself: everything that eats is itself eaten; everything that can be eaten is eaten; every chemical that is made by life can be broken

down by life; all the sunlight that can be used is used …. The web of life has so many threads that a few can be broken without making it all unravel, and if this were not so, life could not have survives the normal accidents of weather and time, but still the snapping of each thread makes the whole web shudder, and weakens it…. You can never do just one thing: the effects of what you do in the world will always spread out like ripples in a pond.

3.2.2 Ecosystem Stability and Biodiversity

The ecosystem stability is determined by the constancy of the planetary system and the release of the solar energy by the sun. Since every other component of the ecosystem depends on the sun for energy for their effective functioning, the sun therefore becomes the stabilising force in the ecosystem. The sun is a fairly constant star, which emits energy required for the proper functioning of the ecosystem, hence the term ***solar constant***. Hare (1996) stated that the sun provides 99.97% of the heat energy used at the earth's surface. Geothermal source makes up the 0.03%, mainly from nuclear disintegrations in the earth's interior and starlight from space. Of course the coal, oil, and natural gas use to generate heat and electric power contain solar energy stored in plants tissues as a result of photosynthesis in the past, which decayed into mineral oil or coal.

The plants of course, are the critical link between the solar energy and the biosphere. Christopherson opined that the fate of all members of the biosphere including man depends on the success of plants and their ability to turn sunlight into food. Indeed, it is obvious that without the sun, there cannot be life on earth. Plants require sun energy to produce food, which animals including humans depend upon. Therefore, there is need to ensure that the environment is made conducive for plants to grow so that there will be stability in the ecosystem and the continuous existence of life on earth.

Biological diversity or biodiversity is the variety and variability of plants, animals and microorganisms, including genes, within organisms and ecosystem in a given habitat where species live. Indeed it is the total sum of genes, species and the ecosystems (Das & Behera, 2008; Rana, 2009). Three levels of biodiversity have been recognised. These are genetic diversity, species diversity and ecosystem diversity. The genetic diversity deals with distinct populations observed under one species due to variation in genes; while species diversity deals with different species living in a region or the world. However, ecosystem or habitat diversity describes the different ecosystem that exists in a region or the entire world, with each system presenting an assemblage of distinct group of species.

Biodiversity is important in the sustenance of life. It beautifies our environment and adds to its ethical and aesthetic value. Biodiversity served human in the provision of food, fibre, fuel, fodder, drugs building materials, etc. It also serves as a reservoir for millions of other species. Man derives his wealth, material and economic benefits from biodiversity. However, all these benefits may be lost due to biodiversity loss.

Loss of biodiversity may be due to destruction of habitat through large development project like road construction, building of dams or establishment of industries. When this happened, many species are destroyed, some relocate to another habitat alien to them, in which they cannot function effectively, hence they extinct. Deforestation also destroys biodiversity and causes erosion which further exacerbates the ecological problems. Monoculture in agriculture, forestry, fisheries and animal husbandry, said to be for better economic returns as well as hunting, trading of animals, over-grazing, over-harvesting, pollution and inappropriate introduction of exotic plant and animal species contribute to very large extent to biodiversity loss (Das & Behera, 2008). Rana (2009) has also noted that life on earth has greatly changed the earth surface during the last three billion years which has affected biodiversity.

It has been noted that the earth temperature has been increasing at a faster rate than what it used to be about three billion years ago. The Climate Unit of the University of East Anglia traced the pattern of temperature increase from 1860 to 2000, and noted that within the last and present centuries, there has been remarkable increase in global temperature (see Figure 1.2). It has been observed that the global temperature has been increasing at the rate of 0.04 ^{O}C. IPCC (2001) estimated that over the last 140 years that the global average surface temperature has increased by 0.6 ± 0.2°C. The Panel therefore stated that weather and climate have a profound influence on life on earth. According to them, they are part of the daily experience of human beings and are essential for health, food production and well-being of plant, animals and humans.

The global climate variability is largely attributed to human activities in the ecosystem. From the Figure below, it has been noted that the global temperature started increasing from 1940, a period which coincided with the peak of industrial revolution when there was increase combustion of fossil fuels for industrial and domestic usage. The burning of biomass and the used aerosols produce greenhouse gases which affect the composition of the atmosphere. The emission of chlorofluorocarbons (CFCs) and other chlorine and bromine compounds has not only impacted on the radioactive forces, but has also led to the depletion of

the stratospheric ozone layer. Land-use change, due to urbanisation and human forestry and agricultural practices, affect the physical and biological properties of the earth's surface. Such changes have potential impact on regional and global climate of which we are experiencing today, (IPCC, 2001).

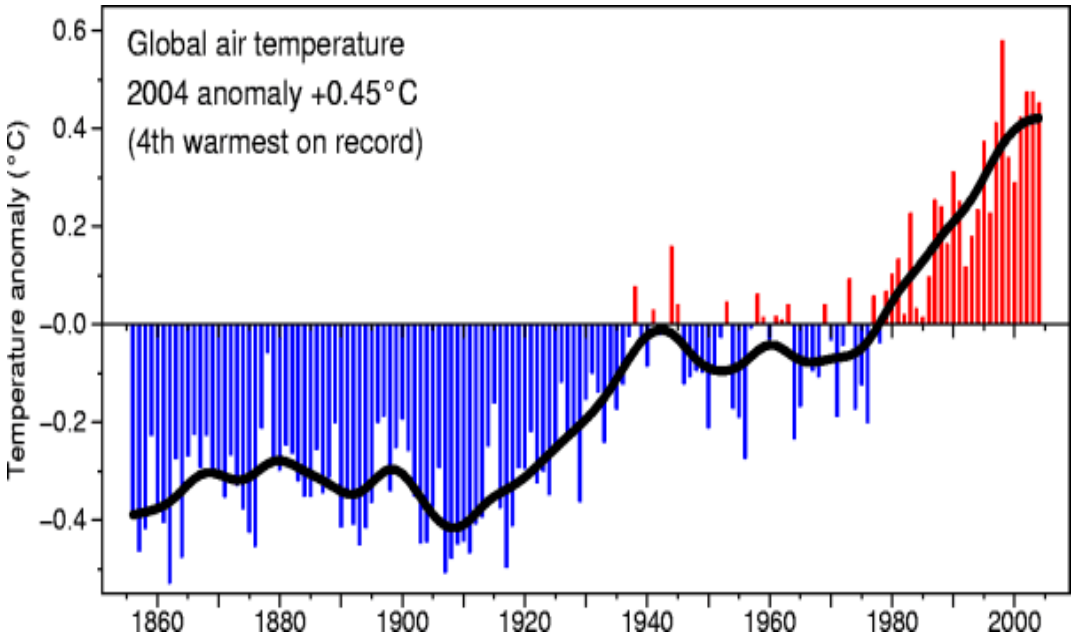

Fig.2.1: Pattern of Global Temperature Increase from 1860 to 2000

Source**:** Climate Research Unit of University of East Anglia, 2005.www.cru.uea.ac.uk/

3.2.3 The Challenge of Urban Planning within the Natural Land Formation

The ecosystem presents a variety of opportunities and challenges to urban planners. The structure of the earth, topography and land formation with natural habitat of some species particularly water bodies, mountains and valley are unique features of the earth which enhance its aesthetic, but when it comes to planning the land use pattern, they could pose serious challenges to planners and developers.

The environmental friendly planner will obviously be weary of destroying the ecosystem for any development project for the preservation of the biodiversity. It is obvious that poor planning has increased the rate of destruction of biodiversity in our urban areas. Lack of effective policy will give rooms for irresponsible planning that

jeopardise the environmental integrity and sustainable development. Planners should endeavour to integrate natural landscape and topography into their planning concert as well as ensure the preservation of biodiversity for the sustenance of the earth ecological balance.

SELF-ASSESSMENT EXERCISE

i. In your own words, define:
   a) Ecology
   b) Ecosystem
ii. What is biodiversity?
iii. List three ecological diversities you learned in this unit.
iv. What is geothermal energy?

4.0 CONCLUSION

The earth was formed from *solar nebula* of fine dust particles with soft substances of mineral from decayed organic matters, chemicals and water in which plants can grow. The earth is the densest of all the nine planets of the solar system. The shape and form which characterised the earth is a result of tectonic and exogenic processes which have taken place over millions of years ago. Several species of plants and animals live on the earth. The diversity of these organisms is the direct response to the interaction of the atmosphere, hydrosphere and the lithosphere. The living organisms and the non-living organism interact in a web-like manner to the extent that nothing is lost or wasted in the ecosystem.

The earth is the only planet known to support life. Living and non-living things coexist and interact in a web-like manner within the ecosystem. The sun provides energy which all living things depend on for survival. Indeed, the energy required for running power system in most countries come from the stored energy of sun in decayed plants which transformed into oil, coal and gas used for electric power. Plants as primary producers play major role in the sustenance of life on earth, hence the need to maintain ecological balance. This can only be achieved through effective conservation of biodiversity.

5.0 SUMMARY

In this unit, you learnt about the earth, its structure, its resources and as the only planet that supports life. You have also learnt about how the earth landscapes and shapes come to be. The unit has also presented to you the ecological system and the interaction that exit among the various living and non-living organisms. You have equally learnt about ecosystem stability and the sun as a major sustenance of that stability. You were informed that biodiversity loss was due to several reasons,

and global warming was exacerbating the problems of biodiversity loss. Lastly, you learnt that the earth landscape and formation pose serious challenge to urban planning and that such natural landscapes should be integrated into every urban planning concept, while efforts should be intensified to conserve biodiversity.

In the next unit, you will learn about urbanisation and urban poverty, including measures that can be taken to control urbanisation and reduce poverty.

6.0 TUTOR-MARKED ASSIGNMENT

1) The sun is the ultimate source of energy in the solar system.
   a) Examine the role of the sun in the maintenance of ecological stability on earth.
   b) Describe the interaction that exists within a defined habitat in the ecosystem.
2) Global warming is contributing significantly to loss of biodiversity.
   a) Examine the role played by humans in the global warming phenomenon.
   b) State what you do as an EHO to advert the looming crisis as a result of global warming.
3) Tectonic and exogenic processes are mainly responsible for the landscapes and topography of the earth. Describe how these processes take place and their major outcomes.

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UNIT 2 URBANISATION AND URBAN POVERTY

CONTENTS

1.0 INTRODUCTION

In unit 1, you learnt about the earth ecosystem and how the organisms interrelate with one another in their habitat. You also learnt that life is sustained on earth through the energy emitted by the sun and the biodiversity on earth. It is hoped that you have gain some understanding of how these interaction affects the environment and the depletion of its resources. Now, you are going to learn about urbanisation and urban poverty.

In recent time, there has been a phenomenal growth of urban areas in terms of their numbers, their sizes and the number of people living in them. Similarly, despite all efforts being made by individuals and governments to reduce urban poverty, yet the number of people living below poverty line has continued to increase unabated. Many reasons have been given for and against these phenomena. It is not clear why there are so many poor people in a country like Nigeria with so much resource. But it is clear that the quest for economic opportunities has been a major driving force behind the growth of urban areas and the population explosion of these areas. While the population of the urban areas keeps increasing, there has been a near stagnation or even decline in the provision of housing and urban social amenities and infrastructures to cope with the explosive urban population and to maintain functional living cities, leading to increase poverty, social vices and urban decay. In this unit, you will learn about the causes and

effects of urbanisation and urban poverty as well as how to plan the urban environment to overcome these problems.

2.0 OBJECTIVES

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

- define urbanisation and poverty
- explain the causes of urbanisation and urban poverty
- describes measures to be taken to reduce the effects of urbanisation and urban poverty
- explain the concept of sustainable development.

3.0 MAIN CONTENT

3.1 Concept of Urbanisation

3.1.1 Definitions of Urbanisation and Urban Poverty

(a) Urbanisation

Heinke (2005) observed that many definitions of urban areas have resulted from historical, cultural and administrative differences among nations, which make it difficult to come up with a single universally acceptable definition. According to him, some countries defined urban area in terms of the population of the area. For instance, while an area with 400 inhabitants in Albania would be an urban area, Heinke noted that in Japan, the minimum population of an area to be accorded an urban status will be 50,000 inhabitants. Other countries like Sweden consider density of built-up area. In Sweden, a built up area with less than 200 meters between houses is regarded as an urban area. On the other hand, India designate areas with population density of not less than 1,000 persons per square kilometer where at least three-fourth of the male adult population is employed in non-agricultural work, as urban area.

Heinke (2005) further explained that other countries determined urban areas base on the extent of urban characteristics such as the number of plaza, schools, availability of sewer, electricity, potable water supply, good road network, etc. However, he concluded that a population size of 20,000 or more is often used to consider an area as urban. Olujimi (2011) also stated that what is regarded as rural in developed countries may well be referred to as urban in most developing countries considering the level of infrastructural facilities available in them. In this context, rural areas cannot be defined in isolation of urban areas. According to him, while both of them represent a geographical space

within which human activities take place, rural is often used to refer to the area of any country with extensive land uses such as agriculture and forestry, and settlements with non-urban environment.

Olujimi (2011) also stated that it is now common in contemporary period to use occupation, population and infrastructure as basic criteria to determine whether an area is urban or rural. According to him, other demographic characteristics such as community size, density, and heterogeneity are casually related to occupational differences. In view of all these characteristics, a rural settlement is a settlement with less than 20,000 inhabitants and whose population is largely homogeneous and predominantly engaged in primary production. Indeed from this premise, rural settlements are often noticed to generally lack adequate infrastructural facilities; thus making living in the community very miserable, one predisposing factor to rural-urban migration.

In summary therefore, urban area in Nigeria is described in term of both population size of 20,000 or more and existence of basic minimal infrastructures and social amenities. Abumere (2002) confirmed that in Nigeria, urban centre is defined as a settlement with population of 20,000 or more people.

(b) Urban Poverty

Poverty, on the other hand is defined as a situation where a person living income is below two US Dollars (N316) per day or commonly refers to the number of people living below poverty line described by World bank as income of about $240 per capita as at 1990 (World Bank 1992). However, poverty is technically defined by UNEP (1995) in absolute and relative terms. Absolute poverty generally refers to people whose income is insufficient to obtain the minimum necessities for purely physical efficiency. Also relative poverty is defined by the inability to live according to cultural norms and expectations or contemporary standards of living measured according to the median income of the society in which it occurs. The measurement of absolute poverty according to UNEP (1995) is based on the percentage of income required for food and housing needs. However, UNEP lamented that in spite of overall increase in economic growth, the number of people living in absolute poverty increased from approximately three quarters of a billion to the then 1.4 billion or one fourth of human population.

3.1.2 Causes of Urbanisation and Urban Poverty

Causes of Urbanisation

Population Reference Bureau (2012) has projected that the number of megacities *(cities with over 10 million inhabitants)* will rise from 16 in 2000 to 27 by 2025 and 21 of these cities will be in less developed countries of the world. The United Nation projected that by the year 2008, half of the world population (then 6.7 billion people) will live in urban areas. Hinrichsen (2011) further projected that as urban areas - particularly smaller towns and cities - continue to grow in size; by 2030 about five billion or 61% of the estimated 8.1 billion people are expected to live in cities. Similarly, Africa is said to be experiencing one of the fastest rates of urbanisation in the world, with sub-Saharan Africa leading the way. By 2030, Govender (2002) equally projected that Africa will have 760 million urban residents. By 2050 that figure is expected to grow to 1.2 billion. All these projections are indicative of the rate of growth and expansion of urban areas. Why is this so? Why are most people deserting the rural areas? You are going to find answers to these questions under the causes of urbanisation and urban poverty. These are:

(i) Natural Increase

Migration of people from the rural areas and other countries to the urban areas, naturally increase the population of such urban areas. Natural increase rate of population as one of the crude rates is defined by Lucas & Gilles (2003), as the number of live births minus deaths expressed over the mid-year population of a particular year. Porta (2008) simple defined it as the difference between crude birth and crude death rate.

Obienusi (2008) had noted that natural population increase was higher in the urban areas than rural areas. Although the National Demographic and Health Survey data of 2008 indicated otherwise, Obienusi further stated that high concentration of potential mothers across urban areas ranges from 43.1 and 51.9 %; thus giving rise to natural population increase in urban areas. Indeed, while the average fertility rate in Nigeria in 2004 was put at 5.2 per woman, it was noted that in some urban areas, the rate could be as high as 6-8 per woman. NPC (2009) found out that though the total fertility rate (TFR) was 6.4 and 4.6 urban and rural, respectively, the crude birth rate in the urban area was 36.2/1000. As health services and nutrition tend to improve in some urban areas, death rate may decline giving room to natural population increase. Urban planners, therefore should factor this trend into their conceptual framework when designing and planning urban areas.

(ii) Colonisation

Abumere (2002) observed that Nigeria is the most urbanised country in Africa as a result of the spread of urbanisation across the country. He noted that from the 1991 population census, the number of settlements with population of 20,000 or more was 359, and was expected to rise to 680 in 2002. Historically, the rate of increase in the number of urban areas in Nigeria can be traced to the colonial era. Earlier on, we have discussed the emergence and spread of urban areas in Nigeria. We specifically stated that one of the reasons why places like Lagos, Lokoja, Calabar, etc. quickly developed into urban centers was due to the influence of the colonial master in the provision the infrastructures in those places to enhance their operations. Consequently, towns and city centers emerged along this pattern of administrative convenience, giving rise to increase and expansion of urban areas.

The massive improvements in roads and other infrastructures in the urban areas, which started during the colonial era, make urban area attractive. For this reason, Nigeria since independence has become an increasingly urbanised and urban-oriented society because of the great influx of people into urban areas. Existence of infrastructure in a particular area has the capacity to attract people to such areas. This has been one of the major reasons why many people moved to and live in urban areas, even when they cannot afford the cost of living in such areas.

(iii) Trade and Commerce

Most of the urban areas evolved as a result of trading activities. It has been noted that most urban town developed faster as a result of trade and commercial activities that took place and is still taking place in such town. George (2009) tracing the history of the growth of Lagos, stated that Lagos became a trade centre from the early 17th century when the Aworis moved Ebute-Metta to Iddo and later to Lagos Island around Tinubu Square, which became the heart of business activities in Lagos. Other towns like Kano, Ibadan, Onitsha, Aba, Calabar, Port Harcourt, etc. have had their fair share of urban drift as a result of trading activities. Some of the cities enlarged as collection centers for wandering immigrants who come in search of daily paid job.

(iv) Underdevelopment

We have earlier traced the genesis of uneven development in Nigeria, that it started when the colonial masters concentrated the provision of infrastructures along the coast in the southern part of Nigeria, where their operations were concentrated. This trend and development

continued into the post-independent Nigeria, that it became very difficult to correct. Such uneven distribution of infrastructures leads to underdevelopment of the inter-land. Another most common cause of underdevelopment in Nigeria is high concentration of uneducated population in certain part of country, particularly in the Far North East, North West and some parts of the North Central.

A country with a well-educated populace tends to develop faster. When the educated are evenly distributed, development follows suit, and there is no concentration of large population in few urban areas. However, a country without adequate educated populace tends to remain underdeveloped. This accounted for the growth and increase in the number of urban areas in Nigeria, as most people will naturally move to developed parts of the country in search of opportunities and other related services that are only available in the urban areas.

(v) Insecurity and Conflict

Insecurity and conflict of different proportions often drove some people to urban areas, where they hoped to be better protected. Day in – day out, we hear of communal conflicts resulting from people contesting ownership of a piece of land or trying to shift boundaries of existing settlements. In most cases, dangerous weapons are deployed to fight one another, resulting into panics and loss of lives and property. When such situation occurs, people are forced to leave their place of abode and relocate to nearby towns where they may decide to rent an apartment and start a new life. In fact, George (2009) mentioned that the movement of the Aworis from Iddo to Lagos Island was for security reason.

Causes of Urban Poverty

Poverty according to Think Quest (2006) is a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. In fact, when people are unable to eat, go to school, or have any access to health care, then they can be considered to be in poverty, regardless of their income.

What causes poverty?

There are several causes of poverty. Some of them include:-

(i) Lack of Employment Opportunities in the Rural Areas

Most people that migrate to urban areas usually do so to search for employment opportunities. Their hope and aspiration is often hung on the numerous establishments, agencies and multi-national companies with their offices in the urban areas. Many of the major cities had growing manufacturing sectors like textile mills, steel plants, large construction companies, trading corporations and departmental stores/malls, as well as financial institutions. There are also government-service centers and secretariats, large office and apartment complexes, along with great variety of small and big business enterprises, many in the informal sector. There are also some educational institutions with variety of job opportunities more than in rural areas. However, the newcomers are usually confronted with the fact that those establishments do not have the expected vacancies to accommodate them. This situation often trigger-off urban poverty as the people who flocked the urban areas in droves are confronted with high cost of living, feeding and accommodation become increasingly difficult.

Ajakaiye and Adeyeye (2001) presented other causes of poverty to include *low economic growth performance; inappropriate macroeconomic policy; macroeconomic shock and policy failure; labour market deficiencies; migration; unemployment and underemployment; human resource development; debt burden; governance; environmental degradation and crime and violence.*

(ii) Low Economic Growth Performance

Economic growth performance is an indicator of how the country's economy is growing in the real sectors, and the ability of the country to produce wealth, sustain her citizens' demand for good and service without resorting to borrowing. Ajakaiye and Adeyeye (2001) averred that since the economic performance of countries in the world has generally been highly volatile since the early 1980s, on the whole, growth rates have been low or negative, with overall declines in several countries. Of course, they noted that this has been due partly to external shocks such as adverse changes in several countries' terms of trade, changes in global demand for exports and changes in global interest rates on developing countries external debt. To overcome this, many countries resorted to various macroeconomic policy reviews, which were largely influenced by the World Bank and International Monetary Fund. Most countries have to devalue their local currencies and went

into greater debt stock, which freeze their domestic economic activities leading to recession. Ideally, countries should look inward and grow their economy without depending on externally influenced comatose policies.

(iii) Human Resource Development

Human capital development is a major driver of economic prosperity. Countries that have invested heavily in the human capital development of their citizens always have higher economic growth rate with lower poverty ratio. The issue is not just how many people have acquired education, but what they were trained to do. There is a common saying in Nigeria that most of our graduates are unemployable. This is very unfortunate that our young people spent years studying but acquired no skill to perform any work. We hope that the much talked about reform in our school system along with the introduction of entrepreneurial skill acquisition program into our tertiary education curricula will address this lapse in our human development effort.

(iv) Macroeconomic Shock and Policy Failure

Macroeconomic disequilibrium in terms of difficulty in balance of payment due to over-dependence on imported goods in many countries including Nigeria has led to structural poverty in such country. Microeconomic shock result from several economic policy summersaults as a result of instability in the global economic situation. According to Ajakaiye and Adeyeye (2001), macroeconomic shocks and policy failure account for large scale poverty as they constrain the poor from using their greatest asset "labour". Again, monetary policies that adversely affect cost and access to credit by the poor, fiscal policy which results in retrenchment, lay-off of workers; high exchange rate which raises the domestic cost of production in an import dependent production system will affect the poor more negatively. The urban poor, as a result of policy failure, are vulnerable to job losses resulting from job-cut-backs in the public sectors or from the decline of industries adversely affected by shifts in relative prices. Indeed, exchange rate policy which boosts exports of agriculture goods from peasants will help reduce poverty.

(v) Ill-Health/Diseases

The axioms "health is wealth" underscores the importance of sound health in wealth creation. When people are sick, they cannot work. Human capital is potential stock of wealth in healthy individuals. Ajakaiye and Adeyeye (2001) maintained that diseases cause poverty and vice versa. Potentiality to create wealth is lost in unhealthy

individuals. Johnson (2011) stated that the Nigeria's dream of becoming a middle income country by 2010 would remain a mirage if people failed to adopt healthy lifestyles that would enable them to live productive lives. Major diseases causing poverty are malaria, HIV/AIDS, onchocerciasis, hepatitis, etc. The prevalence of these diseases is high in Nigeria. HIV prevalence for instance was 4.1% in 2010.This segment of the population if become full blown AIDS cannot participate in economic activities to earn income, hence would remain poor.

(vi) Debt Burden

External and internal debt profile of many developing countries is widening the poverty dragnet in those countries. In several developing countries of the world, debt burden is assuming increasing importance as a cause of poverty. Ajakaiye and Adeyeye (2001) pointed out that in such countries, servicing of the debt has encroached on the volume of resources needed for socio-economic development and wealth creation. The productive sector such as agriculture, manufacturing etc. are equally constrained leading to low productivity, low capacity utilisation, under employment and low purchasing power thereby subjecting people to abject poverty. In most countries of the world, economic melt-down is creating serious problems, forcing a lot of people to laid-off work, which further deepened the poverty index.

3.1.3 Effects of Urbanisation and Urban Poverty

The effects of urbanisation can be listed below as:

- Increase slums and squatter settlements
- Chaotic transport situation and traffic congestion
- Global warming
- Environmental degradation
- Pollution (air, water, land, noise)
- Destruction of ecosystem (fauna & flora)
- Municipal waste problems
- High prevalence of communicable diseases
- Challenge of sustainable development
- Shortage of potable water supply
- Inadequate electricity supply
- Population explosion
- Illegal development
- Violation of land use policy and guidelines
- Urban violence
- High crime rate and other social vices.

Essoh and Ukwayi (2011) stated that urbanisation is capable of destroying moral value of the society. The family is the bedrock of the society. Urbanisation disintegrate families thereby altering the social functions such as economic support to young ones, the aged and the physically challenged, thereby causing families with members in need of care to turn towards institutional care and facilities such as the old people's home and schools/hostels for the physically challenged. Family mentoring is weakened and family members tend to live immature independent lives, hence the proliferation of social vices like drunkenness, smoking, prostitution, violence, armed robbery etc.

Another major effect of urbanisation is environmental degradation. Heinke (2005) stated that environmental impacts of urbanisation are increasing noticed in the way the environment is fast degraded. Urbanisation increases the rate of industrialisation and other economic activities to meet the need of the teaming urban dwellers. Often, there is lack of proper planning for the location of such industries and services. Their concentration in the urban areas couple with increase vehicular use and increase population often leading to environmental pollution and increase emission of greenhouse gases like carbon dioxide, methane, sulphur dioxide, etc. which deplete the ozone layer, and contributing the effects of global warming. The result is increase incidences of urban and coastal flooding and other disasters.

Of course, most urban areas do not have adequate supply of potable water. As the population increased, Heinke (2005) observed that there is greater demand on water resources. When this happened, the water quality standard is compromised as people are forced to use water from doubtful sources.

The volume of waste generated in a given place at a given time is proportionally related to the number of persons living in such a place at that time. When more people move to the urban areas, the quantity of waste in such urban areas increase as human activities also increases. Waste collection, storage and disposal have continued to pose serious challenge to urban dwellers and waste management authorities, (Moses, 2004; Moses, 2008; Aledare, 2008 & Moses, 2012). Solid waste management often overwhelmed the capacity of available resources in urban areas. This result to heaps of uncollected waste found in some open spaces in most urban cities. Health services in some urban areas are in shamble, hence the emergence of high rate of medical tourism among Nigerians who can afford it. When there is shortage of water supply and inefficient waste management, we are presented with various problems like environmental decay, high prevalence of communicable disease like malaria, diarrhea and frequent outbreaks of environment

related diseases like cholera, cerebrospinal meningitis, measles, Lassa fever, etc.

A typical scenario of a peak period in most urban cities in Nigeria like Lagos, Abuja, Enugu, Ibadan, Port Harcourt, etc., is traffic congestion and chaotic transport situation. The road networks in our urban areas are inadequate to cope with the volume of traffic and the number of vehicles on the road. Aside from the inadequate road network, most of the road are very narrow and often in a state of disrepair, hence hardly provide allowance for speeding and overtaking. These are some of the major reasons for most of the road traffic accidents which are rampant in our cities. Again, the increase volume of traffic resulting to road congestion often increases emission level of dangerous gases which pollute the air.

Efficient use of available energy is a challenge in urban areas, and become more chaotic in a country like Nigeria who has been battling to increase power output to appreciable level over the years. The importance of power has been traced by Ahiadu (2008) from primitive Stone Age till date. Electric power is needed for lighting, heating, security, industrial activities and other services in the urban areas. In some countries, mass rail transit relied on electric power. Most of the small scale and cottage industries in and around the urban areas depend solely on electric power which is in short supply in Nigeria, leading to some people resorting to illegal connection and greater use of alternative source – generating set which add to the problems of urban air and noise pollution.

We have earlier stated that urban land is a very scarce commodity. Because of this, land is in high demand and those who have access to a piece of land earlier often sold such land later to new comers at a very exorbitant cost. Due to high cost of urban land, many people who genuinely require land for residential or commercial purpose cannot afford it. Therefore land speculation becomes the order of the day, those many people turned to illegal development and violation of land use principles and regulations. The result is huge urban slums and high prevalence of squatter settlements, which sometimes defiled urban planning principles/ regulations as well as the environmental aesthetics.

Urbanisation poses serious threat to sustainable development; defined by Heinke (2005), as *development that meets the need of the present without compromising the ability of future generations to meet their own need.* Indeed, exploitation of natural resources to meet human need increases as human population increases. The tendency is always for man to exploit whatever resource that is available to meet his need today without recourse to how the future generation will meet their needs. Heinke (2005) observed that such philosophy was destructive and

hinders long term protection of the environment and its inhabitants. In fact, Burgess *et al.* (2003) pointed out that over the last 200 years, unsustainable consumption of resources has resulted in unprecedented pressure on the physical, chemical and biological systems that support life on earth. This pressure is as result of increase population and the effect of urbanisation. Heinke (2005) raised some concern over the impacts of unsustainable resource exploitation on human health and the environment and felt that the existence of both was in jeopardy. He counseled that global sustainable development will require a stabilised world population living in a secure social and physical environment, which for now appears almost impossible in the present setting in most urban areas.

Effects of Urban Poverty

The most degrading effect of poverty is that it **erodes the dignity of humanity**. Poverty is said to be a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. Poverty engendered social exclusion and economic discrimination. People in abject poverty face serious social discrimination. They cannot exercise their right in most circumstances even when their lives are threatened. They have no say in most matters affecting them and are usually shouted down at social gatherings. For this reason, poor people are often neglected even by their own relatives as they are seen as liabilities rather than assets.

Urban poverty causes environmental degradation. Everybody depends on the environment for sustenance. However, poor people exploit the environment for every need. Ijaiya (2000) stated that the intensive exploitation of the environment by the poor often lead to soil degradation, desertification, deforestation and water supply depletion. Poor people are forced to over-cultivate available land for food and subsistent income; they felt trees for firewood for their energy requirement; engage in other activities like bush burning and uncontrolled irrigation which pollute the environment. The effects of global warming at the local level have been blamed on the activities of the poor. Therefore, poverty is a major cause of urban environmental degradation.

Ajakaiye and Adeyeye (2001) have earlier stated that **poverty causes diseases and vice versa**. When people are poor, they cannot afford the cost of food, safe drinking water, and basic sanitation not to mention the cost of treatment when they fall sick. In general, the lower an individual's socioeconomic position, the worse their health. There is a social gradient in health that runs from top to bottom of the

socioeconomic spectrum. This is a global phenomenon, seen in low, middle and high income countries. We can noticed that while countries at the higher economic ladder are able to provide for the needs of their citizens, including quality health services, those countries on the lower rung of the socio-economic ladder depend on the former for aids and sometimes even treatment for primary healthcare level of health needs. Of course, such foreign treatment further drains our external reserves and impoverishes Nigeria the more.

Poverty exacerbates economic backwardness and uneven development within some urban areas. Education is a dynamic tool for social and economic prosperity. When people are poor they cannot access basic education since they may not be able to afford other basic needs of life. Of course, lack of basic education expands the pool of poverty across many generations. The cause and symptom of poverty is capable of affecting individuals, families, communities and even nations from one generation to another. Within the development theory framework, the third world is characterised as poor, underdeveloped or developing countries that are perpetually depending on the rich developed countries for handout for survival.

Poverty, therefore, **perpetuates dependency on others for help**. It causes social disequilibrium, instability, ethnic and religious conflict and raises high sense of insecurity. Most violence in Nigeria has been blamed on the high level of poverty in some part of Nigeria. The situation has been sustained by bad leadership and endemic corruption at all levels of governance. As a result of this, Nigeria has remained a dumping ground for all sort of finished products up to tooth picks and matches. We provide primary raw materials and cheap labour to the rich developed countries, which in turn produce and export the finished products to us at a higher cost. This situation makes Nigeria dependent on the rich developed Nations, and further impoverish our country for decades. A good example is Nigeria's crude oil, exported and refined by foreign oil corporations at the expense of the Nigerian people because Nigeria has no functioning refinery.

Life expectancy has been increasing and converging for most of the world.

Other effects of poverty include (Brooks-Gunn & Duncan, 1997; Guo & Harris, 2000):

- Precarious livelihoods
- Excluded locations
- Physical limitations
- Gender relationships

- Problems in social relationships
- Lack of security
- Sexual harassment
- Alcoholism
- Abuse by those in power
- Weak body immune system
- Dis-empowering institutions
- Limited capabilities
- Weak community organisations.

3.2 Strategies for Planning the Expanding Urban Areas

3.2.1 Application of Policy and Regulations

Policy is a broad statement of intent or proposal to direct and guide government programs and allocation of resources for implementation of project directed at a particular goal and objectives. It is described as a principle or rule to guide decisions and achieve rational outcomes. The term is referred to as either procedure or protocol, (Anderson, 2005). Policies can assist in both subjective and objective decision making. Regulations are set of rules made to enforce standards and policies so as to achieve a stated goal in an orderly manner. Urban planning policy and regulations are therefore designed to direct and control the various interactions within urban ecosystem so as to eliminate or reduce their impact on man and the environment.

The Nigerian Urban and Regional Planning Decree (NURPD) 88 of 1992 as amended, in section 2, assigned the responsibility of policy formulation on urban planning to the Federal Government. It is not clear whether this responsibility was mandatory or expedient. However, available information indicated that so far there are two policies in the sector – the National Urban Development Policy of 2006 and the National Housing Policy of 2006.Other related policies include the National Construction Policy of 1991; the National Economic Policy of 2000; and National Population Policy of 2004.

The goal of the National Urban Development Policy (NUDP) is "to develop a dynamic system of urban settlements, which will foster sustainable economic growth, promote efficient urban and regional development and ensure improved standard of living and well-being of all Nigerians." Among other objectives, the NUDP was intended *to promote efficient urban development and management and create an enabling environment of regulations, laws and institutions which will enhance urban market performance and social welfare.*

Some of the strategies listed for the achievement of the goal and objectives of the policy include: i) establishment of appropriate institutional framework for ensuring orderly development and efficient management of Nigerian urban settlements; ii) classification of urban centres in Nigeria as a guide for policy intervention; iii) revising existing Town & Country Planning laws and regulations in order to ensure their adequacy in addressing current urban development problems; iv) establishment of a land information system and encouraging land registration by title as a basis for efficient urban management in Nigeria; v) adoption of functional designs in order to make urban facilities and amenities more affordable; vi) integrating the NUDP into Regional Economic Policy of government at all levels and vii) embarking on poverty reduction and national wealth creation campaign.

The NUDP (2006) highlighted the problems of uncontrolled and unplanned rapid urban growth rate put at 5.8% per annum. In the prologue to the policy, it is stated:

> The problems and challenges posed by the rapid rate of uncontrolled and unplanned urban growth are immense. Nigerian towns are growing without adequate planning. Millions of people live in substandard and sub-human environment plagued by slum, squalors and grossly inadequate social amenities. The result is manifested in growing overcrowding in homes and increasing pressure on infrastructural facilities and rapidly deteriorating environment. Low level of awareness on the part of the people, absence of effective advocacy and inappropriate programmes of development has further compounded the problems of urban growth and development.

The NUDP further detailed other problems of urbanisation to include inadequate housing, water supply, electricity and waste management facilities; high rate of juvenile delinquency and crime rate; grossly inadequate essential amenities like water, energy, health facilities, sewer, road, etc.; inefficiently managed land-use and poor transport network; to mentioned but a few.

Well, it took several years for the country to expressly come to terms with these obvious facts. Indeed, from the enactment of the NURP Decree in 1992 to the formulation of the policy is a whole 14 years gap. Aside from the time interval, the level of implementation of the Policy is nothing to cheer for. Out of the 17 strategies listed for the achievement of the goal and objectives of the policy, only one (maintenance and sustaining of national Council on Housing and Urban Development)

seems to have been fully achieved. Production of cadastral maps and preparation of master plans have been achieved in some States including FCT. Over 84% of the strategies are yet to be implemented. Indeed, most Nigerians including sector operators are not aware of this policy, therefore even ineffective advocacy highlighted as one of the problem of urban development still persist till date.

In the *National Housing Policy* (NHP) of 2006, housing is defined as the process of providing functional shelter in a proper setting in a neighbourhood supported by sustainable maintenance of the built environment for the day-to-day living and activities of individuals and families within the community. The policy stated that a review of past policy and programs of both public and private sectors revealed that effective implementation of housing policy and programs were yet to be made, tracing that in the early colonial period, housing policy and activities were focused on the provision of quarters for expatriate staff and selected indigenous staff in specialised occupation like Railways, Police, Armed Forces, Marines, etc.

The goal of the NHP is to ensure that all Nigerians own or have access to decent, safe and healthy housing accommodation at affordable cost. Some of the objectives aimed at achieving this goal are: a) develop and sustain the political will of government for the provision of housing for all Nigerians; b) strengthen all existing public institutions involved in housing delivery at the federal level and encourage the participation of other tiers of government; c) develop and promote the use of appropriate technology in housing construction and material production; and d) improve the quality of rural housing, rural infrastructure and environment.

Some of the strategies to achieve these objectives include:- i) strengthen and sustain the Federal Ministry of Housing & Urban Development (FMHUD) to harmonise and monitor housing delivery in Nigeria; ii) restructure and adequately capitalise the Federal Mortgage Bank of Nigeria, Federal Housing Authority, Federal Mortgage Finance Limited, and Urban Development Bank Limited to effectively perform their statutory roles; iii) grant fiscal incentives to small and medium scale local manufactures of building materials; iv) devise simple and affordable techniques for upgrading existing housing stock; v) embark on and sustain appropriate urban renewal programs in blighted areas; and vi) provide statistical data for effective process of housing delivery in Nigeria.

A quick review of the list of 22 strategies intended to achieve the goal and objectives of the housing policy indicated that just like the NUDP, not much have been done so far after about five years of the existence of

the policy. Indeed, it is very unfortunate that only 22.7% of the listed strategies have been implemented so far. In fact, to guide the sector, a *National Building Code,* was issued in *2006.* The Code provides for the establishment of Building Code Advisory Committee (BCAC), building design classification, building construction classification, environmental and general building requirements, architectural design requirements, including civil, structural/ geo-technical design requirements. The code also provides for standards and requirements for building materials and their components, construction requirements, post construction requirements, and the control of building works.

The Code is one of the most important residual legislation in the housing sector, yet is not well publicised, not to mention application and enforcement. To date, the construction of houses in Nigeria is still within the realm of informal sector operation, with complicated structural designs being handled by quacks and those who ordinary have nothing to do with the building and construction industries. These people who described themselves as "builders" use inferior materials and do not keep to simple safety and comfort guidelines. The results have been rampant collapse building and housing not fit for human habitation in most urban areas. These call for urgent need to revisit the Code to make it more operational and enforceable.

3.2.2 Urban Renewal

Urban decay due to infringement on urban planning principles and breakdown of urban infrastructure and amenities is a common phenomenon in most urban areas in our society. Urban decay is described by Andersen (2003), as a process by which a city, or a part of a city, falls into a state of disrepair and neglect. According to him, the phenomenon is characterised by depopulation, economic restructuring, property abandonment, high unemployment, fragmented families, political disenfranchisement, high crime rate, and desolate urban landscapes. Lack of proper planning or refusal to implement the contents of urban plans usually gives rise to urban slum and squatter settlements.

Slum is defined by George as a group of buildings, or an area characterised by overcrowding, deterioration, unsanitary conditions or absence of facilities or amenities such as potable water, drainage system, schools, health facilities, recreational facilities, etc., which because of these conditions or any of them endangered the health, safety or moral of its inhabitants of the community. In most cities in Nigeria, including the new Federal Capital Territory - Abuja, slum and squatter settlements exist and sometimes it become very difficult to rectify some obvious lapses without major economic losses. In some instances, several

structures would need to be demolished to pave way for essential services. When situations like this occur, there is need for urban renewal.

Urban renewal or urban regeneration is described by George (2006), as the aggregate techniques which have been develop for the treatment of urban problems on a physical basis. Businessdictionary.com defined it as the process where an urban neighborhood or area is improved and rehabilitated. The renewal process can include demolishing old or run-down buildings, constructing new ones, up-to-date housing, or adding in features like a theater, stadium or other recreational facilities, landscape and beatification to make such areas attractive. Urban renewal is usually undergone for the purposes of persuading wealthier individuals to come and live in such area and it is often part of the *gentrification* process. *Gentrification is making a particular location or neighborhood attractive to wealthy people.*

Urban renewal process usually starts with investigation and consultation with all stakeholders. This is followed by proposal and urban reconstruction and development plans. The process may be initiated by private or public organisation, which must work with government agencies (renewal authority) as well as private interests to develop workable designs. The involvement of member of the public is very essential at the planning stage to produce a robust plan that will be acceptable to all stakeholders. The actual reconstruction often requires the cooperation of all stakeholders, developers, residents and builders. In most cases, demolition is inevitable. In such cases, there might be compensation, reallocation of the same plot or resettlement depending on whatever is expedient and acceptable to all. Therefore the cooperation by all is the most important ingredient in the entire process (George, 2006).

3.2.3 Structural Economic Development

The ecosystem influences the development of organism and provides the resources which form the foundation for development of any nation. The socio-economic situation of any country at any particular time, according to Ojo (2002), represents the pattern of the ever-changing social and economic feature of such country. These features can be seen on the landscape as determined by human interaction with the physical environment. Of course, the level of development in a given system determines the sort of interaction with a given ecosystem. In agrarian economy, the interaction will be more shifted to cultivation and animal husbandry. The environment must therefore have the capacity to support such activities in a sustainable manner, else the whole economy become jeopardised.

The ecosystem according to Sogo-Temi (2000) provides ecological services; functions and environmental resources that are largely necessary factors of production and wealth creation. The resources include human and materials, such as water, food, and some renewable resources. Harnessing such resources for meaningful and sustainable development is the basis for governance. Igah (2002) noted that the economy is the vital aspect of a nation's life which determines her capacity to develop and ensure the well-being of its population. While the country is blessed with abundant resources, we have experienced what Mabogunje (2002) described as "poverty in the midst of abundant resources", because the country appears to lack the capacity to harness the tremendous resources to our economic prosperity.

In the sixties, Nigeria depended on agriculture for economic growth. There was stability and more hands were deployed in agricultural activities. That in a sense also drove the population dynamics of those years. Then the seventies presented what Igah termed the "glorious decade" of Nigeria – the oil boom and the emergence industrial economy which ushered gradual decline in agricultural activities.

Though the oil boom brought about economic prosperity, it was not sustainable as the wealth was not properly invested and channeled into production of more wealth. Indeed, it is obvious that the oil did not only bring with it environmental degradation, but also entrenched endemic corruption which has debarred further growth both monetary and in the real sector of the economy. This economic retardation has set back Nigeria several hundreds of years when compared with her peers among nations of the same economic resources and marginal growth rate.

The outcome of economic stagnation or retardation has been of a serious concern to many Nigerians. Most of our national woes such as armed robbery, kidnapping, bombing and armed banditry, have been blamed on economic stagnation and high rate of corruption. There is high rate of unemployment providing many idle hands for the devil to use. This can be reversed if there is growth in the real sector of the economy. Sogo-Temi (2000) stated that agriculture has the capacity to create wealth, generate employment and can earn foreign exchange for the country. The explosive population should be an asset if government is ready to stimulate growth in the real sector of Nigeria economy. Therefore, there should be structural adjustment in terms of policy reform, institutional arrangement and resource allocation to meet the desired goal. This is the only way we can dream of sustainable development in Nigeria.

3.2.4 Urban Planning for Sustainable Development

Sustainable development is defined by Heinke (2005), as *development that meets the needs of the present without compromising the ability of future generation to meet their own needs.* The hope for the future of mankind rests on the principle of sustainable development. Planning for sustainable development entails a lot of commitment on the part of the policy makers, the regulators, the planners, and indeed the general public if its goal must be achieved. In fact, Hanley and Atkinson (2003) have noted that sustainable development is capable of serving several goals: economic development, better environment, concern for the poor, community participation in decision making, etc. Sustainable development has actually assumed the front position on the global agenda in recent times because of its importance to the future of mankind on earth. President Bill Clinton of the USA was quoted to have said in 1997:

> Our environment has moved to the top of international agenda because how well a nation honours its will have an impact, for good or ill felt across the globe. Preserving the resources we share is crucial not only for the quality of our environment and health, but to maintain stability and peace, within nations and among them.

Hitherto the issue of sustainable development was taken for granted because it was assumed that the earth resources was unlimited, hence such rich resources were flittered away by myopic greedy leaders and businessmen who behaved as if the earth was a private estate. Wirth (1997) stated that the biggest obstacle to the pursuit of sustainable development is the misguided belief that protecting the environment is antithetical to economic interest. Many people will prefer to do anything to earn a living including degrading the environment, just to live. However, it is becoming clearer that we cannot continue in this manner and expect the earth to sustain all of us. According to Heinke, the concept of sustainable development has challenged society to change from its destructive, exploitative philosophy to one that foster long-term protection of the environment. This new philosophy must be factored into every development agenda and project and well planned for.

Govender (2002) have observed that the challenges in town planning that need to be overcome in the sustainable development of cities are enormous. These challenges include the need for adequate and decent housing, food security, adequate water supply and basic sanitation, urban environment pollution and effects of global warming, sufficient energy requirement, adequate raw materials for industrial processes, etc. Around the world, Govender observed that cities account for two thirds

of global energy demand, 60 per cent of water consumption, and 70 per cent of greenhouse gas emissions. With staggering urban growth rate, with more people moving to cities, the demand for efficient urban infrastructures and sustainable development projects in terms of alternative or renewable energy sources, efficient public transport system, adequate water supply and purification as well as efficient healthcare system is increasing day-by-day. It is only proper planning and innovative technologies that will help cities to meet these demands on a sustainable basis. Indeed, a lot of discipline and transparency is require by political leaders to develop the nation's economy to provide innovative infrastructural concepts and sustainable solutions for water purification and management, public transport, safety/ security, affordable healthcare and education for all, and renewable energy resources like wind energy, solar energy, etc. The private sector, industrialists and indeed the general public have roles to play, to reduce emission and observed set standards, guidelines and regulations to ensure sustainable development.

SELF-ASSESSMENT EXERCISE

i. What is urbanisation?
ii. List 10 effects of urbanisation
iii. List five causes of urban poverty
iv. Explain how to achieve urban renewal in slum.

4.0 CONCLUSION

Urban areas have continued to grow in numbers, size and population; so also the number of people living below the poverty line in these areas. The quest for economic opportunity is the main cause of urban growth with decline in the provision of housing and infrastructure leading to urban decay. Various definitions of urban area exist in different countries base on their cultural, historical and administrative differences. However in Nigeria, the most generally acceptable definition of urban area is a settlement with a population of 20,000 or more people. Causes of urbanisation include natural population increase, colonial intervention in development, trade and commerce, underdevelopment, insecurity and conflict, while the effects include increase slums and squatter settlements, global warming, environmental degradation, pollution, traffic congestion, population explosion, etc.

On the other hand, poverty is situation where people income is insufficient to obtain minimum basic necessities of life. Poverty can be caused by lack of employment opportunities, low economic growth performance, low human resource development, failure in macroeconomic policies, debt burden, etc. The effects of poverty

include social discrimination, low self-esteem, poor nutrition, economic backwardness, lack of security, etc. To advert this, there is need for proper planning of urban areas and the need to initiate urban renewal plans as well as the promotion of sustainable development.

5.0 SUMMARY

In this unit, you have learnt about the concept and definitions of urbanisation and urban poverty; causes and effects of urbanisation and urban poverty; strategies for planning the expanding urban areas, including application of policies and regulations. You have also learnt about urban renewal programme, structural economic development and urban planning for sustainable development. In the next unit, you will learn about the use of geographic information system (GIS) in urban planning and management. It is hope that the knowledge you have gained in previous units will assist you learn how to apply GIS in urban planning.

6.0 TUTOR-MARKED ASSIGNMENT

1. a) Define sustainable development?
   b) Explain the concern being expressed as regard the exploitation of environmental resources with recourse to sustainable development in Nigeria.
   c) Describe how you educate members of the public on the importance of sustainable development in your community.
2) a) Define absolute and relative poverty.
   b) List five causes and five effects of poverty.
   c) How will you eradicate poverty in your community?

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UNIT 3 THE USE OF GIS IN URBAN PLANNING AND MANAGEMENT

CONTENTS

1.0 INTRODUCTION

In the preceding unit, you learnt about urbanisation and one of its numerous consequences – poverty. The current urban challenges require modern techniques in effective planning and management of the urban environment. In this unit, you will learn about the application of geographic information system (GIS) in urban planning and management.

Geo-information techniques allows for effective task execution and problem solving in urban areas. It addresses the exhaustive spatial information needed for better planning, monitoring and evaluation for the rapidly developing urban areas. Hitherto and up to the 1970s, as noted by Gyuse (2012), urban planning and the production of plans and maps were carried out manually using hands, pencils and rulers. This has given way to the use of global positioning system (GPS) – a handheld instrument that calibrates radio signals from satellites to accurately establish latitude, longitude and elevation and computer-aided design for the production of plans and maps (Christopherson, 2006). This unit is therefore designed to guide you through the application of geo-informatics in urban planning and management.

2.0 OBJECTIVES

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

- define GIS and the earth-atmospheric interface
- identify the instruments use in GIS and remote sensing
- list sources of spatial data and describe their presentation
- explain the application of GIS in environmental health, and in the production of plans and maps.

3.0 MAIN CONTENT

3.1 GIS, The Earth and Atmospheric Interface

3.1.1 What is GIS?

GIS also known geospatial information system or geographic information system, is a system used for capturing, storing, analysing, managing and presenting data and associated attributes which are spatially referenced to earth. GIS is further defined as a system or tool or computer -based methodology to collect, store, manipulate, retrieve and analyse spatially (geo-referenced) data. In a more generic sense, GIS is a tool that allows users to create interactive queries, analyse the spatial information, edit data, maps, and present or store the results of all these operations for further use (Wilkipedia, 2008).

Geographic information system (GIS) has been defined severally but the simplest among these definitions is the one given by Heywood *et al.* (2006), as information about places on the earth's surface, while Christopherson (2006), defined it as a computer-based data processing tool or methodology used for gathering, manipulating and analysing geographic information to produce a holistic, interactive analysis. Geographic information technologies include GPS, remote sensing, and GIS. ESRI Panel (2011) noted that a geographic information system (GIS), integrates hardware, software, and data for capturing, managing, analysing, and displaying all forms of geographically referenced information. GIS allows us to view, understand, question, interpret, and visualise data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts.

3.1.2 Space and Satellite Imaging

(a) The Space

Space is defined by Butani (2006), as that part of the universe that lies beyond the earth's atmosphere; the continuous extension viewed with or without reference to the existence of objects within it. The region beyond the earth's atmosphere therefore is known as the space. In general term, space refers to available empty area that can be deployed to any use. It is that extensive expand of atmosphere that surrounds the earth. Space is also described as a thin layer of gases called the atmosphere that surround the earth. The atmosphere closer to the earth is dense and become lighter as we moved farther away from the earth (FEP International, 1988). This principle enables space travel and communication in and from space.

There is continuous information exchange between the earth and the celestial bodies in space. Before 1957, man curiosity about these bodies was limited to what would be obtained from telescopes. On October 4, 1957, the first man-made moon was sent into space to circle around the earth. Then in 1961, men travelled in spacecraft and landed on the natural moon, (FEP International, 1988).There is great distance between the Earth and space. FEP International (1988), revealed that because of this, distance in space is measured in *light years.* Since the speed of light is about 300,000 kilometres per second, one light year is about 9.5 million kilometres.

The earth exerts a force of gravity on all objects in space, with greater force on object closer to it. The gravitational force therefore, acting on an object at earth's surface is the weight of the object. It is this gravitational force that keeps human and other objects on earth from floating away to space. Therefore to move out into space, this force must be overcome; hence scientists built the space rockets to deal with this force.

(b) Satellite

Wikipedia (2011) described an artificial satellite as a semi-independent computer-controlled object which has been placed into orbit by human endeavour for various purposes such as communication, earth observation, navigation, research, weather forecasting, etc. Satellite orbits vary greatly, depending on the purpose of the satellite, and are classified in a number of ways. Well-known (overlapping) classes of satellite according to Wikipedia include low earth orbit, polar orbit, and geostationary orbit. Satellite subsystems attend many tasks, such as

power generation, thermal control, telemetry, attitude control and orbit control.

The moon, one of the celestial (heavenly) bodies is a natural satellite that orbits the earth and is kept moving round the earth rather than moving in a straight line by another force called the *centripetal force.* Artificial satellites have been launched into space starting with the Russian *Sputnik I* in 1957. The satellites are powered by solar energy and scientists use large dish aerial to send and receive radio signals from the satellites. There are weather, earth, communications, etc. satellites all meant for different purposes. As at October 2012, there were about 3,215 satellites in the orbit from 56 countries of the world. Out of this number, the former USSR and now Russia and the USA combined have a total of 2,536 satellites, while the other 54 countries including Nigeria have the remaining 679 satellites. As at 2009, only ten countries had the capabilities of launching satellite into orbit.

(c) Satellites Images

Satellite imagery consists of photographs of earth or other planets made by means of artificial satellites. The first images from space according to Reichhardt (2006) were taken on sub-orbital flights by the US-launched V-2 flight on 24thOctober 1946, which took one image every 1.5 seconds. According to Heywood, Cornelius & Carver (2006), satellite images are collected by sensors on board a satellite and then relayed to earth as series of electronic signals, which are processed by computer to produce an image. Christopherson (2006) observed that satellites do not take conventional-film photographs; rather they record images that are transmitted to earth-based receiver in a way similar to television satellite transmissions or digital camera using *pixels* which are then processed.

The type of image resolution determines the quality of the image being relayed from satellites. The higher the resolution, the better and clearer the image. Heywood, Cornelius & Carver (2006), stated that resolution is an important spatial characteristic of remotely sensed data and determines its practical value. It is the resolution that defines the quality and applicability of image or spatial data. If the resolution is low, the image taken will be blurred and may not be able to represent the exact characteristic or features being relayed.

Campbell (2002) outlined four types of satellite resolution use in remote sensing, which are: *spatial, spectral, temporal, and radiometric*. He defines them thus:- spatial resolution is the pixel size of an image representing the size of the surface area (i.e. m2) being measured on the ground, determined by the sensors' instantaneous field of view (IFOV); - spectral resolution is the wavelength interval size (discreet segment of

the electromagnetic spectrum) and the number of intervals that the sensor is measuring; temporal resolution is the amount of time (e.g. days) that passes between imagery collection periods for a given surface location; and radiometric resolution is the ability of an imaging system to record many levels of brightness (contrast for example).

Campbell further explained that radiometric resolution refers to the effective bit-depth of the sensor (number of grayscale levels) and is typically expressed as 8-bit (0-255), 11-bit (0-2047), 12-bit (0-4095) or 16-bit (0-65,535). Geometric resolution refers to the satellite sensor's ability to effectively image a portion of the earth's surface in a single pixel and is typically expressed in terms of Ground Sample Distance, or GSD, which is a term containing the overall optical and systemic noise sources and is useful for comparing how well one sensor can "see" an object on the ground within a single pixel.

Pixels are smallest area on a computer screen which can be given a separate colour by computer. Heywood, Cornelius & Carver (2006), explained that satellite images are like scanned images stored as a collection of pixels, which have a value representing the amount of radiation received by the sensor from that portion of the earth's surface. The size of the pixel according to them gives a measure of the resolution of the image. Therefore, a satellite orbiting at a resolution of one metre by one metre pixel will give much greater resolution that the one orbiting at 30 metre by 30 metre.

3.1.3 Spatial Data Collection, Analysis and Interpretation

Spatial refers to the nature or character of physical space or location in an area. Spatial association – relationships among different factors at a particular locations on the earth's surface; spatial interaction – the movement of people, goods and ideas within and between regions; and spatial model – the three-dimensional image seen by stereoscopic methods; (Christopherson, 2006 and Bellamy, 2007).

(a) Spatial data

Spatial data are representation of GIS simplified view of the world's location and variables of interest at a particular time. For instance, if one is interested in transport network in order to render a particular service, it would be impossible or impracticable to input every detail of a road network, hence a simplified view, perhaps the road category, speed limit, congestion point may just be all that is necessary. In order to model the real world in a GIS, it has to be reduced to series of abstract features or basic spatial entities such as points, lines and areas. Ability to

model spatial data with GIS requires the knowledge of the character of spatial data use as raw material (Heywood, Cornelius & Carver, 2006).

Data are observations made from monitoring the real world, and are collected as facts or evidence that may be processed into information, which can be used for policy, decision making or certain action. There are three dimensions of all primary and secondary data: *temporal, thematic and spatial.* To explain this, Heywood, Cornelius and Carver (2006) used data from avalanche incident that took place in *Three Pines Valley on 14th February 2002.*

- temporal: 15:30 hours, 14 Feb 2002
- thematic: wet slab avalanche triggered by two off-piste skiers; and
- spatial: three Pines valley, south-facing slope.

From this example, we can notice that temporal dimension provide record when the data were collected, thematic dimension describes the character of the real world feature, while the spatial dimension described the location of the event. It is important to state that for spatial data to be meaningful, the minimum of these dimensions are required, and GIS seeks to ensure that essential data set is always obtain for information we required for certain action or decision (Heywood, Cornelius & Carver, 2006).

(b) Sources of Spatial Data

There are primary and secondary sources of spatial data.
Examples of primary sources of spatial data are:

- Daily meteorological records collected at weather station
- Number of cars that ply a particular road per period of time in a day
- Number of states and LGAs affected by flood in Nigeria in 2012
- Numbers of LGAs in Nigeria that experienced cholera outbreak in 2010
- Census and survey data
- Aerial photographs
- Satellite images and
- Geographic information systems with wide varieties of data sets and wide availability, low cost and wide area view at spectral and spatial resolution with the 3-dimentional perspectives.

Secondary data sources may include:

- Published meteorological maps for an area
- Local topographical maps
- National HIV prevalence for the past five years
- Spot map of Onchocerciasis in Nigeria in 1981-1990.

(c) Spatial Data Collection

Spatial data are collected using active or passive sensors of remote sensing. Remote sensing is a technology design to enhance our understanding of the earth. Remote sensing enables us to obtain information about a distance subject without having physical contact with the subject. A satellite with passive sensor is able to detect radiation from the sun that reflects from the earth's surface, operating across different parts of electromagnetic spectrum and not merely only those portions visible to the human eyes. Such sensors are found on most earth observation satellites. However, a small number of satellite use active sensor for spatial data collection and they have their own on-board energy source and so do not rely on detecting radiation reflected from the surface of the earth (Heywood, Cornelius & Carver, 2006 and Christopherson, 2006).

Geographic positioning system (GPS) according to Heywood, Cornelius and Carver (2006), is a set of satellites control systems that allow a specially designed GPS receiver to determine its location anywhere on earth within 24 hours. Most GPS are small hand held equipment – the size of a small transistor radio. It is used to establish coordinates in maps, and hence used to collect data for plotting maps.

GIS is a computer-based system. Heywood, Cornelius & Carver (2006) stated that GIS run on the whole spectrum of computer system ranging from portable personal computers (PCs) to multi-user super-computers, which are programmed in a wide variety of software languages. The application of computer system is fundamental to spatial data collection, storage, retrieval, analysis, interpretation and presentation. The essential elements for effective deployment of any computer system in GIS operation include:

- The presence of a processor with sufficient power to run the software
- Sufficient memory for storage of large volume of data
- A good quality, high-resolution colour graphics screen and
- Data input and output devices, e.g. digitizers, scanners, keyboard, printers and plotters.

Similarly, there are essential software elements that enable user to input, store, manage, transform, analyse and output data in GIS framework. These include:

- On-screen appearance (user interface)
- Ability to perform task assigned
- Capacity for prompt operation and accurate output.

Environmental Systems Research Institute (ESRI) established in 1969, is the leading worldwide supplier of GIS software and geo-database management application, including *ArcGIS, ArcView, ArcSDE, ArcEditor,* etc. ESRI has been able to develop general and customised GIS software for a lot of clients and is currently helping users to maximise the benefits of the software through conferences and onsite training. GIS architecture relies on efficient information and communication technology (ICT), and the use of internet has opened up the GIS space, enhancing data sharing and data manipulation at greater efficiency. Internet GIS now have the higher number of users at very low cost and enables such uses as online location finding and data exchanging. It is also applied in public participation GIS (PPGIS), which are tools to enable planners, policy makers, citizens of varying backgrounds to build consensus about the design, development, and future direction of their community. It enhances the ability of the planner and members of the public to make better planning decision by enabling improved communication, dialogue, design and analysis of ideas and proposals, (Heywood, Cornelius & Carver; 2006).

In a summary, instrument/ equipment use in GIS include sensors, computer hard and software, GPS and ICT infrastructure.

(d) Spatial Data Analysis

Spatial analysis is a geographic method use to study the interdependence among geographic area, natural system, society and cultural activities over space. Spatial data analysis relies on GIS, which is a computer-based, data processing tool for gathering, manipulating and analysing geographic information. Christopherson (2006), stated that sophisticated computer system have been developed to allow the integration of geographic information from direct survey (on-the-ground mapping) and remote sensing in complex ways, which were not possible before. The first step in GIS is a coordinate system such as latitude and longitude, which establishes reference points against which to position data (geo-referencing). Spatial referencing is used to locate a feature on the earth's surface or two-dimensional representation of this surface as a map.

GIS according to Christopherson is capable of analysing patterns and relationship with single data plane such as floodplain or soil layer. It can also generate an overlay analysis where two or more data planes interact. The utilisation of GIS allows for manipulation of variables for further analysis and to constantly change the map, making the map dynamic and alive.

(e) Spatial Data Presentation and Interpretation

The most common spatial data presentation and interpretation is the use of map. Heywood, Cornelius and Carver (2006) stated that the traditional method for storing, analysing and presenting spatial data is the map. Map therefore is of fundamental importance in GIS as a source of spatial data. According to them, maps may take different forms and use different scales. There are two types of maps: *thematic and topographic.* Thematic maps show data relating to a particular theme or topic such as soil, geology, land use, population or transport. On the other hand, topographic maps contain diverse set of data on different themes in such a way that land use, relief and cultural features of a place can be presented on the same map.

The mapping process will always follow the same pattern no matter the type of map in question. The general nature of the process includes:

- Establish the purpose of the map
- Define the scale
- Select the features to be presented
- Choose a method for presentation (points, lines and areas)
- Generalise these features for presentation in two dimensions
- Adopt a map projection for placing these features
- Apply a spatial referencing system to locate the features and
- Annotate the map with keys, legends and text to facilitate use of the map.

3.1.4 Uses of Maps in Urban Planning and Management

Maps are generalised view of an area, usually some portion of the earth's surface, as seen from above at a greatly reduced size. Aerial photography taken from aerial platform (usually an aeroplane) either vertically or obliquely enhances the interpretation of geo/ spatial data. Maps perform different roles and functions such as:

- Maps record definite facts of positions, relief, climate, vegetation, materials and their distribution broadly over the earth, in continents, countries, states

- Help in the location and study of a particular place of interest
- It is use to represent spatial phenomena across the earth's surface
- It is use reading, analysis, interpretation of earth's features
- Planning – segmenting portion of land into thematic and different land uses
- Storage of Information
- Forecasting and Warning
- Understanding Spatial Relationships
- Jurisdiction, Ownership, Assessment
- Communication, persuasion and propaganda
- Navigation, Control and Route Planning.

3.2 Application of GIS in Planning and Management

3.2.1 The Application of Geo-informatics in Environmental Health and Planning

Geo-informatics is a science which develops and uses information and science infrastructure to address the problems of geosciences and related branches of engineering. Geo-informatics combines geospatial analysis and modeling, development of geospatial databases, information systems design, human-computer interaction and both wired and wireless networking technologies. Geo-informatics technologies include geographic information systems, spatial decision support systems, global positioning systems (GPS), and remote sensing. Geo-informatics uses geo-computation for analysing geo-information (Wikipedia, 2008).
Health geography, health mapping or spatial location of health event and health infrastructure is not new. John Snow applied this knowledge in 1853-1854 in the control of the worst cholera outbreak in Britain. He was able to literally "map" the city of London before being able to identify the source of the infection (Beaglehole, *et al.,* 1993 & Katzenellenbogen, *et, al.,* 1997). Later on, geo-informatics including GIS have been used in the study of bladder cancer and arsenic exposure (Av Ruskin *et al.*, 2004); in storing, tracking and displaying spatial information on HIV epidemic within a small township in South Africa (Busgeeth, 2004); in environmental modeling to control tick borne epidemic in Italian Alps (Furlanello, 2003); in the study of food contamination and disease prevalence from the Chernobyl nuclear power plant disaster (Krivoruchko, 2004); in tracking Schistosomiasis - the snail-borne infection in East Africa (Malone *et al.,* (2001); in extensive description of United State air pollution morbidity and mortality data for a long period (Peng *et al.,* 2004); in epidemiological and spatial analysis methods using global positioning system (GPS) to fix point data (Rytkonen, 2004); in determining environmental factors towards environmentally based diseases (Tanser *et al.,* 2002); in

epidemiological setting for data collection, management, and analysis (WHO, 1999); and finally the utilisation of GIS in public health mapping (WHO, 2003).

In Nigeria, Musa (2004) described how he was able to use GIS to map the entire Federal University of Technology, Yola campus showing every structure, water line, power line, residential area, academic area and offices. This effort paid off as it is now possible, according to him to not just locate a particular point on the campus, but also possible to update the data base, retrieve information and carry out some analysis just in a matter of few minutes.

Recently, Barton and Grant (2006) have underscored the importance of health mapping. They went beyond the mere dotting of health events on drawn maps to pointing out some fundamental facts concerning the environment, economic and social activities, political and macro- forces all playing significant role and affecting the health of the people in one way or the other. They contended that the environment in which we live is a major determinant of health and well-being. Therefore, they proposed that every physical planning of human settlement should take into account all these sub-systems in relation to the environment while people should be at the heart of the 'map' for sustainable development as in the health map below. Their views agrees with that of Lecky (2003) who stated that people should be put at the centre of our thinking in the planning, implementation and evaluation of the national health system. Such philosophy will enable us to choose appropriate strategies and align our priorities to meet the health needs of our people.

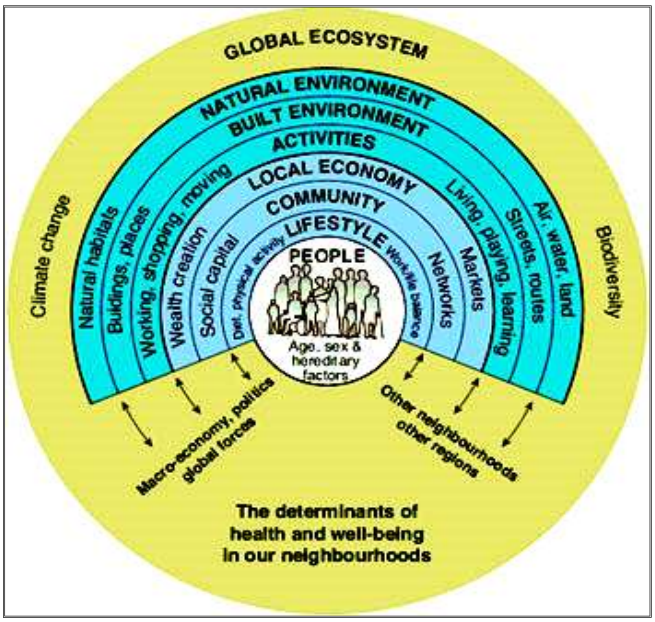

Fig. 3.1: Health Map

Source: Barton & Grant (2006)

Other countries are already making good use of these technologies in their planning efforts and in public health. In Kenya for instance, community based vector control in Malindi is yielding good result as vector population can be tracked and monitored using GIS. Group of people are said to have been trained, and motivated to routinely keep the city clean, destroy mosquito breeding places and help in the distribution of insecticide treated nets (ITNs) and monitor their use (Kibe *et al.*, 2006). In Australia, with the help of remote sensing and GIS technologies, the native Aborigines who owned over 85% of the coastline are able to manage the land for various uses, adapting their indigenous knowledge to the evolving technologies (Bartolo & Hill, 2001). It is therefore apparent that in Nigeria, the application of GIS technology in planning and management of urban areas should be a thing of the past, which ought to receive added impetus with added value when considering a wide spectrum of areas where the technology could be most useful.

Generally, GIS is used in:

- Urban planning and management
- Urban poverty study and alleviation programs
- Urban infrastructure development and management
- Land use and urban growth
- Urban transport management
- Urban services and utility management
- Urban data collection, analysis and application.

SELF-ASSESSMENT EXERCISE

i. Write notes on

   - Spatial
   - GIS
   - GPS
   - Resolution
   - Maps

ii. List the uses of maps.

4.0 CONCLUSION

GIS has a wide range of applications and is evolving in many human endeavour. The use of GIS has been identified in intelligent gathering for security purposes, infrastructural development and maintenance and in land use planning (allocation and mapping) and management. The use

of GIS in urban planning will enhance accurate land mapping, efficient layout planning and proper land use and allocation, remove distortion of urban plans and enhance efficient management of land and urban infrastructure. It has proved to be of tremendous importance in public participation in the design, development and future direction of communities. Indeed, GIS enhances decision making as regard urban planning and management. Therefore, efforts should be made to apply this technology in our urban planning and management.

5.0 SUMMARY

In this unit, you have learnt the meaning of geographic information system (GIS) and the use of geospatial or GIS in urban planning and management. You were reminded of the shape of the earth and atmospheric interface, space and satellite imaging, spatial data collection, analysis and interpretation of spatial data. You were also informed that GIS work essentially in computer-based system and relies on ICT for its effectiveness. You have also learnt about the uses of maps and the mechanism for applying GIS in urban planning and management. You have equally learnt about the use of geo-informatics in public health and planning with several examples of such uses. In the next unit, you will learn about planning and management of built-up environment, land use and economy. Hope you are making progress in grasping the content and purpose of this course so far.

6.0 TUTOR-MARKED ASSIGNMENT

1) a) What is GIS?
   b) Highlight the application of GIS in urban planning and management.
2) Identify the various equipment and instruments used in GIS and explain the importance of the computer system in GIS.
3) In recent times, public health has benefitted from the application of GIS in its functions. Highlight such areas that GIS has been used in public health intervention and explain how it can be used in environmental health services.

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MODULE 3 PLANNING AND MANAGEMENT OF URBAN ENVIRONMENT

UNIT 1 PLANNING AND MANAGEMENT OF BUILT-UP ENVIRONMENT, LAND USE AND ECONOMY

CONTENTS

1.0 INTRODUCTION

In the last unit of Module 2, you learnt about the use of geographic information system (GIS) in urban planning. You would recall that one of such uses is mapping and demarcating land space into layouts for orderly development. In this unit, you will learn about how to plan and manage the built-up environment for several purposes including economic, social, educational, industrial, religious, etc.

The built environment according to Kress and Van Leeuwen (1996) is like written and spoken texts which unfold in time and in space, taken different shape and form from time to time depending on the contextual and conceptual needs and uses of the people at such point in time. It is that part of the earth surface occupied by man and used for several human activities. Such areas usually depict a land mass with road network; structure for residential, commercial, industrial, social and recreational purposes and services. The built environment according to Lake and Townshend (2006) consists of three major elements, which are the physical designs, land use patterns (residential, commercial, office, industrial and other activities) and the transport system. The link between health and the built environment has been established and would continue to form a major consideration in urban planning and management as greater proportion of man's time is spent in the built-up environment and form major aspect of economic, social and spiritual life of man. It is hope that you will gain a lot from this unit just like you did in the previous units.

2.0 OBJECTIVES

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

- state the purpose for planning built-up environment
- identify the features of built-up area
- describe the development of society
- explain how to monitor and control land use.

3.0 MAIN CONTENT

3.1 Physical Planning

3.1.1 Purpose of Physical Planning

You have learnt that the main purpose of urban planning is to ensure orderly sustainable development. It is also aimed at intervening in the processes of land and property development in order to achieve an expected outcome which is physically, mentally, socially and environmentally desirable to produce a stable harmony in the ecosystem. Physical planning therefore entails the demarcation of the physical land-space into manageable fragments for related activities based on human needs in an organised manner, so that the quality, aesthetic value and functional effectiveness of the environment is safeguarded.

Planning is a vocation that requires discipline based on certain guidelines listed in the box below. Generally, these guidelines are meant

to direct the planning process. In essence, physical planning is the translation of thought patterns, perception, imagination and intuition into shapes and forms that convey the physical design the planner has in mind in a coordinated manner. Therefore, physical planning has been defined by Landy (2007), as a form of urban land use planning which attempts to achieve an optimal spatial coordination of different human activities for the enhancement of the quality of life. The World Bank (2010), defined physical planning as:

A design exercise that uses the land use plan as a framework to propose the optimal physical infrastructure for settlement or area, including infrastructure for public services, transport, economic activities, recreation, and environmental protection.

Furthermore, the Bank defined land use planning as a public policy exercise that designates and regulates the use of land in order to improve a community's physical, economic, and social efficiency and well-being. Thus, a physical plan for an urban region according to the Bank can have both rural and urban components based on natural growth, historical background, endowed resources and existence of policy, guidelines and planners to direct the developmental processes. Therefore, physical planning according to Olujimi (1993) is an essential (social) service that every responsible government should provide for its people.

Land is constant and a scare resource. It is required for every developmental purpose. FAO (1976) defined land as:

Comprising the physical environment, including climate, relief, soil, hydrology and vegetation, to the extent that these influence potential for land use. It includes the results of past and present human activity, e.g. reclamation from sea, vegetation clearance and also adverse results such as soil salination and environmental degradation.

Therefore having recognised the centrality of land to development, the need to manage it in a responsible manner becomes imperative to sustainable development.

Guidelines for Land Use and Physical Planning

Laws, regulations, plans, and institutional frameworks should form the basis of land use planning. If existing instruments are not realistic, or are contributing to informality, use the planning process as an opportunity to improve them.

The planning process should incorporate active collaboration among the individual, agencies and the concern community, the private sector, and other stakeholders, thereby engendering their ownership of the planning process.

The planning process should respond to issues of land rights and titling and to discrepancies in the administration of land records, address the needs of informal occupiers of land, and work with them to identify viable alternatives.

While addressing long-term development goals and planning imperatives, land use and physical plans should still be flexible and offer choices, rather than become static "master plans."

Land use and physical plans integrated with strategic planning can address disaster risk reduction (DRR), and long-term development, reconstruction, yet be readily translated into action plans and investment proposals, including those that promote private investment.

The planning process needs high-level support, active leadership from the government agencies that will actually implement the plans, and involvement from local communities.

Adapted from Chap. 7 of "Safer Homes, Stronger Communities: A Handbook for Reconstructing after Natural Disasters," published by the World Bank in January 2010. www.housingreconstruction.org.

The concept of thematic planning has recently been introduced into urban planning as a prescriptive planning tool that seeks the most effective and efficient technical solution to a generic development problem (TCP, 2003). The aim is to provide programmatic guidance on the application of benchmark standard for all developmental projects based on standardised criterion as well as the provision of cost-benefit analysis of applicable technology with defined roles and responsibilities of all stakeholders, and identified resource requirements for outlined course of action. In this context, thematic planning focuses on identifying human need and aspiration and providing opportunity for their expression within the general planning framework such that residential, economic and social rights and related activities are considered within available land space in a given geographic area.

Simply put, the purpose of physical planning is to ensure orderly development and to protect man from the consequences of un-planned development. Olujimi (2011) has stated that one of the basic means of managing our environment is through physical planning commonly referred to as ''Town Planning.'' Physical planning enables Planners to hold the geographic space in high esteem and to create a pleasant and healthy environment for man, animal, plant and other members of the ecosystem to dwell in harmony. It also enables the land resource to be shared amicably among contending human needs and aspiration and cascade development to rural areas.

3.1.2 Mapping and Physical Planning

Mapping is the act or process of making maps or presenting thoughts, designs and imagination using lines and symbols in a reproducible form either in a paper or electronic medium to guide development or other activities in the environment. Therefore map is a drawing of a particular place or location such as a village, town, city or a country. Previously, you learnt about principles and processes of mapping including the use of Geographic Information Systems (GIS). According to Lawrence Group Architects of NC (2009), GIS, is an important useful tool in land-use planning for aerial photography to show land parcels, topography, street names, and other pertinent information. GIS contain layers of graphic information and their relational databases that may be projected into maps that allow the user to view a composite of a specific area, adding an array of graphically oriented decision making tools to the planning process.

George (2006) stated that accurate maps are essential at most stages of any planning scheme. Mapping is a very important exercise in the physical planning, allocation and management of land for sustainable development and for regulation of land use and title delineation. One of the important maps required in physical planning is the *base map*, described by George (2006), as map which shows the existing physical pattern of land upon which survey information or planning proposal is superimposed. She noted that for a base map to serve the intended function, it must have the following properties:

- clear and legible
- capable of cheap and rapid reproduction and
- flexible for other uses.

These qualities enhance the use of the base map for further manipulation, re-designing and annotation as the planner may desire. Good base map is required by every planner and should be drawn by experts using available technologies.

With maps, it is possible to plan and design a whole area on paper, which serves as guide for functional operating procedure, enabling development to progress as planned. Land mapping according to FAO (1976), is the segregating of land into units for different uses according to the type of land and type of uses considered under general physical, economic and social condition prevailing in an area. Land mapping may be by natural resource e.g. river flood plain, natural drainage channels, valleys, hills, etc. or by the use of beacons to demarcate smaller parcels of land mostly for residential, industrial, agricultural or similar other purposes. Planners should be able to read maps of any scale in order to gain an accurate and comprehensive knowledge of physical and human geography of an area (George, 2006).

Map of Urban Renewed City of Kabul Map of Abuja Showing Roads & Built-up Areas

Source**:** *www.en.wikipedia.org/wiki/file*

Source**:** *FGN 2013 Diary. Abuja: FMI*

3.1.3 Land Use Planning, Allocation and Management

Allocation of land for various functional uses is a major discipline in town planning. There are various views as to what planning is and how it connotes different meaning at different setting. Planning in this context is the regulated processes of land and infrastructural development to support human life and good health. Some of the regulated areas include housing, transportation, waste management, employment, and manufacturing; among many other land uses, which must be considered. Land use planning is an aspect of urban governance to regulate the natural and built environments in a manner as to ensure functional living society. Wikipedia (2011) described land-use planning as a decision-making process that facilitates the allocation of land for various uses and provide the greatest sustainable benefits. It is public policy encompassing various disciplines which seek to order and regulate land use in an efficient and ethical way, thus preventing land-use abuses and conflicts. It has been stated before that when land is regulated, title holding is possible, and this help to remove friction among various contended claims to land ownership.

Land use planning enables governments to manage the development of land within their jurisdictions as well as safeguarding natural resources. Planning provide for systematic assessment of land for alternatives uses, economic potentials and social conditions in order to select and adopt the best land-use options. Ogunbodede (2000) noted the need for rational use of land for what it is best suited for. This placed moral responsibility on the planner as a piece of land that is suited for urban development can as well be suited for agricultural production. A comprehensive plan for land-use provides a vision for future possibilities and development option in neighborhoods, communities, cities, or any defined location. Therefore *physical planning* is the designing of the optimal physical infrastructure of an administrative land unit, such as transport facilities - roads, railways, airports, harbors; industrial plants and storage of produce; mining and power generation, and facilities for towns and other human settlements - in anticipation of population increase and socio-economic development as well as taking into account the outcome of land use zoning and planning (Wikipedia, 2011).

Conceptualisation and design of any area into conceived functional uses before demarcation and allocation into plots are often guided by physical planning principles and processes, herein adapted from the University of Wisconsin System Board of Regents Policy Document (2012) and University of California Long-Range Development Plan (2005), which are:

1. Physical development shall be within the context of planning guidelines specific to each area.

2. Planning shall create a physical environment that contributes aesthetically and physically to the overall development of the environment and the welfare of man.
3. Physical planning shall respect the natural environment and preserve open space as well as integrate the natural and built environment as much as possible.
4. Planning must recognise the increasingly diverse population characteristics, and provide for the needs of these populations.
5. Physical planning must maintain an ongoing comprehensive building space management functions as well as a comprehensive space use plan specific purpose.
6. Planning shall encourage sustainability and efficiency in designing of building layouts.
7. Physical planning shall promote broad-based initiatives and sustainable development.
8. Planning shall maintain natural surface drainage flows as much as possible.
9. Planning shall as much as possible protect the investments already made by the State in:

    a. Assuring that proper consideration is given to the health and safety of the general population and the maintenance of existing facilities.
    b. Developing an environment that is accessible to people with disabilities and to remove existing barriers that obstruct access to existing and future facilities.
    c. Assuring maximum efficiency in the consumption of resources within defined environment.
    d. Protecting historic and prehistoric cultural resources.

10. Planning shall encourage collaboration, partnerships, and innovation, including working with other professionals such as engineers, architects, building surveyors, economists, developers, politicians, scientists, environmental health scientists and other environmental scientists.
11. Planning shall encourage and promote the economic and health of the surrounding community.
12. Plan shall provide a transportation system that meets the needs of the target population.

Land allocation usually follows land subject plan and classification of land use into and for physical, economic and social setting. In Nigeria, the *Nigerian Urban & Regional Planning Law, Cap N138 LFN 2004 (NURPL, 2004)* has vested on the States the responsibilities for physical planning within the framework of National Physical Development Plan as well as the formulation of policies and their implementation to ensure

orderly development of the country. In like manner, the Federal Government under the law is charged with the responsibilities of formulation of National Policies and preparation and implementation of national physical plan, supervise and monitor the execution of projects in urban and regional plans.

The planning of built environment is significant to all segments of every society and requires cooperation and commitment of all. Indeed, Lake and Townshend (2006) have noted that modern town planning grew from a concern regarding the unsanitary conditions of industrial revolution which were common features of cities in the 19th Century. Attempt to solve the problems of unhealthy, overcrowded slum, in a place like the United Kingdom, necessitated some form of control including the enactment of the first Public Health Act of 1848. The Act dictated issues like street widths, and most aspect of domestic dwellings that transform most slum cities into modern cities of terraces today.

Monitoring physical development is the function of Development Control agencies established in the NURPL, 2004. Under the law and the *National Urban Development Policy* (NUDP), the control of development and indeed, its management, monitoring and evaluation is a continued process which involves every stakeholder. Land use and evaluation is one of the processes of land use planning. According to FAO (1976), these processes include:

- recognition of a need for change
- identification of aims
- formation of proposals, involving alternative forms of land use, and recognition of their main requirements
- recognition and delineation of different types of land present in the area
- comparison and evaluation of each type of the different land uses
- project design, or other detailed analysis of a selected set of alternatives for distinct parts of the area
- decision to implement
- implementation
- monitoring of the operation.

Physical planning therefore in this context can be seen as a public good for economic and social development aimed at enhancing environmental aesthetics and promoting good health of the population. Therefore, physical planning should precede every development paradigm and project to give way to acceptable standard and control. This should be the hallmark of responsible development in health, economic and social context.

3.2 Planning and Development of Society and Town

3.2.1 Planning for Growth and Expansion of the Society

You learnt earlier how society developed from the family unit as a social microcosm to community. Every development revolved around man and man is indeed at the centre of all development activities. The nucleus of the society is the family unit. Societies grow into communities and communities grow into towns and cities.

A society, particularly the human society, is a group of people related to each other through persistent interaction or a large social grouping sharing the same geographical location or territory and are subject to the same political authority and dominant cultural expectations and experiences. It may also be described as the sum total of such relationships among its constituent members and their shared values. Indeed, what is known as the traditional society exists everywhere. In most location, they have posed serious challenge to proper planning, while in others their integration into modern society has been made easy as a result of articulate planning which is the hallmark of urban planning.

A major challenge today has been the tendency for traditional society to metaphor into urban (town and city) settlement, an erroneous impression of the state of development of such society. Human societies are characterised by patterns of relationships between individuals who share a distinctive culture and social inclination. Over time, some cultures have progressed toward more complex forms of organisation and control. This cultural evolution has a profound effect on patterns of community. These patterns to a large extent also determined the grouping in relation to the land area they occupy and what activities they undertake. All these form the hub and ingredient for physical planning, which must be considered by every diligent Planner (Wikipedia, 2010). Physical planning should take into consideration the diverse cultural setting to create a unique pattern for each location. There should not be any attempt at modification into what is often described as modern society. Each geographic locality should be allowed its cultural uniqueness in terms of road and architectural designs and such other cultural patterns and formations as noted in the physical planning principles outlined above. To a large extent, this will discourage urban migration and promote cultural revival and tourism.

It is in this context that land-use planning becomes very germane. Often, land use planning leads to land-use regulations and effective use of the land space equitably for economic and social purpose. As stated before, land use planning often lead to demarcation of land into smaller

parchment for various uses. On a wider scope, the land is often zoned on thematic areas like agriculture, manufacturing, industrialisation, residential and so on. As a tool for implementing land-use plans, zoning regulates the types of activities that can be accommodated on a given piece of land, the amount of space devoted to those activities and the ways that buildings may be placed and shaped. In most cases and rightly too, there is need to regulate such processes and provide guidelines for all the activities in each zone (Wikipedia, 2011). Conventional zoning has not typically regarded the manner in which buildings relate to one another or the public spaces around them, but rather has provided a pragmatic system for mapping jurisdictions according to permitted land use and the imagination of the planners and developers in relation to their available land space.

3.2.2 Land Use and Economic Activities

The UN Convention to Combat Desertification (1994) defined land as*:*

A delineable area of the earth's terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface including those of the near-surface climate the soil and terrain forms, the surface hydrology (including shallow lakes, rivers, marshes, and swamps), the near-surface sedimentary layers and associated groundwater reserve, the plant and animal populations, the human settlement pattern and physical results of past and present human activity (terracing, water storage or drainage structures, roads, buildings, etc.).

Land is an environment natural resource. The environment is generally seen as the conditions, circumstances and influences surrounding, and affecting the development of an organism or group of organism. The significance and value of the environment's infrastructure cannot be overemphasised. It supports lives and promotes economic activities as well as enhances human comfort (Sogo-Temi, 2000).

Land is a principal factor of production and as such serves as a primary input into every human activity. Land is required for residential, agricultural, industrial, educational and other sundry purposes. Without land, it is very difficult to think of any development project, since every project must be on land. This underscores the importance of proper planning of land use and administration.

Availability and accessibility of land for development are twine problems of urban planning and development. The *National Housing Policy* (2006) lamented that the main problem of availability of land for housing is that of accessibility, ownership and use. These according to

the policy, constitute great obstacle to development in the public and the private sectors of the economy. Government therefore, aimed to make building plots available at the right time, in the right place and at reasonable cost to people willing to build and to ensure the provision of services and infrastructure. To achieve this goal and remove the obstacle, government decided to control the use of urban and rural lands through effective physical planning.

The *Land Use Act*, 1978, according to the policy was to facilitate availability of urban and rural land for development. The Act vested the administration of land in the Governor of a State. However, the inclusion of the Act in the 1999 Constitution makes it inflexible and difficult to effect even minor amendments. Other constraints are the cumbersome and costly procedures for obtaining certificate of occupancy (C-of-O) and consent to mortgage land as well as the delay in payment of compensation for acquired land.

To some extent, many States adopted various modalities to achieve the goal set out in the Act. To a large extent, land is still held in the traditional holding system by family members, which in some cases tend to impede development. While most governments have adopted various incentives including compensation to break through this system to acquire land for vital development project, other development projects have been stalled due to refusal of "land owners" to let go parcels of land for such development projects. As a result of this, there has been a lot of land racketeering and speculations leading to multiple allocation/ ownership, conflict and litigation as well as huge losses as a result of ownership tussles and demolitions of structure due to conflicting ownership of parcel of land.

Location, quality and cost of land are issues of concern. While a parcel of land in a particular area like Asokoro or Maitama in Abuja or Ikoyi or Victoria Island in Lagos may be "over-value" because of its location, land in some jungles elsewhere may almost appear to be without any value until development moves to such location. Generally, land in urban areas attracts higher value than land in rural setting. In this regard, FAO published a *Framework for Land Evaluation* and land use in 1976. The framework defines land units in terms of their characteristics (measurable factors such as slope, soil texture; rainfall, etc.). In terms of qualities the framework highlights the effects such as temperature regime, moisture availability, which result from a combination of characteristics, and matches them with potential uses defined in terms of the *requirements* of such uses.

In the context of development and urban economy, requirements of the land use refer to the set of land qualities that determine the production

and management conditions of a kind of land use. Thereafter the land is rated in terms of suitability for various uses. A use could not be rated as suitable unless it was sustainable. In essence, of what use can a piece of land be put to? Such valuation is necessary when considering an area for some economic activities and other alternative options. It might be necessary to carry out periodic land evaluation using various methods of assessment to determine the characteristics of the topsoil and the underground mineral deposits in every location for informed decision on land uses, including land resources management. It is for this reason that O'Sullivan (2003) and Wikipedia (2012) averred that in terms of land use of urban economy,

the spatial organisation of activities within the cities, urban economics addresses questions in terms of what determines the price of land and why those prices vary across space, the economic forces that caused the spread of employment from central core cities outward, identifying land-use controls, such as zoning, and interpreting how such controls affect the urban economy.

Urban economy has been defined *as a system of production, distribution, and consumption embracing the sum total of productive activity within an urban centre, and that part of its hinterland which is dependent to a marked degree on facilities and services available in the city* (Chapin, 1972 & George, 2006). Urban centres have been noted to have weak economic base due to several factors including high cost of living, high unemployment rate, inadequate land for production, low investment in the real sector, etc. (Oladoja, 2008). In the National Urban Development Policy (2006), it is stated that the formal sector of the economy accounts for relatively insignificant portion of employment, while the informal sector provides about 70-80% of employment. Accordingly, the policy noted that urban poverty has risen rapidly in recent years not only because of the growth in urban population, but also due to worsening employment situation in urban communities.

Urban centres are associated with the diversity of functions where all types of occupations, industries and services are represented. Urban centres are classified into types from small towns, big towns, cities, metropolitan cities, to mega-cities, each reflecting the population size, (Olujimi, 2011). The economic life of every urban area is determined by the quality of factors of production available in such area. These obviously include the land, the human resources and management of such resources. ILO (2011) observed that the economic activities in a given urban area is a function of different sectors which require integration, an approach focusing on development, policy and regulation, operational adaptation, linkages and plan consistency.

According to Olujimi (2011), the diversification in occupation, functions and population make urban centres to serve as engine of economic development and to act as population magnet to surrounding rural dwellers. This is so as most production activities and enterprises will find it convenient to operate in urban centres in terms of availability of infrastructures and adequate market for their products. The production and distribution function of the urban environment create jobs, employment opportunities and attract people to the urban centres (George, 2006). In essence there is a continuous expansion of the urban area, hence the need for proper physical planning and land use administration of the urban environment.

Land resources management according to FAO (1976) is the implementation of land use planning, as agreed between and with the direct participation of stakeholders. It is achieved through political decisions; legal, administrative and institutional arrangement and execution; demarcation on the ground; inspection and control of adherence to the decisions; solving of land tenure issues; settling of water rights; issuing of concessions for plant and animal extraction (timber, fuel wood, charcoal, non-wood products, hunting, etc.); promotion of the role of women and other disadvantaged groups in agriculture and rural development in the area, and the safeguarding of traditional rights of early indigenous people.

Locally, various governments have adopted methods for evaluating land and placing premium on such land. To a large extent, every parcel of land with basic infrastructure will be highly valued and can earn tax and tenement rate for government. Land development, land allocation and general land administration have posed serious challenge to our development efforts. In effect, access to land has impeded many development and economic activities, hence, a call for review and overhaul of the entire system.

There have been calls for amendment of the Land Use Act, 1978, to reflect current realities, particularly to make land more accessible for agriculture and other development project. In 2011, the Federal Government sets out to reform the land administration and land tenure system. It is hope that this process will bring about the much needed land reform in Nigeria. To achieve this, the principle of *physical planning* is required and the knowledge of the structure and functioning of the urban economy is also fundamental to all land use planning analysis and reform, according to George (2006). Indeed, George has noted that the development of an urban area controlled to a large extent, the characteristics of its productive or income producing activity and *its carrying capacity.* Therefore, physical planning is necessary for application of the design and administration of land unit for

infrastructure, such as transport facilities - roads, railways, airports, harbors; industrial plants and storage of produce; mining and power generation, and facilities for towns and other human settlements. This is in anticipation of population increase and socio-economic development, and taking into account the outcome of land use zoning and planning. It has both rural and urban development aspects, though the latter usually predominates. Adequate planning will always ensure proper deployment of land for effective uses. This is the hallmark of sustainable development, which should be a key in every development agenda.

3.2.3 Township Planning and Development Control

Development of township as a major outcome of urbanisation is a growing phenomenon in many countries of the world, especially in developing sub-Saharan countries. Development as defined in the NURPL (2004) means:

The carrying out of any building, engineering, mining or other operations in, on, over or under any land, or making of any environmentally significant change in the use of any land or demolition of buildings including the felling of trees and placing of free-standing erections use for display of advertisements on the land.

As stated in earlier, every town has developed from a nucleus of settlers owing to some economic, social or cultural activity or situation. For instance, Aledare, Okesoto and Oke (2010) noted that what is now known as Lagos metropolis grew from small community with rural characteristics and homogeneous population before the British colonisation of Lagos into a colony in 1865.

Today, Lagos has grown into a mega-city with cosmopolitan characteristics, posing serious planning challenges which hitherto were not an issue. It has equally been stated that planning should precede every development including development of town. When town planning is initiated, there is the possibility of providing needed infrastructure and controlling the emerging development. Township becomes unmanageable when planning is initiated after development and erection of structure have commenced. For this reason, there is compelling need for development control.

Development control according to Adeyeye (2010) is the "power of the state to grant development permit to a) residential development application on a parcel of land not more than 2000 m^2. b) residential development application which is not more than six family units or flats. c) residential structures of not more than three floors including the ground floor." The *NURPL* (2004) defined development permit as:

Permission to develop any land or buildings granted by the authority empowered to give such permission under the Law; while Development Control Department means *any agency performing the duties of urban and regional planning and development control at the Federal, State and Local Government levels.*

Previously, while discussing history of urban planning in Nigeria, it was stated that urban planning concept originated from the need to tame the environment for optimal health and to preserve the environment integrity. Odumosu and Fagbohun (2010) in discussing the background of development control in Nigeria stated that what could be termed as modern urban planning today could be traced back to 1904 when the colonial government started showing serious concern about the deteriorating environmental condition of the Nigeria's urban centres, which also marked the beginning of development control in the country. From 1904 to 1931, they exerted that there was no uniform planning administration in the country until 1932, when the *Nigeria Town and Country Planning Ordinance* for the Colony and the Protectorates was enacted. The Ordinance made provision for the establishment of planning authorities; preparation and approval of planning schemes; acquisition and disposal of land and for compensation for acquisition of land.

From 1955, according to Odumosu and Fagbohun (2010), Nigerian urban areas started to witness unprecedented rate of growth resulting in slums, housing facility problems, squatter settlements, overcrowding and transport problems, which necessitated development control. The first attempt at this was the 1955 slum clearance exercise in Lagos central in preparation for the 1960 independent ceremony. They further stated that though the intension of the colonial master then was to make their administrative towns conducive for their officials, it turned out to set the principles for development control in Nigeria.

Today, many states have adopted some form of development control within their capital city and some urban towns in Nigeria. How much this can be sustained in the face of spiral population growth remain to be seen. Development control sets standards and enforces such standards. It provides for orderly and sustainable development, hence, every policy maker, planner, regulator and all stakeholders should work to ensure proper and effective development control in our society. Indeed, it is necessary to strengthen all Development Control Departments to ensure that physical planning precede every development and that infrastructure is provided in all places before development projects commence.

3.3 Monitoring of Land Use and Remediation

3.3.1 Monitoring of Land Use

No single person or organisation can effectively monitor land use with the aim of curtailing abuses. The best way to achieve this is to empower community members to accept their responsibility as stakeholder in sustainable development and to guard the land against possible abuses. When community members are adequately informed of the existing physical plan, the purpose of the plan and the benefits they stand to enjoy, they will safeguard every plan and ensure its proper implementation. Importantly, the plan must reflect the yearning and aspiration of the majority of the population.

Wikipedia (2011) has stated that it is becoming more widely understood that any sector of land has a certain capacity for supporting human, animal, and vegetative life in harmony, and that upsetting this balance has dire consequences on the environment and human health. It is also a known fact that due to political and economic factors, governments are slow to adopt land use policies that are congruent with scientific data supporting more environmentally sensitive regulations. Therefore, planners and the general public should take note that their action or inaction has implication for the wellbeing of the general population and the ecosystem of today and that of the future. As such, they should under-take advocacy, educate members of the public and carry out necessary actions to influence public policy and ensure a balance and harmony in the environment. Public-interest non-governmental organisations (NGOs) and community-based organisations (CBOs) should form a coalition to ensure the integrity of urban plans and their proper implementation. Government on her part should encourage public participation and formulate enduring policies backed with effective regulations for the monitoring of land use in the country in view of its important to human survival.

3.3.2 Urban Renewable Programme

Earlier in unit 2 of module 2 while discussing *strategies for planning the expanding urban areas*, you learnt the causes of urban decay, which can be remedied through urban renewal. The *National Urban Development Policy (2006)* stated that the problems of urban renewal originated from the planning principles that segregated Nigerian cities into "European and African" area. This principle created the inner city slum comprising mainly of traditional city with indigenous people and the peripheral city of migrants which initially have some rudimentary planning. The objectives of the urban renewal scheme as provided in the policy are: a) to renew the inner areas of Nigerian cities, b) upgrade shanty towns and squatter settlements and c) to integrate the activities of settlement with

the overall development strategy of individual city through inclusion programs to be achieved through development of strategic plans; lowering the cost of providing shelter and improving access to land and secure tenure.

The concept of urban renewal or *urban regeneration* stems from environmental decay and deplorable environmental misused that impact on health and environmental integrity following fragrant environmental abuses and decades of neglect, which can no longer be remedied in a small scale except through a major intervention termed *urban renewal.* In most urban areas in Nigeria, slums and squatter settlements are common phenomena. Indeed, slums have developed side-by-side with most cities in Nigeria to the extent that it is almost taken that they exist to serve the interest of the city dwellers. In some cases, the slums grow and fused with the city that demarcation become very difficult. Generally, slum is characterised by poor sanitary condition, dilapidated structures, high occupancy ratio, inadequate or total lack of provision of basic facilities and services, etc. Such areas are prone to high prevalence of communicable diseases which may sometimes occur in epidemic proportion. To correct this, therefore, urban renewal becomes necessary.

Urban renewal according to George (2006) is the aggregate techniques deployed for the treatment of urban problems on a physical basis. Urban renewal involves re-planning, redevelopment, rehabilitation and preservation (3RP). When a planned or unplanned area has failed in its basic designed functions and tended to impact negatively on the health of man and that of other members of the ecosystem, such an area requires re-planning. Re-planning basically is examination and reorganisation of a particular geographic space, which have changed structurally or undergone changes in the attitude of their owner, which must be altered for collective good of the population.

There are two types of urban renewal: partial and comprehensive renewal. A comprehensive urban renewal is a very expensive scheme and often causes lots of inconveniences to the affected population at great cost for resettlement and reconstruction. You may have noticed that some urban renewal scheme may require a total evacuation and relocation of an entire community to a new location, demolition of entire structures in the area marked for renewal and re-designing the whole place to function optimally. The best approach should be to strengthen effective physical planning so as to avoid urban renewal scheme.

SELF-ASSESSMENT EXERCISE

i. Define the term development.
ii. What is development control?

iii. Mention two factors that have accounted for rising poverty in Nigeria.

4.0 CONCLUSION

Planning and management of built-up environment, land use and economy are processes needed to ensure orderly and sustainable development of every society. The built-up environment is that part of the earth surface occupied by man and use for all human activities, which requires proper planning, regulations, control and monitoring to promote good health and harmony in the ecosystem. Land as a major factor of production is necessary for economic development of every urban centre. Land use planning, allocation and development should attract genuine attention of planners and policy makers. Every built-up environment is located on land. Adopting necessary guidelines and planning principles become necessary to enhance effectiveness and functionality of built-up environment. The general population should be the focus of the planning process and be made major stakeholders for an enduring plan and its ownership as they would be in a better position to ensure smooth implementation of the plan. Importantly, planning should precede every development so as to avoid urban decay and urban renewal at a greater cost.

5.0 SUMMARY

In this unit, you learnt about built-up environment which is that part of the earth surface occupied by and used for every human activity, depicted by road network, residential, commercial, industrial, social and recreational development. You have also learnt that to ensure orderly development, the promotion of optimal health and the enhancing good harmony in the ecosystem, there is need for effective planning. Guidelines and principles for physical planning have been highlighted for use in planning the built-up environment. You have also been reminded of the use of mapping including GIS in planning. Land as a major factor of production holds every development; hence the needs for proper land use planning, allocation and management have been highlighted.

Major preoccupation of every urban centre is economic development. You have been reminded of how society grows and the need to plan for such expansion and ensure proper land use for economic development. Under this menu, you have reviewed the Land Use Act, 1978, particularly the issue of making land more accessible for development and economic activities to reduce urban poverty. Township planning and development control have been discussed, and the need for land use monitoring emphasised, which should be based on the strength and goodwill of every stakeholders, especially the community members. You have noted that if effective urban planning is in place, urban decay will be minimised. However, in some cases, urban renewal may become imperative usually at a very high cost. You should remember the recommendation that planning and the provision of infrastructure should precede every development of towns and cities to ensure sustainable development and avoid waste of vital resources.

6.0 TUTOR-MARKED ASSIGNMENT

1. a) Define the term physical planning.
   b) List and explain five (5) principles for land use planning.
   c) State the purpose of planning built-up environment and identify some challenges toward achieving the purpose.
2. a) Identify the features of built-up environment and highlight how physical planning can integrate these features for harmonious ecosystem and sustainable development.
   b) What is a base map?
   c) List five (5) uses of map in urban planning.
3. a) State the importance of monitoring and controlling land use.
   b) List and justify the inclusion of various stakeholders in the land use monitoring process.
   c) What should be the role of government in land use monitoring?

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UNIT 2 LAYOUT PLANNING AND MANAGEMENT

CONTENTS

1.0 INTRODUCTION

In the last unit, you learnt about planning and management of built-up environment, land use and economy. This unit will introduce you to importance of layout, how it is planned and the provision of utilities in layouts.

Layout forms a major component of built-up environment as used in urban planning, it is the arrangement of plots of land in a particular location such that each plot has an identifiable boundary and can easily be accessed through a well-planned road network within the layout to facilitate movement of goods and services. Functional layout is achieved when area marked for development is thematically demarcated into zones according to the functional needs of the people and in consecration of other factors including the natural ecological zone of the area, climatic factors and availability of other factors of production and raw materials for economic and social life of the people. Commonest layout found in Nigeria society includes residential, commercial/business, industrial/manufacturing, social/recreational and agricultural layouts. Functional layout should make provision for infrastructures, amenities and other provisions to enhance the economic, social and cultural life of the people.

2.0 OBJECTIVES

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

- state the purpose of layout planning and land demarcation
- describe various layout in Nigeria society
- describe the utilities require for functional layout
- explain how to manage layout for sustainable development.

3.0 MAIN CONTENT

3.1 Planning of Layout

3.1.1 Layout Planning and Demarcation

Previously, you learnt about land use planning as a function of physical planning. Oyesiku (2002) defined physical planning as:

An orderly spatial arrangement of the various land uses such as residential, industrial, commercial, recreation and open spaces, transportation, public infrastructure and other ancillary human activities to achieve planned objectives.

According to him, *physical planning is concerned with functional relationship among the various land uses with a view to ensuring that services are available and accessible to all conveniently and efficiently.*

This can be achieved through diligent planning, where a given part of the earth surface is demarcated into layouts with thematic functional zoning and each zone representing the needs of the population characteristics base on the planning principles outlined in the last unit.

Planning is key to efficient functional layout. Olujimi (1993) has stated that the objective of physical planning is to create or provide a pleasant healthy physical environment for living, working, recreation and movement. In this regard, physical planning covers all spheres of human endeavour and all aspects of natural or man-made resources to ensure harmony in the development of the built environment. Layout planning is expected to take into consideration the natural setting, historical, economic, institutional and other facets of human existence for all embracing and acceptable plan.

Osman, Georgy and Ibrahim (2003), have stated that efficient layout planning was fundamental to any successful human undertaking. When layout are properly designed and implemented, it allows for efficient flow of services and enhances the aesthetic value of the environment.

Proper layout of any kind should promote good health, enhance waste management efficiency and reduce risk in emergencies. Introduction of hazards is limited as layouts are designed to exclude extraneous occupation from residential and commercial areas and disease outbreak is reduced to the barest minimum and easily be controlled when they do occur.

There is a huge responsibility placed on the shoulder of physical planners to create functional layout that support human existence. Planners must make human being the focus of every planning process. When planners closed their eyes to human needs, then the objectives of setting out layout is defeated and the outcome would be difficult to implement successfully. The commonest layouts that require our utmost attention are residential, commercial, industrial and agricultural being discussed below.

3.1.2 Residential and Commercial Layouts

Layout as stated before is the way things are arranged, indeed the way component parts or individual items, design or plan are arranged for ultimate purpose (Microsoft Encarta Dictionary, 2009). The major component of city plan is the residential area/ layout. Aderamo (2000) averred that the planning of cities is expected to be carried out in such a way as to secure the maximum practicable high degree of economy growth, social interaction and convenience, health well-being and environment aesthetics. He further stated that such plan is equally expected to result into a physical environment which is conducive to health, allows convenient movement and passage from place to place, facilitate social interaction and possess visual attractiveness. These are the goals of layout planning which should guide every planner.

Most residential layouts are in groups of estates owned and managed by private individuals of company. This planning layout usually follow a particular pattern - square, circular, triangle, rectangle or even pentagon. The shape and sizes of such estate add to the beauty of the landscape and enhances the aesthetics of the environment. Residential layout should be provided with necessary infrastructure and amenities to enable it function effectively.

Now-a-days, commercial activities have been fused into residential layout for the convenience of the residents. In most cases it is always difficult to have a clear demarcation between residential layout and commercial layout. A good example is the mere integration of commercial activities into purely residential areas in Abuja *Phase 1* development zone (Asokoro, Garki, Maitama and Wuse Districts). Despite all the efforts aimed to discourage commercial activities in these

residential layouts, more of such activities are springing up almost on daily basis to the extent that residential buildings are converted to business premises with impunity even with high annual penalty on contravention; landlords are willing to pay in perpetuity.

3.1.3 Industrial Layout

Industrial layout like the residential layout is planned to achieve harmony and orderly arrangement of types of industries, machines and materials needed for production as well as ancillary services like water supplies, electricity road network/ railway, etc. needed for optimal operation and smooth working of the industries. The main feature distinguishing residential layout from industrial layout is recognition of potential hazards that may emanate from the industrial layout in the course of production. It has been noticed that even when hazardous waste strategies have been put in place and operationalised, sometimes the discharge of industrial effluent and dangerous chemical substances into adjourning environment is inevitable. It is for this reason, that industrial layout is often sited out and far away from residential layout.

Industries as a matter of fact requires heavy equipment, high volume of water and electricity and road and rail network that can handle the movement of raw material and the finished good to where they are needed.

3.1.4 Agricultural Layout

Agricultural layout like its industrial counterpart is often sited outside residential area and requires massive land area for its functionality. In addition, agricultural layouts require soil analysis for their planning to determine suitability. When a place is demarcated for agricultural purpose, measures are taken to exclude other activities from that zone because of possible soil and air pollution as a result of the processes within the layout.

Within the layout, further schematic design is carried out to give effect to the functionality of the layout. In a large mechanised farm for example, the layout will be further demarcated for crop and vegetable or even citrus planting, piggery, poultry, goat and sheep raring, snail raring, etc. Further provision is made for product processing, packaging, labeling and transportation. A good schematic design within agricultural layout should make provision for waste management to protect the health of the workers and the animals within the layout. In this case, bio-safety becomes an issue for attention to prevent the introduction of zoonotic disease into the farm that may lead to huge losses and animal or man epidemic. Of course, the layout should be planned in such a way

that there are access roads into and outside the farms, there are provisions for electricity and adequate water supply.

3.1.5 Landscaping

Landscape is an essential feature of urban layouts, which enhances the aesthetics of the urban environment. A good layout must have a well-planned landscape. Zube (1986) defined landscape planning as an activity concerned with reconciling competing land uses while protecting natural processes and significant cultural and natural resources. The creation of harmony between the natural environment and the built-up environment is the major function of landscaping. In this context, landscape planning does not always means an ecological planning, but a process that uses the scientific and technical information for considering and reaching consensus on a range of choices to meet the needs of a specific population. On the other hand, ecology planning is the study of the relationship of all living things including people, to their biological and physical environments. Hence landscape enables a consensus and harmony to be established among the various members of the ecosystem.

The steps in designing a functional landscape plan according to Iowa State University (2007) and Wikipedia (2012) includes:

- Gathering information about the site and who will use it.
- Identifying problems and opportunities.
- Establishing goals.
- Taking inventory and analysing the biophysical and built-up environments.
- Prioritising the needs and wants.
- Developing concepts and the selection of options.
- Determining the shape of the spaces and how they relate to each other.
- Adopting a plan.
- Considering maintenance requirements.
- Determining the budget and cost of implementation and maintenance.
- Organising the landscape space.
- Selecting the plants that will fill the landscape.
- Ensuring community involvement and education.
- Producing detailed design.
- Planning implementation.
- Planning administration and management.

Wikipedia (2012) noted that just like public health, the collective landscape is a public good which should be protected and enhanced, and the activities should involve all stakeholders including the legislators and public administrators. When landscape is not properly planned and

managed, its impact is felt by all and could result in impaired public health. According to Wikipedia if, for example, mineral extraction has a damaging impact on the landscape, proper intervention should be initiated. Negative impacts on the landscape could include visual impacts, ecological impacts, hydrological impacts and recreational impacts. Landscape should protect existing public goods and societies should be responsible for the creation of landscape as new public goods through positive landscape planning.

3.2 Public Utility and Management

3.2.1 Evaluation and Assessment of Needed Public Utility

According to Wikipedia (2012), utilities refer to the set of services provided by publicly- owned companies/organisations and consumed by the public. These services include electricity, natural gas, water, sewage/ waste management, public mass transit (road & rail), etc., and may include telephony in some countries. Public utilities, as noted by Hart (2009) are business enterprises set up to provide essential services to the public. According to him, these services include electricity, gas, water, sewerage, telephone, and telegraph. Because public utilities are so vital to economic and social well-being of the population, they are usually operated as a natural monopoly and subjected to a high degree of governmental control and regulations.

Public utility is an organisation that provides and maintains infrastructure for public services. Oke (2010) confirmed that utility is synonymous with amenities and therefore listed the commonest amenities in Nigeria society to include electricity, water, domestic and community services or facilities that make life worth living. These amenities are not evenly distributed. Oke noted that their provision vary from one town to another and from one neighbourhood to another in types, quality and quantity. Because of their health related implications, the guiding principles should provide adequate provision for the population and quality of service to exclude risk to health and the environment.

Ensuring standard and quality service is the hallmark of public utilities. Therefore in general principle, they are subject to some forms of public control and regulation ranging from local community-based groups to state-wide government policy and monopolies. Regulations and control are meant to ensure quality, safety and appropriate pricing regime as well as to promote healthy competition among providers. It is also desirable to stabilise and control market power, promotes investment and system expansion, (Wikipedia, 2012). However, Hart (2009) has observed that the monopoly status of many utilities has eroded the 1980s

largely due to government deregulation. There is now competition in such areas as long-distance telephone service, natural gas pipelines, interstate and intercity mass transit bus service, etc.

The time to decide what utilities to be provided at a particular time is when the layouts are planned. At the planning stage, it is possible to determine the number of intended users of a particular service, which can become the benchmark with allowance for unexpected increase in population and future expansion. The size of the layout, the population and the economic power of the people to be serviced are determinant factors in deciding the quality and quantity of utilities to be provided in any layout.

As stated before, an industrial layout will require high volume of electricity and water for its production processes. Such may require a setting up of a dedicated electricity generating plant and mini water supply scheme within the layout, whereas a residential layout may be fed from a distant plant and water scheme. In essence, the volume of the required service and safety consideration will determine needed utilities to be provided in every layout. Nonetheless, whatever services are required and provided, they must meet certain minimal safety and quality standards; Hence the need for effective regulations and enforcement of standard. The standard includes ensuring uniformity of service and appropriate pricing.

3.2.2 Planning and Provision of Public Utility

When layout is conceived and needed utilities to be improved upon, there is need to plan how the services will be provided, particularly where pipes, cables and channels will pass through. In many developing countries, it is common to see finished road being cut through to pass water pipe or cables for telephone services or electricity in efforts to provide needed utilities. Although, these practices stem from the fact that public utilities were often limited to wealthier parts of major cities as used to be the case in developed countries in the 19th century, now some developing countries have started to extend some utilities to large urban population and as such these services are being made to crisscross existing infrastructures, most of the time causing great damage to them. Such situation can be avoided if proper planning is embarked upon before the development of the layout and provision of needed utilities.
Attempt at planning of layouts and the provision of utilities has been made in the Nigeria's Federal Capital Territory, Abuja. In the Phase one development area comprising Asokoro, Central area, Garki, Maitama, and Wuse Districts; sewer, electric cables and drainages were provided before the commencement of superstructures. To a large extent, Abuja was conceived to a modern city surface drainage and overhead

electricity cables were undesirable. However, due to several manipulations and compromising the master plan, some additional services have to provided, thereby infringing on laid down standard. It is imperative that if we have to plan and maintain standard as done in most developed countries, we have to be discipline in our planning efforts and implementation of the provision of utilities in our urban areas.

3.2.3 Maintenance of Public Utility

Planning and provision of services at the consumer level, be it residential, commercial, or industrial consumer requires diligent planning and maintenance policy guidelines and implementation. Public utilities can be privately owned or publicly owned. Publicly owned utilities have failed in many developing countries including Nigeria. Oluwakayode (2002) noted that over the years, significant proportion of government revenue have been expended on the provision of public utilities, with little to show for it. He stated that governments have invested tremendously in virtually every sector of the economy, yet the social and economic lives of Nigerian have not improved. For instance, successive governments have drained the national treasury into the power sector, yet Nigeria still boast of generating a maximal four thousand megawatt of electricity for over 160 million population. Aside from inadequacy, most public utilities are poorly maintain, hence do not last their lifespan. Due to this appalling situation, government decided since 1986 to privatise most of her public corporations and companies. Yet ineptitude on the part of operators of these services and interwoven web of corruption has denied Nigerian the benefits from public utilities.

For public utilities to function effectively, there must adequate provision for maintenance. Unfortunately, Nigeria is noted to have poorest maintenance records. In fact, it has been said that Nigerians have very poor maintenance culture. This definitely accounts for the dilapidation in most of the existing public utilities. Mass transit system has failed in most cities in the country as the buses would not just ply the roads two-three months after inauguration, sometimes due to minor maintenance like changing brake pad. Maintaining the infrastructure for a public service or utility demands a set of sound practices to enable Quality of Service (QoS). Uniform construction procedures must be followed by all providers, while consumers must pay for services provided.

3.3 Control and Management of Layout

As a matter of principle, layouts must be subject to control. What makes a layout livable and able to render intended services is the control exercise over its planning, development and use. There must be prescribed standard for building materials, road network, drainage,

sewage treatment and disposal, waste management, power generation and distribution, water supplies, etc., in every layout.

When layout is planned and implemented, there is need for municipal government to ensure that all necessary services are provided and the development is monitored to ensure standard in safety and quality. Odumosu and Fagbohun (2010) noted that exercising such control when the development is taking place help to guide towards the achievement of the development proposals contained in approved layout. Such control and monitoring of the development processes are important to ensure that the intended benefits enshrined in the layout proposal accrue to the population. We have heard of collapse structures in private and public layout/ estate. Some loss of lives is involved in most cases. Though no regulator has ever been punished for negligence, the use of Development Control is apt and necessary to ensure that regulations are enforced in layouts.

SELF-ASSESSMENT EXERCISE

i. What is a layout?
ii. List the common layouts you would find in your community.
iii. State the main objective of planning and demarcating an area into layouts.
iv. Why should you control development activities within layouts?

4.0 CONCLUSION

Layout is best set out holistically with the consideration of the *whole person* needs, aspirations and desires, as well as the future needs and that of emerging population and technological advancement. Planning and management of layouts are important activities in urban planning which requires excellent conceptual mind, discipline on the part of the planner and consultative skill to seek out and deploy necessary input into creating enduring layout scheme.

Therefore, layout should be people-centered, capable of meeting the need and aspiration of majority of the population to avoid introduction of extraneous items unintended when the layout is fully functional. Necessary utilities should be planned and provided to ensure functional effectiveness of every layout. By so doing, improved health and wellbeing of the population will be assured.

5.0 SUMMARY

In this unit, you have learnt how to plan and manage layout to achieve optimal health, sustainable development and risk reduction in a given

geographic space. Under this, you have learnt how geographic space is planned and demarcated into residential, commercial, industrial and agricultural layouts including landscaping. You have also learnt how to evaluate and assess the needed public utilities for each type of layout and how to plan, provide and maintain such utilities to make layout function optimally. Lastly, the need for effective control and enforcement of regulations to ensure standards in safety and quality has been stressed. It is hoped that you will find the information useful in your environmental assessment and monitoring to ensure quality of health of the population in your area of jurisdiction.

6.0 TUTOR-MARKED ASSIGNMENT

1. a) Define physical planning in relation to layout planning and state how layout planning can be used to achieve functional relationship among the various land uses.
   b) List four (4) layouts you have studied and describe how residential layout should be planned to achieve optimal health and aesthetic value of the environment.
2. a) Examine the importance of regulation in layout planning & management
   b) State the features of adequate layout
   c) Explain the relevance of proper layout and landscape planning and management to health
3. a) What is utility?
   b) List the various utilities in Nigerian society.
   c) Planning for the provision of utilities has been a major challenge in Nigeria. Trace the history of utility provision in Nigeria and explain five (5) reasons why it has been difficult to achieve efficient utility services in Nigeria.

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UNIT 3 ENVIRONMENT, SPATIAL QUALITY AND URBAN PLANNING

CONTENTS

1.0 INTRODUCTION

Various definitions of environment have been given, but the sum total points to the fact that the environment is everything (physical, chemical and biological) which is present outside an individual species that may influence it in one way or the other. In essence, each organism has its own environment (Rana, 2009), and this environment exert a lot of influence on the organism. Again the environment is seen as the aggregate of surrounding things, conditions, or influences and their impact on one another. The extent the environment influenced each organism is determined by the quality of the environment. The spatial quality of an environment relates to the created or built-up environments - infrastructure, buildings, landscapes, etc. To ensure the highest standard of this quality and risk-free environment, effective planning and management mechanism must be put in place for orderly development. There is basic assumption that the knowledge you have gained from courses like EHS 202, 204, 205 and 212 will assist you in understanding the concept of spatial quality control. In this unit therefore, you will learn about how urban planning can serve as tools for improved spatial quality of the environment.

2.0 OBJECTIVES

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

- define environment and spatial quality
- state the components of the environment and their inter-relationship
- explain ways urban planning can be applied in spatial quality management.

3.0 MAIN CONTENT

3.1 The Components of the Environment

3.1.1 The Physical Environment

The physical environment is the surrounding which is seen around an organism. According to Howard (2002), this environment plays significant role in human existence and influence health to a large extent. It is made up of the natural and the built (man-made) environments. It has been stated that the environment of a person is all that is other than him or her and which, directly or indirectly, influences or is influenced by that person (Andrewartha & Birch, 1954). The physical environment plays significant role in shaping human lives and enabling man creates the type of environment that he requires or can possible create. Boateng (1990) noted that development is hung on turning available resources to enhance environmental quality and value of life. To achieve sustainable living environment with the highest spatial quality, the need to integrate the designing and planning of the urban centres becomes imperative for orderly development of the physical environment and to meet the challenges of social, economic and environmental demands.

The built-up environment and human settlements according to Boateng (1990) deserve close and careful attention especially in the present circumstances of many developing countries, where urban agglomerations are glowing at alarming rates and many of them are fast becoming unmanageable because of poor physical planning and inadequate institutional arrangement. Oke (2010) also pointed out that environmental quality may deteriorate when certain parameters are ignored or left unregulated or uncontrolled. These are always the outcome of neglecting proper planning of the physical environment, which is the bane of most urban centres in Nigeria today that has necessitated the call for urban renewal. Boateng therefore counseled that human settlement especially in urban centres should be recognised as key elements in the development process because of the crucial roles

played by populations as both agents and beneficiaries of development process itself. The physical environment is where every human activity is conducted. Therefore, it must be handled with care to enable it render its enormous responsibility.

3.1.2 Biological Environment

Biological environment is the environment where life exists, called the biosphere, and includes land, water, and air. WHO (2005) defined biological environment to mean and include the influence of all biological factors such as warmth, moisture and humidity, as well as the plant ecosystem in which the animal lives and the associated populations of vertebrates and invertebrates that may compete for food and space, and may also act as reservoirs for infectious diseases. From this definition, biological environment holds human, animal and plant lives. It is the environment that every interaction among living organisms takes place. Invariably, it is the environment which harbour disease-causing microorganism that impact on human and animal health.

Indeed, Christopherson (2006) has noted that all of the biotic and abiotic factors that act on an organism, population, or ecological community and influence its survival and development take place in the biological environment. It is also needful to note that the biotic factors in this context include the organisms themselves, their food, and their interactions. On the other hand, abiotic factors include such items as sunlight, soil, air, water, climate, and pollution which facilitate growth and development of organisms. Interestingly, organisms respond to changes in their environment by evolutionary adaptations in form and behaviour. In essence, the biological environment must always provide conducive condition for organisms to thrive and continue their existence. Experience has shown that this is not always the case as adverse conditions often limit the growth and development of organism in their natural and adapted environment. The reason for effective planning of the urban environment is very obvious, considering the need to ensure an environment that is balanced and capable of supporting lives. To this end, it is imperative for every stakeholder, particularly policy makers and regulators to put in place enduring mechanisms for the implementation of measures that would constantly ensure harmonious existence and conducive environment devoid of hazard that may adversely affect the health of human, animal and plant lives and compromise the integrity of the environment.

3.1.3 The Chemical Environment

Chemicals are the products of the physical and biological environments. Some chemicals exist freely in nature and are contain in plants, rocks, body tissues and other medium, but most chemicals are compounded by man for various uses. According to ILO (2009), chemicals are widely used throughout human society, with both positive and negative effects on health, well-being, socio-economic aspects and the environment. The chemical environment therefore is that part of man and animals' environment that is composed of chemicals. For farm livestock this includes fertilizers, defoliants, worm drenches, insect sprays, adjuvant to feed, pesticides, etc. (WHO, 2005). There are sundry chemicals used in agriculture and these include pesticides, anti-helmintics, fertilizers, algaecides, herbicides, soil fumigants and the like.

Though chemicals are known to assist man in various ways to fight pest, disease vectors and microorganisms, their wrong applications have equally brought miseries and untold woes to man. ILO (2009) observed that significant but still insufficient progress has been made in international chemicals management and regulations. However, serious incidents still occur and there are still negative impacts on both human health and the environment as a result of the use of chemicals. It is a common knowledge that the sound management of chemicals at the workplace is directly linked to protection of the environment and risk reduction. But many employers and employees have not heeded to guidelines and regulations aimed at sound chemical management. Indeed, many employees and other vulnerable groups like children are often exposed to toxic chemicals in the environment without knowing and without adequate protection.

Knowledge is very important in the prevention and control of the effects of chemicals in our environment. In fact, Dowdeswell (1993) stated that "knowledge is the most effective weapon against diseases caused by chemical exposure". This informed the establishment of *International Register of Potentially Toxic Chemicals* by the United Nations Environmental Programme (UNEP) to inform people of such chemicals and their potential health effects. To this end and to underscore its importance, many international treaties and conventions have been adopted to manage and control the use of chemicals in human environment so as to protect health and the integrity of the environment. Dobson (1993) pointed out that for us to protect the environment; we need to determine where the chemical will occur within the environmental compartments, e.g. in water, soil, etc. which organism are most susceptible and how severe the effect will be on the general population in the ecosystem. The international community went further to establish specialised bodies and convention to control chemicals in the environment and some of these are highlighted below.

a) The Stockholm Convention on Persistent Organic Pollutants

(POPs) is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, and become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife. Exposure to POPs can lead to serious health effects including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and even diminished intelligence (ILO, 2009). Because of their wider applications and long range transport, POPs have created serious problems to people in many regions where they did not originate and posed serious challenge to policy makers, regulators, and environmental mangers to the extent that no one government acting alone can protect his citizens or its environment from POPs. In response to this challenge therefore, the Stockholm Convention, which was adopted in 2001 and entered into force in 2004, requires parties to take measures to eliminate or reduce the release of POPs into the environment, (ILO, 2009). Furthermore, the 2002 Johannesburg *World Summit on Sustainable Development* enlisted the support of the international community and commitment to ensuring that, by the year 2020, chemicals are produced and used in ways that minimise significant adverse impacts on the environment and human health (ILO, 2005).

b) The Rotterdam Convention on the Prior Informed Consent

Procedure (PIC) for Certain Hazardous Chemicals and Pesticides in International Trade, adopted on 10th September 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands. The Convention entered into force on 24th February 2004 with the following objectives:

- to promote shared responsibility and cooperative efforts among parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm.
- to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to parties.

The Rotterdam Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure and built on the voluntary PIC procedure, which was initiated by UNEP and FAO in 1989.

c) Other similar Conventions, Protocols, Code and Programmes

include:

- International Code of Conduct on the Distribution and Use of Pesticides.
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal.
- Convention on the Prohibition of the Development, Production, Stockpiling and use of Chemical Weapons and their Destruction.
- Vienna Convention for the Protection of the Ozone Layer.
- Montreal Protocol on Substances that Deplete the Ozone Layer.
- United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances.
- Programme on Safety and Health at Work and the Environment (SAFEWORK).

International Labour Organisation (ILO) have insisted that firstly, there must be adequate information and understanding about every chemical in the workplace in the form of labels and chemical safety data sheets and job aids. Secondly, that there must be a clearly established policy on the safe use of chemicals in the workplace, providing the framework for both organisational and operational control measures. Thirdly, that the management of chemical hazards is a task requiring the participation of both employers and workers. This bilateral responsibility should starts before the receipt of the chemical and continues without interruption and ending when the chemical is neutralised or destroyed, (ILO, 1993). WHO (2010), have also observed that other interventions that can make the environments safer and healthier include promoting safe, careful use and management of toxic substances at home and in the workplace; and better water resource management. It is hoped that if all these conventions, treaties, codes, procedures and interventions are implemented to the letter, we can be sure of healthy and safe environment free of toxic chemicals and would be able to bequeath our children an environment that is healthier and safer than ours today.

3.1.4 The Inter-relationship between the Components

As stated before, the natural environment is contrasted with the built environment, which comprises the areas and components that are strongly influenced by humans. Indeed, it has been noted that human activities in the natural environment has been the bane of man-environment relationship catastrophe. In a sense when human beings do not disrupt the natural environment, there is harmony and no hazard is introduced. Whenever man enters the natural environment to hunt for food, build shelter or recreate or in one way or the other initiates what is

termed development, harm is done to the environment from waste generated and dumped indiscriminately and the destruction of the ecosystem.

A geographical area is regarded as a natural environment, which is often used synonymously for habitat. Habitat has the potentials to hold the physical, chemical and biological environment of the earth surface without significant effect until and unless there is disruption in environmental equilibrium. Earth science generally recognises four spheres the lithosphere, the hydrosphere, the atmosphere, and the biosphere as correspondent to rocks, water, air, and life (Wikipedia, 2012). These spheres form the natural environment which may be exploited by man and animals for their living.

According to Johnson (1997), the natural environment encompasses all living and non-living things occurring naturally on earth or some region thereof. It is an environment that encompasses the interaction of all living species. The concept of the *natural environment* can be distinguished by two components:

i) Complete ecological units that function as natural systems without massive human intervention, including all vegetation, microorganisms, soil, rocks, atmosphere, and natural phenomena that occur within their boundaries and
ii) Universal natural resources and physical phenomena that lack clear-cut boundaries, such as air, water, and climate, as well as energy, radiation, electric charge, and magnetism, not originating from human activity. The quantum of these components and their composite interaction in the natural setting is therefore the natural environment.

Symons (1997) has stated that it is difficult to find *absolutely natural* environments, and it is common that the naturalness varies in a continuum, from ideally 100% natural in one extreme to 0% natural in the other. It is equally difficult to point out a virgin natural environment in any ecological setting. More precisely, we can consider the different aspects or components of an environment, and see that their degree of naturalness is not uniform. If, for instance, we take an agricultural field, Symons continued, and consider the mineral composition and the structure of its soil, we will find that whereas the first is quite similar to that of an undisturbed forest soil, the structure is quite different. What then will avail us the conclusion of the naturalness of any environment? One may ask. The absoluteness of a natural environment is vague or theory in mirage. What we can then realise is the huge responsibility on human to ensure the harmonious relationship among the organisms within their ecological units. Man must seek to ensure this by adopting

measures to tame the environment for his survival which is the focus of environmental health.

This is why WHO (1997) and Novice (1999), described environmental health as the science that is capable of addressing all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. Behaviour is key to environmental quality management since every human behaviour is caused and most public health intervention often target human behaviour. Hence, environmental health practice is targeted towards preventing disease and creating health-supportive environments. This definition excludes behaviour not related to environment, as well as behaviour related to the social and cultural environment, and genetics.

In summary, biological environment is a component of the physical environment and they inter-relates with the chemical environment as well. Every organism in the ecosystem is capable of causing harm to one another in the course of their interaction and attempt to meet their physiological needs. The inter-dependence of organisms in their various environments also highlights the inter-relationship among them and within the ecosystem also known as the environment. The environment as defined by Howard (2002) is and includes the physical environment we live in and the social fabric of the community and both significantly influence health. Indeed, there is no clear boundary between the component units of environments.

3.2 Spatial Quality and Variations

3.2.1 Definition, Concept and Policy

Spatial quality simple refers to the arrangement and mechanism put in place to ensure orderly development of the human environment to support robust health and the aesthetics of the environment. It is the policies, strategies, designs and effective creation and use of spaces. It applies to buildings, landscapes and infrastructure. It is also a system adopted by stakeholders to ensure sustainable development, which requires the cooperation of all.

As stated by Moulaert, Schreurs and Dyck (2011), planners are always interested in evoking “alternative futures about the qualities of the environment, their potentials and their possibilities”. Urban design according to them, tends to develop sets of “ideas about how space should be organised, what forms it should take and what functions it should perform” as well as saving as a crucial tool in shaping urban

space. Community developers are increasingly interested in the relation between space and the bringing about of social innovation, cultural revival and economic buoyancy from their created environment. There seems to innovative *spatial planning*, *research by design/urban design*, and *social integration* to evolve a living sustainable environment. Therefore, the aim of spatial quality is to improve the quality of life and remove as much as possible the risk to health and prevent environmental pollution by maintaining the integrity of the environment.

Formulating environmental policy for higher spatial quality demand the knowledge of the ecosystem of a given environment, the ecological constituents and the interaction between members of the ecosystem. Carry Institute of Ecosystem Studies (2012) defined ecology as the scientific study of the processes influencing the distribution and abundance of organisms, the interactions among organisms, and the interactions between organisms and the transformation and flux of energy and matter. Such changes have made the demand for quality a continuum and *sine-quo-non* to enduring spatial quality and environmental standard. Maconick (1990) has observed that every environment is an ecological microcosm of the global ecosystem. Each ecological peculiarity requires specific management approach to enhance global environmental equilibrium. Planning the physical environment enables the optimal utilisation of the environment resources and enhances the spatial quality.

3.2.2 Spatial Quality Standard

Spatial standard is considered in term of spatial density. George (2006) explained that density in urban planning refers to the number of objects – i.e. the number of houses, rooms, persons, etc. per unit of space. This accounts for the reason of demarcating geographic space into *high, medium and low* residential density. Generally, house and structural layout in low density area usually appear to be orderly and well planned. It is also easy to provide infrastructures and utilities with minimal damage to structure and the ecosystem. To ensure the objective of planning, spatial quality standard must be established, maintained and constantly improved upon base on emerging environmental challenges, technological advances and emerging and re-emerging public health problems. Updating existing quality standards should be a routine exercise that should be the concern of relevant professional bodies.

Oke (2010) has explained that improvement in the quality of the environment should increase as city increase in size in response to certain environmental requirements. Indeed, this should be expected as ideal to ensure optimal health and improve environmental condition. However, Oke also noted that this is not always the situation as the

reverse could even be the case. He contended that in some ways the environment may also deteriorate either because certain parameters have been ignored or left unregulated or uncontrolled. When such negligence sets in, we are bound to notice deviation in the quality of life. However, adopting supportive environments for health concept could help address this malady. WHO (1997) have noted that when the environment is mismanaged, health can be damaged. WHO then counseled on the need to improve on environmental management to sustain improve health by adopting supportive environment free from major health hazards, satisfies the basic needs of healthy living and facilitates equitable social interaction.

We have seen the practical manifestation of environmental spatial quality neglect in Nigeria societies in form of uncollected solid waste littering everywhere. The results of the general environment quality have been high prevalence of communicable diseases and incidences of epidemics of diseases like cholera, Lassa fever, meningitis, measles, etc, which are all environment related. Physical planning should put some mechanism in place to audit the environmental parameters to ensure that spatial quality is maintained. Such parameters should include indoor and outdoor air quality, efficiency of waste management, housing factors and housing conditions, drinking water quality, maintenance of ambient temperature and ventilation, vegetation and tree planting for environmental heat control, control of disease vector, etc. Community members could decide to embark on waste minimisation as a strategy to improve on the spatial quality standard of their environment. This they can do by developing some control mechanism as highlighted by Das and Behera (2008). This according to them includes source reduction and recycling. The benefits of such control would include:

Improved environmental aesthetics, improved waste management efficiency, cost reduction, conservation of raw materials and energy, improved work environment, better compliance to environmental regulations and good public health image.

Boateng (1990) has pointed out that insistence on high environmental quality standards by developing countries could have certain implications that might works against rapid industrialisation. Indeed, such fear cannot be sustained in the light of available information, knowledge and experience possess today. Developing countries, including Nigeria do not need to follow the path of the developed countries in the quest for industrialisation that compromised environmental safety standards and the quality of life (QOF). It is indeed, unfortunate that today, developed countries are grabbling with the problems and effects of uncontrolled industrialisation like cancers, dermatitis and global warming. Carbon trading is now the new thinking

while the world is battling the effects of global warming. These are unintended consequences of industrialisation, which require global actions. The consequence of variation in spatial quality is not only the woes of today, but persists for generations to come. Man must always note that in his quest to exploit the environment for his immediate benefits, the quality of the environment should remain sacrosanct for the benefit of the population living today and that of future generation. These benefits include optimal health and aesthetic environment.

It is in this regard that WHO (2005) stated that better environmental management could prevent 40% of deaths from malaria, 41% of deaths from lower respiratory infections, and 94% of deaths from diarrheal disease – three of the world's biggest childhood killers. Therefore, maintaining environmental quality standard will continue to enhance sustainable optimal health and prevent environmental pollution. A clean environment as noted by Howard (2002) will help to prevent the spread of communicable disease and may reduce depression and stress. He further observed that safe and adequate water supply, basic sanitation, good drainage and efficient waste disposal all benefit health by moving disease vectors from human contact, whereas in contrast, dirty environments will encourage the spread of diseases and may adversely influence the mental and emotional well-being of individuals.

Furthermore, spatial quality can be improved by good housing quality including indoor air quality. Jiboye (2009) documented from a study he carried out in Osogbo that housing quality was perceived to mean and include houses with good water supply, availability of electricity, efficient waste disposal, good drainage and good road network. Moses (2005) while discussing health risk of indoor air quality in Nigeria, noted that good indoor air quality was essential for the promotion of good health in every community. He mentioned smoking, use of rug carpets, use of biomass for fuel and the use of inefficient stove and adulterated fuel for cooking as well as poor ventilation as some of the causes of indoor air pollution. He recommended the need to control indoor air pollution so as to improve sound health. Therefore, good housing and improved indoor air quality will definitely improve spatial quality.

3.2.3 Maintenance of Spatial Quality

Maintaining high level of spatial quality has been a daunting task to most urban regulators and managers. In fact, in most communities where the link between environmental quality and health problems are not well understood, the general population regards some measures put in place to maintain spatial as burdensome. Mabogunje (1996) mentioned that generally, Africans were oblivious of the necessity to look after the quality of their environment. To them, the maintenance of the

wholesomeness of the environment is in the public domain; hence government should take the responsibility. The problems are compounded where urban planning principles are not adhered to. There is no how the environmental quality can be maintained or improved upon without active participation of the general population.

The main objective of urban planning as stated before is to ensure orderly sustainable development. This is easily achieved when there is effective land administration and good physical planning. Similarly, the main objective of land use planning is to allocate land uses to meet the economic and social needs of people while safeguarding future resources. Proper land use planning can help to facilitate high level of spatial quality. Land use and physical planning have an integrative function to ensure good spatial quality. Proper monitoring of physical planning, land use and development activities are *sine-quo-non* to environmental spatial quality. Efforts should be made to abate nuisances, control air quality, prevent pollution (soil, air, water, noise), conserve energy and prevent risk and manage emergencies. The need to maintain high environmental quality standard is a major pre-occupation of EHOs in collaboration with the Town Planners. This relationship should be sustained.

SELF-ASSESSMENT EXERCISE

i. What is the aim of spatial quality?
ii. Write notes on:
    a) lithosphere
    b) hydrosphere
    c) atmosphere
    d) biosphere.
iii. Define
    a) physical environment
    b) chemical environment
    c) biological environment.

4.0 CONCLUSION

The environment is central to life and holds all organisms in their ecological units. The interactions among these organisms within the environment, the need to exploit the environment for their benefit (food, shelter, etc.), often results in environmental disequilibrium with dire consequences on the organisms particularly man. The various components of the environment - physical, chemical and biological, all act in tandem, and in their natural state pose no threat to man. However, because of the disequilibrium, there is need for spatial quality planning and control. Planning therefore becomes a tool for creating spatial quality and maintaining it for sustainable development and improved

quality of life. All stakeholders should work together to ensure harmony in the environment and high standard spatial quality.

5.0 SUMMARY

In this unit, you have learnt the meaning of environment and its components. You have also learnt about the interrelationship among the components and the organisms in their various ecological unit. You have further been reminded of what the built-up environment is and the need to maintain high environmental standard in planning and management of environmental resources. You have equally learnt about spatial quality as prerequisite for improved quality of life. The need for proper urban planning to ensure spatial quality has also been stressed. A call has been made for Environmental Health Officers (EHOs) and the Town Planners to cooperate to ensure spatial quality for sustainable development and higher quality of life.

6.0 TUTOR-MARKED ASSIGNMENT

1. (a) List five international instrument for the management of chemicals in the environment and write brief notes on two of them.
   (b) List five benefits of these instruments.
   (c) What are the impediments toward implementation of the instruments?
2. (a) Differentiate between physical and built-up environment.
   (b) How would you ensure the maintenance of spatial quality in your LGA?
   (c) Explain the importance of urban planning in achieving the goal of spatial quality.
3. The biological environment is where life exists; discuss this statement using the following headings:

- Definition
- Constituents
- Interaction among organisms
- The ultimate source of energy
- Maintenance of ecological balance.

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UNIT 4 FLOOD PROTECTION, RURAL AND COASTAL INFRASTRUCTURE

1.0 INTRODUCTION

In the last unit, you learnt the different types of environment, spatial quality and risk prediction. You would recall also in the same unit that we mentioned some factors which control environmental integrity and its quality (spatial quality), which pose great risk to the environment and health. We also mentioned that these factors that causes variation in the spatial quality can be predicted using some models and measurements.

The occurrence of flood in a particular geographic area often impact on the environmental integrity accompanied with extensive damage to ecosystem, farmlands/crops and personal and public property. Flood often accompanied with miseries and loss of lives. The low/wetlands, flood plains and coastal land are always the worst hit, hence the need to undertake flood protection measures. In this unit, you will learn about flood - what it is, the type and causes of flood, its effects and ways to predict and manage it, including the protection of coastal infrastructure so as to reduce the effect of flood on man and the environment.

2.0 OBJECTIVES

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

- define flood and state it causes and effects
- list and explain ways to predict flooding
- describe how to protect communities against the effects of flooding.

3.0 MAIN CONTENT

3.1 Flooding: Causes and Effects

3.1.1 Definitions

Flood is the presence of excess water on the surface of the earth due to run-off or overflow of bodies of water such as rivers and seas, or from water embankments like lakes, dams, reservoirs, pipes, etc. Microsoft Encarta Dictionary (2009) defined flood as water covering previously dry area: a very large amount of water that has overflowed from a source such as a river or a broken pipe onto a previously dry area. Flood as a natural phenomenon could occur anytime, but it is more common during the raining season, and more intensive and devastating now due to effect of global warming.

Flood according to Glossary of Meteorology (2000) is an overflow of water that submerges land, surrounding structures and property. The European Union (EU) Flood Directive (2007) defines flood as a covering by water of land not normally covered by water. In the sense of *flowing water*, the term may also be applied to the inflow of sea and ocean tide. Glossary of Meteorology (2000) and Wikipedia (2007) explained that flooding *(a state of being under water)* may result from the volume of water within a body of water, such as a river or lake, which overflows or breaks levees*(natural river embankment)*, with the result that some of the water escapes its usual boundaries, or may be due to accumulation of rainwater on saturated ground in an area. This therefore means that flood is an unusual unpredictable event or disaster, which in some cases may be beyond the capacity of the local population to cope (Moses, 2011).

3.1.2 Types of Flood

Floor as a natural phenomenon can occur anytime at any place due to several causes and the type of flood in question. Flooding can be divided into different categories according to their duration. In terms of duration,

three categories of flood have been identified (www.floodsite.net). These are:

- *Slow-Onset Floods:* which usually last for a relatively longer period of one or more weeks or even months with resultant loses of stock, damage to agricultural products, roads and rail infrastructures.
- *Rapid-Onset Floods:* last for a relatively shorter period of one or two days only, but can cause more damages and pose a greater risk to life and property as people usually have less time to take preventative action during rapid-onset floods.
- *Flash Floods:* may occur within minutes or a few hours after heavy rainfall, tropical storm, failure of dams or levees or releases of ice jams; capable of causing the greatest damages to society.

Flooding can also be divided into different categories according to their location. Under this category, the following types of floods have also been identified:

- Coastal floods
- River or fluvial floods
- Ponding or pluvial floods
- Arroyo floods and
- Urban floods.

(a) Coastal Floods

Coastal floods usually occur along coastal areas like the Niger Delta areas of Nigeria. Hurricanes, tropical storms and heavy tropical rainfall, which produce giant tidal waves created by ocean water, may be driven onto the coastal areas and cause coastal floods.

(b) River Floods

River floods occur when the amount of river flow is larger than the amount that the river channel can hold, leading the river overflowing its banks and flooding the areas alongside the river banks. This may be cause by factors like snow melt or heavy rainfall.

(c) Ponding Floods

Ponding or pluvial flood is a type of flooding that can happen in relatively flat areas, when more rainwater enters a water system than can be stored, or can leave the system. Puddles and ponds may develop on the land, while canals are filled to brim and spill over with layer of

water covering the land. It is like urban flooding, but without the sewage systems and in more rural areas too. Depending on the population size, economic activity and size of the area, it may cause immense economic damage.

(d) Arroyo Floods

An arroyo is a river which is normally dry. When there are storms approaching these areas, fast-moving river will normally form along the gully and cause damages.

(e) Urban Floods

Urban floods are most common in congested thickly populated urban areas. This type of flooding is specific in that the cause is usually lack of drainage in an urban area. High intensity rainfall can cause flooding when the city sewage system and draining canals do not have sufficient capacity to drain away the amounts of rain that are falling. In most of our cities, the situation is further compounded by the habit of disposing of solid waste into such drains, thereby blocking the available channels.

3.1.3 Causes of Flood

The causes of flood can be categorised into two: natural and man-made. Flood is caused by natural factors when the hydrological cycle is interrupted or changed by extraneous circumstances like heavy rainfall, melting snow, hurricanes, cyclone or tsunamis. On the other hand, man-made causes of flood, according to Keim (2009) are often due to alteration in the environment water shed, due to deforestation, overgrazing, failure of dams, embankments and levees, channeling of stream, urbanisation of wetland, slowing run-off into stream and reducing flood peaks. Keim further stated that altering environment affect global climate change predicted to increase the frequency of flood hazards worldwide. He also noted human behaviour as a factor that increases human vulnerability to the effects of flooding. These include improper solid waste management, lack of awareness, failure in engineering flood control such as levee and dam construction which may contribute to greater human losses and physical damage.
In brief, other causes include:

a) **High rainfall:** Heavy rainfall raises the water level higher than the river bank or the dams, thereby causing flooding.
b) **Snowmelt:** Because of global warming, higher temperature melt ice caps and the water goes into the sea, thereby raising the sea level, leading to flooding.

c) **Coastal flooding***:* High tides or storms cause the water level to rise higher than the level of the coastal lowland, hence flooding.

Other human causes of floods include:

- **Deforestation:** Clearing large area of forest near rivers for settlement, roads and farmland leaving less vegetation to protect the soil, which is lost to rivers and raises the river bed, to overflows its banks easily.
- **Poor farming:** Some farming practices damage vegetation cover thereby exposing the soil to weather condition vulnerable to be easily washed into the river, silting its bed, raising its level and causing flooding.
- **Overgrazing:** Grazing too many animals on the land with less vegetation cover results in soil being washed into the rivers easily.
- **Over-cultivation:** A piece of land being cultivated for long period of time, soil became infertile that no vegetation can grow on it again, hence easily washed into the rivers.
- **Poor water management:** Dams are poorly constructed or poorly maintained, easily collapse and this results in flooding.
- **Population pressure:** Large numbers of people live in areas with high risk of flooding due to increase human activities.
- **Solid waste disposal:** The habit of disposing solid waste into water channels and drainage often cause intensive flooding in urban areas as in Picture below.

Car Submerged

2012 Flood, Houses Submerged

Houses Evacuated

Source**:www.hk.geocities.com/ka_kit** and www.naijan.com/flood

3.1.4 Effects of Flooding

The impacts of flood and flooding could be quiet devastating especially among vulnerable groups and the urban poor. Indeed, the recent experiences around the world including Nigeria have shown that flood has the capacity to bring untold hardship and suffering upon human population. Floods bring misery to those that live in flood prone areas on constant basis. They can cause loss of life and often cause a great disruption of daily life. Water can come into people's houses unabated and destroy household items. Drinking water is contaminated, leading to outbreak of communicable disease like diarrhea, cholera, etc. Electricity supplies may break down due to pulling down of transmission lines and towers. Roads can be blocked or totally cut off, thereby making it impossible for people to move around, go to work or to school. Floods all over the world cause enormous damages every year like economic damages, damage to the natural environment and damage to national heritage sites, public building and infrastructures as well as damage to social institutions and educational facilities.

A critical challenge of the effects of flood is food shortage. When flood occurs, farmlands are washed away and farm crops are destroyed. Indeed, where intensive flooding has been recorded, there is always food crisis the following years. Flood affects food security and could lead to serious famine in affected population.

The 2012 flood affecting many States in Nigeria is reckoned to be the worst in recent time. The chairman of Presidential Committee on Flood Control - the Minister of Environment said "the consequences of flood are that there are huge losses of farmlands; there are likely threats to food security. We are likely to have challenges that have to do with the health of the people in some areas. In the estimation of the government, over 5,000 farmlands were washed away by the ravaging flood across the nation." What this portends is that most of the affected areas will face food crisis in years to come. As flood disasters, precipitated by torrential rains across the country continue to wreak havoc on public and private infrastructure with growing human casualties and threat to food security, governments seem to be helpless as many access roads across the country are either washed away or made impassable.

Sometimes aside from flooding, cloudburst torrential rain occur renting havoc on its wake. Cloudburst is a sudden aggressive rainstorm falling for a short period of time limited to a small geographical area, with devastating damage to structures and falling down towers and trees along its path. Meteorologists say the rain from a cloudburst is usually of the shower type with a fall rate equal to or greater than 100 mm per hour. Generally, cloudbursts are associated with thunderstorms. The air currents rushing upwards in a rainstorm hold up a large amount of water and when released could result in intensive flooding.

3.2 Prediction and Management of Flooding

3.2.1 Predicting Flooding

Predicting the occurrence of disaster either natural or man-made has been a very daunting task to scientists and various professional stakeholders. In most countries of the world where best practice is the measurement of the level of government responsiveness to good governance and the welfare of her citizens, agencies are established with the mandate to carry out regular data collation and analysis as well as measurements and testing so as to predict the possible occurrence of disaster so as to issue early warning messages and to alert the public to take necessary steps to avoid impending calamity. The devastating effects of flooding, like any other disaster can be avoided if occurrence of floor is predicted and people heed early warming messages to keep away from flood prone areas.

There are simple obvious ways of predicting flooding. Most of these do not require any scientific measurements, but simple observations and experiences. Some of these include:

a) Areas close to or on flood plain, wetland, lowland and coastal areas. Most of such areas are usually bothering water bodies and are constantly saturated with water all year round. Therefore are prone to flooding with slightest rainfall.
b) Places where solid waste disposal practices fall below minimal standard. In many urban areas in Nigeria, people often dump waste into drainage and water channels, which block and impede the flow of water in these channels. When rain falls or there is excess water in the block channels, flooding occur near the surroundings of channels.

It apparent to predict that flood will occur in such places without further scientific analysis and manipulation. Other methods for predicting flooding include:

i. **Epidemiologic Modelling**: Continuous and systematic data collection, collation, analysis, interpretation and utilisation are constantly being used in public health surveillance to predict the occurrence of disease outbreak, prevention and control. The method is effective and can be used in predicting flood and flooding. This require constant collection of data from the occurrences of flood – when, where, why and who was affected and using such information to enhance proper decisions making and the application of information on climate, health and biodiversity including climate change to predict the occurrence of

flood and to plan for its prevention and control. Nelson (2011) also confirmed that statistical studies can be undertaken to attempt to determine the probability and frequency of high discharges of streams that cause flooding.

ii. **Scenario Mapping**: Presentation of the impact often used to determine the magnitude and to estimate the resources likely to be needed to handle an emergency. From these can be estimated the resources needed for medical attention, to reduce disruption in normal livelihood, accommodation for homeless, and minimisation of the recovery period, etc. Floods can be modeled and maps can be produced to determine the extent of possible flooding when it occurs in the future. Nelson (2011) noted that since the main causes of flooding are abnormal amounts of rainfall and sudden thawing of snow or ice, storms and snow levels can be monitored to provide short-term flood prediction. Indeed, it is possible to produce map that will contain specific information – location and structures, estimated population and other information which can be used to plan and prevent flood and flooding.

iii. **Geo-informatics*:*** The use of information infrastructure to address the geospatial problem like flooding is becoming increasingly possible with the aid of satellite imaging. It combines geospatial analysis and modeling, along with the development of geospatial databases and information systems designed for computer interaction for both wired and wireless networking technologies. For instance, the use of global positioning system (GPS) and remote sensing (RS) technologies will play critical roles in the location of flood prone areas, which may attract attention like removal silt and debris from river bed, expanding or dredging of river channels, etc.

iv. **Watershed Modeling System (WMS):** The watershed modeling system is used to compute peak flow, determine water quality and produce hydrographs for water management. Perry (2000) noted that the model utilises data supported by the hydrologic modeling module (HMM) to determine water level so as to advise on the likeable overflow of known boundary marks of water bodies. The models were developed by the United State Geological Survey (USGS) with WMS software made available for other users.

v. **Hydrologic Modeling Module:** The Hydrologic Modeling Module (HMM) or the Tree Module is the center for hydrologic modeling input, execution and output review for the WMS with a complete graphical interface which allow viewing and edit model

input parameters quickly and easily. The watershed models built using the map or drainage modules are linked to a simple schematic (tree) representation in the hydrologic modeling module. This allows you to quickly select and edit basin parameters and stream (reach) parameters (Perry 2000).

vi. **Development of Early Warning System**: This system relies on extensive use of available data to warn against future events. It leverage and connect to existing data tools and geo-informatics system to generate scenario with marked thresholds. Alert thresholds can be established and people are adequately informed of what to expect and how to avoid human and material losses if flood occur.

vii. **Vulnerability Assessment** is the process of identifying and quantifying vulnerabilities in a community. The vulnerability assessment enable stakeholders and emergency managers to determine population (children, old people and women) most at risk, location (areas close to water bodies, flood plain, areas lacking proper drainage, etc), determine where to relocate such people and develop geo-map indicating such places in the community.

viii. **Risk Assessment** is a scientific-based process of hazard identification, hazard characterisation and exposure assessment, including population most at risk, e.g. population below poverty line, the aged, children, household without vehicles, etc. This is necessary to reduce the impact of flood, when it occurs.

3.2.2 Flood Emergency Management and Remediation

Flood exposes human to hardship, pains and miseries. When flood occurs, people lost their lives and property. Most urban and rural infrastructures are damaged and people are exposed to the risk of disease epidemics. Most flood-related deaths are due to flash floods. Fifty percent of all flash flood fatalities are vehicle related, and about 90 percent of deaths during hurricanes are due to drowning. Flood often trigger-off emergency that requires urgent attention, effective management and remediation. Therefore during flooding, the following actions should be undertaken to bring succor to the effected and reduce further loss of lives and damage to property. These should include:

- Effective management of information. The information mechanism must be well-managed so that the effected know where to access immediate needed help to avoid further danger.

- Effective coordination of logistics to provide rescue to those trapped in flood ravaging areas. There is need to put in effective mechanism for identification and easy mobilisation of resources to meet the need of those trapped.
- Prompt evacuation of those affected.
- Provision of shelter.
- Provision of essential relief materials (warm-clothing, food, beddings, etc.).
- Prevention of further losses.

Health Specific Interventions

- Treatment of injured and the sick
- Outbreak investigation
- Immunisation
- Monitoring of environmental indicators
- Provision of environmental health services (EHS) like potable water, sanitation, food, safety and hygiene, pest and vector control, disease surveillance, prevention and control of communicable diseases and outbreak, chemical tracking and prevention of chemical and metallic poisoning, radiation control, health education and promotion, mortuary service and handling the dead.

It is equally important to undertake the following before and after the flood:

- Development and production of disaster and emergency management plan
- Adoption of disaster and emergency preparedness and response strategies
- Advocacy and public enlightenment campaign
- Training and capacity building for emergency management
- Mobilisation of needed resources
- Regulation of flood plain and land use control and
- Proper supervision of construction in and around flood plain and coastal areas to ensure sound foundation.

3.3 Coastal Infrastructure and Flood Control

3.3.1 Coastal Infrastructure

The coastal areas are constantly exposed to flooding. According to Nnodu (2008), the replacement of the natural landscape by several structures leads to disturbances of the natural ecosystem exposes the coastal areas to flooding. Indeed, she observed that the replacement of natural watercourses, vegetation, swamps, etc. with concrete structures, cemented surfaces and walls disrupt the hydrological cycle of urban coastal areas, which often lead to urban flooding.

You have noted that most of our urban areas as explained previously, developed along the coast line for obvious historical fact (see the development of urban areas). These coastal areas are under constant ocean surge, especially now, due to rise in the sea level as a result of the effects of global warming. This is further compounded by human activities that go on within and around the coastal areas. Such activities include dredging, sand recovery for construction purposes. Again trees along the coast line are cut down for timbers and for firewood. Some concrete barriers have broken down due to some human activities along the coast, thereby exposing the coastal areas to flooding. There is constant struggle between man and water for space, as man is often fighting the forces of nature in an attempt to virtually build on water. All these desecrate the natural coast line and coastal infrastructure.

Failure of the natural embankment as discussed above necessitated the construction of coastal infrastructure. Indeed today, it is a common feature to see most coast line being supported by concrete pavements of various thicknesses. Some coast line like the Bar Beach in Victoria Island, Lagos, is protected by bulwark of big stones and rock pieces rock. All these effort is to protect the shoreline from ocean surge and flooding.

Nigeria has an extensive coast line stretching from the Bight of Benin bothering Lome in Togo and Badagry in Lagos, through the southern trough of Gulf of Guinea, Mouth of the Niger up to the Bight of Bonny through to Bakassi in Cross River State, and the Douala in Cameroun. In the inter land, there coast lines along major rivers and their tributaries, exposing the entire land mass of Nigeria to flooding as has been witnessed in recent times.

Indeed, it can rightly be predicted that the entire coastal areas of Nigeria, (urban and rural) are prone to flood. This therefore, calls for concerted efforts to protect coastal infrastructures to ensure that water limit is

maintain so as to minimised the frequency and velocity of flood in our country.

3.3.2 Flood Control

The ability to control flood will depend on so many factors: type of flood, causes, location, impact, and resources available. Generally, flood control measures should focus on reengineering our urban, coastal and land use infrastructures as well as changing people's attitude and practices. Therefore, the following measures are necessary to prevent and control flood and flooding:

- Deepening and widening existing water and drainage channels are necessary measures that should be taken to prevent as well as control flood and flooding. Most floods have occur because the water and drainage channels were block by waste, silts, debris, mud, etc. Aside from these, in most cases, the channels are so narrow that they can hardly contain the volume of water in them. Rana (2009) urged measures to be taken to deepen and widen river bed to increase their capacity to hold water so as to reduce the area of flood plain.

- Legislation, according to Michael (2009) should be applied to stop people from building and farming on flood prone areas. It has been found that most areas devastated by floods were those settlements erected on flood prone areas. It is a fact as noted by Michael that there are a lot of attraction to settle on flood prone areas in our society, chiefly for farming purposes and other ancillary purposes. It has also been found that increase activities by those occupying these areas often exacerbated flooding. Therefore it is important that measures be taken to prevent people from continuous occupation of flood prone areas to avoid flood disaster.

- People should develop flood protection structure to serve as buffer zone against flood around marshy and flood prone areas. This should include culverts, artificial embankment, planting trees and grasses to prevent erosion, etc.

- Rana (2009) also recommended the need for the construction of diversion and relief channels like opening grass-lined channels, constructing concrete of stone-lined channels in flood prone settlement to divert water instead of relocating people from such areas. This should be carefully planned and implemented to avoid possible environmental impacts.

- Measures should also be taken to discourage some attitude and practices that exacerbate flooding. Indeed, a) afforestation programs including tree planting should be embarked upon in erosion and flood prone areas; b) farmers should improve their farming practices and adopt crop-rotation and the planting of vegetation that cover the soil and protect it from being easily washed into the river thereby reducing flooding; c) Herdsmen should be encouraged to move their animals to new grazing land to discourage over-grazing. They should also be taught to plant grass to replace the one used; d) more dams should be constructed and effectively maintain to avoid collapse dams. The practice of releasing water from dams without adequate measures for draining the water should be discontinued; e) urbanisation should be discouraged by making the rural and peri-urban areas attractive to remove the pressure on the urban areas and the multivariate activities that impact on the environment and lead to flooding; f) solid waste should be properly disposed of. The practice of dumping waste in water and drainage channels should be prohibited.

- Urban management of drainage: aside from functional engineering infrastructure, the drainage system must be well designed and properly maintain. The natural drainage and the constructed drainage should be mended when damaged; debris, silt and mud should be removed at regular intervals, particularly when rainy season approach.

3.3.3 Indigenous Techniques in the Management of Coastal Erosion and Flooding

Titilola (2008) has noted that lack of proper recognition and harnessing of indigenous knowledge was aggravating environmental degradation in Nigeria. Indigenous knowledge, according to him is local knowledge that is unique to a given culture or society, which is information base of that society, and it is consistent and coherent set of cognition and technologies that have slowly evolve through trial and error over several generations.

In traditional society, it is often noticed that when land is being cleared for farming purpose along the coastal areas, that a portion in between the farm land and the edge of the water is always left fallow, while unwanted items from the farmland are heap along this artificial boundary to form a ridge. In some local coastal areas, sand bag is used to create embankment against flood. Well-coordinated efforts of the

local dwellers can result in effective protection of communities against flood in the rural areas applying indigenous knowledge.

SELF-ASSESSMENT EXERCISE

i. List five types of floods you have learnt in this unit.
ii. Enumerate five effects of flooding.
iii. List two natural causes and five human causes of flood.

4.0 CONCLUSION

Flood is excess water covering previously dry areas. It is capable of submerging land and surrounding structure and it is a very disastrous phenomenon caused by natural and human factors usually leading to loss of lives and damage to property and public infrastructures. Flood though can be predicted but hardly planned for. Most developers and planners do not give adequate attention to flood prevention and control, hence when it occurs; the impact is usually very great. Floor can be controlled through engineering redesign of urban and rural areas and the alteration in man-environment relationship and practices. There is need to educate members of the public to take measures to prevent and control flood, particular the protection of coastal infrastructures to so as to minimise the impact of flood when it occurs.

5.0 SUMMARY

In this unit, you have learnt about flood as one of natural and man-made disaster capable of causing loss of lives and serious damage to property and public infrastructures. Some definitions of flood and flooding were given, while types of flood, causes, effects and control of flood were discussed. In the unit, you were also intimated with some methods for predicting flooding as well as some ways of mitigating the effects of flood. It is important to note that flood degrade the environment and causes serious disequilibrium and disorientation in human population. Therefore there is need to provide adequate environmental health services so as to limit the impact of flood on the population and the environment.

6.0 TUTOR-MARKED ASSIGNMENT

1. a) What is flood?
   b) Enumerate five causes of flood and describe measures you would take to prevent urban flooding.
2. Explain the epidemiologic modeling method for predicting flooding and state five measures you would take to control flash flood.
3. a) Discuss four human practices you will want to alter so as to ensure flood-free society in your area.
   b) As an EHO, list and discuss five environmental health services you would want to strengthen and implement during flooding in your area.

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UNIT 5 DEVELOPMENT OF SCENARIO AND RISK MANAGEMENT

CONTENTS

1.0 INTRODUCTION

In the previous unit, you learnt about flood, one of the major phenomena with great potential to cause environmental disequilibrium and losses. This unit will introduce you to how to predict and manage risk in our environment.

Scenario according to Microsoft Encarta (2009) is *an imagined sequence of possible events, or an imagined set of circumstances* to occur in the future. Scenario is also seen as ability to project into the future and plan to meet future challenges. Scenario development for instance, may be applied to understand future marketplace in business, operating environment in industries, weather changes that would affect agricultural production or even how climate change may affect health in 2020. Scenario development is a process of using data, available information and human experiences to predict, forecast, and plan to prevent, manage, control and mitigate environmental risk when it occurs. In this unit, you will learn about how to predict and manage disaster and other environmental risk in our society using the principles of urban planning and management.

2.0 OBJECTIVES

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

- define scenario and risk
- describe the methods for development of scenario
- explain ways of forecasting, planning, preventing, managing, controlling and mitigating environmental risk.

3.0 MAIN CONTENT

3.1 Environmental Risk Assessment

3.1.1 Data Base for Scenario Development and Environmental Risk Management

Data is vital to every aspect of human endeavour. It provides the basis for current and future decisions and actions. Data is for planning, implementation and evaluation of programs - be it health, energy, agriculture, education, etc. Singer (2000) and Moses (2009) have observed that the application of data in public health has been a long standing practice, which began in England in the 10th century, when vital events were recorded and the records well maintained for various purposes. They stated that statistical application enables population estimation and prediction; enhances surveys of population characteristics, establishes mechanism for determining health needs as well as identification of health problems. They further stated that statistical application helps in the analysis of health trends; stimulates epidemiologic research; supports treatment regime and protocol, enhances program planning, implementation and evaluation. Garenne, M. and Gakusi, E. (2006) and Moses (2009) noted that data creates strong base for budget preparation and justification; sets out framework for operational and administrative decision making; and provides indices for health education and other health interventions. They concluded that when data is satisfactory organised, the data base could serves as brain for the health system and the general hub for national planning and development.

It is on these bases that you will appreciate the importance of data in scenario development and environmental risk management. The basic step to developing scenario is to have a robust data base. The data sets required to develop scenario will include population structure and population characteristics, occupation, poverty index, housing factors and housing characteristics, location of built-up environment, health facilities and health services, schools, home for the aged, food supply, water supply, transport system, local organisation and structure of local

authority, etc. It might not be an easy task to have all the data required under one roof or in a single system or book. However, it is important where the data is located is known and it is accessible when the data is required.

One of the major challenges to effective development of scenario just like every other national endeavour in Nigeria is lack of reliable data. This challenge has been traced to human factor in the management information system (MIS) in the country. It has been stated that MIS often failed because of human behaviour and poor attitude to data management as well as weak institutional capacity to handle data, (Moses, 2009). Whenever human element/behaviour is allowed to determine the direction of input and output of MIS, there are always bound to be traceable and intractable problems. Other problems encountered are when trying to apply a system that works in one country to another, without proper comparative analysis of the two environments, corresponding resource outlay and available technical expertise.

The weakest link in building a robust data base for development of scenario is weak data collection and storage systems. Adequate and reliable MIS have been recognised as essential in the achievement of sectoral goals in health, environment, education, agriculture, science and technology, etc. However, data collection in most developing countries including Nigeria is still dependent on irregular and largely unreliable rendition of monthly returns from departments and ministries. Systematic data collection arrangement is lacking, hence posing serious challenge to information utilisation (Moses, 2009).

For instance, Moses (2009) has observed that an attempt at seeking for any information in most health establishment often result in serious frustration, forcing researchers do with whatever is available, which often lead to wrong conclusions, while they find it very difficult publishing in international Journals. It is no longer news that the Nigerian column in international data bank is always presented with no data, and when reported at all, there are often conflicting data on basic health indices from Nigeria. Within the country too, it is almost an acceptable norms to see varying figure on the same data set and indices from different public departments, organisations and agencies as if there was competition on the best data presentation. This often creates doubt in the minds of data users and decision makers, leading to some huge bogus data being discarded. Be it as it may, there has never been a greater need for robust MIS in Nigeria than now as the world is watching us as the deadline for meeting Millennium Development Goal (MDG) targets draws closer and as we struggle to tame the tide of disaster in our environment. Therefore, there is an ever increasing need

to develop effective MIS that is responsive to the need of the health system as well as provide basis for effective scenario development, (DFID, 2006).

3.1.2 Scenario Development and Risk Prediction

Scenario has already been defined as an imagined sequence of possible events, or an imagined set of circumstances to occur in the future and ability to project into the future and plan to meet such challenges. On the other hand, Microsoft Encarta (2009), defined risk as the expected losses (lives, property, economic activity and the environment) due to a particular hazard or a chance of something going wrong - that is the danger that injury, damage, or loss will occur; while hazard is somebody or something likely to cause injury, damage, or loss. Hazard is further described as a rare or extreme event in natural or man-made environment that adversely affects human life, property or activity to the extent of causing a disaster; while disaster is described as unpleasant and sometimes devastating situation usually causing disequilibrium in the environment and human population with attendant human and material loses (Ukpong, 2001).

Disaster is broadly defined as sudden and unexpected event of such severity and magnitude resulting in deaths, injuries, illness, and or damage to property. It may also result in the disruption of economic and social activities that cannot be effectively managed by the application of routine procedures or resources. A disaster is said to have occurred when there is a serious disruption of the functioning of a society, causing or threatening to cause widespread human, material, or environmental losses, which exceed the ability of the affected community to cope with, using its own resources. Disasters may arise out of complex events and occurrences, in which the affected community's ability to cope has been overwhelmed, and where rapid and effective action is required to prevent further loss of life and livelihood, (Wisner & Adams, 2002 and Goyet, Marti & Osorio, 2006).

The ability to predict that something wrong is going to happen during a course of action, or within a specific environment in the course of time, has been seen to be beyond natural human capability. Sometime, the prediction of the occurrence of exact event has been attributed to the divine or other supernatural power. However, it has been established that science and technological advances is capable of enhancing human capacity to accurately predict and project into the future with near precision.

It has already been stated that data enables the analysis of trends of events within a defined community. With robust data, it is possible to

analysis past and current risk factors and emergency situation so as to predict what will happen if the current environmental situation persist, worsen or is improved upon. Identification of the current situation in the community, that is, make the baseline per each characteristic from the list of variables will enable projections to be made. From that point of view, it is possible to identify the situation expected at the end with each characteristic per listed variable. What that means is that taking a particular variable of interest, one is able to manipulate a given data set to establish what will happen with that variable with different characteristics and changes. At this stage, it is equally necessary to mention partners and communities' actors, describe their current and possible roles, and list available resources and describe their availability, accessibility and functional-ability.

Moses (2010) stated that disasters are events that affect significant numbers of people who are exposed to extreme conditions to which they are vulnerable, with resulting injury and loss of life, often combined with damage to property including livestock and livelihoods. Most disasters are capable and sometimes trigger-off emergencies. Emergency on the other hand, is a situation or state characterised by a clear and marked reduction in the abilities of people to sustain their normal living conditions, with resulting damage or risk to health, life and livelihoods.

In developing scenario, it is necessary to identify and estimate resources that would be needed to intervene in any emergency situation. Scenario mapping is often used to estimate the resources likely to be needed to handle an emergency. The number of people killed and injured, and the losses arising in other elements is estimated. From these can be estimated the resources needed for medical attention, to reduce disruption, accommodate the homeless, and minimise the recovery period.

The need to outline past experiences and activities embarked upon and the success rate are equally important. Sometime, it may not be very clear just handling and manipulating data sets. Wisner and Adams (2002) have counseled on the importance of institutional learning and memory. They stated that one of the keys to improving emergency preparedness is ability of organisation and indeed individuals to learn from previous disasters and to incorporate such learning into practice. Hand-on-experiences may describe the data more vividly and give credence to what has been theorised as well as enhance practical application of new strategies. The process and steps in scenario development can be summarised as follows:

Steps in development of scenario

- Review secondary data
- Collect additional data where necessary using semi-structured interview, focus group discussion and direct observation
- Identify and analyse community baseline data
- Frame and define boundary conditions
- Identify driving forces for disaster *(descriptors)*
- Formulate possible developments of descriptors *(sub-scenarios)*
- Evaluate descriptors interdependence
- Analyse the consequences and discuss alternative interventions
- Map vulnerable sites/ location and population
- Apply seasonal calendar and seasonal variation and understand climate change phenomenon
- Study and use the historical profile of the community
- Assess household/neighborhood vulnerability
- Asses the capacity of local resources including local NGOs and CBOs
- Analyse livelihoods and coping strategies
- Assess institutional and social network and map their location
- Assess additional resources including eternal development partners and organisations
- Construct possible and consistent scenario
- Test and simulate scenario
- Share developed scenario.

Some methods for predicting flooding discussed earlier include: *epidemiological modeling, scenario mapping, geo-informatics, development of early warning system, vulnerability and risk assessment, etc.* Prediction may be difficult in areas with high range of uncertainty, complexity and high susceptibility to interference, or their dependence on human decisions. Indeed where urban planning principles are neglected, such a place is prone to unnecessary and unquantifiable risk at all times. Planning therefore allows for some level of prediction with degree of certainty since several factors are under control and some environmental parameters and their characteristics are known. For instance, in comparing the impact of flood in a planned area with adequately provision of necessary infrastructures (road, drainage, sewerage system, solid waste disposal facilities, etc.) with an unplanned area without these infrastructures, one is bound to notice a wide range of difference. In a planned area, the prediction of the impact of flood can to some extent be made with some degree of certainty that flood water will flow in a particular manner since there is adequate drainage that is not blocked by waste materials. But in unplanned area, it would almost be difficult to predict the same scenario since the environmental parameters are not in any way clear and cannot be measured.

3.1.3 Environmental Risk Identification, Quantification and

Characterisation

The human environment whether at natural state or man-made has potential to cause harm to man. Therefore man is surrounded by risks. He lives with risks and also exposes himself to risk in the process of economic ventures. Indeed, risks are part of man daily lives and the activities undertaken by man exposes him to more risks, this is why man sometimes, whether intentionally or inadvertently engages in risky behaviours. There is growing interest in estimation of probable losses not only by disaster managers, but development planners, facilities managers and public administrators, etc. This is important to both the developed and developing countries as everybody is concern with loss of lives and property in an event of disaster (natural or man-made).

Hazard identification according to Calderon (1999) is the process of determining whether an exposure to man environmental agent is associated with an adverse health effect. Natural environmental hazards according to Burton (2005) are conditions or process in the environment that give rise to economic damage or loss of life in human populations. He stated that natural hazards like floods, drought, earthquakes, tornadoes and sometimes fire are distinguished from human environmental disturbances by the fact that they owe their origin to the "*God-given*" environment rather than to human action. Natural hazards can be classified under a) climatic and meteorological, b) geologic and geomorphic, c) floral and d) faunal.

Under climatic and meteorological, he listed snow, flood, drought, fog, frost, hail, cyclones, tornadoes, etc. Avalanches, earthquakes, erosion, landslides, tsunamis and volcanic erupts are listed as geologic and geomorphic hazards. For floral, he listed fungal disease (e.g. athlete's foot), infestation (e.g. weeds & water hyacinth), hay fever and poisonous plants. Faunal group appears to be of significant interest to health professionals. Under this group he listed bacterial and viral disease like influenza, malaria, rabies, infestation (e.g. termites & locust), and venomous animal bites. Generally, hazards can be identified and analysed using the following methods:

Hazard identification and analysis comprise:

- Construction of hazards identification protocol, framework and checklist.
- Establishment of relative priorities and impact analysis for hazards.
- Mapping risk consideration areas for hazards.

- Assigning scores within risk consideration areas, where possible.
- Listing the hazards in that area, e.g. toxic release inventory, discharge areas, nuclear facilities areas, solid waste facilities.
- Score the hazards in the area.
- Determine the hazards to be used in vulnerability analysis.
- Conduct environmental analysis.

Risk determination and vulnerability assessment is the process of identifying and quantifying environmental risk and vulnerabilities in a system. Risk assessment according to Calderon (1999) was adopted as a decision-making process to assist government to estimate the risk in human populations. It is the use of a factual base to define the health effects of exposure to pollutant of interest. The process involves hazard identification, dose response and exposure assessment. It also involves studying the pattern of environmental factors and phenomena (weather and climatic factors, natural environmental resources like bodies of water, forest, etc.), their variation, including environmental modification and human behaviour for a long time, and their impacts on human health as well as gathering data and analysing such data to make projection and to find out what will happen if there was a shift in those factors and their patterns or the data was moving in the opposite direction.

Available data can be used to construct some models to determine future behaviour or direction of events in the light of existing situation or changes within the system. Giordano, Weir and Fox (2003) while discussing *simulation modeling*, stated that prediction about behaviour can be made either using gathered data or conducting experiment to investigate the relationship between dependent variables and selected values of independent variables based on observed behaviour. According to them, in some circumstances, it may be possible to observe the behaviour directly and in others, the behaviour might duplicate under controlled or uncontrolled conditions. This observation is possible when data is available. Again, they stated that in instances in which the behaviour cannot be explained analytically or data collected directly, the modeler might simulate (*Monte Carlo Simulation)* the behaviour indirectly in some manner and then test various alternatives under consideration to estimate how each affects the behaviour using computer. Further discussion on simulation modeling or Monte Carlo Simulation is beyond the scope of this course, but suffice it to say that it is important that you appreciate the various methods of predicting environmental risks in every setting in your locality/community.

How can you identify risk in the environment? Environmental threats according to WHO (1997) can be divided into two broad groups - Traditional hazards associated with lack of development and modern hazards associated with unsustainable development. Traditional hazards

can be induced by lack of access to potable water supply, inadequate basic sanitation, food contamination with pathogens, indoor air pollution, inadequate solid waste disposal, occupational injuries, natural disasters (flood, droughts & earthquakes) and disease vectors. On the other hand, the modern hazards are results of water pollution from populated areas, urban air pollution from automobiles, solid and hazardous waste accumulation, chemical and radiation hazards, emerging and re-emerging infections, deforestation, land degradation, and climate change. All these abound in our urban environment.

To identify risk in the environment, first and foremost, you must know what risk is and what constitute risks in your community. Second, you must be able to determine ideal environment capable of supporting optimal living and be in a position to determine any variation from the ideal. Last you must be able to document and develop checklist of environmental parameters for ideal environment. This will enable you monitor trends and any variation tending toward becoming risk factors.

Some of the parameters to monitor would include*:*

- seasonal rainfall
- length of dry season
- weather variation
- use of temporary structure for dwelling place
- proportion of population living on flood plains
- unusual increase in incidence and prevalence of communicable and non-communicable diseases
- sudden increase in number of immigrants
- increase in risky behaviours - homosexuality, multiple sexual partners, smoking, alcoholism, bush burning, etc.

Identification of secondary risk and consideration of sites for such risk is equally important. There is need to determine key environmental resources sites, their state of functionality and possible variation in expected standard. Identification of intersection of secondary risk site, environmental sensitive areas and natural hazards areas/ sites is also necessary. For instance, if there are known areas prone to seasonal flooding (flood plains, low lying areas, areas near river banks), such areas could be identified and mapped with contingency plan for immediate action. Identification of key environmental resources, their locations and their proximity to secondary risk sites should also be carried out.

As a professional working in an environmental sector, you should differentiate between risk and vulnerability. Possible risk are areas identified geographically (typically on maps) most likely to be affected

by a given hazard. Such area should be clearly marked and made public. Generally, people and resources located within the risk areas are considered to be at risk from hazards and may or may not be vulnerable to impacts of hazard. The vulnerability of the people and resources within the risk areas is a function of their individual susceptibility to the hazard impacts. Indeed, it has been said that a disaster occurs when hazard and vulnerability meets. Some underlying factors predisposing to vulnerability include poverty, economic systems, lack of education and appropriate skills, environmental degradation, dangerous location like living in urban discarded fringe, etc. Some methods for identifying and establishing vulnerability and risk analysis include:

- Hazards identification and analysis
- Critical facilities analysis (*water, electricity, sewage, road, school, health, etc.)*
- Society analysis (*housing, organisational structures, recreational facilities, etc.)*
- Economic analysis (*occupation/ occupational groups, commercial activities, etc.)*
- Environmental analysis (*wetland, ecological zones, flood plain, fire prone area, etc.)* and
- Mitigation analysis (*existing local organization and resources, existing health facilities, NGO and CBO, LEMC, SEMA & NEMA, etc.)*.

Why risk assessment?

Risk assessment is very important to every segment of the society - the individual, organisation and government. Generally, risk assessment helps in identifying people and resources that are at risk of injury, damage, loss from hazardous incidents and natural hazards. It is used to determine and prioritise the precautionary measures that can make a community more disaster resilient as well as some behaviours that can make a community more prone to risk than others. It further helps in efficient management of resources and identification of mitigation options and alternative action in an event of disaster.

Calderon (1999) exerted that risk characterisation is the estimation of incidence of adverse effects in a given population due to some identified risks. It is the development of quantitative estimate of risk to human of specific hazard, based on availability of exposure data. Risk characterisation is performed by combining information from the dose-response assessment and exposure assessment.

3.2 Environmental Risk-Mapping and Contingency Planning

3.2.1 Environmental Risk-Mapping

Map is a representation of place or item with symbol in relation to the earth surface. Microsoft Encarta (2009) described map as geographic diagram with visual representation that shows all or part of the earth's surface with geographic features, urban areas, roads, and other details. According to George (2006), a map at all times should maintain its functional qualities in terms of clarity and legibility, no matter the type of map in question. Environmental risk mapping therefore, is the visual representation of hazards in a particular location in relation to the earth surface.

When hazards have been identified and hazardous areas determined in a community, the next thing is to map the hazard. The map enables identification of location, planning for management and mitigation. ***Scenario Mapping*** is the presentation of the impact of a single hazard occurrence in a reproducible or retrievable form. Scenario mapping is often used to plan and estimate the resources likely to be needed to handle an emergency. It is useful to determine the number of people killed and injured, and the losses arising in other elements in an event. From these can be estimated the resources needed for medical attention, to reduce disruption, accommodate the homeless, and minimise the recovery period as well as logistics needed for evacuation and other relief during emergencies.

Major upset and emergency have been noticed during disease epidemic. In fact some disease outbreaks have assumed the magnitude of pestilent in some communities and keep recurring without visible warning. Efforts at predicting the occurrence of disease epidemic or public health event of international concern (PHEIC) has posed serious challenge to public health practitioners. Health maps also called spot maps have been developed for special health interventions and disease outbreaks. However, the development of health-risk maps has not been given adequate attention in most societies in the sub-Saharan Africa due largely due to inadequate reliable data trained personnel. Atkinson & Graham (2007) further averred that this challenge is due to issues relating to scale and uncertainty in the global remote sensing of disease. Another factor is epidemiological shift and epidemiological transition as well as inadequate and inconsistent data. Hence, Hay, Talem, Graham, Goetz and Roger (2007) suggested the use of global environmental data for mapping infectious disease distribution as done for malaria, onchocerciasis and such other diseases.

Though this may appear restrictive, but the template and the process can be used to develop the health risk maps. Where data is available and environmental and other factors are known, the health risk map can

easily be developed. First, it may appear like a spot map where previous outbreak or public health events that have taken place in a particular geographic location can be presented. Such factors like accumulation of waste, area without access to potable water and open defecation, urban air pollution and such other public health risk could be mapped. The map could be reviewed from time to time depending on the prevailing situation and changes and modification that have taken place after the last review.

Mapping the effect of expected *hazard occurrence probability* across a region or country which shows the location of communities likely to suffer heavy losses is called ***potential loss studies.*** This is used to determine the effect of the hazard of each area as calculated for each of the communities within those areas to identify the *'Communities Most at Risk'*. The map shows, for example, which towns or villages are likely to suffer highest losses, which should be priorities for loss-reduction programs, and which are likely to need most aid or rescue assistance in the event of a major disaster.

Vulnerability mapping help to identify areas such as:

- Minority population
- Proportion of the under fives
- Proportion of households below poverty line
- Proportion of population over the age 65 years
- Proportion of single parents with children
- Proportion of the population with no education
- Proportion of household without means of mobility.

Maps such as these will enable policy makers, professionals, regulators and indeed the general public to plan and take measures to prevent and reduce the impact of disaster in event of emergencies.

3.2.2 Contingency Planning

All the assessments, studies and mapping are to enable appropriate response to be initiated in the event of a disaster. To achieve this, emergency preparedness and response (EPR) plan must be developed, tested, cost-estimated and activated when the need arise. Emergency contingency plan is a document detailing what is to be done in an emergency situation. It should also outlined resources needed, where to find them and how to get them. The plan also indicates roles and responsibilities and state what objectives to be achieved from activities spelt out in the plan. Those who may be involved in the development of EPR contingency plan should include:

- Those responsible for development and physical planning of an urban area.
- Environmental related professionals like EHOs, Town Planners, Surveyors, Architects, Engineers, etc.
- Economic planners and people dealing with budgetary estimates.
- Estate developers and managers.
- Those responsible for civil protection, relief, emergency services, etc.
- Those who draft building regulations and codes.
- Organisations who engage in insurances and investments.

3.3 Risk Management Strategies

3.3.1 Creating Awareness on Environmental Risk

You will learn about the techniques for creating awareness on environmental management later. The details of the methods will be presented, but some of the methods as presented by Ajibade (2000) are listed here:

- TV and radio jingles
- Visual displays like poster and billboards
- Drama
- Film show
- Training programs
- Road show
- Public campaign
- Establishment of environmental clubs in school
- Advertorial in print media
- Discussion
- Town announcing

Furthermore, Munn, Heinke and Henry (2005) held that designing an environmental impact assessment (EIA) does not only guarantee the safety of the environment but also create awareness on possible environmental hazards likely to be introduced in the process of carrying out some modification of the environment or any other development activities - construction, manufacturing, etc. This is because the EIA Act 86 of 1992 makes it mandatory for public involvement in the EIA process. Public involvement in the EIA process enhances public knowledge and capacity to participate and protect the environment against abuses. If the provision of the Acts is adhered to, then the process provide not just opportunity for public education, but also serve as medium for capacity building in environmental protection and management. A framework for stakeholders to relate reconstruction to longer term mainstream development priorities; and an opportunity to

modify policy, legislation, and regulations to strengthen institutions; and improve construction methods are all possible ways of educating the public on environmental risks.

3.3.2 Strategies for Environmental Risk Management

Risk mitigation and management is a major component in the development of scenario and risk control. When hazard has occurred or is known to exist or when there is a disaster, there is need to take measures to alleviate the suffering and restore the lives of the affected back to normal. This entails a lot of planning and enormous resources. First and foremost, there should be a coordinating agency like the National Emergency Management Agency (NEMA) to coordinate the sectoral response to emergencies. Each relevant sector should therefore develop her EPR plan and such plan should outline what could go wrong and what can be done to assist survivors. Preparedness is key to effective disaster management. The plan should be used to establish a coherent framework within which affected populations can permanently reestablish their housing need, settlements, and livelihoods after a disaster.

To carry out effective disaster mitigation, you should know the population most affected. From the environmental risk map, it is possible to identify areas most affected using the vulnerability assessment map. Other activities should include identification of areas of underdeveloped land and their intersection with high risk areas, inventory of high risk areas and underdeveloped and assessment of mitigation options for the community to make choice. Second, there is need to identify resources needed (local and international) for mitigation. The management and coordination of relief material could pose serious challenges if not handle with care. To this end, there is need to develop a robust mitigation plan for disaster management. The distribution of relief material should be monitored to ensure orderliness and accountability. The intervention of Federal government and the use of civil society, NGOs could be considered to add credibility to the process.

After each disaster, there is always need for resettlement and rehabilitation. All government and other stakeholders should be involved in providing reliefs for the affected. Resettlement of persons from hazard-prone areas should be a continuous exercise. However, organising housing, infrastructure and reconstruction in space and over time to address the impacts of the disaster and *disaster risk reduction* (DRR) should be well planned and implemented. In essence, steps should be taken to ensure that reconstruction and rehabilitation do not

pose more risk, generate more hazards or expose the population to greater risk.

SELF-ASSESSMENT EXERCISE

i. What is scenario?
ii. List some steps in scenario development
iii. What is *Monte Carlo Simulation?*
iv. Why is risk assessment necessary?
v. What is emergency contingency plan?

4.0 CONCLUSION

Urban planning is very vital to the development of scenario in every human endeavour. To be able to *imagine the sequence of possible events or set of circumstances* that may occur in the future, robust data is required. Urban planning therefore is capable and should provide baseline data for such purpose. Since scenario development depend on accurate data to predict, forecast, and plan to prevent, manage, control and mitigate environmental risk, efforts must be made to ensure proper data collection, storage and analysis to prevent environmental hazards and loss of materials and human lives. Effective urban planning will also help to establish proper framework for risk and vulnerability assessment, particularly since data from physical plans will contain information on settlement types, existing natural resources and land topography as well as vegetation in a particular geographic area. Indeed, planners should anticipate trends and needs of the population in advance in order to adequately prepare to meet these changes in urban environment. Therefore, it is important that the planning process is thorough and devoid of extraneous materials and inconsistencies that may compromise planning standard.

5.0 SUMMARY

In this unit, you have learnt what scenario development is and the steps to develop it. You have realised the importance of data in the development of scenario as well as on how to manage risk and disaster. You have also learnt the definitions of risk, hazard, disaster and how they occur in our environment as well as how risk can be predicted, identified, quantified and characterised. Now, you can assess risk and the level of vulnerability of individuals and community to a particular hazard or even disaster. Remember that mapping is the best way of presenting risk and hazards in the environment for proper management and this should be part of the plan for planning mitigation of environmental risk in our society.

6.0 TUTOR-MARKED ASSIGNMENT

1. Traditional hazards according to World Health Organisation (WHO) are major drivers of public health problems in our society.
   a) List ten of these hazards.
   b) Explain how physical planning can reduce these hazards or their impact in society.
   c) List five vulnerability predisposing factors in your community.

2. a) What is natural environmental hazard?
   b) List four classes of natural environmental hazards.
   c) List and explain five methods for identification and analysing of hazard.
   d) What steps would you take to prevent and mitigate flood disaster in your LGA?

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MODULE 4 ENVIRONMENTAL HEALTH IN URBAN PLANNING AND MANAGEMENT

UNIT 1 ENVIRONMENTAL HEALTH FEATURES OF URBAN PLANNING AND MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Previously, you learnt that the concept of urban planning in Nigeria started when the colonial government began to show serious concern about the deteriorating environmental conditions of Nigeria's urban centres and the need to take measures to correct the situation (Odumosu and Fagbohun, 2010). The purpose of urban planning is therefore to create or restore the environment to a state of orderly development that will support robust health and enhance sustainable development. Environmental health on the hand is and comprises all activities undertaken to *control all those factors in man's physical environment, which exercise or may exercise deleterious effect on his physical, mental or social well-being* (WHO, 1979). You also learnt how to manage environmental risk. The best approach in this regard is to prevent risk from occurring in the environment so as to protect human health from environmental hazards. Environmental health therefore aims to ensure that the environment is safe, devoid of intended or non-intended harm to human health and the health of other members of the ecosystem.

In this unit therefore, you will learn about some components of environmental health, the link between environmental health and urban planning and management, some environmental health features of urban planning and how to monitor those features for sustainable robust health and development. The aim is to enhance effective collaboration among all stakeholders involve in the planning and management of our environment, particularly to create a mechanism for collaboration between Town Planners and Environmental Health Officers for sustainable living urban environment.

2.0 OBJECTIVES

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

- identify environmental health features in urban planning
- state the purpose of environmental health services in an urban area
- explain how to provide environmental health services in an urban area
- describe the mechanism for collaboration between relevant professionals within the environment sector for sustainable living environment.

3.0 MAIN CONTENT

3.1 Components of Environmental Health

3.1.1 Definitions of Environmental Health

There are several definitions of environmental health given by various persons and organisations under various circumstances, perspectives, perceptions, understanding and focus of the author's base on the complexity of the subject matter derived from two core domains - environment and health. As varied as they may appear, three fundamental issues are central to all the definitions and any of them that do not include these basic parameters and underling would definitely fail in an attempt to present or describe what environmental health is. Therefore some of these definitions taken from various sources and authors are gratefully acknowledged and are given below to highlight what environmental health is and why it is necessary to ensure its centrality in every urban planning concept.

First, what is environment? In a public health sense, the environment includes the surroundings, conditions or influences that affect an organism (Davis, 1989). Along these lines, Last (2001) defined the environment for the International Epidemiological Association as: "All that which is external to the human host; which can be divided into physical, biological, social, cultural, etc., and any or all of which can influence health status of populations…". Similarly, Krieger (2001) defined environment as any or all physical, biological, social, cultural, etc., aspect or factors that can influence the health status of a population. According to these definitions, the environment would include anything that is not genetic, although it could be argued that even genes are influenced by the environment in the short or long-term. Therefore, environmental health is defined as follows:

- "The control of all those factors in man's physical environment, which exercise or may exercise deleterious effect on his physical, mental or social well-being" (WHO, 1979).
- World Health Organisation (WHO) Scientific Group (1972 definition): Environmental health is concerned with the control of all physical, chemical, and biological processes, influences, and factors that exercise or may exercise, by direct or indirect means, a significant effect on the physical and mental health and social well-being of man and his society.
- Environmental health services are those services which implement environmental health policies through monitoring and control activities. They also carry out that role by promoting the improvement of environmental parameters and by encouraging

the use of environmentally friendly and healthy technologies and behaviours. They also have a leading role in developing and suggesting new policy areas. (www.agius.com/hew/resource /envhlth.htm).

- WHO, Environmental Health Services (1989 definition): Environmental health is comprised of those aspects of human health and disease that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health.
- WHO (draft definition developed at a WHO consultation in Sofia, Bulgaria, 1993): Environmental health comprises of those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social, and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations.
- National Environmental Health Association (NEHA): Environmental health and protection refers to protection against environmental factors that may adversely impact human health or the ecological balances essential to long-term human health and environmental quality, whether in the natural or man-made environment.

From these definitions, you would have noticed that environmental health is science that deals with taming the environment to protect health. The focus of urban planning is to protect and promote robust health. Therefore, urban planning processes should take into account how other environmental factors affect health and how environmental health science can help tame those factors or alleviate them within regulated environment so as to protect health in a holistic manner. The listed components of environmental health must be given adequate attention in a planned urban area to achieve the objectives of urban planning.

3.1.2 Components of Environmental Health

The components of environmental health are listed below:

- waste management
- food control and hygiene
- pest and vector control
- environmental health control of housing and sanitation
- epidemiological investigation and control
- air quality management

- occupational health and safety
- water resources management and sanitation
- noise control
- protection of recreational environment
- radiation control and health
- control of frontiers, air and sea ports and border crossing
- pollution control and abatement
- educational activities (health promotion and education)
- promotion and enforcement of environmental health quality standards
- collaborative efforts to study the effects of environmental hazards (research)
- environmental health impact assessment (EHIA).

It is indeed obvious that an effective urban planning and management should take into consideration these components of environmental health, if the purpose of such plan is to enhance public health and safety as well as promote sustainable development. What is important to mention here is for planners to ensure the provision for basic services like waste collection, storage and transportation; recreation; adequate transport system, etc. Creating a living city starts with such initiative and conceptual framework meant to ensure that things are put in place to work and to protect public health and enhance healthy living environment.

3.1.3 The Purpose of Urban Planning and Environmental Health

Inadequate environmental planning and management including lack of provision of public utilities, resulting from the diverse and complex activities within the urban centres often lead to severe negative environmental consequences, (Olujimi, 2011). These activities, according to him include the haphazard locations of industries and emissions of hydrocarbon and poisonous gases that are depleting the ozone layer as well as causing climate change and global warming. Slum and squatter in towns and cities characterised by inadequate housing, non-provision of functional infrastructural facilities such as portable water, electricity and motorable roads pose great danger to public health. The levels of these problems in Nigeria prompted Nigerian cities and towns to be describes the dirtiest, most unsanitary, least aesthetically pleasing and dangerously unsafe for living which are characterised by non-functioning infrastructure facilities, most poorly governed and intensively dotted with illegal structures, with high crime rate.

Therefore, the purpose of planning is to harmonise the various political, social, economic, and physical forces and their competing interests that determine the location, form and effect on human development so as to order and guide such development in the environment within the limits of available economic resources and political decision making aimed to meet optimal health and environmental standards.

Indeed, as stated by WHO (1979), environmental health aims to:

Control all those factors in man's physical environment, which exercise or may exercise deleterious effect on his physical, mental or social well-being. It also *comprised of those aspects of human health and disease that are determined by factors in the environment, and refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health.*

Looking at these prepossessions and their imports, there is need to garner synergy among and between these two sub-sectors (environmental health and environmental planning) to create living environment since they both aimed at the same purpose - the protection and sustaining of public health.

3.2 Environmental Health Features of Urban Areas

3.2.1 Planning and Management of Public Utilities/ Amenities

Public utilities are and include services such as water supply, dams, canals, electricity, transportation/mass transit, rail transport, communication, waste management facilities/sewerage system, parks, etc, provided by government departments, public enterprises or private companies to the public (Oluwakayode, 2002). It is generally recognised as organisation that provides these basic services to the public and maintains infrastructure, which are subject to public control and regulations and they ranged from local community-based groups to state-wide government monopolies, (Agbola & Omirin, 2008; Wikipedia, 2009).

The term utilities can also refer to the set of services provided by these organisations and consumed by the public. The firms providing these services are sometimes given monopoly status by the government, when doing so is perceived to be in the best interest of the consumers. Microsoft Encarta (2009) described public utilities as business enterprise set up to provide essential services to the public and such services include electricity, gas, water, sewerage, telephone, and telegraph. Encarta also stated that due to their importance and centrality to urban development and functionality, public utilities are usually operated as a

natural monopoly and are subjected to a high degree of governmental control. The monopoly status of many utilities, however, has eroded during the 1980s largely due to government deregulation. There is now competition in such areas as long-distance telephone service, natural gas pipelines, interstate railroads, and even intercity transportation services.

The provision of these services in an urban area is essential for the survival of such area, generally for social well-being and for the promotion of good health and effective functioning of urban areas. The provision of public utilities must be planned for, while the area is yet to be habited since most of the facilities like sewerage system, channels, pipes and canals may be for such necessity be laid underground. Adequate planning for the provision of public utility is very essential for the proper functioning of the services. Indeed urban planning without adequate consideration to the provision of these essential services often result in chaos, poor social and economic activities and high incidences of communicable diseases. The timing of such planning and actual provision of the service is very important and should be underscored.

Providing the facilities and such infrastructure is one thing but another most important aspect is their maintenance. Most public utilities in our society are often in a state of disrepair and dilapidation due to our poor maintenance culture. When these facilities and infrastructures are not well-maintained, they not only failed to serve their intended purpose, but become public nuisance, which often needed to be abated. Therefore, while it is important to provide these facilities/ amenities, it is equally very important to ensure their regular maintenance to safeguard public health which in this case is a key management issue, requiring adequate budgetary provision.

3.2.2 Planning for Mass Transport System

Transportation is described as the movement of people, goods and services from one location to another using various modes - air, road, rail, water, animal or pipeline. Transportation is a major issue in every urban area due to rural neglect and poverty, which are the two major pushing factors encouraging rural-urban drift, (Okesoto, 2010). Efficient transport system therefore, is key to guaranteeing freedom of movement of citizens as provided for in Section 15 (3) a) of the 1999 Constitution of the Federal Republic of Nigeria as amended, which states that:

For the purpose of promoting national integration, it shall be the duty of the State to provide adequate facilities for and encourage free mobility of people, goods and services throughout the Federation.

This Constitutional provision put enormous responsibility on the State (Federal, State and Local Governments) to ensure adequate and efficient transport system for the country. However, experience in most part of the country has shown that this provision only exists in the book and is hardly noted nor effectively implemented by any of the tiers of government.

Transport system in most urban areas in Nigeria has been described as most chaotic. Communities have developed in virtually everywhere without plans for the provision of means for transportation. None of the arms of the sector has shown significant improvement after 50 years of political independence. The rail sub-sector is comatose, the road network is in shamble, and the aviation sub-sector is unreliable and frightening as a result of occasional crashes due to weak regulatory enforcement, while inland water transportation has been abandoned in most communities. Occasional Federal interventions have not yielded the desire result due to in-depth rooted corruption and lack of sustainability.

The importance of transportation in human life and socio-economic development of any society cannot be over emphasised. Indeed, transportation plays a critical role in every aspect of human endeavour and it is the basis for economic, social and political development in all societies as it exhibits a close relationship to the style and quality of living of the society (Abdulkareem, Musa & Ndawaya, 2011). Transportation plays an important role in the day-to -day activities of the society and defines the ability of people to exercise their freedom of movement. Therefore, there is need for the transport sector to be adequately planned and effectively managed for socio-economic prosperity of Nigeria.

3.2.3 Planning Healthy Housing

Housing is a very important aspect of human development and sustainable good health of the individuals and families. WHO (1997) stated that housing is of central importance to quality of life, able to minimise disease and injury. WHO (2010) further stated that housing and built environments have a profound impact on human health. According to WHO, in developed countries, 80-90% of the day is spent in built environments and most of these in the home. Aledare (2010) stated that housing is one of the most basic human needs with great influence on health. Housing therefore has been defined by WHO (1961) as the residential environment, neighborhood, micro-district or the physical structure which mankind uses for shelter and the environs of that structure, including all necessary services/facilities, equipment and the devices needed for the physical health and social well-being of

family and the individual. WHO (2010) described a house (or dwelling) as the physical structure used, or intended to be used, for human habitation. These definitions go to stress the component and the importance of good housing.

Howard (2002) has pointed out that good-quality housing was a key element for ensuring a healthy society be it village, town or city. Housing is often recognised as an important determinant of health and quality of life, and lack of adequate housing is acknowledged to have a negative impact on health. Unfortunately, majority of the world's population live in shelter that does not meet even basis health requirements, hence they are exposed to health risk (WHO, 1997). Poor housing - cramped and overcrowded conditions give rise to poor hygiene, promoting breeding of disease vectors and transmission of diseases; enhances food contamination; encourage poor indoor air quality and promote increase stressor in the environment. Ebisike and Moses (2004) have observed that poor housing was exposing the general population to serious health risk. Having realised the importance of housing and the factors that make up good housing, the need therefore to plan effectively for good housing becomes apt and urgent.

Housing is one of the environmental health features of urban planning that requires adequate attention. The way the layout is planned, the provision for infrastructure and other amenities and the construction of houses determined the quality of housing in a particular environment. The quality of houses eventually determines the health status of people in such areas. Planners and other stakeholders, particularly environmental health officers should take keen interest in planning and development of housing for improved quality of life. In this regard, Jiboye (2009) counseled that Planners, Architects, Builders and other stakeholders involve in housing development should consider the views of households (users), their socio-cultural characteristics and preferences when planning and designing new houses. When planning residential housing, attention should be paid to ancillary services like waste disposal, water supply, energy efficiency, road network, etc. All these are components of good housing and should be adequately planned for and well-managed to serve their intended life-span (Aledare, 2010).

3.2.4 Waste Management

The management of waste (solid and liquid) is a very important municipal function in an urban area that requires adequate planning and efficient resource allocation to enable it function effectively. Most urban areas have grown into big communities and even towns and cities without adequate provision for waste management. Indeed, some communities are poorly developed without access road to enable

evacuation of solid, while liquid waste is discharged into every adjoining portion of land indiscriminately. In some of such communities, open defecation is still a common practice due to lack of toilet facilities. Of course, these accounts for Nigeria's poor health indices compare with other nations of the world and seem to continue to be so until we learn to pay serious attention to environmental health matters in our urban planning schemes.

When urban areas grow without proper planning or when planned areas do not carry environmental health concept with them, provision for waste management is often seen as a waste of time and resources. It is a common scene in most part of Nigeria even in big cities like Lagos, Ibadan, Kano, etc. where cities grow without provision for facilities for solid waste disposal. Before now, Lagos used to dump her untreated solid waste in an open valley somewhere along Abeokuta Road, and keep moving the location as volume of waste increases. In essence, the State did not plan for constructing functional facilities for solid waste management. Along the line, three high sophisticated incinerators - located in Lagos Island, Oshodi and Ogba were built in the late 70s without trained personnel to neither operate them nor provision for spare parts and maintenance. The structures still stand till today, while the Lagos State Waste Management Authority (LAWMA) – a recent creation has evolved some mechanism in a very bad situation to somehow manage waste in Lagos State. The noticeable efficiency of LAWMA is not that it is following any pre-plan Lagos city waste management, but becomes a child of necessity that must survive among all odds.

It is dis-heartening that despite such vivid example and experience, new city like Abuja could develop with a master plan without functional facilities for solid waste management. Up till 2006 or there about, solid waste from all parts of Abuja were dumped in the open along AYA – Kubwa Road new Mpape junction. The nuisance created by this act was unimaginable (Moses, 2004). The location has now been moved to somewhere in Idu. Building a new city like Abuja would have provided an opportunity for efficient facility like landfill to be built for solid waste in Abuja if the planers included Environmental Health Specialists. It is even more dis-heartening that the proposed six landfills (one for each geopolitical zone) has not been built by Federal Ministry of Environment to date. It is worrisome how policy makers and technocrats perceive environmental health matters, yet it is a known fact that diseases resulting from this systematic neglect does not have boundary. We should factor-in necessary environmental health principles into our urban planning to ensure the protection of public health.

3.2.5 Planning for Recreation

Recreation prolongs healthy living and should form part of a living urban area. Recreation has been described by Bale (1989) as any free-time activity which is pursued voluntarily for intrinsic rewards. Vickerman (1975), further defined recreation as essentially organised activities, entertainment, sport, eating, etc. meant to enhance healthy living.

Most urban areas in Nigeria are lacking in recreational facilities. Often, most layouts are over-built to the extent that children have no place than to play in the street or the sitting room of the house (for those that their parents own houses or live in big rented apartments). To encourage recreation in urban areas, planners should make conscious efforts to designate areas for recreation as well as suggest what recreational facility should be deploy to such areas to serve the need of the population.

3.2.6 Planning for Public Institutions and General Administration

Municipal layout should uniquely have provisions for public institutions like general administration and political authorities, offices service providers, banking and other commercial entities, security outfit, maintenance organisations, etc. A well-planned urban area should make provision for worship centres, recreation and sporting facilities, hospitality industry and other services as the need are perceived for future expansion.

A major challenge noticed over the years in planning for public institutions and general administration in Nigeria has been the concentration of all government ministries, department and agencies (MDAs) in one location for administrative conveniences but which often turnout to create parking problems and traffic lock-jam. The push and pull traffic theory explained that movement of people will gravitate from residential land-use areas to business districts (BD) in the morning and vice versa in the evening. The volume of traffic to and from such places in major cities in Nigeria has indicated lack of foresight in the part of planners.

Lagos, the former capital of Nigeria was a case study which would have guided the planners engaged in the design of Abuja - the new federal capital. Instead of learning from that ample experience, the Abuja planners repeated the same framework and mistake made in Lagos by concentrating all federal MDAs in one location without commensurate infrastructural provision in terms of efficient mass transit for movement

of people to and from this nucleus/ centre of all activities. Today, many people are wondering whether we ever learned from pass experiences. People are asking questions - why concentrate all MDAs in one location in the first place and disperse the service providers and workers afar off from their offices that many have to travel upward of 30 to 120 kilometres to and from their offices in chaotic transportation system? The negative consequences of such policy outweigh any objective rationale behind its implementation. Today, Ministry of Federal Capital Territory Administration (MFCTA) is battling to decongest the city centre of Abuja of traffic and ancillary service providers, creating a lot of bad publicity for herself in a matter that would have been avoided if the planners were circumspect in their professional disposition. As it is now, the MFCTA have wide and wild options either to decentralise the MDAs and service providers or create alternative mass transit system - rail and tramps and strengthen mass transit bus operation which can move large volume of commuters from well functional Satellite Towns to the city with ease. Ideal situation will be making provision for every worker to live a walking distance from his place of work, which sound like utopia.

3.3 Monitoring and Evaluation of Environmental Health Services in Urban Areas

3.3.1 Developing Synergy and Collaboration among Stakeholders

Designing and planning a livable urban area demands the collaboration of all stakeholders. There are diverse professional groups which must work in tandem to create an environment which will support a robust health and sustainable development. When it comes to creating living urban areas, the following professional groups should work in effective collaboration.

They are:

- Town Planners
- Surveyors
- Environmental Health Officers (EHOs)
- Engineers
- Architects and
- Builders.

While urban planning may seems to the responsibility of Town Planners, all other listed professionals have roles to play in the design or planning of a functional urban area. The Town Planner will develop the concept of an urban area, the Surveyor will take the measurements,

while the EHO will advise on the health implications of the propose design and functionality of the proposed facility to meet the need of the people the area is being planned for. Similarly, it is the duty of the Engineer and the Architect to advise on the type of structures that will be built in such area and their design to the prevailing environmental factors. The builder will also need to make input and advice on the nature of the structure and the challenges in terms of availability of building materials, etc. Of course, as earlier mentioned in this unit, the input of the users must be collated to make an informed and robust decision on what type of urban area should be planned and design for the people base on their culture and economic status. It is clear that every stakeholder has a contribution to make in urban planning. Therefore, all must work to develop synergy and framework for collaborating together for the common goal of creating a sustainable urban environment that is functional.

3.3.2 Mechanism for Professional Collaboration and Application of Monitoring Tools

You have learnt that it is expedient for professional groups in the environment sector to collaborate for the common goal of creating a sustainable living environment. It is now left for us to describe the mechanism for such collaboration and to design unified monitoring tool for joint inspection of implementation of the designed plan and development projects in a planned urban area. The mechanism should be mutually adopted and agreed upon for effective implementation as described below:

Having produced a plan with input from all stakeholders, the first step is to ensure accessibility of the plan to all those involved. In fact, the urban plan should be made accessible to the general public. Such a step will enhance the monitoring of implementation of the plan by all stakeholders. Within such framework, it will be possible for members of the public to insist that only project designated to a particular area is erected in such places. In most developed areas, we have noticed a place planned for recreational park being turned into residential, industrial or even commercial area with no justification for the change in land use. Such practice often goes on unchecked because the majority of the people living close to such place do not know what such place was meant for. This often results in the distortion of the master-plan of urban areas. To guard against this, approved master-plan should have a force of law and when accented, can only be reverted through the process of amendment.

Second, there should be a joint approval of project (building) plans in every urban area. During the pre and post-colonial era, building plans

were jointly approved by the town planners and health officers (now EHOs). The two professionals were responsible for site inspection and monitoring the progress of work on the project from foundation to roofing, ensuring the use of quality materials and building to specifications. Then, cases of collapsed building were un-heard of and every building erected met all health requirements. The practice was in place up till the late nineties in most states. Today, the situation is different as a result of some professional groups claiming that approval of building plans is their sole responsibility. Needless to say that the general public and indeed the nation are paying for such folly and it is time to redress the situation in the interest of public health.

Last is the adoption of a joint monitoring tool. The adoption of monitoring tool will enhance the "policing" of the urban environment to ensure compliance with guidelines and regulations and remove ambiguity from what is ideal and what is real. The current practice in most States is that a developer submits a set of drawing of proposed building plan to the town planning office and then receives approval and proceeds to erect the structure and moves into occupation. Of course this practice is in breach of the Chapter 2 of 2007 *Environmental Health Practice Regulations.* Therefore, the tool should contain and include but not limited to the following:

- Site plan approval
- Date of building plan approval
- Names of approving authorities
- Designations of approving officers
- Office location of approving authorities
- Date of pre-occupation inspection
- Rate of compliance to Environmental Health requirements (in percentages)
- Certificate of fitness for occupation (for sighting)
- etc.

SELF-ASSESSMENT EXERCISE

i. Mention two definitions of environmental health and state why you have chosen each of them.
ii. List ten components of environmental health.
iii. List five environmental health features that should be in an urban plan.

4.0 CONCLUSION

The purpose of planning is to create an orderly environment that will protect and promote public health. For such plan to fully meet the intended objective, it must consider and indeed provide for environmental health services. When urban plans are devoid of environmental health features, the urban environment becomes exposed to environmental hazards. Such plans in themselves will fail to achieve its immediate purpose. Urban plans should make provisions for such facilities/features like efficient housing scheme; waste management, recreation, and layout for various land use, etc. When this is done, the urban environment will function optimally and promote health in a sustainable basis.

5.0 SUMMARY

In this unit, you have learnt that the purpose of urban planning and environmental health are in tandem to harmonise interest of all spheres/ stakeholders and to tame the environment so as to protect and sustain robust public health. You were also provided with 15 definitions of environmental health, which tried to highlight basic principle controlling environmental factors to protect human health through 16 core components areas/ services. You have also learnt that the provision of public utilities and amenities is a very important municipal function which should be well provided for. You have equally learnt the importance of efficient transportation system, provision of adequate standard housing, waste management facilities and proper layout to enable the proper functioning of the urban environment. Lastly, you have been informed of the importance of collaboration among the various professional groups in the environment sector, and you have learnt how to develop mechanism for such collaboration including the development and adoption of joint monitoring tool. Now as an EHO, you will need to identify and appreciate roles and functions of the various professional groups in the environment and understand how to work with them to protect public health. In the next unit, you will learn about the effects of unplanned environment on health and the integrity of the environment.

6.0 TUTOR-MARKED ASSIGNMENT

1. List five professional groups involved in the planning and maintenance of urban environment and describe the mechanism for collaboration among them for healthy living urban society.
2. List five environmental health features of urban area and explain how those features can be managed for optimal health.

3. State the importance of planning efficient transportation system in an urban area of five hundred thousand populations and explain how the various transport modes can be integrated for the well-being of the city dwellers.

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UNIT 2 EFFECTS OF UNPLANNED ENVIRONMENT ON HEALTH

CONTENTS

1.0 INTRODUCTION

In the preceding unit, effort was made to introduce you to some environmental health features of a planned urban environment and how they can be managed to ensure optimal health and well-being of urban dwellers. You would have noticed that these features are basic to ensuring environmental risk-free society. Steps towards the smooth working of these features in a sustainable manner require a well-planned urban environment. A well-laid urban plan should therefore make provision for efficient solid and liquid waste management, including sewerage system. There should be provisions for potable water supply to the maximum uptake of the expected population of such urban areas as well as the provision for power transmission lines, road/rail network, recreational facilities and facilities for educational and religious activities, to mention but few.

Ideally, this is how a living urban area should be planned. However, experiences have shown that in most urban areas in Nigeria, the reverse is always the case. As stated earlier, most of our urban areas have developed spontaneously without control, lacking essential and basis facilities. Indeed, our urban areas have often developed into slums and squatter settlements to the extent that it become necessary to devote more resources and efforts to correct the anomalies at greater cost to ensure human survival and environmental sustainability. In this unit, you will learn about some of the effects of unplanned urban environment so as to prepare your mind to understand how to adopt measures to prevent and control these effects as presented in the last unit of this course.

2.0 OBJECTIVES

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

- list and explain the effects of unplanned urban environment
- explain factors responsible for the effects in unplanned urban environment.

3.0 MAIN CONTENT

3.1 The Effects on Physical and Chemical Environment

3.1.1 Damage to Topsoil and Vegetation

Problems of unplanned environment can manifest in various ways in any society. When the environment is not planned into subject land use, the possibility of every portion of land being turned into farmland, industrial zone, mechanic workshop, residential areas, etc., becomes inevitable. Earlier on, you learnt about layout planning. Ideally, it is appropriate to break the entire land mass of an area into segments for various land-uses. When this is done, it becomes easy to manage every portion of available land space according to its design and intended purpose.

The natural environment is being exposed to physical and chemical factors that impact on human health, environmental aesthetic and other property. The misuse of available land space could lead to the disruption in the ecosystem, which affect the natural working of the environment. Sometimes the application of chemicals like fertilizer and pesticide in the course of agricultural practices may lead to land, surface and underground water pollution when such land space is not meant for agricultural purposes. The topsoil may be removed due to bush burning and over-grazing resulting from unplanned land use. When this happen, soil erosion sets in, vegetation is removed and the effects of

desertification become apparent. Subsequently, other members of the ecosystem may be adversely affected and could relocate from their natural habitat, leading to biodiversity loss. In all these, the environment becomes negatively impacted, resulting in environmental risk to man and other living things in the environment.

3.1.2 Erosion and Gullies

One of the major effects of unplanned environment is the upsurge in incidences of flooding. When structures are erected without recourse to the principles of planning, natural water channels are blocked leading to devastating flood. As mentioned earlier, bad agricultural practices expose the topsoil to weathering effects leading to erosion. Sometimes water courses may be diverted in the course of construction and agricultural intervention. Such unplanned activities in the environment often exposes the land to weathering effects, erosion which create deep gullies that 'eat' up valuable land and aggravate the effect of flooding.

Though man cannot do without agriculture, there is need to plan the environment to cater for every human need and activity to avoid one activity causing serious impact on the environment. With the growing effects of global warming, it is expected that flooding will be almost a seasonal occurrence. To this end, being proactive and circumspect in every human activity in the environment will help in alleviating the impact of these effects from human health and the integrity of the environment.

3.1.3 Pollution

Pollution is one of the major consequences of unplanned environmental often exacerbated by other factors including population explosion, uncontrolled resource exploitation, and lack of concern for sustainable development. With uncontrolled and unplanned industrial and other ancillary activities everywhere in the environment, pollution becomes obvious and imminent with glaring consequences on human health and environmental integrity. Most of human woes stem from environmental pollution. Today, there is serious concern over the spate of environment-induced health problems like epidemics of communicable disease and increase prevalence of non-communicable diseases resulting from pollution. These problems are compounded by the fact that in most cases it is difficult to adequately ameliorate the situation due to lack of urban plan, depicting what should be the ideal situation and the absence of an outline to put needed facilities in place to control or overcome hazardous situation.

Sanni and Ipingbemi (2008) have noted that urbanisation and environmental health issues were the major challenges facing planners, city managers, and various professional stakeholders in the environment sector. Indeed, it is hard to find an urban area where facilities are planned to function with the aim of protecting public health. In most cases, consideration is paid to maximising the use of available land space in place of provision facilities to prevent environmental pollution.

In heavily built-up areas, it is often difficult to provide access for solid waste removal. Such situation still exists in most of our urban areas to date. Within Ibadan South-west Local Government in the inner core of the city centre is a massive expands of built-up of area known as "Foko" stretching from Lugbe in the South to the fringes of Bodija in North, Ring Road in the East and Mokola in West. Same situation exist in Lagos Island from Tinubu Square to Carter Bridge bothering the inner Marina in what is popularly known as "Isale Eko". In areas like these, human traffic and vehicular movement is extremely difficult hence, solid waste evacuation is almost impossible. Since places like these exist without planning, several activities go on which expose the inhabitants to adverse health consequence.

Rana (2009) has mentioned air pollution, water pollution, noise pollution, radioactive pollution and land pollution as some of the environmental pollutions likely to be found in unplanned urban areas. There is land, air and water pollution everywhere as if the entire earth is a sinking cesspit. Indeed, there is social disorientation due to urban noise pollution in most of our city centres. Aledare (2008) pointed out that when solid waste is not promptly removed from human habitation, it often become a source of pollution leading to the transmission of diseases like typhoid fever, cholera, dysentery, Lassa fever, etc. Moses (2005) identified indoor air pollution as one of the problems associated with poor housing and poor environmental planning. It is common to notice houses built without adequate ventilation or the ventilation openings have been blocked by other structures on adjoining plots of land. Another growing problem in our unplanned urban areas is air pollution due to emission from automobiles, which is being exacerbated by poor transport arrangement, inadequate road network and the use of aged vehicles as a result of lack of economic power by a large proportion of the population to acquire new vehicles with less emission. It is obvious that where urban planning is not considered as an important aspect of sustainable development, pollution will become an inevitable harbinger of health risk in human settlement.

3.1.4 Urban Solid Waste

Solid waste management is a major challenge in unplanned urban areas. When a community is not adequately planned with consideration for environmental health services; collection, storage, transportation and final disposal of solid waste become a major problem. Sanni and Ipingbemi have recognised the problems of urbanisation and environmental health as major challenges facing planners and other professional stakeholders. Unfortunately not much is done by these stakeholders to address this situation. In fact, Adegoke (1990) noted that one of the spheres of life in which Nigeria has virtually made no start is in the area of waste management. This accounts for heaps of uncollected solid waste that lot our entire landscape. Adegoke stated that there was no systematic approach to waste collection in most urban cities and where collection existed, disposal was often in open dumpsites with virtually no environmental safeguards. Of course this situation will continue to be so since as at today, there is no urban plan with efficient solid waste management system in place in part of Nigeria. Several years have gone past with the Federal Government dream of building sanitary landfill in each of the geo-political zones.

Adegoke (1990) observed that effective waste management is essential for sustainable development. Aledare has recalled that the major function of urban governance was to ensure that the cities were livable. Such a fundamental role can only be possible when there is a well-planned layout with adequate provision for solid waste management. Until our urban areas are planned with environmental health services focused, we cannot but continue to neglect this function and allow cities which can barely support living in a sustainable basis.

3.1.5 Hydrologic Imbalance and Problems of Urban Water Supply

The importance of water is depicted to be life. Unplanned exploitation of water resources is capable of causing water crisis at the national and global level and such situation is capable of causing catastrophic effects on health of human and other members of the ecosystem. When conscious effort is not made in planning the utilisation of water resources because of poor or lack of urban planning, the result is abundance of water for a few and no water for majority as it is the case in many urban cities in Nigeria. You would have noticed the phenomenal growth in un-planned urban settlements with human-induced water scarcity leading to a situation where virtually every developer must as it were, sink his/her own borehole. Such practice is capable to cause hydrological imbalance with potential for huge water crisis. Burton (1996) observed that changes in hydrological cycle by

uncontrolled extraction of underground water will lead to a shift in hydrologic balance. When this combined with deforestation and urbanisation of watersheds, cloud seeding and reservoir construction will result to significant level of global water crisis and dare consequences on human health and stability in the ecosystem.

3.1.6 Ozone Depletion and Global Warming

One of the major noticeable effects of unplanned development is the glowing problems of global warming. This is predicted to continue to rise as a result of increase human activities in unplanned environment (Christopherson, 2006). Major ozone depleting substances in the environment are said to be chiefly released into the atmosphere from activities in the informal setting carried out in unplanned environment. Today, we are confronted with the problems of extreme weather conditions resulting to phenomenal flooding, draught and food crisis, desertification and other effects of varying magnitude. These effects of global warming impact negatively on the general population resulting in various poor health conditions and environmental degradation. Indeed, it is projected that if the current level of anthropogenic emission is maintained, the global temperature will continue to rise above the current annual average, thereby aggravating the health and environmental problems. What must be done is for everyone to think globally and act locally to ensure sustainable management of our ecosystem.

3.2 Effects on Biological Environment

3.2.1 Epidemic of Diseases

Disease epidemics do occur often in most communities in sub-Saharan countries due to several factors including poor environmental sanitation. However, epidemics are even more rampant in un-planned environment where people live in slums and squatter settlements. In most cases a communicable disease will spread to several persons as a result of contiguousness of houses which are poorly built and providing harborage to vectors of disease. Poor urban planning or lack of it enhances and sustain outbreak of disease in our communities. When outbreaks occur, there is apprehension, anxiety and loss of live. The epidemic may be so severe to put enormous pressure on the health system, which further weakens our already weak health system.

3.3 Effects on Social and Economic Environment

3.3.1 Housing Problems

Housing factor is a major challenge in unplanned environment and it is always very glaring when housing is not planned. The problem exhibits in various ways that present the entire landscape like a huge jungle of unhealthy housing crisscrossing in no defined pattern. In an urban area where planning is not considered, buildings are erected without recourse to the provision of basic infrastructure like road, water line, electricity, inadequate drainage, waste disposal facilities, etc. A situation like this often create confusion resulting to a state that people are unable to even have access to their own building. According to WHO (1997), as much as 30-60% of urban population live in poor-quality housing. In most of these urban slums, facilities for basic sanitation are lacking, hence people resort to unhealthy practices like open defecation, which is one of the major drivers of outbreak of communicable diseases.

3.3.2 Transportation and Traffic Management Problems

You have learnt in previous units that urbanisation and increasing population in urban areas was causing a lot of traffic problems in most cities in the world including those in Nigeria. Municipal governments are deeply worried and are often rolling out policies to manage traffic problems in their domain. Recall that when the capital of Nigeria was in Lagos, the odd-even numbers policy was introduce to reduce the number of vehicles on the road. Of course, the policy did not go far in achieving its intended objective. Today, transportation and traffic management problems have taken new dimension as a result of the increase in the volume of vehicles on existing road network. Bi-modal and tri-modal transport schemes are being tried in many cities of the world to solve transport and traffic problems in planned cities. Recently, Lagos adopted bi-modal system for her intra-modal transport where people converge at the Marina, Mile 2 or Apapa to be ferried across the Lagoon to ease the traffic on Okokomaiko-Mile 2-Orile-Marina axis of the State.

Mass transport schemes like high capacity buses, tramps and trains are introduced in planned cities to compliment the regular taxi and mini-buses. However, the situation becomes chaotic when the urban areas and cities are not planned with consideration for high volume of traffic. Today, in most cities in Nigeria notably Abuja, Port Harcourt, Owerri, Lagos and some parts of Kano and Ibadan, traffic situation is sometimes described as night-mare and chaotic as people spent up to two hours or more in traffic on some routes before they can get to their destination. Transport and traffic management problems often result in man-hour loss, accident and loss of lives and property. When there is some

element of transport planning, traffic management becomes less burdensome. But the reverse is the case in Nigeria.

3.3.3 Crimes and Conflicts

Crimes and conflicts are often by-products of unplanned areas. George (2009) noted that crime and other aspects of urban violence manifest as consequence of urbanisation and have profound effect on the quality of urban life. Generally in urban slums, the phenomenon of street children is common. These children grow to carter for their needs and are forced into various crimes from pilfering to house burgling till they graduate into armed robbers. They also learn to fight among themselves and as time goes on, they may organise themselves into gangs, raise some agitations and lead violent protest, which sometimes graduate to armed conflicts. Such youths become readily tools for political, communal or ethnic violence.

Occasionally, since there is no plan and plots are not clearly demarcated, people engaged in squabbles which often result in violent communal conflict with serious consequences including loss of lives and property. Violence of any magnitude is always a serious concern to those involved, those closed by and to the local authorities and law enforcement agents. Slums and such other areas in our urban environment are noted to be breeding ground for violent characters. Violence is defined by WHO (2002) as *the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has high likelihood of resulting in injury, death, psychological harm, mal-development or deprivation.* Urban planning in the context of violence prevention should include human capital development and economic empowerment of the youths.

3.3.4 Urban Poverty

Earlier on, you have leant that poverty is the inability of people to meet their basic need. WHO (1997) further explained that poverty hinders people's ability to access economic and other resources and poor people are those who are denied the opportunities to improve their lot. In this context, poverty can be a cause or an outcome of unplanned environment. Indeed, poverty is one of the major consequences of unplanned environment. Majority of people living in urban slums do not have means of livelihood. Poverty and environmental degradation is inextricably linked. WHO noted that the world's poorest people are often found predominantly in either remote and ecological fragile rural areas or at the margin of expanding urban fringe, where precarious conditions like lack of access to water and basic sanitation expose poor population

to health risk. WHO (1997) pointed out that about 2.9 billion people live in countries where per capita GNP is less than US$600, while about 800 million live in countries where per capita GNP is greater than US$9600. Obviously, most of the countries with less than US$600 per capita are developing countries (including Nigeria) and are forced to live in varying degrees of degraded conditions. In fact, it has been stated by WHO (1997) that as much as 30-60% of urban population live in poor-quality housing. Inequality, according to WHO is therefore a major driving force in the health-environment framework, which hinder the improvement of the health status of many people living in unplanned environment.

3.3.5 Poor Tourism Development

Tourism strives in well-planned urban areas. However, where the environment is not well-planned, tourism is hampered. Nigeria has made huge efforts in promoting tourism through the establishment of the Nigerian Tourist Board and the Nigerian Tourism Development Corporation in the 90s. Today, there is a Federal Ministry of Culture and Tourism saddled with the responsibility of promoting tourism in the country. However, the physical environment has not been made conducive for the promotion of tourism. Nobody will like to visit any place that things are not put in order. Urban areas where the landscape is dotted with heaps of uncollected solid waste, couple with poor infrastructure cannot attract any visitor. As a result of this, Nigeria is unable to tap into the huge potential resources from tourism. While efforts are being made at propagating the ideals of tourism in Nigeria, the same amount of energy should be dissipated at improving our infrastructures as well as planning our urban areas to look attractive to visitors.

SELF-ASSESSMENT EXERCISE

i. List the effects of unplanned urban environment.
ii. Explain how unplanned urban environment causes environmental pollution.

4.0 CONCLUSION

Planned environment does not only improve aesthetic but its pleasantness adds to improve psychological health. When the environment is devoid of some sense of organisation, the obvious outcome is always a state of confusion, which depicts animalistic tendency, anarchy, annoyance and a total disregard to environmental aesthetics. The outcomes of unplanned environment are the enormous effects which impact on human health, environmental quality and the

impact on the general ecosystem. The sustained high prevalence of communicable diseases in most communities in Nigeria can be traced to unplanned environment, where there are absence of sanitary facilities, poor drainage system and lack of access to potable water. The importance of urban planning therefore cannot be overemphasised, hence the need for every stakeholders to see urban planning as public good which must be invested in and sustained.

5.0 SUMMARY

In this unit, you have learnt about the effects of unplanned environment on human health, the quality of the environment and the general ecosystem. It has been highlighted that unplanned environment effect the physical and chemical environment due to damage to topsoil leading to biodiversity loss and desertification. You have also leant about the effects of erosion and gullies as result of poor planning or lack of it particularly when drainage channels are not provided or are blocked in the process of unplanned development. Another major effect of unplanned environment is the problem of waste management resulting from lack of provision for effective management of waste in urban environment. Most communities in Nigeria are experiencing water crisis due to hydrologic imbalance as such communities sprang up without any plan for the provision of water. Some of these problems are being compounded by the effects of global warming.

You have also learnt about the effects of unplanned environment on the biological, social and economic environment such as increase prevalence of communicable disease due to lack of provision of sanitary facilities and adequate potable water and poor quality housing. You have noted the effects of unplanned environment on transportation and traffic management resulting into chaotic traffic situation in most cities in Nigeria. Of course, poor planning or lack of it provide breeding ground for criminals and enhances violence. It also exacerbate urban poverty and hinders robust tourism development, which the denied the country the much needed foreign exchange. All these go to the importance of urban planning for sustainable development in our country. Therefore in the next unit, you will learn how to adopt some measures to control and prevent these effects.

6.0 TUTOR-MARKED ASSIGNMENT

1. (a) Poverty is said to be inextricably linked to environmental Degradation. Discuss.
   (b) Examine the effects of poverty in urban fringe and recommend ways to tackle these effects.
2. (a) As EHO, your boss has directed you to prepare a paper for

him to deliver a lecture at the Annual Public Lecture of Society for Environmental Health on the theme "Our Environment, Our Health". He has equally pointed out that he will like to focus on the effects of unplanned environment on health. Present a concise outline you intend to use for the lecture preparation.

(b) Examine the increase in violence crimes in our contemporary society and describe how effective urban planning can reduce the rate of violence in our society.

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UNIT 3 PREVENTION AND CONTROL OF THE EFFECTS OF UNPLANNED ENVIRONMENT

CONTENTS

1.0 INTRODUCTION

Previously, you learnt about the effects of unplanned environment. Indeed, you were informed that unplanned environment will lead to chaos, societal decay, poor public health outcome and poor environmental aesthetic. In this unit, you will learn some of the ways and strategies to be adopted to control these effects and prevent their occurrence.

It is obvious that every human being appreciates a well-planned society. A planned environment will provide for orderly development of the society, promote good health and enhance social, spiritual and psychological well-being of the populace. To achieve this, every member of the community must be involved in urban planning and management. Therefore, the need for public education, sound urban planning and management policy as well as effective legislation and enforcement become essential ingredients for such a desirable environment. When human being is the centre of every urban planning effort, then such planning can enhance sustainable development. This unit will expose you to some of the techniques to tackle the effects of unplanned environment and suggest some ways to prevent its occurrence.

2.0 OBJECTIVES

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

- explain methods and techniques for creating awareness of the effects of unplanned environment
- describe how to prevent the effects of unplanned environment
- discuss environmental governance and policies for controlling unplanned environment
- describe how enforcement of extant rules could be applied in development control to enhance planned society.

3.0 MAIN CONTENT

3.1 Techniques for Creating Awareness on Environmental Management

3.1.1 Education and Awareness

Unplanned environment impacts negatively on human health and the environment. In fact, it leads to environmental decay, which enhances environmental pollution and outbreaks of communicable diseases in our communities. Unplanned environment promote social disorder, insecurity, high crime rate and moral decadence. These cannot promote sustainable development of any society. To address this, steps must be taken to involve the citizens in the planning processes and encourage them to make contribution to the plan being developed for their community. Indeed, the citizens should be guided to see every urban plan as their own so as to make it operational.

The first step to public participation in urban planning is the creation of awareness and education of members of the public. Ajibade (2000) and

Moses (2004) listed the techniques for creating awareness on environmental issues to include:

- Legislation
- Training programmes
- Drama, music and dance
- Discussions
- Jingles and advertisement (radio & television)
- Print media campaign (advertorials and features)
- Visual display like posters
- Public consultation
- Public campaign
- Establishment of environment related clubs and associations
- Incorporating environmental education (EE) into school curricula.

Moses (2004) have lamented the negative consequences of none involvement of community members in planning, implementation and evaluation of environmental programs. Indeed, Moses observed that community members were not involved in the planning and implementation of programs as basic as solid waste management, which ought to be community driven. Despite the obvious benefits of such participation, planners still adopt the top-bottom, know-it-all approach to planning issues and in planning activities with dire consequences. When community members are not involved in planning, they tend to oppose the ideals and outcome of such planning. They may impede the planning process or oppose its implementation. This results in the distortions of many master plans of towns, cities, regions, states or even the country. It is a common happening for community members to see "strangers" in their community with surveying equipment trying to take measurements from one point to another for one project or the other or for whatever purpose. In most circumstances even the community leader may not be aware. This type of attitude cannot promote sustainable development.

Community involvement can take different forms and can use different methods. As highlighted by Ajibade (2000), it is important to choose the most suitable and effective method on community-to-community basis. In essence, it might be necessary to undertake a wide public awareness like the use of mass media to inform many people of government intention to obtain necessary input into such proposal. This may take the form of radio and television jingles, press advertorials and electronic announcement. Further education could take the form of town hall meetings, seminars and focus group discussions (FGD). Depending on the literacy level of the community members, such other methods like use of posters, drama and dance group or folk songs could be deployed.

The most important consideration is to ensure cost effectiveness of any method being planned and implemented.

Indeed, community members should be the centre of every planning activity and planning goal. Titilola (2008) has traced the genesis of economic stagnation and environmental degradation in Nigeria to lack of public participation in public policies and programs due to lack of awareness. He suggested that for a paradigm shift, there was need for a sustained effort at creating needed awareness and appropriate understanding as well as application of indigenous knowledge and local structure/ institutions through which changes must be transmitted for sustainable development.

It has been pointed out by Titilola (2008) that a growing number of development experts and local and international organisations are slowly appreciating the importance of working with and through these local systems. The benefits are two folds. On the one hand, it allows for effective planning due to cooperation and proper understanding by the local people of the objectives of the planning process and planning outcome. On the other hand, it serves as confidence and capacity building mechanism for the local people to enhance their participation in future planning processes. Indeed, Moses (2002) had earlier opined that such capacity building is able to enhance sustainable development as people would be able to choose what to do, how to do it and the rational for doing it. By this, it is possible for individual to apply indigenous skill and knowledge to assist the realisation of the principles and objectives of urban planning and management more readily than when they are without such skills.

Every planning activity takes place in a community. Within such framework, the local people through their experiences and knowledge of the community are in better position to identify the topography, existence of natural resources and location of other geographic feature of the area. The involvement and participation becomes an asset for smoother planning and management in such an area. Titilola (2008) has defined indigenous knowledge as local knowledge unique to a given culture or society, which formed the information base of any society and it is consistent and coherent set of cognition and technologies that have slowly evolved through trial and error of generations of users who have to live by the results. Indigenous knowledge is community asset that cannot be denied. Planners therefore, need to tap into this local resource-base for success. Therefore, efforts should be made to educate community members on the concept and contents of urban planning as well as involve them in the planning process and the implementation of the plan.

3.1.2 Training in Environmental Planning and Management

Urban planning and management require specific skills and knowledge that must be acquired. Community members are not experts or professionals in this area. Since they are to be involved in planning and management of urban environment in a sustainable basis, they need to receive appropriate level of knowledge to enable them function effectively. Ajibade (2000) suggested bringing the local people together and training at forum such as workshops, seminars and symposia. Such arrangement should ensure that the method and language chosen are appropriate for the participants to achieve the desired result. The deployment of visuals, film show and models/ graphs could aid understanding. Indeed, the contents of such training exercise should be made simple. Avoidance of technical jargons should be the gold standard during such training to maximise interest and understanding.

3.1.3 Inclusion of Environmental Planning in School Curricula

The school system has been recognised by Moses (2004) as change agent. Information effectively passed through the school system always gain wider acceptance as the school is often regarded as credible source of information. Aside from passing general information on urban planning and management through the school system, concepts and principles of urban planning can be incorporated into the school curricula. This can be planned within existing framework with active participation of all stakeholders. The ministry of education, school board and the administrators of the school should be consulted to make necessary adjustment to enable it work.

It has been noted that poverty of knowledge was the greatest enemy of man (Olaleye, 2003 & Moses, 2004). When people are not informed of government policies and programs, they tend to behave in a way that cast aspersion on the intention of government. It is obvious that incorporating urban planning concepts and principles into the school curricula will enhance the knowledge of the future generation on the basis and objectives of urban planning and management. Therefore, efforts should be made to involve all stakeholders in this regard.

3.2 Prevention of the Effects of Unplanned Environment

3.2.1 Environmental Governance, Policies and Politics of Urban Planning

In our society, policy makers determine the direction the country should go. Invariably, the way policy makers think, behave and act in certain manner and circumstance affects and eventually direct how the urban environment is planned and managed. This is a major issue in planning

which should always occupy the mind of planners and other stakeholders. You have explored how planners function in the real world and what motivate their designs. This sub-unit present to you the idea on how planners can be effective in an intricate environment characterised by politics, limited resources, socioeconomic intrigue, and social distinction /class. This task involves learning how to manage these various situations: building relationships in government, getting diverse and hostile people to work and plan together; navigating the tricky waters of implementation, understanding, and sacrifices, negotiation; and finding the financial and fiscal resources needed to develop the plans as well as creating innovative ways to get citizens to participate in the planning process.

Contemporary urban planning institutions and processes in the towns, cities and countries date from the colonial era and do not reflect current local conditions. Zoning schemes and land-use plans have some relevance in some countries, but in other countries they are ignored by both central and local governments. Identifying the various stakeholders and their particular characteristic are necessary for effective planning and management of urban environment. Urban planning and management should therefore be based on the five principles of good urban governance as identified by United Nations Human Settlements Program (2004) being effectiveness, equity, participation, accountability and security. These principles were adopted in the UN-Inter-Agency meeting in 2001, to form the framework for developing indicators for the Urban Governance Index (UGI), which places emphasis on the actors, mechanisms, processes and institutions to create more inclusive cities, relying on process indicators which can be evaluated and the results used for effective review and if necessary re-negotiation, adjustment, and reconstruction of the urban environment.

Environmental governance is aim at sustainable development, equity, fair representation and social justice. To achieve these, there must be sound environmental policy backed up with effective implementation, proper monitoring and systematic evaluation. The people should be taken into confidence and their views sort as important input into the policy and implementation strategies.

3.2.2 Policy Formulation and Legislation

(a) **Policy**

Policies are broad statement of intent with goal to direct course of action, project or program with a set of principles on which they are based in the pursuit of the course of such action. One of the major steps to ensure orderliness in a society is to formulate certain guiding policies

on which public and individual actions must be determined and evaluated. In reality, members of the public are the real determinant of policy direction while government's responsibility is to guide such policy direction. Policy that will be endured and be generally accepted with the cooperation of all in its implementation must adopt a bottom-top approach in its formulation. What that means is that those formulating public policies should endeavour to seek the opinion and obtain input from members of the public who are the primary stakeholders in whatever we perceived as good for them.

Members of the public should on their own decide what course of action to follow and how to go about it. The basis of policy formulation is to direct such course of action. Hence, planners and policy makers are expected to seek for and obtain input from common man on the street. Urban planning policy should guide urban planning and management action to prevent unplanned environment and its effects. When people are conscious of their health and the need to live in a well-planned environment, participation in the formulation of urban planning policy becomes very easy. Such can be achieved through environmental education and public enlightenment.

The process of policy formulation is quite laborious especially if the policy is meant to address already perceived or real urban planning and management problems. In such situation, there will be contending factors, which may influence the policy direction. By and large, popular opinion should be allowed to prevail reflecting the views of majority of stakeholder. At the stage of policy formulation, all issues should be placed on the table and well canvassed. Indeed, nothing should be taken for granted or swept under the carpet as they will eventually re-appear sometimes in the future. It is a wise thing to seek for the opinion of every segment of the society – opinion/ religious leaders, teachers, market women/ traders, the youth, the aged, business men, local artisans, builders, architects, planners, etc. When policy making follow this steps, its implementation and evaluation become very simple as every stakeholder is carried along.

The 2006 *National Urban Development Policy* was meant to be a master piece instrument to guide urban planning and development. However, a quick review of this policy revealed that it is lacking both in craftsmanship as well as input from major stakeholders. No wonder it is less popular both in terms of proportion of Nigerians who know of its existence as well as its implementation. Aside from the fact that this policy has outlived the mandatory five years for review, it is pertinent now that its contents should be made to reflect the opinion of a large proportion of Nigerians so as to stimulate its implementation to remove or better still reduce the effect of unplanned development in our society.

(b) **Legislation**

Good policy is expected to engender equity, fairness and social justice and can easily be turned into law. Some good pieces of legislations have been drawn from well-formulated policies. In practice, policy document have been passed on to legal draftsman for onward transmission to the legislators for necessary input and enactment. Such legislation stemming from popular opinion and input from majority of stakeholders always endure with easy implementation/ obedience with less friction and sanction. On the other hand, the Executive through sectoral guidance or professional agitations may initiate a Bill for a law to address certain urban planning and management problems. Such Bill if not subjected to thorough public debate through *Public Hearing* may contain the views of minorities as it is in most cases with our legislation lacking in legislative due processes.

Urban planning law should be well-thought out with expected roles for every stakeholder and appropriate sanctions against defaulters. Experiences have shown that most of our laws are lacking in enforcement. The 1992 Decree 88 *Nigerian Urban and Regional Planning Law (CAP 138 LFN, 2004)* as amended have existed entirely on paper without any strategy for its enforcement. The law has not been domesticated in most States of the Federation and nobody is known to have been brought to answer for any of its infringement. It is ridiculous that even in the amended version of the Decree 18 of 1999, the fines for offences under the Nigerian Urban and Regional Planning Law ranged from N1,000 to N5,000. Furthermore, as at the time of writing this unit, we understand that *the National Urban and Regional Planning Commission* established through Section 5 of the law has not been constituted for a long time, talk-less of performing its functions of initiating, preparing and implementing the National physical development plans, formulating national urban planning policies, maintaining urban planning standard, conducting research, coordinating the state plans and supervising/ monitoring the implementation of National Physical Development Plan and Development Control. Therefore, there is need to review this law and make it more functional to address the myriad of urban planning and management problems in our society.

3.2.3 Application of Urban Planning and Environmental Laws and Regulations

Effective application of any law begins from the level of public understanding of the issues involved, how much input they made into its enactment, the level of public awareness of its existence, the level of public willingness to participate and cooperate with its implementation as well as the capacity of the sectoral technocrats and professional to enforce its provisions. A good law should not only aim at sanctioning of the offenders but should also tend to educate and encourage compliance. To this end, the law should enjoy robust public consultation and input with adequate information to educate the public on what they stand to gain by obeying the law.

3.2.4 Sustainable Development

The major challenge of unplanned environment is that it hinders sustainable development. No development can take place in an atmosphere of chaos, left alone such development being sustained. Ordinarily, towns and cities are planned to support life and even development. In most planned cities and towns, deliberate attempts are usually made to ensure orderly expansion to enable such towns and cities to cope with upsurge in population. Infrastructures are provided with projection into the future and for a certain maximum population beyond which the carrying capacity of such infrastructure/ facilities is exceeded. Indeed, in every planned area, adequate attention is paid to every minute detail with the ultimate objective of ensuring that the environment provides adequate comfort and security to its dwellers. Structures are built to last for a long time and to provide maximum security and comfort. The structures are built in safe places devoid of any obvious or potential environmental hazards. Drainage channels are provided to avoid flooding and prevent collapse of structure. Such structures are also maintained regularly to last their life-span. Unfortunately, when the concept of planning is thrown overboard, all these are neglected.

3.2.5 Coordination and Implementation of Environmental Action Plan

The imperative of effective urban planning and management lies with effective coordination and implementation of environmental action plan, which in some cases, is referred to as environmental master plan or just master plan. Production of environmental master plan requires the cooperation and input from all stakeholders. These stakeholders would ordinarily include: Policy Makers, Urban Planner and NGO, CBOs and Developers. The input from all stakeholders at this stage is very vital to

an enduring master plan. It is expected that every issue raised at this stage should be considered on a synthesised merit to avoid the effects of unplanned development.

A major defect noticed over the years in our urban planning has been the assumption by the technocrats and professionals that planning and implementation of urban plan was their exclusive right to the knowledge and power to offer to the public a plan that they are bound to accept and implement. Such attitude has led to confusion and distortion in such plan. A good urban plan must be seen as a public good and an enduring legacy for generations to come and therefore should enjoy input from all and sundry. With such notion and objective in mind, the initiation, development and implementation of urban plan should go beyond personal and political interest of those involved.

Planning is one thing; implementation of the developed plan is another. Coordination of the implementation of the plan is very important. Since every plan is set out to achieve specific purposes, their implementation should be monitored and guarded jealously.

Waiting for plans to be violated or distorted and then demolition sets in is not the best way and should be discouraged. The most efficient way to go about this is to ensure public consultation during the development of the plan, adequate education and creation of adequate awareness and effective publicity of the contents of the plan. When this is done, the public will be at the vanguard to protect and monitor the implementation of the plan. The Planners and the Officers in Development Control should form alliance with members of the public. Indeed such corporation can even allow for integration of indigenous ideas into a well-structured urban plan. When such synergy exist, frictions will be removed; wastage as a result of demolition reduced and the public stand to own the plan and appreciate its usefulness in enhancing their well-being and that of generation yet unborn. We can therefore conclude that cooperative urban planning (CUP) will lead to economic prosperity, remove distortion in urban plans, enhance the aesthetic of the environment and encourage compliance to implementation of existing plans.

3.2.6 Establishment of Urban Planning Management Information System (UPMIS)

A systematic and routine system for data collection, collation, analysis, interpretation and presentation is necessary for proper management of the urban environment. Currently, this system is not in place for land management in Nigeria, except in Abuja, which is struggling to set up proper automatic land management for the Federal Capital Territory

(FCT) under the Abuja Geographic Information System (AGIS). This challenge has made land administration cumbersome and very chaotic in many parts of country, resulting to multiple allocations, and encroachment on public land leading to several demolitions, squabbles and outright communal disturbance, acrimony and loss of lives and property as attendant social and economic woes. In this wise, a robust urban planning and management information system (UPMIS) become imperative for effective coordination of the planning and management of the urban environment.

Such a system will provide routine data for the planning and management of urban environment, provide data-base for future planning and help to harmonise urban development in all part of the country. The system will rely on information and communication technology infrastructure and architecture now available with the cooperation of all stakeholders.

Of course, UPMIS is the application of methodologies and techniques of information science, computing, networking and communication to support land administration in three dimensional approaches -who is serves, what services it provides, and what technology it employs. Emphasis is on data collection and processing and its role in land management and administration. It is also the effective and efficient collection, analysis and evaluation of information relating to characteristics of people and communities, their external milieu (i.e. environmental, socio-cultural, economic systems), processing thereof into appropriate information for action.

A robust urban planning and management information system is not a single system but comprises many components, including administrative, financial and surveillance dimensions. The system will include persons, computer hard wares, GPS and a well laid data flow pathway for easy data uptake, processing and information dissemination for action. In view of the fact that data transfer capabilities improve constantly, it would be appropriate to establish an open system with good linkages rather than a single system. With UPMIS in place, it will be possible to know at a glance what parcel of land is allocated for what purpose. The system will assist in land administration and management and enhance efficient third party transaction on pieces of land with real-time on-line verification capabilities, therefore reducing to the barest minimum the problem of double allocation.

Indeed, the establishment and implementation of UPMIS will help to minimise the problems of unplanned environment. When there is a system in place for land use and allocation, it will be difficult for any person not authorised to allocation land for purpose rather than intended.

Inbuilt surveillance system, monitoring and evaluation will help highlight any variation and initiation of prompt action to correct any anomalies when it is not overwhelming. It is now therefore imperative for the Federal Government to come up with a policy back up with appropriate legislation for the establishment and implementation of UPMIS in the country.

3.2.7 Public Participation in Urban Planning and Environmental Management

Public participation in urban planning and management begins with environmental education. This is the pivot of public participation. People need to know what urban planning and management policies and regulations are in place. Indeed, environmental education should include information on responsible utilisation of environmental resources especially the land which is a scarce resource. Ajibade (2000) has listed the techniques for creating awareness discussed above. Strategies should be adopted and efforts made to ensure that land use policies are well popularised, respected and implemented. There must be deliberate efforts to ensure that due processes are followed in land administration and management.

The public private participation initiative could be used as a platform for galvanising the public into groups for sensitisation and education as well as for meaningful participation in urban planning and management. Indeed, it is important that the public be carried along in every planning stage as their input into every plan is very important since they are the primary stakeholders and immediate users of developed plans. Community members should be made to understand and appreciate the purpose and direction of every intended plan and expected benefits to them. When people understand what a plan stands for, they will willingly want to support its production and implementation. Therefore, it is important that mechanism for public involvement and participation be evolved in every LGA and State, while the Federal Government (Federal Ministry of Housing and Urban Development) should put in place a framework for policy direction and guidelines for implementation.

3.2.8 Planning and Implementation of Simulation for Risk Reduction

Strategies for environmental risk management are an integral part of a well-planned urban area. There are bound to be some risks associated with natural phenomenon or as a result of human activities in the environment. Urban planning and management should take cognizance of such risk and how to prevent or reduce its impact on health and the

environment. Planner should ensure risk reduction as much as possible. This can be achieved through assessment of environmental risk potentials and vulnerability. To this end, flood plains, rocky topography and areas prone to disease vectors should be avoided in land allocation.

The public should be trained on risk assessment, risk recognition, risk prevention and risk control strategies. Indeed, it is important that simulation exercises should be organised for members of the public to equip them with necessary skills to apply when there is risk to health and property. Not only should urban plans include fire stations and fire points at public places but the public should be taken through fire drills. Education on hazard prevention and management should equally be offered in schools to children to be safety conscious. By so doing, environmental risk in planned urban areas will be reduced to the barest minimum if not eradicated.

3.3 Control of Unplanned Development

No matter how robust the awareness and public education on a particular law may be, most people would still default in some of its provision. Therefore, the law itself must make adequate provision for sanction with stiffer penalties that will serve as deterrent to others. There must be monitoring mechanism put in place to ensure compliance and enforcement of the provision of the law. One major challenge to the enforcement of urban and regional planning law is selective justice system and fragrant abuses from the top. When some people like *politicians* are treated as being above the law, such a law is bound to suffer set back in its enforcement. Therefore, everybody should be treated equally in the eyes of the law. There should be high level of fairness and justice in the enforcement of Urban and Regional Planning Laws at all levels. The law should not respect any person, while the dispensation of justice in related matter should be prompt and accurate to reduce harms to all concern.

Colossal losses have been recorded in our society as a result of increasing and unabated unplanned urban development. In every new area being developed, one is likely to find slums and squatter settlement emerging side-by-side with planned layout. When there is need to rectify or correct the situation, sometimes demolition become inevitable. It is difficult to quantify such losses in monetary term as there are no records of several collapsed buildings and those demolished for whatever reasons. Buildings are collapsing at almost daily basis with attendant loss of lives and property. In most cases, some of such buildings were erected on reclaimed land not meant for such development, aside from building collapses resulting from the use of inferior and substandard building materials. In other instances, structures

have been demolished in many towns and cities because they violated some guidelines, building code and development regulations. Enforcement of these instruments requires enormous resources, the will power of regulators and cooperation of the general population. The Nigerian Urban and Regional Planning Law (NURPL) Cap N138 LFN, 2004 as amended, empowers every State to establish Development Control Department. This department is essentially meant to enforce development guidelines, regulations and laws.

The main objective of the NURPL and indeed *the National Urban Development Policy, 2006* is to ensure orderly development that is sustainable. Reviewing some of the regulations in this regard, Adeyeye (2010) noted that for an existing developed area to be improved upon, there was need to embark on a 'planning scheme'. Relying on Section 3 of 1946 Town and Country Planning Ordinance, Adeyeye quoted that:

> A planning scheme is authorised to be made with respect to any land, whether or not there are buildings thereon, with the general objective of controlling the development and use of land in the area to which the scheme applies, of securing proper sanitary conditions, amenity and convenience, and preserving buildings or other objects of architectural, historic or artistic interest and places of natural interest or beauty and in general of protecting existing amenities whether in urban or rural portions of the area.

Indeed, when planning scheme become necessary, demolition is inevitable. Section 61 of the *NURPL*, 2004 outlined the power of the Planning Authority to demolish or order demolition of building or part of existing building in an improvement area. Such demolition, however, must meet the following conditions:

- That the building must fall, so far, below the standard of other buildings used for rehabilitation in that area that it is or is likely to become a danger to health of its occupiers or occupiers of adjacent building.
- That the building must be in such a state of disrepair that it is likely to become a danger to public safety and cannot, at reasonable cost, be repaired.
- That two or more contiguous building are badly laid out and so congested that without the demolition of one or more of them, that part of the improvement area cannot be improved, and
- That the building is in connection with the provision of infrastructural facilities of the area.

Enforcement of planning laws and regulations usually goes with some responsibilities and pains. It is important to note that demolition can be avoided if development is preceded by effective planning, obedience to its provision and provision of needed infrastructures. Unfortunately, this is not always the case in most of our urban areas. Lack of planning or inability to abide with the planning rules and principles is a major drawback to sustainable development in Nigeria. Of course, we cannot ensure sustainable development when our urban areas are not well-planned. Sustainable development has consistently be defined as *development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs,* (WCED, 1987; Munn *et al.,* 2005; Malamud, 1997; Hanley & Atkinson, 2003). Unplanned environment cannot support sustainable development. Indeed obvious indication of a community that is moving towards sustainable development is a proper planned environment. Therefore, for our country to move towards the part of sustainable development, efforts must be made to ensure proper planning and management of our urban areas, including enforcement of extant rules and regulations. This must be seen as a task that involves every stakeholder.

SELF-ASSESSMENT EXERCISE

i. List five (5) effects of unplanned environment.
ii. Mention three (3) ways of improving environmental awareness and education.
iii. List five techniques for creating environmental awareness.

4.0 CONCLUSION

In this unit, we have highlighted the fact that unplanned environmental will lead to chaos, societal decay, poor public health outcome and poor environmental aesthetic. It is obvious that unplanned environment impact negatively on human health and environmental aesthetics. In fact, it leads to environmental decay, which enhances environmental pollution and outbreaks of communicable diseases in our communities. It is capable of promoting social disorder, insecurity, high crime rate and moral decadence. For these reasons, efforts must be made to ensure orderly society through proper urban planning and management. The public must be carried along in every planning effort, while their views should form core input into such plan. When CUP is in place, there will be less friction and cooperation among every stakeholder resulting in a well-planned and implemented urban areas.

5.0 SUMMARY

In this unit, you have learnt about measures to prevent and control the effects of unplanned environment. Techniques for creating awareness on environmental issues have been listed as the first step in instituting education and awareness. You have also learnt about how to organise training of the public in environmental planning and management and the need to include environmental planning and management in school curricula for sustained education and internalisation of knowledge and skills in environmental issues in the country. You have been presented with the need for effective urban environment governance starting with robust environmental policies, legislation and enforcement of environmental laws and regulations. Coordination of the implementation of environmental action plan (master plan) has been highlighted as an important ingredient in environmental management to reduce lack of proper planning. Since information is required for effective urban planning to avoid the effects of unplanned environment, the need to establish UPMIS has been advocated which should be implemented along with public participation and cooperation. Generally, every plan should include risk management strategies which have also been highlighted.

6.0 TUTOR-MARKED ASSIGNMENT

1. (a) What has been responsible for poor enforcement of environmental laws and legislation in Nigeria?
   (b) Discuss five (5) steps you may wish to suggest to enhance effective enforcement of urban laws and regulations in your State.
2. You have been appointed a member into your State Urban Planning and Management Review Committee and you are expected to present a proposal on the establishment of Urban Planning and Management Information System (UPMIS).
   (a) Describe the system.
   (b) List its component parts.
   (c) Discuss what it will take to establish a robust UPMIS in your State.
3. Public participation is sine-quo-non to effective urban planning. Mention and discuss five (5) steps you adopt to involve members of the public in urban planning and management in your State.

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