EMT506: HUMAN SETTLEMENT AND DEVELOPMENT

COURSE UNITS – 3

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EMT 506: Human Settlement and Development (3 Units)

COURSE SYNOPSIS

I) Human settlements: size and density.
2) Factors influencing human settlements
   i) Location
   ii) Landscape designs
   iii) Parks and reserves.
3) Rural, urban land use and environmental quality.
4) Culture and environment: patterns, health and safety and Impact of human settlement and development on the environment
5) Environmental ethics with **Case studies:** examples of significant human settlements and developments projects and their environmental impacts.

INTRODUCTION

Human beings invariably need food, clothes and shelter for normal living. These three are the basic necessities. Shelter is the place for a safe rest and comfortable stay. Shelter is also a place for human cultural activities and social linkages. The word "shelter" may denote houses, dwellings, group of dwellings and habitations. The word hamlet was also used for a small group of shelters, in the rural areas.
Human settlement and development is the study of the evolution of human settlement and how it impacts on the physical, social and economic wellbeing of man.

WHAT YOU WILL LEARN IN THIS COURSE

COURSE AIM

The aim and objectives of this course is to introduce and expose students to the concept of human development and settlement and how it has evolved over time and space.

COURSE OBJECTIVES

It is believed that at the end of this course, you will have a better understanding of the concepts of settlements, their patterns, functions, factors that affect settlements and how settlements and human development interplay.
On successful completion of the course, you should be able to:

- Define human settlement
- Explain the concept of human settlement
- Explain the concept of human development

- Identify various types of settlements
- Identify factors responsible for the growth and decline of a settlement
- Access and establish environmental quality
- Establish the relationship between culture and the environment
- Identify the impact of man on the environment
- Understand environmental ethics and safety
- Advocate on the need for sustainable settlement and human development

COURSE OVERVIEW

It is expected that the student will spend quality time in studying the course material. It is also expected that the students will avail themselves of the opportunity to garner knowledge by applying themselves fully in order to get the best of the resource material provided. They are also encouraged not to limit themselves to the course material alone but to increase their knowledge of the subject matter by reading additional study materials.

STUDY UNITS

There are five (5) modules broken into 25 study units in this course as follows:

MODULE 1: HUMAN SETTLEMENT, SIZE AND DENSITY

UNIT 1: CONCEPT OF HUMAN SETTLEMENTS
UNIT 2: HISTORY OF HUMAN SETTLEMENTS
UNIT 3: TYPES OF HUMAN SETTLEMENTS
UNIT 4: DEVELOPMENT AND GROWTH OF HUMAN SETTLEMENT
UNIT 5: HUMAN DEVELOPMENT

MODULE 2: **FACTORS INFLUENCING HUMAN SETTLEMENTS**

UNIT 1: LOCATION
UNIT 2: LANDSCAPE DESIGNS
UNIT 3: PARKS AND RESERVES
UNIT 4: CLIMATE
UNIT 5: ECONOMIC

MODULE 3: RURAL, URBAN LAND USE AND ENVIRONMENTAL QUALITY

UNIT 1: FUNCTIONS OF SETTLEMENTS
UNIT 2: RURAL LAND USE
UNIT 3: URBAN LAND USE
UNIT 4: ENVIRONMENTAL QUALITY

UNIT 5: IMPACT OF HUMAN SETTLEMENT AND DEVELOPMENT ON THE ENVIRONMENT

MODULE 4: CULTURE AND ENVIRONMENT: PATTERNS, HEALTH AND SAFETY
UNIT 1: CULTURE
UNIT 2: CULTURE AND ENVIRONMENT
UNIT 3: PATTERNS
UNIT 4: HEALTH AND SAFETY
UNIT 5: SUSTAINABLE PRACTICES

MODULE 5: ENVIRONMENTAL ETHICS
UNIT 1: STATE OF THE ENVIRONMENT
UNIT 2: ENVIRONMENTAL ETHICS
UNIT 3: ENVIRONMENTAL EDUCATION
UNIT 4: SUSTAINABLE DEVELOPMENT
UNIT 5: CASE STUDIES, EXAMPLES OF SIGNIFICANT HUMAN SETTLEMENTS AND DEVELOPMENT PROJECTS AND THEIR ENVIRONMENTAL IMPACTS

COURSE MARKING SCHEME

ASSIGNMENTS	MARKS
TUTOR MARKED ASSIGNMENTS (TMA)	30%
EXAMINATION	70%
TOTAL	100%

FACILITATORS AND TUTORIALS
There are thirty-nine (39) hours of tutorials provided for this course. You will be required to belong to a tutorial group. Information regarding date, time and venue for the tutorial will be communicated to you through your study center. Do not hesitate to contact your facilitator(s) if:

a) you do not understand any part of the course material or assigned readings
b) you have difficulty with your TMA
c) you have a problem with your assignment

WORKING THROUGH THIS COURSE

The following are practical strategies for working through this course:

1) Read the course guide thoroughly.
2) Organize a study schedule. Refer to the course overview for more details. Note the time you are expected to spend on each unit and how the assignment relates to the units.
3) Once you have created your study schedule, do everything to stick to it. The major reason students often fail is that they fall behind in their course work.
4) Assemble the study materials. Gather information on what you need for the unit that you are studying.
5) Carry out research on the internet in order to gain more knowledge about the subject matter.
6) Always have a pen and paper handy to jot down important points as you read and research
7) Work through the unit and the content of the unit systematically let it serve as a guide.
8) Do not jump from one unit to another. Try to ensure that you have completely understood all about a unit before moving on to the next unit.
9) Set tasks ad goals for yourself concerning each unit and ensure that these are achieved.
10) Discuss extensively with your study group. Sets tests and quizzes that would help to ensure that you have fully comprehended what you studied.

MODULE 1: HUMAN SETTLEMENT, SIZE AND DENSITY

UNIT 1: CONCEPT OF HUMAN SETTLEMENTS
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UNIT 5: HUMAN DEVELOPMENT

UNIT 1: CONCEPT OF HUMAN SETTLEMENTS

CONTENTS

1.0 INTRODUCTION

Though we use the term settlement very frequently, but when it comes for defining, it is very difficult to give a clear cut definition. In simpler term we can define settlement as any form of human habitation which ranges from a single dowelling to large city.

The word settlement has another connotation as well as this is a process of opening up and settling of a previously uninhabited area by the people. In geography this process is also known as occupancy. Therefore, we can say settlement is a process of grouping of people and acquiring of some territory to build houses as well as for their economic support.

2.0 OBJECTIVES

- After going through this unit, you will be able to:
- Describe the meaning of settlement;
- Understand the need for settlements

3.0 MAIN CONTENT

The concept of a human settlement is both social and physical, and it can be defined as having two components: a human group, and the habitat of this group. This important distinction makes it clear that settlements are not just roads, houses and other infrastructure: they are also sets of social relationships. Defined in this way the issues of human settlements are wide-ranging - population, pollution, employment, social welfare, health and food as well as the more normally under- stood questions of shelter According to the British Broadcasting Corporation (BBC) English Dictionary for the World (2018), a settlement is a place where people come to live and build houses. The key features of this definition being; Place, People, Live and Homes. Place refers to a site which describes the characteristics of the actual point of which the settlement is located relative to other locations. People/Live implies that a settlement is congregated by variety of inhabitants either related or unrelated which interact with each other and the environment for mutual benefit. Situation describes the characteristics of the actual point at which the settlement is located and was of major importance in the initial establishment and growth of that settlement. Homes on the other hand provide shelter elements (temporary/permanent) for man and his domestic animals and prevent man from external invasion if such interaction is to be sustained and maintained.
Thus a settlement can be a big city of hundreds of thousands of people or a small village with few people living there. Settlement is very important for human activities so whatever the size of the settlement there is always some reason for living in it.

Since the emergence of the first settlements when migratory bands of hunters and collectors who lived at subsistence level became sedentary farmers, settlements have evolved over time. The transition has witnessed the growth of the three settlements earliest civilizations in the three river basins of the: Tigris-Eupharates (in Mesopotamia); the Nile and the Indus through the settlement of the middle ages where

larger towns and urban centers were developed with an increasing range of functions like administration, commercialization of food supply and distribution, craft engineering and mining, defence and so on. Today settlements have grown so much and in such sophistication made possible by highly sophisticated technologies.

3.1 HUMAN SETTLEMENT OBJECTIVE

The overall human settlement objective is to improve the social, economic and environmental quality of human settlements and the living and working environments of all people, in particular the urban and rural poor. Such improvement should be based on technical cooperation activities, partnerships among the public, private and community sectors and participation in the decision-making process by community groups and special interest groups such as women, indigenous people, the elderly and the disabled. Countries will need to set priorities in accordance with their national plans and objectives, taking fully into account their social and cultural capabilities. Furthermore, they should make appropriate provision to monitor the impact of their strategies on marginalized and disenfranchised groups, with particular reference to the needs of women.

This could be achieved through the following:

3.1.1 Providing adequate shelter for all.

Access to safe and healthy shelter is essential to a person's physical, psychological, social and economic well-being and should be a fundamental part of national and international action. The right to adequate housing as a basic human right is enshrined in the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights. Despite this, it is estimated that at the present time, at least 1 billion people do not have access to safe and healthy shelter and that if appropriate action is not taken, this number will increase dramatically by the end of the century and beyond.

3.1.2 Improving human settlement management.

By the turn of the century, the majority of the world's population will be living in cities. While urban settlements, particularly in developing countries, are showing many of the symptoms of the global environment and development crisis, they nevertheless generate 60 per cent of gross national product and, if properly managed, can develop the capacity to sustain their productivity, improve the living conditions of their residents and manage natural resources in a sustainable way. It is therefore important to ensure sustainable management of all settlements, particularly in developing countries, in order to enhance their ability to improve the living conditions of residents, especially the marginalized and disenfranchised, thereby contributing to the achievement of national economic development goals.

In order to achieve this all countries should, as appropriate and in accordance with national plans, objectives and priorities and with the assistance of non-governmental organizations and representatives of local authorities, undertake the following activities at the national, state/provincial and local levels, with the assistance of relevant programmes and support agencies. These could be further achieved through:

- Improving urban/rural management
- Strengthening urban/rural data systems
- Encouraging intermediate city development

3.1.2a IMPROVING URBAN/RURAL MANAGEMENT

(a) Adopt and apply urban and rural management guidelines in the areas of land management, urban environmental management, infrastructure management and municipal finance and administration

(b) Accelerate efforts to reduce urban and rural poverty through a number of actions, including:

(i) Generating employment for the urban/rural poor, particularly women through the provision, improvement and maintenance of urban infrastructure and services and the support of economic activities in the informal sector, such as repairs recycling, services and small commerce;

(ii) Providing specific assistance to the poorest of the urban/rural poor through, inter alia, the creation of social infrastructure in order to reduce hunger and homelessness, and the provision of adequate community services;

(iii) Encouraging the establishment of indigenous community-based organizations, private voluntary organizations and other forms of non-governmental entities that can contribute to the efforts to reduce poverty and improve the quality of life for low-income families;

(c) Adopt innovative city planning strategies to address environmental and social issues by:

(i) Reducing subsidies on, and recovering the full costs of environmental and other services of high standard (e.g. water supply, sanitation, waste collection, road telecommunications) provided to higher income neighbourhoods;

(ii) Improving the level of infrastructure and service provision in poorer urban areas;

(d) Developing local strategies for improving the quality of life and the environment, integrating decisions on land use and land management, investing in the public and private sectors and mobilizing human and material resources, thereby promoting employment generation that is environmentally sound and protective of human health.

3.1.2b STRENGTHENING URBAN/RURAL DATA SYSTEMS

All countries should undertake, with the active participation of the business sector as appropriate, pilot projects in selected settlements for the collection, analysis and subsequent dissemination of urban/rural data, including environmental impact analysis, at the local, state/provincial, national and international levels and the establishment of settlement data management capabilities.

3.1.2c ENCOURAGING INTERMEDIATE CITY DEVELOPMENT

In order to relieve pressure on large urban agglomerations of developing countries, policies and strategies should be implemented towards the development of intermediate cities that create employment opportunities for unemployed labour in the rural areas and support rural-based economic activities, although sound urban management is essential to ensure that urban sprawl does not expand resource degradation over an ever wider land area and increase pressures to convert open space and agricultural/buffer lands for development.

Therefore all countries should, as appropriate, conduct reviews of urbanization processes and policies in order to assess the environmental impacts of growth and apply urban planning and management approaches specifically suited to the needs, resource capabilities and characteristics of their growing intermediate-sized cities. As appropriate, they should also concentrate on activities aimed at facilitating the transition from rural to urban lifestyles and settlement patterns and at promoting the development of small-scale economic activities, particularly the production of food, to support local income generation and the production of intermediate goods and services for rural hinterlands.

Intermediate cities, particularly those characterized by severe sustainable development problems, should, in accordance with national laws, rules and regulations, develop and strengthen programmes aimed at addressing such problems and guiding their development along a sustainable path. They should as appropriate:

(a) Institutionalize a participatory approach to sustainable urban development, based on a continuous dialogue between the actors involved in urban development

(the public sector, private sector and communities), especially women and indigenous people;

(b) Improve the urban environment by promoting social organization and environmental awareness through the participation of local communities in the identification of public services' needs, the provision of urban infrastructure, the enhancement of public amenities and the protection and/or rehabilitation of older buildings, historic precincts and other cultural artifacts. In addition, "green works" programmes should be activated to create self-sustaining human development activities and both formal and informal employment opportunities for low-income urban residents;

(c) Strengthen the capacities of their local governing bodies to deal more effectively with the broad range of developmental and environmental challenges associated with rapid and sound urban growth through comprehensive approaches to planning that recognize the individual needs of cities and are based on ecologically sound urban design practices;

(d) Participate in international "sustainable city networks" to exchange experiences and mobilize national and international technical and financial support;

(e) Promote the formulation of environmentally sound and culturally sensitive tourism programmes as a strategy for sustainable development of urban and rural settlements and as a way of decentralizing urban development and reducing discrepancies among regions;

(f) Establish mechanisms, with the assistance of relevant international agencies, to mobilize resources for local initiatives to improve environmental quality;

(g) Empower community groups, non-governmental organizations and individuals to assume the authority and responsibility for managing and enhancing their immediate environment through participatory tools, techniques and approaches embodied in the concept of environmental care.

3.1.3 Promoting sustainable land-use planning and management

Access to land resources is an essential component of sustainable low-impact lifestyles. Land resources are the basis for (human) living systems and provide soil, energy, water and the opportunity for all human activity. In rapidly growing urban

areas, access to land is rendered increasingly difficult by the conflicting demands of industry, housing, commerce, agriculture, land tenure structures and the need for open spaces. Furthermore, the rising costs of urban land prevent the poor from gaining access to suitable land.
In rural areas, unsustainable practices, such as the exploitation of marginal lands and the encroachment on forests and ecologically fragile areas by commercial interests and landless rural populations, result in environmental degradation, as well as in diminishing returns for impoverished rural settlers.

In order to Promote sustainable land-use planning and management the government should provide for the land requirements of human settlement development through environmentally sound physical planning and land use so as to ensure access to land to all households and, where appropriate, the encouragement of communally and collectively owned and managed land. Particular attention should be paid to the needs of women and indigenous people for economic and cultural reasons.
The government as a matter of urgency should consider, as appropriate, undertaking a comprehensive national inventory of their land resources in order to establish a land information system in which land resources will be classified according to their most appropriate uses and environmentally fragile or disaster-prone areas will be identified for special protection measures and should subsequently consider developing national land-resource management plans to guide land-resource development and utilization. To this end the government should:

(a) Establish, as appropriate, national legislation to guide the implementation of public policies for environmentally sound urban development, land utilization, housing and for the improved management of urban expansion;

(b) Create, where appropriate, efficient and accessible land markets that meet community development needs by, inter alia, improving land registry systems and streamlining procedures in land transactions;

(c) Develop fiscal incentives and land-use control measures, including land-use planning solutions for a more rational and environmentally sound use of limited land resources;

(d) Encourage partnerships among the public, private and community sectors in managing land resources for human settlements development;

(e) Strengthen community-based land-resource protection practices in existing urban and rural settlements;

(f) Establish appropriate forms of land tenure that provide security of tenure for all land-users, especially indigenous people, women, local communities, the low-income urban dwellers and the rural poor;

(g) Accelerate efforts to promote access to land by the urban and rural poor, including credit schemes for the purchase of land and for building/acquiring or improving safe and healthy shelter and infrastructure services;

(h) Develop and support the implementation of improved land-management practices that deal comprehensively with potentially competing land requirements for agriculture, industry, transport, urban development, green spaces, preserves and other vital needs;

(i) Promote understanding among policy makers of the adverse consequences of unplanned settlements in environmentally vulnerable areas and of the appropriate national and local land-use and settlements policies required for this purpose.

At the international level, global coordination of land-resource management activities should be strengthened by the various bilateral and multilateral agencies and programmes. All countries, particularly developing countries, alone or in regional or sub-regional groupings, should be given access to modern techniques of land-resource management, such as geographical information systems, satellite photography/imagery and other remote-sensing technologies.

Environmentally focused training activities in sustainable land-resources planning and management should be undertaken in all countries, with developing countries being given assistance through international support and funding agencies in order to:

(a) Strengthen the capacity of national, state/provincial and local educational research and training institutions to provide formal training of land-management technicians and professionals;

(b) Facilitate the organizational review of government ministries and agencies responsible for land questions, in order to devise more efficient mechanisms of land-resource management, and carry out periodic in-service refresher courses for the managers and staff of such ministries and agencies in order to familiarize them with up-to-date land-resource-management technologies;

(c) Where appropriate, provide such agencies with modern equipment, such as computer hardware and software and survey equipment;

(d) Strengthen existing programmes and promote an international and interregional exchange of information and experience in land management through the establishment of professional associations in land-management sciences and related activities, such as workshops and seminars.

3.1.4 Promoting the integrated provision of environmental infrastructure: water, sanitation, drainage and solid-waste management

The sustainability of urban/rural development is defined by many parameters relating to the availability of water supplies, air quality and the provision of environmental infrastructure for sanitation and waste management. As a result of the density of users, urbanization, if properly managed, offers unique opportunities for the supply of sustainable environmental infrastructure through adequate pricing policies, educational programmes and equitable access mechanisms that are economically and environmentally sound. In most developing countries, however, the inadequacy and lack of environmental infrastructure is responsible for widespread ill-health and a large number of preventable deaths each year. In those countries conditions are set to worsen due to growing needs that exceed the capacity of Governments to respond adequately.

An integrated approach to the provision of environmentally sound infrastructure in human settlements, in particular for the urban and rural poor, is an investment in sustainable development that can improve the quality of life, increase productivity, improve health and reduce the burden of investments in curative medicine and poverty alleviation. Most of the activities, whose management would be improved by an integrated approach, are covered in Agenda 21 as follows:

Protecting and promoting human health conditions

Protecting the atmosphere

Protecting the quality and supply of freshwater resources

Environmentally sound management of solid wastes and sewage-related issues.

In promoting the integrated provision of environmental infrastructure, water, sanitation, drainage and solid-waste management the government is to ensure that it provides adequate environmental infrastructure facilities in all settlements. For countries to achieve this it would require that all developing countries incorporate in their national strategies programmes to build the necessary technical, financial and human resource capacity aimed at ensuring better integration of infrastructure and environmental planning. This could be done by assessing the environmental suitability

of infrastructure in human settlements, developing national goals for sustainable management of waste, and implementing environmentally sound technology to ensure that the environment, human health and quality of life are protected. Settlement infrastructure and environmental programmes designed to promote an integrated human settlements approach to the planning, development, maintenance and management of environmental infrastructure (water supply, sanitation, drainage, solid-waste management) should be strengthened with the assistance of bilateral and multilateral agencies. Coordination among these agencies and with collaboration from international and national representatives of local authorities, the private sector and community groups should also be strengthened. The activities of all agencies engaged in providing environmental infrastructure should, where possible, reflect an ecosystem or metropolitan area approach to settlements and should include monitoring, applied research, capacity-building, transfer of appropriate technology and technical cooperation among the range of programme activities. Developing countries should be assisted at the national and local levels in adopting an integrated approach to the provision of water supply, energy, sanitation, drainage and solid-waste management, and external funding agencies should ensure that this approach is applied in particular to environmental infrastructure improvement in informal settlements based on regulations and standards that take into account the living conditions and resources of the communities to be served.

All countries should, as appropriate, adopt the following principles for the provision of environmental infrastructure:

(a) Adopt policies that minimize if not altogether avoid environmental damage, whenever possible;

(b) Ensure that relevant decisions are preceded by environmental impact assessments and also take into account the costs of any ecological consequences;

(c) Promote development in accordance with indigenous practices and adopt technologies appropriate to local conditions;

(d) Promote policies aimed at recovering the actual cost of infrastructure services, while at the same time recognizing the need to find suitable approaches (including subsidies) to extend basic services to all households;

(e) Seek joint solutions to environmental problems that affect several localities.

The dissemination of information from existing programmes should be facilitated and encouraged among interested countries and local institutions. Scientific and

technological means within the existing programmes should be coordinated wherever possible and should:

(a) Accelerate research in the area of integrated policies of environmental infrastructure programmes and projects based on cost/benefit analysis and overall environmental impact;

(b) Promote methods of assessing "effective demand", utilizing environment and development data as criteria for selecting technology.

(c) Human resource development and capacity-building

With the assistance and support of funding agencies, all countries should, as appropriate, undertake training and popular participation programmes aimed at:

(a) Raising awareness of the means, approaches and benefits of the provision of environmental infrastructure facilities, especially among indigenous people, women, low-income groups and the poor;

(b) Developing a cadre of professionals with adequate skills in integrated infrastructural service planning and maintenance of resource-efficient, environmentally sound and socially acceptable systems;

(c) Strengthening the institutional capacity of local authorities and administrators in the integrated provision of adequate infrastructure services in partnership with local communities and the private sector;

(d) Adopting appropriate legal and regulatory instruments, including cross-subsidy arrangements, to extend the benefits of adequate and affordable environmental infrastructure to un-served population groups, especially the poor.

3.1.5 Promoting sustainable energy and transport systems in human settlements

Most of the commercial and non-commercial energy produced today is used in and for human settlements, and a substantial percentage of it is used by the household sector. Developing countries are at present faced with the need to increase their energy production to accelerate development and raise the living standards of their populations, while at the same time reducing energy production costs and energy-related pollution. Increasing the efficiency of energy use to reduce its polluting effects

and to promote the use of renewable energies must be a priority in any action taken to protect the urban environment.

Developed countries, as the largest consumers of energy, are faced with the need for energy planning and management, promoting renewable and alternate sources of energy, and evaluating the life-cycle costs of current systems and practices as a result of which many metropolitan areas are suffering from pervasive air quality problems related to ozone, particulate matters and carbon monoxide. The causes have much to do with technological inadequacies and with an increasing fuel consumption generated by inefficiencies, high demographic and industrial concentrations and a rapid expansion in the number of motor vehicles.

Transport accounts for about 30 per cent of commercial energy consumption and for about 60 per cent of total global consumption of liquid petroleum. In developing countries, rapid motorization and insufficient investments in transport planning, traffic management and infrastructure, are creating increasing problems in terms of accidents and injury, health, noise, congestion and loss of productivity similar to those occurring in many developed countries. All of these problems have a severe impact on populations, particularly the low-income and no-income groups.

In order to promote sustainable energy and transport systems in human settlements Governments should ensure the provision of more energy-efficient technology and alternative/renewable energy for human settlements and reduce negative impacts of energy production and use on human health and on the environment.

A comprehensive approach to the promotion of sustainable energy development in all countries should be adopted and carried as thus:

(a) **Developing countries:**

(i) Formulate national action programmes to promote and support afforestation and national forest regeneration with a view to achieving sustained provision of the biomass energy needs of the low-income groups in urban areas and the rural poor, in particular women and children;

(ii) Formulate national action programmes to promote integrated development of energy-saving and renewable energy technologies, particularly for the use of solar, hydro, wind and biomass sources;

(iii) Promote wide dissemination and commercialization of renewable energy technologies through suitable measures, inter alia,fiscal and technology transfer mechanisms;

(iv) Carry out information and training programmes directed at manufacturers and users in order to promote energy-saving techniques and energy-efficient appliances;

(b) **International organizations and bilateral donors:**

(i) Support developing countries in implementing national energy programmes in order to achieve widespread use of energy-saving and renewable energy technologies, particularly the use of solar, wind, biomass and hydro sources;
(ii) Provide access to research and development results to increase energy-use efficiency levels in human settlements.

Promoting efficient and environmentally sound transport systems in all countries should be a comprehensive approach to transport planning and management. To this end, all countries should:

(a) Integrate land-use and transportation planning to encourage development patterns that reduce transport demand;

(b) Adopt transport programmes favouring high-occupancy public transport in countries, as appropriate;

(c) Encourage non-motorized modes of transport by providing safe cycle-ways and footways in urban and suburban centres in countries, as appropriate;

(d) Devote particular attention to effective traffic management, efficient operation of public transport and maintenance of transport infrastructure;

(e) Promote the exchange of information among countries and representatives of local and metropolitan areas;

(f) Re-evaluate the present consumption and production patterns in order to reduce the use of energy and national resources.

In order to enhance the skills of energy service and transport professionals and institutions, all countries should, as appropriate:

(a) Provide on-the-job and other training of government officials, planners, traffic engineers and managers involved in the energy-service and transport section;

(b) Raise public awareness of the environmental impacts of transport and travel behaviour through mass media campaigns and support for non-governmental and community initiatives promoting the use of non-motorized transport, shared driving and improved traffic safety measures;

(c) Strengthen regional, national, state/provincial, and private sector institutions that provide education and training on energy service and urban transport planning and management.

3.1.6 Promoting human settlement planning and management in disaster-prone areas

Natural disasters cause loss of life, disruption of economic activities and productivity, particularly for highly susceptible low-income groups, and environmental damage, such as loss of fertile agricultural land and contamination of water resources, and can lead to major resettlement of populations. Over the past two decades, they are estimated to have caused some 3 million deaths and affected 800 million people. Global economic losses have been estimated by the Office of the United Nations Disaster Relief Coordinator to be in the range of $30-50 billion per year.
The General Assembly, in resolution 44/236, proclaimed the 1990s as the International Decade for Natural Disaster Reduction and the goals of the International Decade for Natural Disaster are as follows:

(a) To improve the capacity of each country to mitigate the effects of natural disasters expeditiously and effectively, paying special attention to assisting developing countries in the assessment of disaster damage potential and in the establishment of early warning systems and disaster-resistant structures when and where needed;

(b) To devise appropriate guidelines and strategies for applying existing scientific and technical knowledge, taking into account the cultural and economic diversity among nations;

(c) To foster scientific and engineering endeavours aimed at closing critical gaps in knowledge in order to reduce loss of life and property;

(d) To disseminate existing and new technical information related to measures for the assessment, prediction and mitigation of natural disasters;

(a) To develop measures for the assessment, prediction, prevention and mitigation of natural disasters through programmes of technical assistance and technology

transfer, demonstration projects, and education and training, tailored to specific disasters and locations, and to evaluate the effectiveness of those programmes.

In addition, there is an urgent need to address the prevention and reduction of man-made disasters and/or disasters caused by, inter alia, industries, unsafe nuclear power generation and toxic wastes. This is to enable all countries, in particular those that are disaster-prone, to mitigate the negative impact of natural and man-made disasters on human settlements, national economies and the environment.
In order to achieve this government needs to develop awareness and programmes in line with three basic themes that will help mitigate the issue. These are:
The development of a "culture of safety",
Pre-disaster planning
Post-disaster reconstruction.

(a) Developing a culture of safety
To promote a "culture of safety" in all countries, especially those that are disaster-prone, the following activities should be carried out:

(a) Completing national and local studies on the nature and occurrence of natural disasters, their impact on people and economic activities, the effects of inadequate construction and land use in hazard-prone areas, and the social and economic advantages of adequate pre-disaster planning;

(b) Implementing nationwide and local awareness campaigns through all available media, translating the above knowledge into information easily comprehensible to the general public and to the populations directly exposed to hazards;

(c) Strengthening, and/or developing global, regional, national and local early warning systems to alert populations to impending disasters;

(d) Identifying industrially based environmental disaster areas at the national and international levels and implementing strategies aimed at the rehabilitation of these areas through, inter alia:

(i) Restructuring of the economic activities and promoting new job opportunities in environmentally sound sectors;

(ii) Promoting close collaboration between governmental and local authorities, local communities and non-governmental organizations and private business;

(iii) Developing and enforcing strict environmental control standards.

(b) Developing pre-disaster planning

Pre-disaster planning should form an integral part of human settlement planning in all countries. The following should be included:

(a) Undertaking complete multi-hazard research into risk and vulnerability of human settlements and settlement infrastructure, including water and sewerage, communication and transportation networks, as one type of risk reduction may increase vulnerability to another (e.g., an earthquake-resistant house made of wood will be more vulnerable to wind storms);

(b) Developing methodologies for determining risk and vulnerability within specific human settlements and incorporating risk and vulnerability reduction into the human settlement planning and management process;

(c) Redirecting inappropriate new development and human settlements to areas not prone to hazards;

(d) Preparing guidelines on location, design and operation of potentially hazardous industries and activities;

(e) Developing tools (legal, economic etc.) to encourage disaster-sensitive development, including means of ensuring that limitations on development options are not punitive to owners, or incorporate alternative means of compensation;

(f) Further developing and disseminating information on disaster-resistant building materials and construction technologies for buildings and public works in general;

(g) Developing training programmes for contractors and builders on disaster-resistant construction methods. Some programmes should be directed particularly to small enterprises, which build the great majority of housing and other small buildings in the developing countries, as well as to the rural populations, which build their own houses;

(h) Developing training programmes for emergency site managers, non-governmental organizations and community groups which cover all aspects of disaster mitigation, including urban search and rescue, emergency communications, early warning techniques, and pre-disaster planning;

(i) Developing procedures and practices to enable local communities to receive information about hazardous installations or situations in these areas, and facilitate their participation in early warning and disaster abatement and response procedures and plans;

(j) Preparing action plans for the reconstruction of settlements, especially the reconstruction of community life-lines.

(c) Initiating post-disaster reconstruction and rehabilitation planning

The international community, as a major partner in post-reconstruction and rehabilitation, should ensure that the countries involved derive the greatest benefits from the funds allocated by undertaking the following activities:

(a) Carrying out research on past experiences on the social and economic aspects of post-disaster reconstruction and adopting effective strategies and guidelines for post-disaster reconstruction, with particular focus on development-focused strategies in the allocation of scarce reconstruction resources, and on the opportunities that post-disaster reconstruction provides to introduce sustainable settlement patterns;

(b) Preparing and disseminating international guidelines for adaptation to national and local needs;

(c) Supporting efforts of national Governments to initiate contingency planning, with participation of affected communities, for post-disaster reconstruction and rehabilitation.

Scientists and engineers specializing in this field in both developing and developed countries should collaborate with urban and regional planners in order to provide the basic knowledge and means to mitigate losses owing to disasters as well as environmentally inappropriate development.

Developing countries should conduct training programmes on disaster-resistant construction methods for contractors and builders, who build the majority of housing in the developing countries. This should focus on the small business enterprises, which build the majority of housing in the developing countries.

Training programmes should be extended to government officials and planners and community and non-governmental organizations to cover all aspects of disaster mitigation, such as early warning techniques, pre-disaster planning and construction, post-disaster construction and rehabilitation.

3.1.7 Promoting sustainable construction industry activities

The activities of the construction sector are vital to the achievement of the national socio-economic development goals of providing shelter, infrastructure and employment. However, they can be a major source of environmental damage through depletion of the natural resource base, degradation of fragile eco-zones, chemical pollution and the use of building materials harmful to human health.

In order to promote sustainable construction the governments working in close collaboration with the private sector first, need to adopt policies and technologies and to exchange information on them in order to enable the construction sector to meet human settlement development goals, while avoiding harmful side-effects on human health and on the biosphere, and, second, to enhance the employment-generation capacity of the construction sector.

Equally all countries should, as appropriate and in accordance with national plans, objectives and priorities:

(a) Establish and strengthen indigenous building materials industry, based, as much as possible, on inputs of locally available natural resources;

(b) Formulate programmes to enhance the utilization of local materials by the construction sector by expanding technical support and incentive schemes for increasing the capabilities and economic viability of small-scale and informal operatives which make use of these materials and traditional construction techniques;

(c) Adopt standards and other regulatory measures which promote the increased use of energy-efficient designs and technologies and sustainable utilization of natural resources in an economically and environmentally appropriate way;

(d) Formulate appropriate land-use policies and introduce planning regulations specially aimed at the protection of eco-sensitive zones against physical disruption by construction and construction-related activities;

(e) Promote the use of labour-intensive construction and maintenance technologies which generate employment in the construction sector for the underemployed labour force found in most large cities, while at the same time promoting the development of skills in the construction sector;

(f) Develop policies and practices to reach the informal sector and self-help housing builders by adopting measures to increase the affordability of building materials on the part of the urban and rural poor, through, inter alia, credit schemes

and bulk procurement of building materials for sale to small-scale builders and communities.

Countries should also:

(a) Promote the free exchange of information on the entire range of environmental and health aspects of construction, including the development and dissemination of databases on the adverse environmental effects of building materials through the collaborative efforts of the private and public sectors;

(b) Promote the development and dissemination of databases on the adverse environmental and health effects of building materials and introduce legislation and financial incentives to promote recycling of energy-intensive materials in the construction industry and conservation of waste energy in building-materials production methods;

(c) Promote the use of economic instruments, such as product charges, to discourage the use of construction materials and products that create pollution during their life cycle;

(d) Promote information exchange and appropriate technology transfer among all countries, with particular attention to developing countries, for resource management in construction, particularly for non-renewable resources;

(e) Promote research in construction industries and related activities, and establish and strengthen institutions in this sector.

Developing countries should be assisted by international support and funding agencies in upgrading the technical and managerial capacities of the small entrepreneur and the vocational skills of operatives and supervisors in the building materials industry, using a variety of training methods. These countries should also be assisted in developing programmes to encourage the use of non-waste and clean technologies through appropriate transfer of technology.

General education programmes should be developed in all countries, as appropriate, to increase builder awareness of available sustainable technologies.

Local authorities are called upon to play a pioneering role in promoting the increased use of environmentally sound building materials and construction technologies, e.g., by pursuing an innovative procurement policy.

3.1.8 Promoting human resource development and capacity-building for human settlement development.

Most countries, in addition to shortcomings in the availability of specialized expertise in the areas of housing, settlement management, land management, infrastructure, construction, energy, transport, and pre-disaster planning and reconstruction, face three cross-sectoral human resource development and capacity-building shortfalls. First is the absence of an enabling policy environment capable of integrating the resources and activities of the public sector, the private sector and the community, or social sector; second is the weakness of specialized training and research institutions; and third is the insufficient capacity for technical training and assistance for low-income communities, both urban and rural.

Promoting human resource development and capacity-building can be achieved by improving human resource development and capacity-building in all countries by enhancing the personal and institutional capacity of all actors, particularly indigenous people and women, involved in human settlement development. In this regard, account should be taken of traditional cultural practices of indigenous people and their relationship to the environment.

In order to do so, all countries, as appropriate, should take the following action:

(a) Strengthening the development of human resources and of capacities of public sector institutions through technical assistance and international cooperation so as to achieve substantial improvement in the efficiency of governmental activities;

(b) Creating an enabling policy environment supportive of the partnership between the public, private and community sectors;

(c) Providing enhanced training and technical assistance to institutions providing training for technicians, professionals and administrators, and appointed, elected and professional members of local governments and strengthening their capacity to address priority training needs, particularly in regard to social, economic and environmental aspects of human settlements development;

(d) Providing direct assistance for human settlement development at the community level, inter alia, by:

(i) Strengthening and promoting programmes for social mobilization and raising awareness of the potential of women and youth in human settlements activities;

(ii) Facilitating coordination of the activities of women, youth, community groups and non-governmental organizations in human settlements development;

(iii) Promoting research on women's programmes and other groups and evaluating progress made with a view to identifying bottlenecks and needed assistance;

(e) Promoting the inclusion of integrated environmental management into general local government activities.

Both international organizations and non-governmental organizations should support the above activities by, inter alia, strengthening subregional training institutions, providing updated training materials and disseminating the results of successful human resource and capacity-building activities, programmes and projects.

Both formal training and non-formal types of human resource development and capacity-building programmes should be combined, and use should be made of user-oriented training methods, up-to-date training materials and modern audio-visual communication systems.

5.0 SUMMARY

The concept of a human settlement is both social and physical, and it can be defined as having two components: a human group, and the habitat of this group

A settlement can be a big city of hundreds of thousands of people or a small village with few people living there. Settlement is very important for human activities so whatever the size of the settlement there is always some reason for living in it.

The overall human settlement objective is to improve the social, economic and environmental quality of human settlements and the living and working environments of all people, in particular the urban and rural poor.

In developing strategies, countries will need to set priorities in accordance with their national plans and objectives, taking fully into account their social and cultural capabilities. Furthermore, countries should make appropriate provision to monitor the impact of their strategies on marginalized and disenfranchised groups, with particular reference to the needs of women.

4.0 CONCLUSION

Developing countries should, with appropriate international assistance, consider focusing on training and developing a cadre of managers, technicians, administrators and other relevant stakeholders who can successfully manage environmentally sound settlement development and growth, and are equipped with the skills necessary to analyze and adapt the innovative experiences of other.

For this purpose, the full range of training methods - from formal education to the use of the mass media - should be utilized, as well as the "learning by doing" option. Developing countries should intensify their efforts to develop a participatory structure by mobilizing the human resources of the private sector, non-governmental organizations and the poor, particularly women and the disadvantaged.

UNIT 2: HISTORY OF HUMAN SETTLEMENTS

CONTENTS

1.0 INTRODUCTION

The historical background of an area or a region has a great bearing on the growth and development of settlement of a society or societies occupying it. The culture, socio-economic infrastructure, settlement distribution pattern and many other things take

shape in an area from its historical base. Hence, it is very important to know the history of the area to understand the process of settlement evolution.
The dogmatic effects of different historical periods and cultural traits on rural settlements have brought about changes in their own way. Rural settlement is primarily an agricultural workshop. The shape, arrangement and distribution of settlements are often in conformity with the nature of work and agricultural techniques. The relics of implements used by them at some places can be helpful in forming rudimentary ideas of their lives.
The process of early settling led to the union of families into villages. The demarcation of fields from habitation developed a sense of integrated community life comprising several families. The idea of collective security and defense against different kinds of adverse environmental forces further strengthened the process of cohesion among families. But the first settlers have hardly left any actual record of the habitation in the area.
The settling of men in the clearing of dense forests may be regarded as the precursor of settlements. These early inhabitants were constantly exposed to different hazards and attack of wild animals. The instinct to combat the danger and need of collectivity and cooperation to construct houses (buildings), village well and tanks etc. brought people closer and closer. The settlements originated on relatively high sites along with fertile agricultural land and river levees where water supply was plentiful and life could be secure. These were, however, unplanned settlements with poor transport facilities. For this reason they were often close to river banks.
The history of human settlement reveals that man has close association with the rivers since the early times. Men are always attracted to the riverine plains and human relationship with the river is reflected in the distributional pattern of settlement in the floodplain.

2.0 OBJECTIVES

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

1. Explain the conditions for the emergence of the first cities.
2. Provide a brief overview of the development of cities from antiquity to the present.
3. Describe the different characteristics of cities in historical periods.
4. Analyze changes in the development of cities in the connection with economic and social development.

3.0 MAIN CONTENTS

3.1 EARLY/FIRST HUMAN SETTLEMENT

Human settlement began with a village through sedentary agriculture. During the eons of the stone ages, primitive man, a nomad, a hunter, ever on the search for meat and edible plants, could seldom stay in one place for long though he would shelter in caves during spells of severe weather. Growth of settlements however was evolutionary (gradual), it started from nomadism to sedentary agriculture then the need for settlement became obvious with improvement in agriculture. By very slow degrees man learned those things that helped to shape his daily life and environment: to control and use fire, to fashion and use tools, to domesticate animals, to cultivate and store food crops, to build shelter for protection from the elements; and these acquired skills enabled him to remain in one locality for as long as the land remained productive. Settlements then grew and became bigger and stronger. When the soil in one place had lost its fertility he moved, with his flocks, to another.

By the Neolithic Age ,the milder, wetter climate that set in after the last glacial period around 6000 B.C., brought about richer vegetation, great soil fertility and an increased animal population thus mankind grew in numbers and evinced both the desire and ability to live in sizeable communities. At the end of the last ice age the world's population consisted of small bands of hunters and collectors living mainly in subtropical lands and at a subsistence level. These groups of people who were usually migratory could only support themselves if the whole community was involved in the search for food. At this time, two major technological changes, known as the Neolithic revolution turned the migratory hunter- collectors into sedentary farmers. The first was the domestication of animals (sheep, goats, cattle) and the second the cultivation of cereals (wheat, rice and maize). Gradual improvements in early farming gradually led to food surpluses and enabled an increasing proportion of the community to specialize in non-farming tasks.

At the dawn of the Bronze Age, 3500 B.C., a typical settlement comprised something between five and fifty families sheltering in round hut dwellings on the site provided by earthworks or with a place of refuge nearby to which women, children and cattle could retire to comparative safety in the event of attack. Settlements on the scale large enough to be of significance in a study of urban civilization emerged in the so-called urban revolution' around 3500 B.C., simultaneously in various regions with a broad belt extending roughly from the Sahara in the west to the Himalayas in the east. The evolution farming appears to have taken place independently but at about the same time in three river basins regions in particular which showed evidence of advanced and extensive town planning and development. These regions were i) Tigris-Euphrates, (Sumer, Akkad, Mesopotamia); ii) Mesopotamia, the Nile and iii) Indus.

These areas had similar natural advantages such as:

- Hills surrounding the basins provided pasture for domestic animals.
- Flat flood plains next to large rivers.
- **S**easonal flooding of great rivers spread
- Rich fertile silts of alluvial soil deposited over wide areas by the rivers during times of flood.
- A relatively dry but not too dry climate, which maintained soil fertility, prevented leaching
- Mud, which became an indispensable building material when reinforced with cut straw
- A warm subtropical climate and a permanent water supply from the rivers for domestic use and as farming developed for irrigation.
- Each area could produce even higher yields if irrigation channels were dug and maintained

The resultant effects of these natural advantages led to the need for higher skills in handling and preserving the great yield and providing for the increasing population. The formidable tasks of agricultural engineering skills, demanded organized labor on a large scale. A need arose, and was met, and this helped further in the formation of organized communities in large urban settlements. These larger towns and urban areas had developed with an increasingly large range of functions. With the rise of these functionalities came the need to spread and with this spread came the need to acquire land. Land was often held in large blocks by tribes or even by the urban god or goddess. Plots could also be rented by the priests acting as agents of the deity. Urban population which now comprised of craftsmen such as potters, spinners, weavers, carpenters, metal workers, jewelers, and others such as farmers and farm labourers organized for effective harnessing of resources for mutual benefits. Administrators were needed to organize the collection of crops and the distribution of food supplies, the exchange surplus goods with other urban centers, early engineers were need to build and maintain irrigation systems and craftsmen were needed to make farming equipment and articles. All these fell under the jurisdiction of an administrator which was carried out by a profusion of bureaucrats under the direction of priests or/and secular rulers.

3.2 MAJOR CIVILIZATION TYPES

A civilization is a complex culture in which large numbers of human beings share a number of common elements. The six most important characteristics of a civilization are; **cities, government, religion, social structure, writing, arts and architecture.**

3.2.1 NILE CIVILIZATION

In the Nile Valley, various tribal groups were united under a long succession of Pharaohs who ruled Egyptians from 3000 B.C. until the territory was annexed by the Persians in 525 B.C. Here too, the entire economy depended upon river, which also fed on extensive network of canals, ditches and dams. Collective effort created artificial environment and enabled highly organized communities to be housed and protected in large towns. The society evolved as sharply-defined hierarchy of priests, clerks, soldiers, merchants, craftsmen, labourers, and slaves, each group living in appointed sectors of the town. Imposing examples of the monumental architecture produced by this ancient civilization still abound in modern Egypt; temples, pyramids, obelisks, avenues of sphinxes and statues of colossal size endue because they were built of stone hewn from neighbouring cliffs.

There are evidences of more planning by the Egyptians than the Sumerians as dwellings were arranged on a simple geometrical plan of long parallel streets crossed at right angle by short alleys. Each street had a central drainage channel of stone, and some surfaces were paved. Workmen's dwellings were single-storey structures of three or four rooms arranged in long back- to-back blocks built of crude brick and roofed with reed or straw bound with mud plaster. The town may have housed as many as 10,000 people at as high a density as 500 persons per net acre.

The need to secure increased supplies of raw materials and new markets for manufactured goods spurred rulers and merchants in prosperous Mesopotamia, Akkad, Sumer and Egypt to extend their sphere of influence far beyond national boundaries. New settlements were thus founded and Neolithic fishing villages and trading posts around the Mediterranean seaboard were soon transformed form subsistence economy to an urban economy.

3.2.1 SUMERIAN CIVILIZATION

The Sumerian civilization, generally acknowledged as the cradle of urban civilization, began to develop around 3500 B.C.; and by about 2500 B.C. several of its cities had grown to considerable size. Ur of the Chaldees, was said to have then attained a population of some 34,000, Lagash 20,000 and Erech probably as many as 70,000.

The area of Ur within its walls was some 220 acres (0.89 Sqkm) and Erech some 2 square miles (5.18sqkm). Ur is in Mesopotamia in the present-day Iraq. Ur, which means fire, was the most important urban settlement for much of the third millennium B.C.

The scarcity of stone in the region caused Sumerian cities to be constructed mainly of burnt brick and mud. They were strongly fortified with walls and moat, supplied with water by canals and dominated visually by the massive Ziggurat (temple) complex standing in its private enclosure. The buildings do not survive long because they were made of mud bricks. Surrounding the ziggurat (originally a three storey structure with a base of 64 by 46 meters) were residential areas containing a dense network of narrow winding streets and courtyards. However, very little evidence exist about the form and density of the dwellings, their forms or street pattern, but evidence from excavations shows that they were an orderly disposition of compact buildings along straight footways. The houses were usually two storey's buildings with narrow rooms surrounding an internal courtyard that gave both privacy and shade.

3.2.3 MESOPOTAMIA CIVILIZATION

The oldest known pottery woven, textiles were found in Yuchanyan Cave, Hunan,Â China. As towns continued to grow, it became necessary to have a legal system and an army for defense. During this period, people settled around Mesopotamia because of the rich fertile farmland. The land was so rich because of the Tigris and Euphrates River valley. The people of ancient Mesopotamia didn't exactly come from anywhere. They went wherever their crops grew, they went wherever animals were as well, and they traveled a lot.

Ancient Mesopotamia was located in between the Tigris and Euphrates River valleys. Its current location is in present day Iraq. Many early Mesopotamians spoke Sumerian up until Sargon of Akkad started his empire. From then on, many spoke Akkadian. Ancient Mesopotamians believed in Shamanism and Animism. Shamanism is when people meditate to a point where they feel like they're sleeping. They believe that it helps them reach the spirit world; animism is when people believe that everything has a spirit and mind. The settlement in Mesopotamia never really ended. The settlement turned into a town and became more modern. It is now modern-day Iraq. The Ancient Mesopotamians grew many things. They grew barley, onions, grapes, turnips, and apples.

3.3 Origins and evolution of cities in the preindustrial period

3.3.1 Cities in ancient times

The emergence of settlements was the result of the first social division of labor, i.e. the allocation of the first farmers. Later, the separation of crafts and their concentration in certain settlements took place - the first cities arose (the so-called second social division of labor). The emergence of the cities was the result of third social division of labor, i.e. the separation of the exchange of goods from crafts. Pre-industrial city became the center of an agricultural area and concentrated trade and crafts. The foundation of the city from the earliest times until the industrial revolution consisted of:

1. Crafts,
2. Trade,
3. Defensive function,
4. Administrative functions.

Crete was one of the many places developed in this way by prospectors from Syria and Egypt from 3000 B.C., onwards together with the Aegean islands it formed an important staging point between those countries in the European mainland and by 2000 B.C. the so-called Minoan civilization had reached maturity there. The civilization ranking that of the Crete made first brief appearance on the Greek mainland in the Achaean fortress settlements of Mycenae and Tiryns shortly after the collapse of the ordered existence in Crete. The destruction of this civilization by the Dorian tribes in 1100 B.C. was the prelude to a long period of strife lasting until the eighth century B.C., when the various Greek tribes had settled down in small isolated independent communities which eventually emerged as city states. Topography imposed isolation and many sites suitable for settlement were few and scattered and separated by mountains or sea islets, many of them overgrew the capacity to feed the population from local produce such as in Athens, Sparta, Corinth , Thebes, Miletus and others. Athens which was the largest city-state in ancient Greece was probably the first city in the history to attain a population of 100,000. Urban civilization gradually expanded into other areas of the Mediterranean (Greece, Rome, the "Roman" new towns that were created as military camps e.g. Cologne, Strasbourg, Vienna, Budapest, Barcelona, Marseille, Paris, and London).

Until the collapse of the Roman Empire and the diffusion of the industrial revolution across Europe during the nineteenth century, most of the world‘s largest cities were located in Asia rather than Europe. Around A.D. 900, the five most populous cities

were thought to have included Baghdad (in present–day Iraq), Constantinople (present-day Istanbul in Turkey), Kyoto (Japan), and Chang‘an (modern Xi‘an) and Hangzhou (in China). Beijing, China, competed with Constantinople as the world‘s most populous city for several hundreds of years, until London claimed the distinction during the early 1800s. Agra (India), Cairo (Egypt), Canton or Guangzhou (China), Isfahan (Iran), and Osaka (Japan) also ranked among the world’s most populous cities prior to industrial revolution. The oldest settlements originated on the hills, especially for security and defense reasons some of these cities were: Jericho, Babylon, Mennofer (Memphis) Carthage, Troy, Mycenae, Olympia, Delphi, Sparta and Athens, Miletos.

Ancient cities were characterized by regular layout and showed common features of the city such as:

1. The landmark was the palace of the ruler, temples and palaces of the courtiers,
2. Cities were very extensive,
3. Various neighborhoods were formed,
4. Often showed a large population.

The main building material during the Antiquity and the Middle Ages was wood. Stone was used only for the foundations of houses, larger buildings and religious objects. Since Roman times (and then subsequently up to the 19th century) bricks are used in construction.

3.3.2 Cities in the Middle Ages

The Roman civilization which had been developing slowly while Greece was at its zenith, gained ascendancy in western Europe first in Italy, subduing Etruscans in the north of the country by the end of the second century B.C., and then the conquest of Macedonia by 168 B.C. and Greece and Carthage by 145 B.C. Thereafter it dominated the known world for five centuries. In the homeland with topography, unlike that of Greece, imposed few constraints upon intercommunication, the Roman people acquired the characteristics of nationhood: of conformity rather than individuality, of co-operation rather than competition, of military genius, administrative ability and respect for law and order rather than discursive democracy.

They copied and adapted Greek architectural styles but perfected the arch and the vault. Their techniques of road-making and public health engineering were vastly superior to anything the Greeks had ever envisaged. Ruthless exploitation of slave labour enabled them to embark upon massive projects of engineering and construction of the scale undreamt of by their predecessors: witnessed by their aqueducts, the Pont

du Gard in southern France with three tiers of arches, a height of 158 feet 948.2 meters) and a length of 902 feet (274 metres). All Roman towns, of whatever size or wherever located, seemed to accord with set specifications, modified as necessary to suit climatic conditions. At the heart of the built-up area, continuing the tradition of the Greek agora, was the forum, a formal open space of rectangular shape, colonnaded , decorated with statues and flanked by public buildings including the basilica (assembly room or town hall), the curia (law courts), temples, municipal offices, tax collector and sometimes, shops.

The city of Rome grew to at least 250,000 inhabitants, although some claimed that the population may have reached as high as 1 million. The city's centrality in the Roman Empires communication network was reflected in the old saying, ―All roads lead to Rome. The fall of the Roman Empire in the fifth century brought a decline in urban settlements. The prosperity of the majority of urban settlements had rested on the ability to conduct trade in a secure environment provided by the empires armies. With the empire fragmented into control of hundreds of rulers, trade decreased, and the need for urban settlement diminished.

After the collapse of the Western Roman Empire the Rhineland followed the ancient tradition - the "idea" of a city spread further into eastern, northeastern and southeastern Europe. From the 3rd century, due to Migration Period, the structure of population in cities was altered - the rich part of the population was suppressed, primarily artisans and traders remain. Breakthrough in the evolution of the city is significant in 8th-9th century when princes and bishops begin to establish their castles and monasteries. Royal and ecclesiastical seats then often become the core of the settlement, around which the city life evolves. Each period of the middle ages was associated with a particular architectural style, which was also connected with a function or meaning of the cities:

1. Romanesque
2. Gothic style
3. Renaissance
4. Baroque.

3.3.3 Cities of the industrial era

Under the rule of Pericles in the golden fifth century B.C. (444-429), there emerged a culture that was to serve as the fount of education for the Western world throughout the centuries until modern times. Urban life was revived in Europe at the beginning of the eleventh century. Feudal lords established new urban settlements and gave the

residents charter of right to establish the settlements as independent cities. In exchange for the charter of rights, urban residents agreed to fight for the lords. Trade boomed in the urban areas as surplus from the countryside were brought to the city for sale or exchange. The typical medieval European urban settlement was a dense, compact town, frequently surrounded by a wall. Important public buildings, palaces, and churches were arranged around a central market square. The tallest and the most elaborate structure was the church, many of which still dominate the landscape of smaller European towns.

In the modern era the nature of economic activity was qualitatively changing - agriculture was more mechanized and released labor forces headed to the cities. In the 18th-19th century a new town function was created - the industrial production. This led to significant social and economic changes which birthed the Industrial Revolution.

With the industrial revolution a large number of people were employed in large-scale production in cities (at the beginning manufactures, later factories), and significant population movements from rural to urban areas occurred. The localization factor for urban development or industrial period was mineral fuel (coal).Therefore; most of these cities developed in mining areas. Industrial development retrospectively influenced the development of other urban functions such as:

1. Trade;
2. Finance;
3. Administration;
4. Education and culture.

A very important factor then became transportation, because sufficient water resources were required in addition to the fuel. For this reason, the settlement also developed around rivers and in the lowlands.

Due to population growth in cities and urban sprawl, the original medieval fortifications (walls) vanished and in its place industrial buildings or warehouses were built.

Formerly farming villages near the city merge with large cities and become their suburbs.

Basic characteristics of cities in industrial period:

(1) The use of new basic materials, chiefly iron and steel,

(2) The use of new energy sources
(3) The invention of new machines

3.3.4 Cities of the postindustrial epoch

- In the postindustrial era, the economic transformation is reflected in the transition from an economy based on secondary sector (manufacturing) to an economy based on the tertiary sector (services).
- The national and global capital (which reflects, among other things demand a new standard of living = emphasis on mental work, reducing working time, leisure, individualization, informatics development,) is extending.
- Changes in production technology and modern way of buying goods puts greater demands as far as area is concerned.
- New productions (e.g. car assembly) and superstores are built on previously undeveloped areas close to the city limits. The condition is a good communication network allowing easy and especially fast access.
- Urbanization of postindustrial period affects still larger areas. Cities are expanding into rural areas and are changing the economic and cultural character of the village.

3.4 FACTORS THAT ENHANCED URBANIZATION OF SETTLEMENTS

❖ *The rapid growth of urban population*:

1. In 1800 in the whole world there were about 750 cities over 5 thousand inhabitants, 200 cities over 20 thousand inhabitants and 45 cities over 100 thousand inhabitants and no city had more than 1 mil. inhabitants;
2. In 1950, in the same categories there were 27600, 5500, 880 and 50 cities.

❖ *The proportion of urban residents to the world's population also significantly increased*

Urban phenomenon affected all regions of the world:

1. Old network of medieval towns, but also new cities in the coalfields and around railways,
2. The area where cities were absent (North America, Australia). In Asia and Africa among the indigenous towns new colonial cities were created (eg. Shanghai, Hanoi, New Delhi, most cities in sub-Saharan Africa).

❖ *Areal expansion of cities into surrounding communities;*

With the growth of cities differentiation of urban design occurs, which subsequently leads to social differentiation.

4.0 CONCLUSION

The first need for shelter arose when man realized that there was a need to keep him safe from the vagaries of weather. Protection was the need that drove man then. With the need for protection, came the need for comfort and thus began the journey of man into the formation of settlements. Man began to seek out area that could offer all that he needed without him having to exert himself much and that would keep him safe from other creatures. These areas where man settled in usually had similar natural advantages such as fertile soil, means of defence, water etc. The consequences of these actions are what we enjoy today as settlements.

5.0 SUMMARY

City settlements began to arise in connection with the surplus of food and with the creation of cities, urbanization occurred - concentration of population in cities. According to the period of the city we distinguish between preindustrial, industrial and postindustrial urbanization. The actual construction in cities may be regular or irregular, "chaotic". To delineate the cities there are a number of criteria (e.g. the size and function of the city, way of life, administrative significance).

Every historical period is characterized by the emergence and development of cities in connection with economic and social conditions. Cities in antiquity or in the Middle Ages were characterized primarily by local significance; they were the center of trade and crafts. Cities of the industrial period already had regional or national significance and the main city-forming factor was industry and transport. Cities in the post-industrial era are global in character, and their main economic function is services.

Questions

1. Explain the concept of social division of labour and provide a connection with the emergence of the first cities.
2. Locate the first urban civilization and explain what were the most important natural conditions for the emergence of the first cities.
3. Describe how the ancient city fell
4. Briefly characterize the economic and political functions of cities in antiquity.

5. Explain the conditions of formation and urban development in the industrial period.
6. Compare the changes in the social structure of the city in industrial and post-industrial period.
7. Explain the concept of urbanization.
8. Define the term city.
9. What are the 4 river valley civilizations? (i)Mesopotamia: Tigris and Euphrates Rivers. (ii)Egypt: Nile River. (iii)Harappa (Indus): Indus and Ganges Rivers. (iv)China: Yellow and Yangtze River.

Bibliography

1. Chalupa, P., Hübelová, D.: Sídelní struktury v přehledu a cvičeních. Brno: Mendelova univerzita, 2011, 101 s. ISBN 978-80-7375-506-5

UNIT 3: TYPES OF HUMAN SETTLEMENTS

CONTENTS

1.0 Introduction

Settlement is a place that contains buildings in which people live, this may contain many or few houses, it may cover many square kilometers, and contains not only houses but also shops, schools, offices, industries, factories, government buildings and many other buildings. Settlements could be permanent or temporary; it comes in different shapes, sizes and locations. The function of a settlement can be identified by looking at its shape, size, site and situation. Settlements are the basis on which any form of village, town, city or mega polis are built, a settlement may have known historical structures such as the date, painting, inscription or era in which it was first settled by a particular people.

Every settlement has a site and a location, sites refer to the position of a settlement within its immediate neighbuorhood. It describes the characteristics of the actual point at which a settlement is located and was of major importance in the initial establishments (rivers and uplands), while location refers to the position of a settlement in relation to another place in the region.

2.0 Objectives

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

1 Describe various settlement types
2 Establish the relationship between settlement types with relief, climate and building materials;
3 Define an urban area
4 Define a rural area
5 Analyze the distributional patterns of rural and urban settlements

3.0 MAIN CONTENT

In this unit, the following aspects are highlighted:

a) Definition and Formation of settlements
b) Approaches to studying and Analysis Settlements
c) Classification of settlements
d) Identify various kinds of settlements
e) Significance of studying settlements.

3.1. **Definition and formation of settlements**

Settlement studies relates to the study of human use of land, water and resource, patterns of population density and the growth of settlement. It is an essential part of planning and design. Settlement studies focuses on population clusters, and tries to find out why they arose and what sustains them.

A settlement has not exact definition of its boundaries. It is very difficult to say where it starts and where it ends. In the ancient settlements, walls may have defined it and its boundary. Settlement plays an important role in all our lives today, and also in future. Industrial revolution has contributed to the growth of urban centers during the last sixty years. There has been an unprecedented growth of settlements all over the world which is also indirectly reflected by population explosion.

3.1.1 FORMATION OF SETTLEMENTS

The Site of a settlement describes the physical nature of where it is located.

In the formation of settlements, the unit of residence may be a very small hut, tent or a shed type house constructed with tin sheets and asbestos. A unit of settlement may also range from a slum, hut or a farmhouse. It is always correlated with the facets of geography like climate, relief, geology and socio-economic conditions.

There are five basic principles considered in settlement formation, these are;

1. Maximization of potential contacts
2. Minimum effort to be applied in terms of energy, time and cost
3. Optimization of man's protective space if he is alone or with others
4. Optimization of the quality of man's relationship with his environment
5. Optimization in the synthesis of all principles

Applying these principles, we have three broad patterns of settlement formations;

i) Dispersed settlements
ii) Linear settlements and
iii) Nuclear settlements.

1) Dispersed settlements had no central point and have individual buildings spread out, and are often found in rural areas.

2) Linear settlements clustered along rivers, creeks and streams. This trend continued along highways and railways.

3) Nuclear settlements have buildings grouped close together, occur along cross-roads, at river mouths, adjacent to bays and near centers of industry and are often used for defence purposes.

1 2 3

Figure 1: DIAGRAM DEPICTING SETTLEMENT PATTERNS

3.2 APPROACHES TO STUDYING AND ANALYSIS OF SETTLEMENTS:

3.2.1 Basic Approaches to Study of Settlement

In approaching a subject for the first time it is useful to begin by obtaining an overview of the main conceptual approaches, themes, and issues that comprise the field. Each subject has a need for systematic rules, methods, techniques & system for appropriate and scientific study. These methodologies are known as approaches.

There are two popular approaches to settlement geography according to Hartshorne are:
1. Systematic
2. Regional

Dickinson expresses the settlement geography in the terms of Structure, Process and Stage and therefore posits that there are three important approaches and these are:

A) GENETIC APPROACH:

The Genetic approach has the following underlying principles;

· It works on the basis of historical processes
· Supported and influenced by historical, archaeological and geographical perspective.
· It carries out proper investigation of documents, place names etc.
· It undertakes a comprehensive understanding of individual characteristics in relation to the surrounding subsystem.

The genetic approach deals with a genetic progression that is the past, present, and future of the settlement. There are three subsets.

i) **Retrogressive**: - which focuses on or upon the past evidence and are also a concern with present pattern of settlement.

ii) **Retrospective**: - which focuses upon the present and the past conditions regarding settlements being considered for a better understanding of the existing state.

iii) **Prospective**: - which is concerned with the future but the past and present are considered as a relict feature for future probability need.

B) SPATIAL / REGIONAL APPROACH

This approach was introduced by Ratzel because he states that from place to place or region to region all over the world differences in the settlement are due to spatial differences of their environment. The Spatial/Regional approach encompasses and covers many aspects such as:

1) Understanding patterns and processes by considering the man-environmental relationship.
2) Undertaking analysis of system and subsystems, through which several aspects of settlement-like: - types, pattern, classification, functional integration and rank local identity, planning and rationalization, site, and situation are understood.
3) Exploring, the interrelationship of man-nature-society which is better expressed in any cultural landscape.
4) Analysis of patterns and process as an expression of spatial organizations in environmental space.
5) Consideration for the spatial analysis using several techniques Like- nearest neighbor analysis method of dispersion concentration, land model, functional analysis method to predict and project future situational trends.

C) ECOLOGICAL / ENVIRONMENTAL APPROACH

The ecological point of view is applied to explain the processes of change in human behavior and settlement over time. Hudson has explained that this approach arises form understanding and describing the setting process in human settlement which have three phases that explains the man-environment adaptation over the region.

- He postulates that behavioral differences show regional variation.
- The approach is very fundamental in understanding man-environmental inter-relationship.
- The trial settlement has a proper adoption of available environment several traditions, festivals, functions etc.
- Nearest neighbor analysis has been widely used for studying the concentration and dispersion of settlement

3.3 CLASSIFICATION OF SETTLEMENTS

Classification of types of dwellings and settlements is an essential part of studying both rural and urban patterns.

Several scholars have worked on different types of classification systems. The notable ones are:

1. Muller-Willes classification based on degree of permanence.
2. Uhlig and Lienau classification based on rural-urban relationship.

Muller-Wille classified the settlements based on the degree of permanence. He stated that it depends on the residence time of a Settlement in a place

TIME	RESIDENCE TYPE
1-7 days	Ephemeral
8-15 days	Episodic
8-30 days	Temporary
16-30 days	Periodic
Several months	Seasonal
Several years	Semi-permanent
Several generations	Permanent

In the classification of Rural settlement, he states that this is also done, using several other criteria and of the many criteria these four were core.

Mean population (MP)

On the basis of mean population, all rural settlements can be divided into 3 groups: a) Small size when MP < 300

b) Medium size when MP is 300-500

c) Large size when MP is > 500

Mean Distance (MD)

On the basis of Mean Distance (MD), all rural settlements can be classified into 3 groups:

a) Relatively widespread distribution when village distance exceeds 3 km

b) Relatively less widespread distribution when MD is 2-3 km

c) Relatively close distribution where MD is less than 2 km

Mean coefficient of dispersion (CD)

On the basis of mean Coefficient of Dispersion (CD) settlements are divided into 2 groups as

a) Rural settlements having uniform distribution when CD is < 50% and
b) Non-uniform distribution when CD is > 50%

Coefficient of variation (V).
On the basis of CV (Coefficient of variation)
Settlements are classified as
a) Centers of population when CV is > 1.00 CV and
b) No clearly defined concentration when CV is less than 1.0

3.3.1 CRITERIA FOR SETTLEMENTS CLASSIFICATION

There is also a general classification of settlements based on Physiographic and other factors.
The kinds of settlements/categories of settlements; on the basis of **physiographic setting:**
a) Plain settlement
b) Plateau settlement
c) Lacustrine settlement
d) Coastal settlement
e) Forest settlement and
f) Desert and used land

On the basis of **spatial distance** between dwellings and hamlets, settlements are grouped as
a) Dispersed settlements
b) Compact settlements
c) Isolated settlements
d) Semi compact settlements
e) Hamlet settlements

On the basis of **occupations of settlers**, settlements are group as
a) Agriculture settlements
b) Livestock raising settlements
c) Vegetable growing settlements

Function based classification is also done to differentiate Settlement patterns as
a) Agricultural villages
b) Fisherman's villages
c) Pastoral Huts.

The Size – based classification is used to classify the kinds as Farmstead, Hamlet Town, City and Metropolis.

Shape-based classification was proposed by Dickinson from Germany and was later modified by Christaller.
They include:
1. Irregular clustered villages
2. Isolated farmsteads
3. Hamlets – Founded by landlords
4. Place villages
5. Angerdorfer (2 rows of farms on long space)
6. Street village
7. Linear villages
8. Estate villages
9. Urban villages
10. Suburban settlements
11. Modern industrial settlements

On the basis of forms or shapes, settlements can be differentiated into 12 kinds.
1. Linear
2. Circular
3. Radial
4. Triangular
5. Block
6. Arrow
7. Star
8. Fan
9. Beehive
10. Stair
11. Terrace
12. Checker board pattern.

Taylor of the Association of Geographers proposed a classification of towns, with reference to **stages of its growth**. There are 7 stages and unique classes in it.
1. Sub-infantile stage-a settlement has one street with shops amidst residences.
2. Infantile stage. Beginnings of a street-grid system
3. Juvenile stage exclusive and clear segregation of commercial shops etc at the center of the town including number of streets without residences.
4. Adolescent stage – houses move away from the center, early houses survive in the expanding zones.

5. Mature city with 4 quadrant zones.
6. Late Maturity – planning of the town
7. Senile stage – No growth, expansion is abandoned.

In India, B.K. Roy has provided 5 kinds of Settlement Patterns for the purpose of mapping the zones:

1. Block pattern – compact / rectangular / checkerboard.
2. Elongated and linear pattern: Elongated on levees, river fronts, ridges Fish bone Linear along beaches and canals Elongated along highways
3. Fan pattern: With convergence of lanes on a main road, Lanes towards a pond Lanes converging on temple, mosque or church.
4. Circular pattern: Hollow circular Radial settlements
5. Other patterns: I – shaped settlements T – shaped settlements Dispersed (or) sprinkled settlements Hamleted settlements Irregular (or) amorphous settlements Deserted settlements.

Settlement Geography also deals with rural or urban agglomerations.
These may be
a) Sedentary Agglomeration: this may further be classified into
i) Small towns
ii) Strong point villages with hamlets
iii) Village Communities, and
iv) Villages.
b) Semi-sedentary Agglomeration
c) Mobile Agglomeration

3.3.2 Types of settlement

Settlements can be grouped hierarchy by using their size and shape to categorize them. The result is a settlement hierarchy. A settlement hierarchy is a simple way of classifying settlements into a hierarchy based on their population, function, size or other criteria. Settlements come in many different sizes and these can be ranked according to their population and the level of services available. As you move up the settlement hierarchy the size of the settlement increases, as does the population and the range of services available. Smaller settlements tend to provide only low order services such as a post office and newsagents. Whereas, larger settlements have more high order services such as leisure centers and chain stores. The result of this, is that the larger the settlement, the greater the range of services and therefore the market area or sphere of influence. This is the market area that a settlement services (the distance people will travel to use services).

High order services usually have a high threshold. This means they need a higher number of people to use the service in order to remain profitable. This means high order service such as department stores need a greater number of customers than a low order service such as a newsagent. This is why there are so few department stores in villages.

Based on this this, we therefore have the following;

- Isolated dwellings
- Villages
- Hamlets
- homesteads
- Towns
- Cities

1. **Homestead-:** these are one family residence, they have dispersed settlement, and they contain very few numbers of people with little opportunity for social gathering. Moreover, they are separated from one another by bushes or by geographical barriers.
2. **Isolated dwellings**- Isolated dwellings would only have 1 or 2 buildings or families in them. They may have negligible services.
3. **Hamlets**-: these types of settlements may be nucleated with few houses usually less than a hundred with many people with no services.
4. **Villages**- a village is a human settlement or community that is larger than a hamlet but smaller than a town. A village generally does not have many

services, most likely a church, school, markets or only a small shop. The population of a village varies however; the average population can range from 500-2000 people. They are usually situated so that they have access to the region around them and they tend to cater for the needs of the region. Village type of settlement can be classified using the following criteria:

(a) Functions which may include agriculture, fishing, mining or residential. For instance, good types of residential settlement in Nigeria are the FESTAC village in Lagos, mining in Jos and fishing in Lembe village in Bayelsa.

(b) Morphology; a village can be classified either as an isolated farmstead, disperse, nuclear or linear, planned or unplanned. Village settlements usually have one of these three basic shapes which are: compact, linear or cross type.

i) **Compact** shape- the shape may be round or square, but in all cases, the buildings are close to each other and are connected by roads, footpaths or both, which links all building together.

ii)**Linear shape**- some building may form a line, may be straight or curved which may follow a line of movement. For instance, a road, river, or railway, relief features.

iii) **Cross shape**- this occurs where two lines of movement cross for example the crossing of two roads.

5. **Towns**-: these are medium-sized settlements; a town is generally larger than a village, but smaller than a city. Some geographers further define a town as having 2,500 to 20,000 residents or a population of about 1,000-20,000. Thousands of people live in them and they have shopping centers and factories. Most towns are not new, they have grown over a long period of time and as a result their present day- function may not be the same as at when they first began to develop.
6. **Large town-** a large town has a population of about 20 thousand to 100 thousand (20,000- 100,000).
7. **Cities**-cities are large human settlements with certain responsibilities for self-administration; they are usually densely populated and majority of their residents are occupied in non-rural and non-, for example, the base of a ridge or a zone where water is near the surface. They may have many services but not as many as a large city. The population of a city is between 100,000 and 300,000 people.
8. **Large city**- this is a city which makes up a large population; it also offers many services, the population in a large city is less than 1million people but more than 300,000 people.

9. **Metropolis**-it is a large city and its suburbs consisting of multiple cities and towns. The population ranges from one to three million (1000000- 3000000) people.
10. **Conurbation**- it is a group of large cities and their suburbs, consisting of 3-10 million (3000000- 10, 000000) of people.
11. **Megapolis**-this is where conurbations have joined to become one large urban area. It consists of more than 10 million (10, 000000) of people.

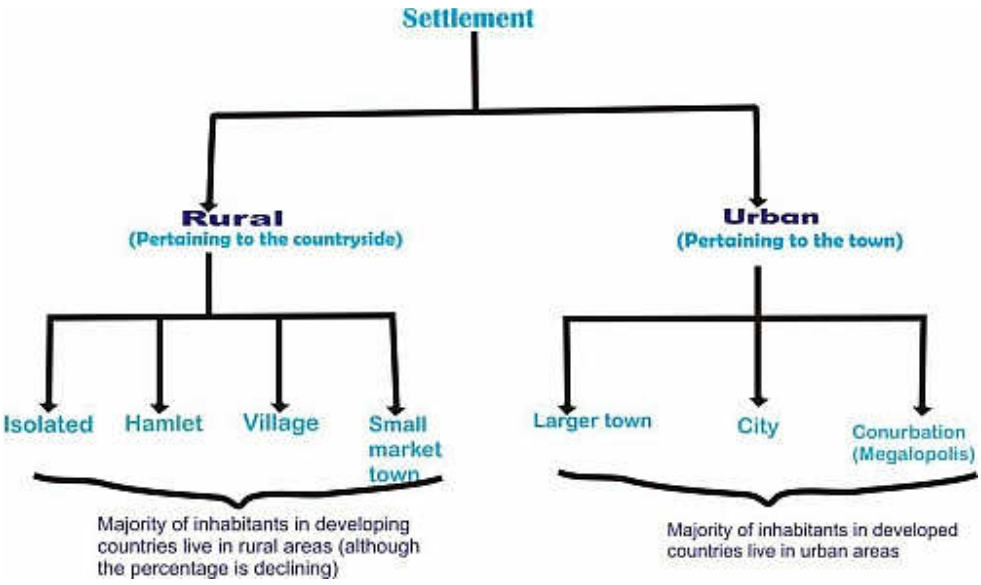


FIGURE 2: DIAGRAM DEPICTING SETTLEMENT CATEGORY

3.3. OTHER APPROACHES TO STUDY OF SETTLEMENTS'

Aside the basic approaches to studies of the geography of Settlement, other notable approaches to settlement studies include;

3.3.1 Historicity

Historicity which is the historical actuality of people and events meaning the quality of being part of history as opposed to being a historical myth, legend or fiction. Historicity focuses on the true value of knowledge claims about the past denoting historical actuality, authenticity and factuality and focuses on the true value of knowledge claims about the past. The historicity of a claim about the past is its factual status. Some characterize it as a dimension of all natural phenomenon that place in space and time. Others equally characterize it as an attribute reserved to certain human phenomena in agreement with the practice of historiography. Herbert Marcuse defines Historicity as that which defines history and thus distinguishes it from nature or the economy and signifies the meaning we intend when we say that something is historical. The Blackwell Dictionary of Western Philosophy defines historicity as denoting the feature of our human situation by which we are located in specific concrete temporal and historical circumstances. Wilhelm Dilthey is of the opinion that historicity identifies human beings as unique and concrete historical beings.

The scope of historicity involves not just the issue of “what really happened” but also the issue of how modern observers can come to know “what really happened”, an issues that is closely tied to the historical research and practices and methodology for analyzing the reliability of primary sources and other evidence because various methodologies denotes/thematize historicity differently, it is not possible to reduce historicity to a single structure to be represented. In some methodology, like Historicism can make historicity subject to constructions of history based on submerged values commitments. Questions of historicity are particularly relevant partisan or poetic accounts of past events. Eg the historicity of the lliad has become a topic for debate because later archeological finds suggests that the work was based on some true events.

Questions of historicity also arise frequently in relation to historical studies of religion in these cases value commitment can influence the choice of research methodology. In philosophy, historicity is the idea or fact that something has a historical origin and developed through history concepts, practices and values. This is opposed to the belief that the same thing, in particular Normative Institutions are correlated ideologies are a natural or essential and facts exists universally. Historicity relates to the underlying concept of history or the interception of theology. The concept of history or the interception of theology-the concept and study of progress and purpose, temporality, the concept of time and historiography, symbiotics of history and history, various(varying) conceptualizations of historicity emphasis linear progress or the repetition or the modulation of past events. In phenomenology, it is the history of constitution of any intentional object both in the sense of history as tradition and in the sense where every individual has its own history. The two senses are very similar or usually intertwined as ones individual history is heavily influenced by the tradition the

individual is formed in, but personal history can also produce an object that wouldn't be a part of any tradition. In addition personal historicity doesn't develop in the same way as tradition. Martin Heideggrr argued that being in time, that it is temporality that gives rise to history. All things have their place in time and nothing passes outside of history. Francis Fukuyama in the end of history and the last man famously argued that the collapse of the Soviet communism brought humanity to the end of history whereby the worlds global dialectical imaginations had/s been resolved/dissolved by the triumph of liberal capitalism. Before Fukuyama, Ginbot Baldrilan argued for a different concept of the end of history. He most in deep writings on the notions of historicity is found in the book Fatal Strategy and The Illusion of the end. Baldrilan maintains that the end of history in terms of achieving a logical goal has always been an illusion brought about by modernity's will towards progress, civilization and rational unification and this was an illusion to all intents and purposes vanished towards the end of the twentieth century brought about by the speed at which society moved effectively destabilizing the linear progression of history. It was this comment that specifically that provoked Soko's criticism as history was outpaced by its own spectacular realization as Badrilad himself put it " the end of history is alas the also the end of the dustbins of history. There are no longer any dustbins for disposing of old ideologies, old regimes, old values where are we going to throw Marxism which actually invented the dustbins of history yet there is some justice here since the very people who invented them have fallen in. if there are no more dustbins of history this is because history itself has become a dustbin. It has become its own dustbin just as the planet itself is becoming its own dustbin."

3.3.2 Analytical Approach to study Function and Form

Settlement analysis seeks to build up from the static spatial distribution of material cultures and anthropogenic modifications visible in contemporary landscape to the understanding of the dynamic cultural and environmental processes of human settlement systems. With the obvious exception of phenomenological approaches, most studies of settlement and landscape accept that there is a need to adopt an empirical approach to pursuing this goal, even if in so doing, many fail to embed their conclusions within a wider inferential framework. Standard quantitative methods tend to explore either:

(i) Correlations between settlement (or other zones of human activity) and social or environmental variables (predictive modelling), or;
(ii) The degree to which new settlements or households are located in physical relation to existing ones (neighbourhood dependence).

The traditional tools used by archaeologists include, respectively, linear regression or logistic regression, nearest neighbour or quadrat analysis, but each of these raises methodological problems. The first two have the capacity to mislead in contexts where spatial dependence can be shown to exist especially within most geographic contexts: and the last two are insufficient for detecting multiscalar spatial patterns. Settlement distributions are often described in terms of their configuration viz-a-viz three idealized states – namely **random, regular, or clustered** – but rarely do these states occur so clearly in practice. In reality, settlement patterns are more complex, and measures such of these need to be contextually sensitive to the fact that the scale of analysis can change what appears to be a nucleated or centralized pattern, to one better described as dispersed.

A regular or uniform pattern between contemporaneous sites may be seen to reflect a form of competition between settlements, the existence of site catchments or both sometimes because of demographic growth from an initial random distribution. Clustering of sites may result from a number of factors, although localized distribution of resources and the emergence of polities or regional centers have often been highlighted. In contrast, random distributions have usually been treated as the statistical null-hypothesis, though several commentators provide good examples of how apparent random distributions in fact can be conditioned by selected environmental, biological, and social variables. However point pattern analysis implicitly assumes spatial isotropy (i.e., invariance by rotation) and homogeneity despite the fact that actual human landscapes offer both topographically dependent movement environments and spatially heterogeneous natural resources (water, soils, etc.). The favoured technique of archaeologists for detecting clustered or uniform distributions is nearest neighbour analysis.

Clark and Evans (1954) first explored the utility of this method for ecological purposes, and it was soon being used to understand settlement patterning. Its application to archaeological settlement pattern analysis followed some time later, continued in the 1980s and 1990s, and the technique retains its prominence today both in general textbooks and culturally specific studies. Clark and Evan’s nearest neighbour coefficient is probably popular in the archaeological community for two reasons: (i) it is straightforward to calculate, and; (ii) it provides an easily interpretable coefficient. However, nearest neighbor analysis was not designed to detect spatial patterning at anything but the 1st nearest neighbour. Increasing the nearest neighbour measurement to the 2nd, 3rd . . . nth neighbour may detect clustering at different scales, but the statistical validation of patterning then becomes difficult “Nearest Neighbour Analysis” is also significantly influenced by the size of the area to be analyzed, with regular, random, or clustered distributions arising being dependent on

the amount of surrounding area included in the analysis. While there are workarounds for these problems, the technique remains a relatively coarse ruler with which to measure point distribution patterns.

Consider, for example, the point patterns in Diagram.

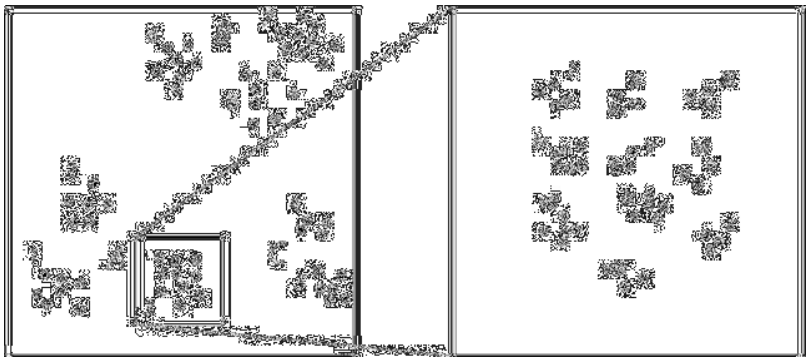


Diagram3 illustrating Multiscalar point patterns.

The left panel shows a hypothetical distribution of 56 sites. A single order nearest neighbour analysis applied to the 56 points in the left panel would detect the presence of clusters, and a K-means statistic could be employed to show that the optimum number of clusters was likely to be 8. However, neither of these analyses would be able to identify the fact that there is also a higher-order scale producing three clusters. Furthermore, if we include the finer artefact-scale resolution represented on the right panel (rather than just an approximation of the center of the artefact distribution), then clustering can be shown to exist at three different spatial scales: (i) artefacts forming sites (clusters i–x); (ii) sites forming primary clusters (clusters 1–8); and (iii) primary clusters forming secondary clusters (clusters A–C).

Another major problem with nearest-neighbour analysis is the effect the size of the study area has on the detection of patterning. For example, Diagram shows how adjusting the scale of analysis has a major influence on the homogeneity, intensity and clustering tendencies of point distributions

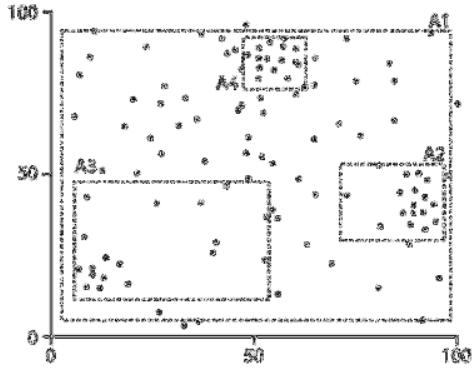


Figure 4: The influence of study area size on the detection and characterization of patterns (after Goreaud and Pe´lissier 2000).

In the entire study area, A1, the pattern is homogenous with a clustered structure (i.e., clustering occurs relatively evenly) so that a frequency distribution of nearest neighbour values would be normally distributed. At smaller scales, for example in area A2, the pattern is heterogeneous with a strong left to right gradient. A neighbourhood density function would be positively skewed with a bimodal tendency. Area A3 is similarly heterogeneous, although its density value is significantly lower than A2. Area A4 has a high intensity and homogenous distribution, although here it is far more regular than seen elsewhere. These two scalar issues – one related to analytical resolution, the other related to analytical area – although presented in abstract, are very real when attempting to make sense of settlement distributions, given that the latter may show a variety of characteristics depending on the resolution and the shape of the study area. The fact that GIS-led approaches to the collection and management of archaeological survey data are able to store data at several different scales within the same environment (e.g., artefacts, sites and regions) underlines the need for spatially sensitive approaches to the analysis of distribution patterns. Moreover, the dichotomy created by nearest neighbour analyses, dispersion vs. nucleation, is useful only at a very general level. Measures that take into account the intensity of settlement, its homogeneity, and the scale at which it is clustered or dispersed are clearly superior.

The limitations of the Nearest Neighbour Analysis led to the adoption of a broader range of statistical approaches to point patterning, including methods that are inherently multiscalar such as Ripley's K-function. Ripley's K-function was designed to identify the relative aggregation and segregation of point data at different spatial scales. It is defined for a process of intensity ƛ, where ƛK(r) is the expected number of neighbours in a circle of radius r at an arbitrary point in the distribution (Pe´lissier and Goreaud 2001:101).

The K-distribution is a cumulative frequency distribution of average point intensity at set intervals of r. Significance intervals are generated by Monte Carlo simulation of

random distributions of the points, and a 95% confidence interval can usually be obtained within 1,000–5,000 iterations (Manly, 1991). These estimates can be compared with the observed values of K to provide a statistically robust measure of cluster size and cluster distance in the dataset.
For clarity of presentation, the cumulative K distribution is usually transformed to;
$L(r) = \sqrt{K(r)}/\pi - r$

Where the expectation under randomness (L(r) =0) is a horizontal line.
L(r) < 0 means that there are fewer than expected neighbours at distance r, suggesting a regular pattern
L(r) > 0, means that there are more neighbours at distance r, indicating a clustered pattern
Using a combination, therefore, of Monte Carlo testing, frequency distributions, local density mappings and Ripley's K-function a more sensitive assessment of multiscalar patters and a more critical evaluation of the processes underlying settlement distributions can be had.

3.3.3 PLACE NAME ANALYSIS

The rise of villages is a major phase of human social progress. The names of villages of places are the footprints of the human steps towards civilization. It seems to be a common belief that every place has its name. The reality looks a little different, though. It often happens that a modern collector of toponyms (a place name, especially one derived from a topographic feature), while walking on a terrain, finds places, or at least natural objects that the informant cannot provide a name for. Place name can simply be defined as the name of a geographic locality. It can also be the name given or held by a geographical location. The encyclopedia defines place name as the proper name of a locality, either natural (as bodies of water, mountains, plains and valleys) or social (as of cities, nations and states). The first known use of *place-name* was in 1772.
Place names are an important part of our geographical and cultural environment. They identify localities of different kinds and represent irreplaceable cultural values of vital significance to people's sense of belonging and well-being. Place names function as a social consensus or a sort of an agreement reached over many generations.
Place names may be said to represent the oldest living part of human cultural heritage, in the sense that they have been handed down orally from generation to generation for hundreds or thousands of years at the place where they were coined. They are a special part of our cultural heritage in that they tell us something about the place to

which they refer and about the name givers. Thus they provide important supplements to the history of the places where people settled, as ties to the past.
Place names contain social, cultural, historical and geographical information about the human life. We can conclude that the language that was discovered as a basic tool for communication and the place names given based on the experiences are inter-related and therefore the linguistic analysis of place names is vital. The existence of a name therefore depends on extra-linguistic factors, even though a name is a linguistic item, being a part of a language rather than of a place.

Depending on the predominant way of living in different periods of history, man has chosen to live in places with different natural conditions). According to everyday needs, men gave names to places of some importance to him, thus differentiating them from other, unimportant places. Although several definitions have been offered for the term "place name," every language user knows quite well, what a place name is. He has learned that certain linguistic signs identify a place, differentiating it from all other, either similar or different places.

Names are an important aspect in the analysis of any work. Besides helping in the understanding of the character in question, names also help in communicating important thematic aspects in various works. In most cases, these names usually obtain their meanings contextually, hence behind every name is a story, and this goes for place names too. Although each individual place has a unique specific definition, there are some common components and terms for the names of English-speaking cities, towns and settlements. Knowing the meaning of these recurrent, generic root components can help you decipher the original meanings of place names.

Many place names are also identified with past events and are pegs upon which stories both written and oral can be hung. Geographical names equally are a reflection of the interplay between humans and nature through different periods of time. Besides, if a person has some meta-linguistic and historic awareness, he may listen to place names as voices of the past, which in its turn may strengthen his feeling of home. Thus place names can function as a textual representation, often in an obsolete language, of the historic landscape. When one takes into account that many place names have been coined as descriptions of the area or place in question, it becomes evident that we are dealing with material of immense historic value. Place names are links to the past, mirrors reflecting various scenarios and activities of the past. More recent names like names of dwelling places, streets, and fields and other microtoponyms also form a part of our collective onomastic memory and heritage. Although many people do not seem to be particularly aware of the historical richness of the place names in their surroundings they may still feel that the name stock contributes to their rootedness.

People who have become acquainted with the etymological contents of names will of course appreciate their historical value to a greater degree. Through the place names of a district small or large, in particular its settlement names, it is possible to read many details of the area's history.

3.3.3.1 SPACE AND PLACE

When talking about place names and identities it is also necessary to see place in relation to space. The two terms are interrelated but should be used separately as is common in, for instance, geography and anthropology. Space may be defined as "superficial extent or area; also, extent in three dimensions"; "extent or area sufficient for some purpose; room", whereas place may be defined as "a particular part of space, of defined or undefined extent, but of definite situation"; "the portion of space actually occupied by a person or thing; the position of a body in space, or with reference to other bodies; locality, situation".

One way of separating place from space is to name it: applying a name to a piece of space means creating a place. One of the frequently cited scholars regarding humans' adaptation to nature is Claude Lévi-Strauss, who defines space as "a society of named places, just as people are landmarks within the group. Places and individuals are designated by proper names, which can be substituted for each other in many circumstances common to many societies". Yi-Fu Tuan puts it this way: "What begins as undifferentiated space becomes place as we get to know it better and endow it with value", "it is an object in which one can dwell", or simply "localities on the surface of the earth".

According to geographer Robert David Sack, Space/place if seen from the point of view of one's experience, 'place differs from space in terms of familiarity and time'. Hence 'place requires human agency' and also time if we are to know what a place means. The notion of space and place can be drawn from the view that in the contemporary context, due to the increasing mobility of societies, 'places are merged into one another losing track of their qualities and they may coalesce into the sense that we are moving through space'.

3.3.3.2 IDENTITY

Identity is understood in terms of how people develop a sense of relatedness with a place through interaction, which enables their sense of identity with the environment.

There are ways in which identity studies can be carried out these include the relational identity concept;

i) Where the context includes the socio-spatial realm, with identity being developed through peoples' response to, and their interaction with, the physical environment.
ii) Identity construction/negotiation Identity construction/ negotiation is the way people interact, adapt, and devise strategies to enable place engagement which gradually develops, restructures or reconstitute their sense of identity.

In this regard, Christopher Tilley suggests the following distinction between place and space in an identity perspective:

i) Personal and cultural identity which is bound up with place;
ii) A topo-analysis that explores the creation of self-identity through place.

Geographical experience begins in places, reaches out to others through spaces, and creates landscapes or regions for human existence. Still it is not so easy to delimit a "place", "as there can be a range of different ways in which specific places are represented". Many places are defined according to their particular function, for instance properties and streets, but many others are features with unclear boundaries. Nevertheless they are felt as places as soon as they are brought into mind and become an object of interest. This concept is appropriate as it delves into the contemporary settlement context, considering space and place are as terms whose boundaries blur and that become intertwined, depending on and defined by contingent activities and objects

3.3.3.3 TYPES OF PLACE NAMES

There are several clearly definable types of place name, the primary division being between the names of natural features and the names of human settlements. That the latter are 'places' is obvious. The case is slightly more ambiguous for natural features, depending on how exactly 'place' is defined, and what exactly the concept of a 'place' is used for. If, as is probable, natural features were originally given names to distinguish nearby hills, streams etc. from each other, then these features can be thought of as places, in that they represent distinct geographic locations. However, as names are applied on a larger scale, they may become less useful as place names. For instance, a relatively small, distinct upland valley (e.g. Swaledale) clearly represents a definable geographic location. However, the broad, extended valley of a major river, such as the Trent, is not easily understood as a single location. That notwithstanding, it is probable that the origins of the names of both settlements and natural features is the

same, namely to distinguish one from another; and thus that both should be considered place names.

Many other types of place name can be defined, for example those relating to tribal or personal names. Previously names relating to pagan religion were extensively studied as these were thought to be early. Another class studied was those relating to particular people, example: the Ancient British.

3.3.3.4 TOPONYMIC PROCESSES

There are identifiable processes which occur over time to place names, and which alter the place names in such a way that their original meanings are lost. These apply to both the names of settlements and natural features, although more so to the former.

The processes by which place names change include abbreviation, conflation, convergence, development in the parent language (but stasis in the place name) and replacement of the parent language. The latter in particular can result in dramatic shifts in place names, since the original meaning (and often sounds) are not conveyed in the new language, the place name thus shifts to a form appropriate for the new language.

- Abbreviation tends to break down a name into a more easily pronounced form, e.g. Cantwaraburh to Canterbury; Dornwaracaster to Dorchester.
- Conflation is where two similar elements of place names become confused, for instance the Old English roots den (hill) and don (valley) are conflated in place names e.g. Willesden ('stream hill'), Croydon ('crocus valley').
- Convergence occurs when place names drift towards other familiar phonemes in place names; e.g. in Abingdon (Aebbeduna, 'Aebbe's hill'), the middle sound has converged to the familiar 'ing' found in many place names (usually meaning 'people of').
- Evolution of the parent language may not change a place name by itself; indeed names may show more inertia to change than languages themselves. However, evolution of the parent language permits other processes to occur. For instance, if a name no longer means anything in the modified language, it may drift towards a new form; e.g. Maethelac ('Moot-oak') to Matlock. Or, as the parent language changes, attributes which already form part of a name may be appended to the name. For instance Portsea Island ('Port-island island'); once the meaning of Portsea became obscure, it became necessary to add island.
- Replacement of the parent language is one of the most dramatic processes of change. If, for whatever reason, a new language becomes spoken in the area, a place name may lose all meaning. At its most severe, the name may be completely

replaced. However, often the name may be recycled and altered in some way. Typically, this will be in one of the above ways; as the meaning of place-name is forgotten, it becomes changed to a name suitable for the new language. For instance Brittonic Eborakon (perhaps 'place of the yew trees') became Anglo-Saxon Eoforwic ('Boar-town'), then Old Norse Jorvik ('Horse-bay'), and modern English York.

- Elaboration of place names often occurred to make distinctions between similarly named settlements. For instance, in England, two nearby and related settlements often became 'lower/nether' and 'upper/higher'; or 'little' and 'great' (or the equivalent in Latin, parva and magna). Alternatively, two geographically separated places might be distinguished by local features; e.g. Newcastle-under-Lyme and Newcastle upon Tyne; or Newton-le-Willows, Newton-by-Frodsham, Newton under Roseberry (and so on). In England, many additions were made in the medieval period, to show that settlements were ruled by certain families, e.g. as Stoke Mandeville. Some elaborations (particularly in Latin) date back to medieval times, such as Weston-super-Mare('Weston-on-sea'), while others were added relatively recently, for instance Bognor Regis ('Bognor of the King').
- Backformation: the process whereby names are derived from one another in the opposite direction to that which would be expected - in many cases a river with an obsolete or forgotten name is renamed after a town on its banks rather than vice versa. For example, the river running through Rochdale became known as the 'Roch' through this process. Cambridge perhaps uniquely illustrates both normal and back formation. Originally Grantabrice, a bridge on the Granta, the name became Cantebrugge, and then Cambrigge, from which the river was renamed 'Cam'.

3.3.3.5. PROBLEMS OF INTERPRETATION

Place names often need specialists to interpret their meanings. Some of the main problems are:

Language.

Sometimes the language used in the formation of a place name is unclear; for example, some names may be plausibly derived from either Old English or Celtic roots. In recent years there has been a tendency to seek Celtic origins for names in England that were previously taken to be Anglo-Saxon.

Element order.

In Germanic languages, and thus in Old English and Old Norse, the substantive element is generally preceded by its modifier, such as "north farm" (Norwich), "Badecca's spring" (Bakewell). In Celtic place names the order is usually reversed with the thing being described (hill, valley, farm, etc.) as the first element, for

example "settlement of the Cuebris" (Tregonebris), "mouth of the Dee" (Aberdeen). However, this is not true of all Celtic names, for example "bald hill" (Malvern).
Translation.
The general similarity of Old Norse and Old English meant that the place names in the Danelaw were often simply "norsified". For instance, in Askrigg ('ash (tree) ridge') in Yorkshire, the first element is indubitably the Norse asc (pronounced ask), which could easily represent a "norsification" of the Old English element aesc (pronounced ash) with the same meaning.
False analogy.
Sometimes, however, the place names were changed by new settlers to match pronunciation habits without reference to the original meaning. For example, the Old English name Scipeton ("sheep farm"), which would normally become Shipton in modern English, instead was altered to Skipton, since Old English sc (pronounced 'sh') was usually cognate with Old Norse sk — thus obscuring the meaning, since the Old Norse word for 'sheep' was entirely different.
Lost reason.
Interpreting some names can be difficult if the reason for the name is no longer evident. Some names originally referred to a specific natural feature such as a river, ford or hill that can no longer be identified. For example, Whichford (Warwickshire) means "the ford of the Hwicce", but the location of the ford is lost.

Confusion between elements.
Pairs of original elements can produce the same element in a modern place name. For example, the Old English elements den (valley) and dun (hill) are sometimes confused, as they can now lack obvious meanings. Croydon is in a valley and Willesden is on a hill.
Multiple meanings.
Some elements, such as wich and wick, can have many meanings.
Generally wich/wick/wyke indicates a farm or settlement (e.g. Keswick "cheese farm"). However, some of the sites are of Roman or early Post-Roman origin, in which the wich represents Latin vicus ("place"). These viciseem to have been trading-posts. On the coast, wick is often of Norse origin, meaning "bay" or "inlet" (e.g. Lerwick).

3.3.3.6. NAMES OF LANDSCAPE FEATURES

The names of natural or man-made features in the landscape tend to be older than those of settlements since the former are often more widely known. Names are given to water features, hills and valleys, islands and marshes, as well as woods and districts. Man-made landscape features that have been given names include roads and track ways as well as burial mounds, etc. Many topographic elements become

incorporated into settlement names, together with plant, creature names or personal names. Many topographical words convey not just an image of the place but also a wealth of information about the likely size, status and pattern of farming practiced by the community living there.
Water was of major importance to the early settlers of an area, both for subsistence and for religious reasons. Names were given to springs, streams, rivers and lakes as well as marshes, bays and seas. Eilert Ekwall carried out an early study of river names in England while Krahe conducted a European-wide examination of river names which showed that there were common roots in the names over a wide area. There is still controversy over the language of these roots. Sometimes a generic word was adopted as a specific label, for example the Celtic word for river was afon which is used in many cases as the name (Avon) of rivers in England.
Land characteristics were important to both hunters and farmers, and there are many terms relating to different types of hills and valleys. Some terms, like cumband penn, were adopted from Celtic by Anglo-Saxons. Other terms relate to the expansion of farming.
Topographical names were held in low esteem by early place name scholars but their importance was raised in a book by Margaret Gelling, first published in 1978.

3.3.3.7 PLACE NAMES OF SETTLEMENT

Most pre-modern settlement names contain a generic element describing the place's function (e.g. 'farm', 'market', 'fort') or a prominent natural feature, or both; if only one of these is present, it is often modified by a personal name or an adjective.
For instance, examples from England:
Personal name + function + feature - Todmorden - 'Totta's boundary valley'
Personal name + function - Grimsby - 'Grimr's farm'
Existing name + function - Exeter - 'River Exe (Roman) fort'
Function + natural feature - Church Fenton - 'Marsh Farm (with a church)'
Personal name + natural feature - Barnsley - 'Beorn's clearing'
Existing name + natural feature - Cockermouth - 'River Cocker mouth'
Function - Keswick - 'Cheese farm'
Natural feature - Blackburn - 'Black stream'
These basic elements can also be found in place names in other countries;
e.g. Amsterdam ('River Amstel dam'), Liechtenstein ('Light-
stone'), Copenhagen('Merchants' harbour), Paris ('Home of the
Parisii'), Shanghai (approximately 'Seaport'), Tashkent ('Stone city').
These elements are also clearly present in the less 'weathered' New World place names – e.g. Fort Knox, Thunder Bay, Little Rock and so on. Carson City, for instance, was named for Kit Carson, and Belo Horizonte means "beautiful view". However, some apparent meanings may be deceptive; New York was not directly named after the

English city of York but after the Duke of York, who was the head of the British Navy at the time of the British take-over, and Los Angeles was not named after angels but after the Virgin Mary, or the Queen of the Angels (El Pueblo de Nuestra Señora la Reina de los Angeles).

Countries which have seen repeated large-scale cultural and/or linguistic changes, such as England or France, tend to have more broken down place names, as the original meaning is forgotten and drifts more quickly. They may also have more linguistically diverse place names; for instance in England place names may have Pre-Celtic, Celtic, Roman, Anglo-Saxon, Norse, or Norman-French origins. Conversely, countries with a more uniform cultural/linguistic history tend to have less broken down and diverse place names. Generally place names may be based on the following:

1. Place names based on surrounding hills, mountains and valleys:

Many places are named after nearby land features such as hills and valleys:

i) HILLS:

Synonyms for hills include:

Berg

usually found at the end of a place name, “berg” means hill or mountain, and is derived from Germanic origins. It can be seen in the place names Falkenberg and also in Bergen, the second largest city in Norway. The term “berg” has even reached non-place name words like the word “iceberg” which literally is ice-mountain.

Figure 7

In some cases “berg” has evolved into berry, bury, and borough, although usually these are derived from a different root, “burg”, which has another meaning as will be discussed below.

Bryn or Vern

These mean hill in Celtic e.g. the place Malvern which literally means “bald hill”.

How or Howe
"How" (originally spelled haugr) is an Old Norse word for a hill or a mound.
Examples of places with "how" in them: Greenhow, Gledhow, Howe
Tel
"Tel", as in Tel Aviv, means hill in Biblical Hebrew. The full phrase "Tel Aviv" means Hill of Spring.
Don or Dun
Places with the suffix "–don" or "–dun" come from the word dun which means hill in Old English.
For example:
Swindon means Swine Hill
Hendon means Highest Hill

Note that sometimes don became corrupted to "–den" which has a different meaning as is addressed below. Corruption of the word is what happened for the name of the London area of Willesden which should really be Willesdon because it got its name as a result of being situated on a hill.
ii)VALLEYS:
Places that are named for their valleys may include the following synonyms for valleys:

Figure 8

Den
"-den" on the end of a place name is either a corruption of "don", or it comes from the word "*denn*" which means valley or pasture in Old English. Examples of place names that use –den:
Camden – The "cam" is from the same root as the Old English word "*campas*" which means an enclosure, and "den" means valley. So Camden means: enclosed valley.
Harlesden


Figure 9

Sometimes places with “–den” were misspelled as “don” and the incorrect spelling was kept, as in the case of the London area of Croydon which is in a valley despite having the word for “hill” (don) as its suffix.

Dale

A dale is an Old English word for a valley and several place names like Rochdale, Bairnsdale or Colindale utilize this word component. In other languages Dale becomes Tal (Germanic), as in the place Wuppertal or Otztal.

Combe or Coomb

The terms combe or coomb come from the old Saxon word, “cumb”, meaning valley. Examples of place names with this word element include:
Compton where the Comp was originally Cumb (valley), and the ton means farm; Valley Farm.
Ellacombe, Babbacombe, Watcombe and more.

Hope

“Hope” means valley in Old English, as in the place name Woolhope and Bramhope. Sometimes it becomes corrupted to “-op” as in Glossop.

2.Place names based on nearby rivers and other bodies of water:


Figure 10

i)Burn, Born or bourne

The terms burn, born or bourne which are often seen at the ends of place names as in Melbourne, Cranbourne, Gisborne, Goulburn, Eastbourne or Blackburn come from the Old Anglo-Saxon English word meaning brook or stream. It is likely that these settlements arose around streams.

ii)Beck

Figure 11

A place name that contains the element "Beck" in it refers to the Old English word for a stream that may have Viking origins. In Germany "beck" is sometimes seen in place names as "bach".

- The place Boosbeck in Northern Britain means the cow shed (*boos*) near the stream
- Birkbeck may translate to "birch tree by the stream", or to a market (*byrck*) by the stream.

iii)Fleet

Fleet as in the famous Fleet Street in London comes from the Old English word flēot which means a river or estuary. Fleet Street is indeed not far from the river Thames.

iv)Ford

Places that have the Suffix "*-ford*" were often places that had fords, which were portions of a stream that were shallow enough to cross by foot or horse. Examples of places with this name:

- Bradford – Literally it means broad (= brad in Old English) ford.
- And others: Oxford, Trafford, Milford, Gosford


Figure 12

v)More or Mere

A “mere” or “more” is an Old English word for a pond, lake or pool. Examples of place names with this term:

- Windermere which literally means Vinandr’s lake”, from the Old Norse name Vinandr.
- Stanmore which means stoney (Stan) lake or pool (More) in Old English.

vi)Mouth

Places with “–mouth” on the end are likely to be talking about the mouth of a river. Such places include Plymouth and Bournemouth. The German equivalent is the suffix –mund.

The mouth is not the only body part that is used to describe certain locations. The term “ness” as was made famous by Loch Ness and also Iverness literally means “nose”. This alludes to the portions of land that jut out into the open water like a nose into the open air.

vii) Names based on specific nearby rivers

Some places are named after specific rivers, for example:

- Aberdeen is named after the river Dee and literally means “Mouth of the Dee”.
- Cambridge is named after the river Cam and literally means the area where there was a bridge over the river Cam.

3.) Places named by nearby woodland

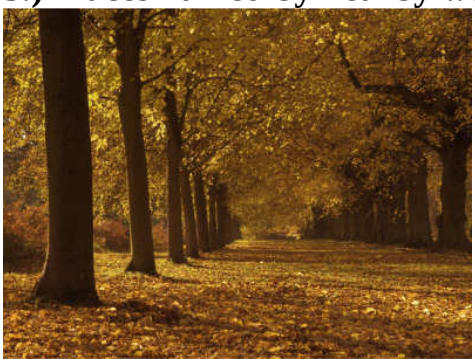


Figure13

There are many examples of these including:

- **Hurst** means wooded hill in Old English. Places with this word element include Dewhurst, Bromley Hurst and Woodhurst.
- **Holt** is also a wood or a wooded hill, as in the place Northolt
- **Ly, ley or leigh** are all from the same root for a word (*leah*) that means a wood or clearing in a wood. It is used in many place names including Barnsley, Hadleigh and Crawley. In some place names it is seen as "loh" or "loo" as in Waterloo.
- **Shaw** is an Old English word for a woodland area, as in the places Grimshaw, Birkenshaw, Penshaw and Openshaw.
- **-try:** The suffix –try as in "Coventry" or "Daventry" is the Saxon spelling of "tree". So Coventry translates to Coffa's tree.
- **Wold or Wald** are the Old English words for woods. The quaint Cotswolds in England are named after their location near woodland.

4.) Place names based around a well or a spring

The obvious place names based on wells or springs are those that have these words within their names, as in Bakewell, Stawell, Clerkenwell, Shadwell, Shaklewell, Muswell.

5.) Places named after roads

Having "gate" in a place name comes from the Old English word gata which means a street or road. Examples include Highgate and Billingsgate.

6.)Places named after the fact that they were near or resembled islands

Figure14

-ey on the end of a place name comes from the Old English word “haeg” which means “enclosure” or “island”. The place names Orkney (a small island in Scotland), Jersey, Guernsey and Alderney are clear examples of how this was used for actual islands, but it can also be used to describe enclosed inland settlements, as in the place Hornsey.

7.) Place names based on fortified areas or settlements

Figure15

Burg / Burgh / Borough/ Brough / Borg
The suffix “burg” or “burgh”, as in Pittsburgh, Salzburg, Johannesburg, Hamburg, Gothenburg and Edinburgh, means a fort or fortified settlement from Germanic roots. Fortified places were often towns or cities which made the term “burg” synonymous with both forts and cities. For example Salzburg came to mean “Salt City”.
Later burg and burgh became corrupted into bourg (e.g. Strasbourg), borough (e.g. Scarborough, Marlborough), brough (e.g. Middlesbrough), borg, and even bury (e.g. Salisbury) or berry, although it is likely that they all come from the same origin.

Chester / Caster / Caer / Car / Cester
All these place name elements come from the Latin root for camp, “castra” and are derived from the days of the Roman Empire to describe a Roman town that was often fortified. Examples of place names with these elements:
Chester in northern England
Cardiff which literally means fortified city (Car) on the River Taff (diff).
Gloucester which literally means “bright” (glou from the Celtic word Glevo) “fortified town” (cester).
Chichester which literally means Cissa’s fortified city (where Cissa was a Saxon landowner)
Doncaster which may mean a fortified city (caster) on a hill (don).
In some cases “caster” can also mean “castle” as in the place Lancaster which means “castle on the Lune river”, although Lune became modified to “Lan”.

Figure 16
Ham
Places with “–ham” on the end refer to the Old English word for farms, villages, homes or estates. It may be linked to the word heim which is the Germanic word for a home. Examples include Birmingham, Rotherham and Newham.
In some place names this heim element is sometimes shortened to –eim, -im, -um, or –m.
Stoke
Stoke comes from the Old English word, “stoc” meaning small settlement or hamlet.
Examples:
Stoke-on-Trent literally means the small settlement on the river Trent.
Basingstoke translates to Basa’s people’s (ing) settlement (stoke).
Worth
In Old English, “worth” translates to “enclosure” and would refer to settlements that were often enclosed by a wall or fence of some sort. Examples include Tamworth and Warkworth.
-by
Places that end in –by are from the Old Norse word for village or settlement.
Examples:
Derby is Deer (der) Village (by) Grimsby, Tenby, Corby, Selby, Lumby

8.) Places named for simply being places

Stead

The suffix "–stead" comes from the word "stede" or staddt if you look at the Germanic version of it, and it translates simply to "place". A good example is the London area of Hampstead which ties in the word components "ham", meaning home, village, estate or farm, with "stead", meaning place so that the full word means Home Place.

Figure 17

Stow

The word "stow" or "stowe"found in several place names including "Stow-on-the-Wold" and Walthamstow, simply means "place of assembly".

The British town Bristol was originally Brigg Stowe meaning the place of assembly (stowe) by the bridge (brigg).

Thorp or Thorpe

These are from the Danish word for settlement. A few example places with "thorpe" in them include: Kellythorpe, Langthorpe and Burythorpe.

9.) Place names based on the landowner's name or of the people living there

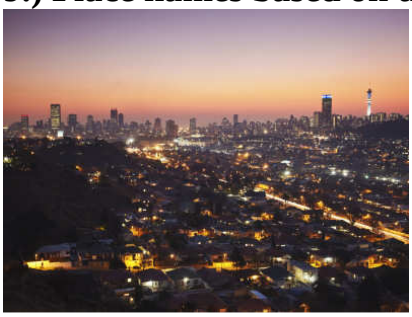


Figure 18

Many place names seem to be named after previous landowners. A few examples are:

Johannesburg: Johannes' town or fortified place

Petersburg or Peterborough: Peter's town or fortified place

Frederiksberg in Denmark

An “ing” in the middle of a name also indicates that a place belongs to someone. Some examples:
Birmingham is likely to translate to “village belonging to Birm”, although Birm is likely to be a corruption of the name Beorma.
Sheringham is likely to translate to “village belonging to Sher” or its uncorrupted equivalent.
Nottingham translates to “village belonging to Nott”, (or as history books tell us, to Snotta. Good thing Nottingham is no longer called Snottingham, eh?).
Other places are named for the people living there. For example the ending “ing” comes from the Latin word “ingas” which means “people of”. So a place like Hastings is named for the people of Hast, and Kettering is named after Ketter’s people.
Sometimes “ing” also comes from the Old English word used to describe a place or a small stream.

10.) Place names based on nearby farms or estates


Figure 19

If an area was mostly defined by a farm being there, it often got named after this farm.

Tun or Ton mean farm in Old English but can also mean someone’s estate too. Later on some people extended the use of “ton” to refer to towns. Some examples:

- Skipton is a corruption of Shipton which means Sheep Farm.
- Preston means the priest’s farm or estate
- Kensington means Cynesige’s estate or farm, where Cynesige is an Old English personal name.
- Bickerton means bee keeper’s farm
- Washington means settlement or farm of Wassa.
- Brighton means Beorhthelm’s farmstead
- Others: Wellington, Islington, Clapton, Newington, Paddington, Hamilton, Shepparton, Frankston

Ster
Having “ster” on the end of a place name indicates that it was a farm, because “ster” is from the Old Norse word for a farm. Note that these are not places with a “cester” suffix, but just a “ster”.

Wich or Wick
These endings of place names can have several different meanings but one possible translation is “farm”, as in Chiswick which translates to “Cheese farm” or Gatwick which was once a “goat farm”.
Others interpretations of wich or wick may be “place” (from the Latin word *vicus* which became “wick”), or it may mean “bay” if the place got its name through Norse origins from the word *vik*.

Place names based on whether a place had a market
Names with “cheap”, “chep” or “chip” in them are from the Old English word for market. Examples of places that use this name: Chipping, Chepstow, Cheapside, Chippenham.

Place name origins in Nigeria
In Nigeria we have place names which can be denoted from the names of our villages and the history attached to it. Most of the place names in Nigeria are derived mainly from the natural geographical features present and historical events.

The place name of my village is “EKEKHEN”. It means camp of traders. History has it that my people were migrant traders from Benin to Agbor. They would camp at a particular spot which made it easy for them to shuffle between Benin and Agbor. Over time that place became known as the camp of traders and this place name has come to stay even as the village has grown in size and population.

What is the place name of your place and how was it arrived at?

Delta- Delta formation
Kaduna- Crocodile
Abeokuta- rocks and hills

3.3.4 SOCIO SPATIAL APPROACH
It assumes that social space operates as both a product and a producer of changes in the environment. In the **socio-spatial perspective**, built environment is intrinsically meaningful: It has its particular “semiotics” that tell about policy, culture, society, economy, etc., and about security as well. The socio-spatial approach to analysis is the consequence of a paradigm shift that took place beginning with the late 1960s. The

Socio-spatial perspective addresses how built infrastructure and society interact. It assumes that social space operates as both a product and a producer of changes in the metropolitan environment. In the socio-spatial perspective, built environment is intrinsically meaningful: It has its particular “semiotics” that tell about policy, culture, society, economy, etc., and about security as well. Billingham, 1994, states that the Socio-Spatial Process addresses physical dimension and social dimension of space simultaneously and is a better process of transformation and to understand space. A socio-spatial view point in which these two dimensions with their complexities are intermeshed will allow us to see how spatial structures express the social formations as well as how it affects them.

Without moment and change, we have learnt that there is no life and thus there is a constant transformation of space around us as we live. This is a result of man’s desire not only to better his lot but to have the ease of comfort from his environment. The transformation of space has to be done very carefully, because it affects people who use and live in it. Exploring space therefore through its physical and social dimensions, in order to understand how it exists in socio-spatial continuum is thus necessary as special emphasis would be given to dimension of human behavior since it is ignored and insufficiently addressed.
The basic underlying rules for the socio-spatial approach include:

- Consideration of interactions of society with space;
- Consideration of social needs;
- Involving citizens in planning projects (citizen participation);
- Integrating the society into planning
- Integrating approaches and findings from social sciences and humanities.

3.3.5 ECOLOGY, HABITAT AND SETTLEMENTS.

A habitat is ecological or environment area that is inhabited by a particular species of animal, plant or the other type of organism. It is the natural environment in which an organism lives, or the physical environment that surrounds a specie population. Human habitat is the environment in which human beings exist and interact. Habitats form a vast tapestry of life across the Earth's surface and are as varied as the animals that inhabit them. They can be classified into many genres—woodlands, mountains, ponds, streams, marshlands, coastal wetlands, shores, oceans, etc. Yet, there are general principles that apply to all habitats regardless of their location.
A biome describes areas with similar characteristics. There are five major biomes found in the world: aquatic, desert, forest, grassland, and tundra. From there, we can classify it further into various sub-habitats that make up communities and ecosystems.

3.3.5.1 AQUATIC HABITATS

The aquatic biome includes the seas and oceans, lakes and rivers, wetlands and marshes, and lagoons and swamps of the world. Where freshwater mixes with saltwater you'll find mangroves, salt marshes, and mud flats. All of these habitats are home to a diverse assortment of wildlife. Aquatic habitats include virtually every group of animals, from amphibians, reptiles, and invertebrates to mammals and birds. The intertidal zone, for instance, is a fascinating place that is wet during high tide and dries up as the tide goes out. The organisms that live in these areas must withstand pounding waves and live in both water and air. It is where you will find mussels and snails along with kelp and algae.

3.3.5.1.a WETLANDS

A wetland is an area of land that is either covered by water or saturated with water. The water is often groundwater, seeping up from an aquifer or spring. A wetland's water can also come from a nearby river or lake. Seawater can also create wetlands, especially in coastal areas that experience strong tides.
A wetland is entirely covered by water at least part of the year. The depth and duration of this seasonal flooding varies. Wetlands are transition zones. They are neither totally dry land nor totally underwater; they have characteristics of both.

Wetlands exist in many kinds of climates, on every continent except Antarctica. They vary in size from isolated prairie potholes to huge salt marshes. They are found along coasts and inland. Some wetlands are flooded woodlands, full of trees. Others are more like flat, watery grasslands. Still others are choked by thick, spongy mosses. Wetlands go by many names, such as swamps, peatlands, sloughs, marshes, muskegs, bogs, fens, potholes, and mires. Most scientists consider swamps, marshes, and bogs to be the three major kinds of wetlands. A swamp is a wetland permanently saturated with water and dominated by trees

3.3.5.1.b SWAMPS

A swamp is a wetland permanently saturated with water and dominated by trees.

There are two main types of swamps: freshwater swamps and saltwater swamps. Freshwater swamps are common in inland areas. Saltwater swamps protect coasts from the open ocean.

i) Freshwater Swamps

Freshwater swamps often form on flat land around lakes or streams, where the water table is high and runoff is slow. Seasonal flooding and rainwater cause the water level in these swamps to fluctuate, or change. Water-tolerant plants, such as cattails, lotus, and cypress, grow in the swamp's wet soil, these plants are key to maintaining the swamp's ecosystem.

Freshwater swamps are common in tropical areas near the Equator. These equatorial swamps usually experience year-round heat and humidity. Distinct cultures have also developed near bayous and other freshwater swamps. In Louisiana, the food and music of Cajun culture is closely associated with bayou wildlife and imagery. The Eastern and Western Congolian Swamp Forests surround the Congo River, in the nations of the Democratic Republic of Congo and the Republic of the Congo.

ii) Saltwater Swamps

Saltwater swamps are usually found along tropical coastlines. Formation of these swamps begins with bare flats of mud or sand that are thinly covered by seawater during high tides. The brackish water of saltwater swamps is not entirely seawater, but not entirely freshwater, either.

Dozens, perhaps hundreds, of different species of mangrove trees thrive in the Sundarbans. In drier areas of the swamp, palms and grasses grow. Insects such as bees build hives in the trees. In fact, harvesting honey has been a major economic activity in the Sundarbans for centuries. The Bangladeshi portion of the wetland is a UNESCO World Heritage Site.

3.3.5.1.c MARSHES

North and south of the tropics, swamps give way to marshes. A Marsh is usually found near a river, lake or tidal waters. Marshes are subject to periodic flooding, and the water level can change drastically in a short amount of time. These wetlands form a flat, grassy fringe which are Marshes are overgrown with coarse grasses, sedges and rushes near river mouths, in bays, and along coastlines as the boundaries of a marsh are not well defined. Many are alternately flooded and exposed by the movement of

tides and in draught, a marsh can completely dry up. Like swamps, marshes are often divided into freshwater and saltwater categories.

i) Freshwater Marshes

Freshwater marshes, often found hundreds of kilometers from the coast, are dominated by grasses and aquatic plants. These marshes often develop around lakes and streams. Many freshwater marshes lie in the prairie pothole region of North America, the heart of which extends from central Canada through the northern Midwest of the United States. Prairie potholes are bowl-shaped depressions left by chunks of glacial ice buried in the soil during the most recent ice age. When the ice melted, muddy water filled the potholes. Fertile soil and a temperate climate make these marshes some of the richest in the world. For this reason, many prairie potholes have been drained and the land used for agriculture.

ii) Saltwater Marshes

Salt marshes are some of the richest ecosystems for biodiversity. Dominated by grasses, they provide food and shelter for algae, fungi, shellfish, fish, amphibians, and reptiles. Wading birds and other animals feed on the vegetation and abundant insects. The warm saltwater marshes of northern Australia are influenced by the tides of the Indian and Pacific oceans. They often overlap with the freshwater marshes of rivers, such as the Jardine. A few mangrove trees may dot saltwater marshes, but they are dominated by grasses and a layer of algae called an algal mat. This algal mat is home to many insects and amphibians.

3.3.5.1.d BOGS

Swamps and marshes are generally found in warm climates. Bogs are more common in cold or even Arctic areas in North America, Europe, and Asia. They also exist at high altitudes in warmer regions, such as the Sierra Nevada in the United States. Bogs are often called moors or fens in Europe, and muskegs in Canada.

Like many wetlands, bogs develop in areas where the water table, or the upper surface of underground water, is high. They often begin in glacial depressions called kettle

lakes, which are deeper than prairie potholes.

A bog forms as a kettle lake gradually fills with plant debris. Leaves, roots, and stems of large plants accumulate on the bed of the lake. As the lake becomes shallower, mosses and other plants growing along the edges of the lake extend into the water. They form a loose, floating layer of tangled vegetation on the water's surface. Eventually, these plants are followed by water-loving grasses and sedges. Soon, the water is choked with vegetation. The oldest, partially decayed vegetation at the bottom of the bog forms a thick, spongy mat called peat.

A Peat bog is a poorly drained area that is covered by mats of moss, which slowly decompose in successive layers and eventually form a material called peat. There are 2 types of peat bogs; ***Bogs and Fens***. The water of a Bog is much more acidic than that of a Fen, due to the larger quantities of sphagnum moss and the more advanced process of decomposition in a Bog. The vegetation of a Peat bog is mainly Sedges, Spruce and low-growing members of the Heath family. Peat is a valuable fuel in many parts of the world. It is often the first step in the creation of coal, a fossil fuel. (The fossils in coal are wetland plants.) Some people living near bogs cut and dry squares of peat. It is burned for heating and cooking, or used to insulate buildings. In Ireland, peat supplies a portion of the country's electrical energy.

Bogs preserve more than the remains of plants, however. The bodies of dozens of prehistoric people have been found in bogs in Europe and Asia. Some bogs can support a person's weight. They are called quaking bogs because the surface quakes when a person walks on the spongy peat. The island of Ireland, with its cool, wet climate, has hundreds of quaking bogs.
Unlike other wetlands, bogs usually are not agriculturally fertile. The amount of acid in the soil and water is generally higher than that in swamps or marshes. The supply of nutrients, especially nitrogen, is low.

3.3.5.1.e PONDS

A Pond is a well-defined basin that is filled with stagnant water and ringed by vegetation. It is fed mainly by rainstorms and snowmelt, and loses most of its water

through seepage and evaporation. In hot, dry months, parts of a Pond may dry out, exposing mud flats. In shallow Ponds, bottom rooted plants such as water lilies can reach the surface, while milfoils, pondweeds and other submergent plants thrive below the water's surface.

Importance of wetlands for settlement development

Wetlands are some of the most valuable ecosystems on Earth. They act like giant sponges or reservoirs. During heavy rains, wetlands absorb excess water, limiting the effects of flooding. Wetlands also protect coastal areas from storm surges that can wash away fragile beaches and coastal communities. Saltwater swamps and tidal salt marshes help secure coastal soil and sand.

Wetland ecosystems also act as water-treatment facilities. The plants, fungi, and algae of a wetland filter wastes and purify water. Nitrates and other runoff chemicals often wash into wetlands from urban areas and farms. Organisms there absorb the harmful chemicals. Pollutants not absorbed by plants slowly sink to the bottom, where they are buried in sand and other sediment.

Wetlands, especially marshes and swamps, are home to a wide variety of plant and animal life. Some animals, such as shrimp, live in tidal marshes. All of these wetlands are home to economically valuable fisheries.

Wetlands are economically important to people. They are popular places for recreational activities, such as hunting, hiking, canoeing, and bird-watching. According to the U.S. Fish and Wildlife Service, Americans spend more than $100 billion on wetland-related recreational activities every year.

More than 75% of the fish and shellfish that are commercially harvested worldwide are linked with wetlands.

Until recently, draining wetlands was accepted practice. Drained wetlands provided land for agriculture, housing, industry, schools, and hospitals. The capital of the United States, Washington, D.C., is built on a drained wetland along the Potomac and Anacostia rivers.

Almost half of U.S. wetlands have been destroyed for development. Drainage and peat harvesting have destroyed wetlands in Ireland and Scandinavia.

Many fish that depend on wetlands have become rare. Some of these species, such as flounder, trout, and bass, are commercially important. Freshwater and ocean fisheries depend on wetlands to provide habitat for the next generation of fish.

In the early 1970s, governments began recognizing the enormous value of wetlands. To protect the vanishing ecosystems, hunting and fishing licenses were restricted. Living shorelines and other restoration projects encouraged the development of coastal wetlands to protect communities from storm surges. Fines and restrictions on agricultural and industrial runoff reduced the toxic chemicals spilling into wetlands.

In some parts of the world, including the United States, it is now against the law to alter or destroy wetlands. Through management plans and stricter laws, people are trying to protect remaining wetlands and to recreate them in areas where they have been destroyed.

The Pantanal is the largest natural wetland in the world. The Pantanal extends more than 171,000 square kilometers (66,000 square miles) through Brazil, Bolivia, and Paraguay.

3.3.5.2 Desert Habitats

When someone says the word "desert," it's almost certain that you immediately picture the stereotype depicted in movies and other forms of popular culture: Sand as far as the eye can see in all directions, no plants with the possible exception of cactus or two, a total absence of water and an abundance of searing sunlight. Deserts appear, in a word, inhospitable. Yet few people in North America have any first-hand experience with deserts.

Deserts, in fact, account for one-fifth of Earth's land area, and come in four distinct varieties, and they are found on every continent. They're known to be the driest areas on Earth and that makes living there extremely difficult. Deserts and scrublands are landscapes that have scarce precipitation. They are place that receives less than 10 inches (25 centimeters) of rain per year. Deserts are part of a wider class of regions

called drylands. These areas exist under a “moisture deficit,” which means they can frequently lose more moisture through evaporation than they receive from annual precipitation. Still, deserts are rather diverse habitats. Some are sun-baked lands that experience high daytime temperatures. Others are cool and go through chilly winter seasons.

Large mammals are uncommon in deserts because most of them cannot store sufficient water and tolerate the heat (camels are a notable exception). While smaller animals might be able to find patches of shade sufficient to cover their bodies, deserts typically offer little protection from the sun for larger animals. The dominant animals of the warm deserts are non-mammalian vertebrates, mainly reptiles. Whatever mammals have managed to thrive in these biomes tend to be small, such as the kangaroo mice that inhabit some deserts in North America.

3.3.5.2.1Classification according to deserts

Deserts have been defined and classified in a number of ways, generally combining total precipitation, number of days on which this falls, temperature, and humidity, and sometimes additional factors. While ecologists agree that there are four fundamental types of deserts, the nomenclature of these four desert biomes varies slightly from source to source.

The four basic desert types are the hot-and-dry (or subtropical) desert, the semiarid (or cold-winter) desert, the coastal desert and the cold (or polar) desert.

i)Hot-and-dry deserts

This probably best fit the average person's idea of what a desert should look and feel like. The Sahara is one such desert. Others appear in Australia, South Asia, and Central and South America. The U.S. features the Chihuahuan, Sonoran, Mojave and Great Basin deserts.

The seasons are warm to quite hot year-round, and owing to the low humidity of these environments, the temperature swing from the hottest time of day to the coldest time of day may be extreme – over 45 C (about 80 F) in some regions. This is mainly because the surface receives twice as much solar radiation during the day as would the surface in comparable but more humid environment, and loses twice as much heat at night.

Rainfall is usually very sparse in hot-and-dry deserts, and evaporation rates routinely outpace rainfall rates. Falling rain has even been noted to evaporate before reaching

the ground. What little rain these deserts get occurs in short, brief and sometimes intense bursts, though monsoons and remnants of tropical systems that drift into some deserts can provide abundant moisture at times. The Atacama Desert in Chile on the western coast of South America, known as the world's driest place, receives an average of 1.5 cm per year of rain – barely a half-inch.
Plants in hot-and-dry deserts are mostly low shrubs and short, woody trees. Animals include small nocturnal carnivores, with comparatively high populations of burrowers and kangaroo rats. Insects, arachnids, reptiles and birds are also common. The animals hide from the sun and then come out to forage at dusk or at night, when the desert is coolest.

ii)Cold Deserts

Cold winter deserts, also called semiarid deserts, are characterized by moderately long, dry summers and winters that include brief intervals of rain. This pattern is like that of hot-and-dry deserts, but the overall temperatures are somewhat cooler. U.S. examples include the sagebrush zones of Utah, Montana and the Great Basin. They also include northern, but subarctic, portions of North America, Newfoundland, Greenland, Russia, Europe and northern Asia.
Summer temperatures in these deserts usually average between 21-27 C (70-80 F). It normally does not rise above 38 C (100 F), and evening temperatures are cool, at around 10 C (50 F). Annual rainfall can be as low as only 2 to 4 cm (about 0.8 to 1.5 inches).
Soil can range from sandy and fine-textured to loose rock fragments, gravel or sand. There is no subsurface water in these environments. As for vegetation, cacti (the plural of "cactus") are found here. The spines of cacti and other plants in cold winter deserts provide protection in a difficult natural setting. The multitude of spines offer enough shade for the surface of these plants to reduce water losses through transpiration. Many plants have glossy leaves, which let them reflect more light energy. Semiarid desert plants include Creosote bush, bur sage, white thorn, cat claw, mesquite, brittle bushes, lyciums and jujube.
As for animals, insects and jack rabbits are seen during the day, staying in shadow as much as possible. Many animals seek protection in burrows underground, where they

are insulated from the hot, dry air. These include kangaroo rats, rabbits, skunks, some insects, birds and reptiles.

iii) Coastal Deserts

Coastal deserts are found in regions that are generally cool to moderately warm. Portions of the aforementioned Atacama Desert in Chile represent the coastal desert biome. Here, cool winters alternate with relatively long and warm summers. Temperatures are moderate compared to the two desert biomes already discussed. Average summer temperatures range from 13-24 C (55-75 F); winter temperatures are 5 C (41 F) or colder. The maximum annual temperature is close to 35 C (95 F), and the minimum is about -4 C (25 F).

Rainfall, while sparse, exceeds that of hot-and-dry and cold-winter deserts, averaging around 8 to 13 cm (3 to 5 inches) per year. The soil in these deserts is high in salt and other nutrients. Some of the plants have extensive root systems, unlike the flora in the aforementioned desert types. These plants are almost botanical analogs of camels in that they can store very large amounts of water for future use when it is available. These plants include the salt bush, buckwheat bush, black bush, rice grass, little leaf horsebrush, black sage and chrysothamnus.

Coastal-desert animals boast special adaptations for dealing with heat and lack of water. For example, some toad species seal themselves in burrows with sticky, gel-like secretions and remain inactive for eight or nine months until a heavy rain washes them out. Amphibians that include larval stages of development feature accelerated life cycles, bettering their chances of reaching maturity before the rainwater evaporates. Some insects lay eggs that are able to stay dormant in adverse conditions, maturing only when their environment is more suitable for hatching; fairy shrimps do the same. Coastal-desert mammals include coyotes and badgers; birds include the famed great horned owl, golden eagle and the bald eagle. Lizards and snakes are the chief reptilian representatives

Polar Deserts

Polar deserts or cold deserts are curiosities, like almost everything about the Earth's poles. Compared to other desert biomes, they receive a veritable flood of precipitation, especially in the winter months. Mean annual precipitation is about 15 to 26 cm (6 to 10 in). Winter in the Arctic Polar Desert – which spans 5.4 million square miles in parts of Alaska, Canada, Greenland, Iceland, Norway, Sweden, Finland and Russia – occurs between mid-December and mid-March, while that in the 5.5-million-square-mile Antarctic Desert that spans the continent after which is was named falls between mid-June and mid-September.

Polar desert plants are widely scattered over the vast lands in which they grow. Plant heights can reach 122 cm (about 4 feet) in some areas. The main plants are deciduous, meaning that they have leaves they shed seasonally with most of these having spiny leaves. Fungi and dwarf shrubs are also common.

Major Types of Desert Biomes

Some sources list more than four desert types to better account for the variability in geographic and ecological factors from place to place. For example, the U.S. Geological Survey lists eight types of deserts: trade wind, mid-latitude, rain shadow, coastal, monsoon, polar deserts, paleodeserts and extraterrestrial deserts. The last two are not found on Earth; paleodeserts are areas that show evidence of having been deserts in the recent geological past, whereas extraterrestrial deserts are found on other planets, such as Mars.

Trade wind deserts are analogous to hot-and-dry (subtropical) deserts. Mid-latitude deserts overlap with the cold-winter deserts in the four-desert-type scheme. Rain shadow deserts, which are also cold-winter-style deserts, form on the sides of tall mountain ranges blocked from receiving much moisture. Monsoon deserts are seen in India and Pakistan. Coastal and polar deserts retain the same basic definitions as before.

The Five Largest Deserts in the World

The two largest deserts in the world are the Antarctic Polar Desert, which is 5.5 square million miles in area, and its northern counterpart, the Arctic Polar Desert, which includes 5.4 million square miles. The Antarctic Polar Desert is more easily visualized because it is confined to a single, large, somewhat circular land mass.The Sahara Desert in northern Africa covers about 3.5 million square miles and is recognized by

some sources as being the world's largest desert because the polar deserts are not traditional deserts. The fourth-largest at 1 million square miles is the Arabian Desert that takes up the Arabian Peninsula in the Middle East, while the fifth-largest is the Gobi Desert of China and Mongolia, which covers 500,000 square miles.

Importance of deserts for settlement development

Despite their reputation for being dry empty wastelands, deserts are home to one-sixth of the world's population, and they cover over one-fifth of the Earth's landmass. Deserts can be found on every single continent, and even though they lack water, they play an important role in helping animals, humans and the environment.

Animals and Plants

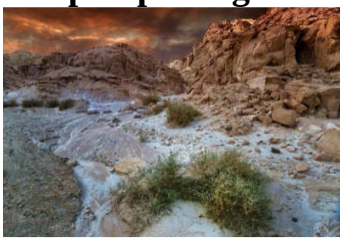
Far from being empty wastelands, most deserts are home to a vast array of plants and animals who have adapted to their harsh habitats. Besides adding to the Earth’s biodiversity, many of these plants and animals benefit humans. Domesticated camels in the deserts of Asia and North Africa have been reliable pack animals for thousands of years. Desert plants such as the date are an important food source in North Africa and the Middle East; dates are also one of the oldest cultivated foods in the world, dating back to biblical times.

Mineral Wealth

The dry condition of deserts helps promote the formation and concentration of important minerals. Gypsum, borates, nitrates, potassium and other salts build up in deserts when water carrying these minerals evaporates. Minimal vegetation has also made it easier to extract important minerals from desert regions. According to United

Nations statistics, over 50 percent of world copper comes from deserts in Mexico, Australia and Chile. Other minerals and metals like bauxite, gold and diamonds can be found in large quantities in the deserts of China, the United States and Namibia. Desert regions also hold 75 percent of known oil reserves in the world.

Bio-prospecting



Desert plants have adapted special properties to help them survive in harsh desert climates. Scientists believe that certain chemically based adaptations can have medical applications in humans. According to a UN report on the global outlook of deserts, a recent survey of plants in Israel's Negev desert found plants that could be used to fight malaria.

Archeological Discoveries

Arid conditions are ideal for preserving human artifacts and remains. Mummified human remains found in countries like Peru, China and Egypt have taught present day archaeologists about ancient civilizations. For example, in March 2010, the New York Times reported that scientists working in western China discovered a 4,000-year-old cemetery of 200 corpses with European facial features. Discoveries such as these help shape modern understanding of how our societies first formed.

Carbon Sinks

According to an article in science daily in April 2008, desert sands are an important carbon sink on Earth. Scientists discovered that bacteria living in the sands of the

Kalahari desert in Africa help gather and store carbon dioxide from the air. Since carbon dioxide is one of the prime causes of global warming, these desert sands may play a critical role in preventing additional carbon dioxide from entering the atmosphere.

3.3.5.3 Forest Habitats

Forests and woodlands are habitats dominated by trees .They are also f a complex ecosystem consisting mainly of trees that buffer the earth and support a myriad of life forms. The trees help create a special environment which, in turn, affects the kinds of animals and plants that can exist in the forest. Trees are an important component of the environment. They clean the air, cool it on hot days, conserve heat at night, and act as excellent sound absorbers. Forests extend over about one-third of the world's land surface and can be found in many regions around the globe.

Types of forests habitats

There are different types of forests but six broad classifications

1. Equatorial Moist Evergreen or Rainforest
2. Tropical Deciduous Forest
3. Mediterranean Forests
4. Temperate Broad-leaved Deciduous and Mixed Forest
5. Warm Temperate Broad-leaved Deciduous Forest
6. Coniferous Forest.

1.) Equatorial Moist Evergreen or Rainforest

This evergreen hardwood forest is the natural vegetation of low-latitude high precipitation zone. This vegetation generally occurs in between 10° N. and S. of equator where annual rainfall is very high and distributed equitably throughout the year. The total extent of tropical rainforest was 714 million hectares in 1990, which is half of the world’s forest cover. This forest habitat experiences convectional rainfall almost every-day. They have mean annual rainfall which exceeds 200 cm. They have no well-marked dry season, visible throughout the year and have average daily and annual temperatures which are very high, around 30°C. The range of temperature is very low. Relative humidity is very high throughout the year, varies between 80-90%. Its trees are evergreen hardwood type. For example, Selva of Equatorial America is so dense that, light cannot penetrate it.

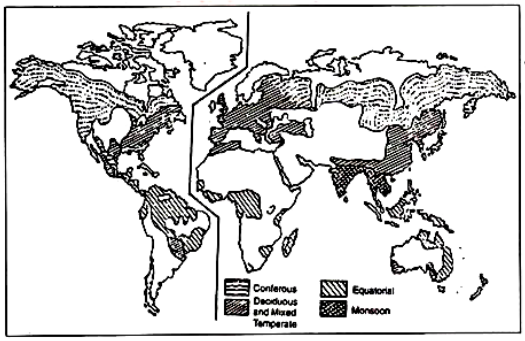


Figure: World distribution of forests

Major characteristic features of Rainforest

(i) Different plant species grow together.
(ii) Trees are sky-high and epiphytes are common.
(iii) Light cannot penetrate into the lower strata full of undergrowth.
(iv) Due to the presence of trees of different height, several canopies also develop
(v) Foliage is leathery in texture.
(vi) Parasites, saprophytes, climbers grow luxuriantly

Major Tree Species of the rainforest

Several valuable trees are found in tropical rainforest. Important among these are: Mahogany, iron wood, teak, ebony, rubber, palm, deodar, Brazil nut, bamboo and cane etc.

The uses of rainforest resources in different economic activities are:

Teak and Mahogany are widely used in furniture industry.
Wood collected from forest is used as fuel.
Brazil nut is rich in protein.
Tagua nut is used for button-making.
Barasu is an important raw material to produce soap and margarin.
The milky juice of zopota tree is chickle which is converted to chewing gum.
Wild rubber can be collected from rubber trees.
Balata gathered from this forest is used for cable-making and other industrial purpose.
Babassu palm nut is used in paint industry.
Cohune nuts for perfume manufacturing,
Toquilla palm for hat making.
Quinine, camphor, tannin are other important raw materials for drug industry.

2.) Tropical Deciduous Forest

In tropical monsoon region where rainfall is seasonal and a definite dry season exists, the deciduous and semi-evergreen forests are prevalent. Unlike Equatorial region, here the variations of trees in different regions are much more. Generally the tropical deciduous forest has its average temperature of the year ranging between 25°- 32°C.

Lowest temperature in winter is around 10°C. Trees shed their leaves in winter. It has an average annual rainfall is very high and ranges between 100-250 cm. Most of it occurs in rainy season. This rainfall encourages trees of luxuriant growth. Its Relative humidity during rainy season ranges between 80- 90%. In winter, it drops somewhat.

Major characteristic features of Tropical Deciduous Forest

(i) Most of the tress are broadleaved and provide hardwood variety.
(ii) Trees are so heavy that in most cases they do not float in water.
(iii) Several layers are visible in forest, according to height of the trees. Trees with height of 50 meters to 10 meters are common.
(iv) Wide variety of climbers, creepers, parasites, epiphytes and saprophytes are common.
(v) No dominance of single species — as trees are intermingled with one another.
(vi) Thick undergrowth of shrubs, bushes and bamboos are common.
(vii) Swampy, marshy areas exhibit mangrove forests, e.g. Sundarban in West Bengal.

Major Tree Species of the tropical deciduous forest

Among the valuable trees, notable are: mahogany, ebony, ironwood, teak, greenheart, logwood, sal, gamur, sissu, acacia catechu, palash, haldu, chapeas, margose (neem) etc.

Economic Importance of the tropical deciduous forest

(i) Presence of valuable species like sal, teak, mahogany etc.
(ii) This forest is more accessible than equatorial forest.
(iii) Improved communication network.
(iii) Good market and capital inflow.

3. Mediterranean Forests

Primarily found in the Mediterranean climate within 35°-45° North and South of the equator. It is a peculiar climo-floral development found in several areas. This type of vegetation covers an area of nearly 80 million hectares of land. It has average annual temperature varying between 18° – 25°C. Winters receive moderate temperature while summer months remain hot. The peculiar climatic characteristics of Mediterranean climate is its winter rainfall. The region receives much of its rainfall during winter, summer months remain dry and rainless. Its average annual rainfall usually varies between 50-100 cm. This is the only region on earth where winter months remain humid while summer months are dry.

Major characteristic features of Mediterranean Forests

Winter rainfall and dry summer separates Mediterranean vegetation from all other vegetation type. Lush green winter and pale brown summer is typical. Much of the

original vegetation has long been destroyed due to ruthless human interference. To protect themselves from the dry summer, the vegetation of this area has adopted several devices such as:
1. Trees are covered by hairs, e.g. Olive trees.
2. Leaves are very thick and skin-like, e.g. Bolen trees.
3. Some trees may adopt wax layers in the leaves.
4. Barks are very thick, e.g. cork and oak.
5. Roots are very long, e.g. grapes.
Beside these characteristics, some trees like lavender, rose-merry etc.. are orchids and distinctly different from others.
The present vegetation of Mediterranean forests can be classified into three broad groups:
(a) Mediterranean Evergreen vegetation: Oak, Cork, Eucalyptus, Redwood etc.
(b) Evergreen Coniferous Forest: Pine including Aleppo Pine and Stone Pine, Fir, Cypress etc.
(c) Mediterranean Scrub and Bush: Laurel, Myrtle, Lavender, Rose-merry etc.. It is called Maquis in France, Machia in Italy, Chapparel in California (U.S.A.) and Mallea-scrub in Australia.

Economic Importance of Mediterranean forests
1. Large trees are rare and are isolated, so lumbering industry is limited.
2. The barks of cork and oak are used to produce caps of the bottles.
3. Lavender and rose-merry trees produce perfumes.
4. Olive oil is extracted from olive trees.
5. Wine is produced from grapes.

4. Temperate Broad-leaved Deciduous and Mixed Forest
In the eastern side of the continents, in warm temperate region, this forest is located in
(i) South China.
(ii) South Japan.
(iii) South Africa.
(iv) South-East Australia.
(v) South Brazil.
It is characterized by rainfall all the year and a minimum annual temperature over 10°C. Due to heavy rainfall which is evenly distributed throughout the year, trees are evergreen, broad-leaved and hard-wood type.
Major Species of Temperate Broad-leaved Deciduous and Mixed Forest

1. Koebrack in South-East Brazil.
2. Deodar.

3. Eucalyptus.

5. Warm Temperate Broad-leaved Deciduous Forest

In warm temperate region, where temperature remains above 6°C at least 6 months of the year. This forest developed in central and north-west China, Korea, Japan, New Zealand and Tasmania.

Characteristics of Warm Temperate Broad-leaved Deciduous Forest

1. Trees shed their leaves during spring.
2. No layer in the leaves.

Major Species of warm temperate broad-leaved deciduous forest

Elm, Beach, Maple, Walnut etc.

Economic Importance of Warm Temperate Broad-leaved Deciduous Forest

1. As same type of trees are concentrated in different regions, wood collection is easier.
2. Wood transportation is also easier.
3. As there is very little undergrowth, collection of forest product is much easier.

6. Coniferous Forest

In both the hemisphere 50°-70° latitude, this forest extends through Europe, Asia and North America in Northern hemisphere and Chile, Argentina and New Zealand in Southern hemisphere. In Switzerland, Sweden, Norway and Finland in Europe; North Japan, North China in Asia; C.I.S. in Eurasia and Canada. In North America this coniferous forest is known as Taiga. 35% of the total global forest extending over 1,200 million hectares is included in the coniferous forest. The winter temperature remains very low. Sometimes it goes below -10°C. Winter experiences heavy snowfall, summer very low snowfall. Annual rainfall varies between 30-50 cm. 5°C isotherm line demarcates its northern limit while 10°C isotherm line delimits its southern limit in summer. They usually experience three major types of seasons;

(i) Prolonged winter.
(ii) Mild short summer.
(iii) Scanty rainfall.

Major Species in coniferous forest

(i) Pine
(ii) Fir
(iii) Birch
(iv) Spruce
(v) Willow
(vi) Lirch

(vii) Aspen
(viii) Alder
(ix) Douglas.

Characteristics of trees of the Coniferous Forest

1. Most of the coniferous forests or Taiga or Boreal forest are evergreen (except lirch). Forest occurs in places where minimum temperature is above 6°C.
2. The individual trees are cone-shaped as this helps prevent accumulation of snow on the trees.
3. The leaves are leathery and conical. So transpiration can be reduced during summer.
4. Characteristically, most of the coniferous trees are tall and have few branches.
5. Most of the trees are of soft wood variety. This is very useful for production of pulp, paper, newsprint, artificial silk, plywood etc.
6. As the trees are not very dense and evergreen, they do not create good shadow.
7. Same species of trees are found in separate regions.

Economic Importance of Coniferous Forests

The major economic utilization of the coniferous forests can be grouped into several industries:

(i) Match-box industry:

This industry has only developed in coniferous forest where softwood is available. Sweden, Denmark, Norway, Canada are the forerunners in match-box industry.

(ii) Paper industry:

Economically this is the largest industry developed in coniferous forests. Softwood is favourable for the preparation of principal raw material, i.e. paper pulp, for paper manufacturing. Almost 93% of the pulp is manufactured from coniferous softwood.

(iii) Rayon & Synthetic Textile industry:

Synthetic textile and rayon requires cellulose. Cellulose is obtained from coniferous trees.

(iv) Other industries

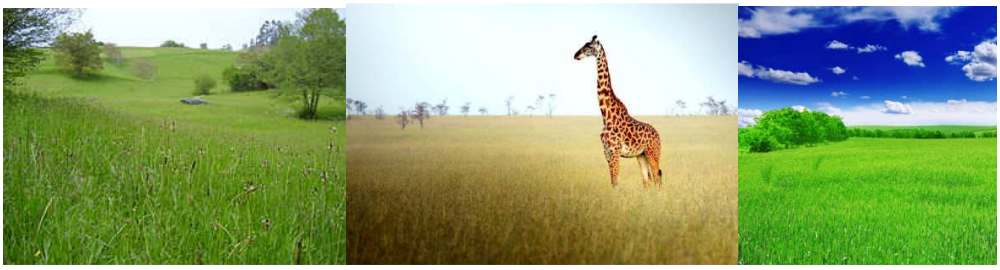
Depending on various raw materials obtained from Coniferous forest, a host of other industries has developed in this region. Important among these are cardboard, different boxes, boat and ship materials and different chemical products.

General importance of forests

Forests are vital to our lives and the natural systems that sustain us.
Forests protect the soil from erosion and reduce flooding.
Forests cycle water between the soil and atmosphere and help make rain.
Trees produce oxygen for us to breathe.
Trees absorb carbon dioxide so are valuable "carbon sinks" to help counter climate change.

Forests are also places we like to visit, to camp or picnic in, or walk, horse-ride and mountain-bike through.
Forests are also an important part of our economy – our production forests provide a range of timber and wood products for domestic and export markets. Our native forests are popular tourist sites and help to boost our valuable tourism industry.
Forests are a habitat for a wide variety of plants and animals. They are powerhouses of biodiversity.

3.3.5.4 Grassland Habitats



Grasslands go by many names. In the U.S. Midwest, they're often called prairies. In South America, they're known as pampas. Central Eurasian grasslands are referred to as steppes, while African grasslands are savannas. What they all have in common are grasses, their naturally dominant vegetation though they may have few large trees or shrubs. Grasslands are found where there is not enough regular rainfall to support the growth of a forest, but not so little that a desert forms. In fact, grasslands often lie between forests and deserts. Depending on how they're defined, grasslands account for between 20 and 40 percent of the world's land area. They are generally open and fairly flat, and they exist on every continent except Antarctica, which makes them vulnerable to pressure from human populations. Threats to natural grasslands, as well as the wildlife that live on them, include farming, overgrazing, invasive species, illegal hunting, and climate change.
At the same time, grasslands could help mitigate climate change: One study found California's grasslands and rangelands could store more carbon than forests because they are less susceptible to wildfires and drought. Still, only a small percentage—less than 10 percent—of the world's grassland is protected.
Rainfall can vary across grasslands from season to season and year to year, ranging from 10 to 40 inches annually. Temperatures can go below freezing in temperate grasslands to above 90 degrees Fahrenheit.
The height of vegetation on grasslands varies with the amount of rainfall. Some grasses might be under a foot tall, while others can grow as high as seven feet. Their roots can extend three to six feet deep into the soil. The combination of underground biomass with moderate rainfall—heavy rain can wash away nutrients—tends to make grassland soils very fertile and appealing for agricultural use. Much of the North

American prairielands have been converted into land for crops, posing threats to species that depend on those habitats, as well as drinking water sources for people who live nearby.

3.3.5.4.1 Grassland plants and animals

Grasslands support a variety of species. Vegetation on the African savannas, for example, feeds animals including zebras, wildebeest, gazelles, and giraffes. On temperate grasslands, you might find prairie dogs, badgers, coyotes, swift foxes, and a variety of birds. There can be up to 25 species of large plant-eaters in a given grassland habitat, comprising a sort of buffet where different grasses appeal to different species.

Some grass species in these habitats include red oat grass and Rhodes grass in tropical savannas, and purple needlegrass and galleta in temperate areas. When rainy season arrives, many types of grassland become coated with wildflowers such as yarrow, hyssop, and milkweed. The plants on grasslands have adapted to the drought, fires, and grazing common to that habitat.

Fires, both natural and human-caused, are important factors shaping grasslands. In the U.S. Midwest, for example, Native Americans set fires to help maintain grasslands for game species such as bison. Fire can also help prevent fire-intolerant trees and shrubs from taking over while increasing the diversity of wildflowers that support pollinators

Types of grasslands

There are three main kinds of grasslands: tropical, temperate and steppe.

i)Temperate grasslands

Temperate grasslands are dominated by grasses, lacking trees and large shrubs. Temperate grasslands include tall-grass prairies which are wet and humid, and dry, short-grass prairies that experience hot summers and cold winters. The soil of temperate grasslands has a nutrient-rich upper layer, but fires that prevent trees and shrubs from growing often accompany seasonal droughts.

ii)Tropical grasslands

Tropical grasslands are located near the equator. They have warmer, wetter climates than temperate grasslands and experience more pronounced seasonal droughts. Savannahs are dominated by grasses but also have some scattered trees. Their soil is very porous and drains rapidly. Tropical grasslands are found in Africa, India, Australia, Nepal, and South America.

iii)Steppe grasslands

Steppe grasslands border on semi-arid deserts. The grasses found in the steppe are much shorter than those of temperate and tropical grasslands. Steppe grasslands lack trees except along the banks of rivers and streams.

IMPORTANCE OF GRASSLAND

1. Provision of habitat

Grassland plant species provide habitats for many animals.
One can see plenty of insects flying above or hiding in grass: nice butterflies, beetles and grasshoppers and, of course, annoying flies and gadflies. Moreover, this is only the visible part of the world of insects. Many of them live in the soil.
Grasslands also serve larger animals - various birds, such as corncrakes and white storks, amphibians (frogs and toads), and reptiles (lizards and snakes).
Even larger mammals (roe deer, wild boars) benefit from grasslands for stealing grass from cattle and sheep, or like foxes hunting for mice. We usually perceive grasslands only in the dimension of grass.
In addition, there is the soil below the grass that feeds plants and hosts plenty of soil animals (worms, snails) and various microorganisms.
If you raise your eyes, there are insects and birds flying above in the air. All these dimensions form the ecosystem characteristics for grasslands, which are highly valued by humans.

2 Maintaining the ecological balance

Every ecosystem maintains various processes linking together the living (biotic) and non-living (or abiotic) environments.
For the maintenance of a functional and healthy natural and man-made environment, the preservation of these processes is as important as the protection of species and habitats.
Numerous processes in nature ensure the availability of essential resources, such as water, oxygen and nutrients, for organisms - including humans.
Although these processes are common for different ecosystems, they differ in their performance.
While overall biomass production can be similar in both forests and grasslands, the biomass flow is much more intensive in grasslands - opposite to forests, where biomass is mostly being accumulated in timber.
Also, soil formation processes are different in both ecosystems. In grasslands, the accumulation of organic matter is much more intensive.

3 The provision of forage for livestock

There are many ways for direct use of grassland products, which can be collected, consumed or sold, thus contributing to human well-being.

For millennia, grasslands have been a source of food for domestic animals, either in the form of raw grass or hay for feeding in winters.
Although more and more farms start using crops for feeding, grass remains as the most natural forage for cattle, horses, and sheep providing minerals, vitamins and other active substances supporting living processes and providing healthy meat and milk for people.
Nowadays, when grass is losing its primary role due to a decrease in forage, still, it may be used for energy production needs.
Some people use local grass for burning and heating houses which also helps to maintain high nature value grasslands and keeps a healthier environment by using renewable biomass instead of fossil oil-shale.
Medical plants are another important good, and the more diverse the grassland is, the more possibility to find the species needed to improve your health.
Nothing sweetens life like good honey collected by bees in a diverse natural meadow. It is also good for the health. Medical properties of other bee products - pollen, ambrosia and propolis - beat many pills.

4 Protecting soil and cleaning water

When you step on arable land and look back, usually you see a deep footprint in the soil.
If you step on grassland, you hardly see changes in the soil.
Thus, grassland plants with their root system keep the soil stable and prevent erosion – the washing out of soil particles by water and wind. This is particularly important in hilly places.
Before, when humans had not changed the natural flow of water streams, excess water was stored in floodplain meadows that served like a sponge and regulated the water flow.
Traditionally, society tried to solve the flooding problem by building dams around settlements, but the smartest people restore floodplain meadows.
Grasslands have also another benefit related to water – they clean it by removing solid particles, nutrients and other substances, which results in cleaner surface waters.

5 Providing inspiration and keeping traditions

The role of grasslands goes far beyond providing products and regulating natural processes.
It is a significant part of the cultural landscape, which has formed the traditional mosaic living environment over many centuries.
A landscape itself has a scenic value for many people enjoying it through a car window or a walk in the countryside.

Mosaic landscapes are used for many recreational activities including hiking, riding a bike, skiing, and animal watching.
For example, Northern European countries have old Midsummer celebration traditions. Setting a fire on the top of hilly grasslands and making a summer solstice crown from various flowering plants are important traditions of Midsummer celebrations.
Grasslands give inspiration for the arts: painters and photographers produce nice pictures, which are later enjoyed by other people.
The beauty of grasslands has inspired people to create folk songs.
All these benefits are physically intangible and are not usually perceived in everyday life, but they highly improve the quality of human living.
They are probably the most difficult to measure, however, most people will admit that they gain some pleasure when seeing or being in grasslands.

6 Providing ecosystem services

There are many types of grasslands. Although most of them provide the same set of ecosystem services, their values are different.
By analysing differences in ecosystem service provision in various grassland types, people can plan the most appropriate agricultural land use structure to satisfy economic, social and environmental needs of the society.
Ecosystem services are all those benefits that ecosystems (e.g. grasslands, forests, mires) provide to humans, and they include provisional (goods that can directly be used by humans), regulating (benefits gained from processes in nature) and cultural (nonmaterial) services.
Ecosystem goods and services that are produced in an area but not used right away (e.g. grass that is growing but currently not being grazed by animals) form the ecosystem service potential of an area.
When these services are actually used (e.g. harvested grass that is fed to animals), an ecosystem service flow from nature to society is generated.
The sum of all ecosystem services used in a certain area in a certain period of time denotes the demand for ecosystem services.
This also includes goods and services that are imported to the region (e.g. fodder for animals). In highly populated areas, the current demand for most ES is much higher than the supply
They are the basis of world economies Global Productivity (g/m2/yr dry matter)

7 Other Importance

Grasslands are globally important because they are a natural Carbon Sink and natural carbon sinks are an important part of a natural process called Carbon Cycle
The grass land equally helps in weed/fire management

Contribution to the attractiveness of the landscape

3.3.5.5. Tundra Habitats

Tundra is a cold habitat. It is characterized by low temperatures, short vegetation, long winters, brief growing seasons, and limited drainage.

It is an extreme climate but remains the home to a variety of animals.

The Arctic National Wildlife Refuge in Alaska, for instance, boasts 45 species ranging from whales and bears to hearty rodents.

Arctic tundra is located near the North Pole and extends southward to the point where coniferous forests grow. Alpine tundra is located on mountains around the world at elevations that are above the tree line.

The tundra biome is where you will often find permafrost. This is defined as any rock or soil that stays frozen year-round and it can be unstable ground when it does thaw.

SUMMARY

While dealing with settlement one, becomes a historian, cartographer, artist, sociologist, mathematician and finally an environmentalist. The essence analysis comes from data collection, based on remote sensing, mapping, field studies, interpretation, and explanation of facts by using qualitative and quantitative methods. With all these, one studying settlement can therefore attempt to explain the form, function and genesis of various kinds of human settlements. There are many ways from which on can approach the studying and analysis of settlements and the habitats that result thereof.

CONCLUSION

The historical background of an area or a region has a great bearing on the growth and development of settlement of a society or societies occupying it. The culture, socio-economic infrastructure, settlement distribution pattern and many other things take shape in an area from its historical base. Hence, it is very important to know the history of the area to understand the process of settlement evolution.

UNIT 4: DEVELOPMENT AND GROWTH OF HUMAN SETTLEMENT

HUMAN SETTLEMENT DEVELOPMENT

1.0 Introduction
2.0 Objectives
3.0 Main content

1.0 INTRODUCTION

A city is shaped by the economic system at work in that place, which in turn, is itself shaped by the available technology as well as the narratives of that economic system.

The earliest human societies consisted of hunters and gatherers. These are small groups or tribes with fixed territories, migrating regularly around them. Not many hunter and gatherer cultures remain today. About twenty thousand years ago, pastoral societies and agrarian societies emerged. Pastoral societies, relying on domesticated livestock, move across large distances, while agrarian societies grow crops, settle in a certain place, and form the first permanent human settlements. From about 6000 BC, large societies emerge in which cities develop, although society is still largely based on agriculture. Large-scale urbanization is a much more recent phenomenon, linked to the industrialization of society. The Industrial Revolution originated in eighteenth century England, and resulted in the concentration of many human activities in the city. Human settlements are currently called cities, towns, or villages, and a distinction is made between urban and rural settlements.

2.0 OBJECTIVES

3.0MAIN CONTENT

3.1Human Settlement Development

Human Settlement Development is responsible to facilitate, promote, co-ordinate and manage integrated human settlements, emergency housing, and upgrading of informal settlements within the province.

Functions:

The promotion and facilitation of integrated and sustainable social housing environments

The promotion of integrated and sustainable settlement post land restitution

The co-ordination and facilitation of settlement upgrading

The promotion and facilitation of settlement development

Assistance to Municipalities with housing in emergency situations

4.0 GROWTH OF HUMAN SETTLEMENT

Since the 1970s, economies have evolved from national to global scales, and this has had profound effects on the shape and functioning of human settlements. These changes are also a result of the rapid evolution in telecommunications and modes of transportation, which neutralizes distances or makes human activity less dependent on a particular place. Consequently, a deindustrialization of large, old manufacturing cities, and the rise of new landscapes of high-technology industry and “edge city” office complexes can be seen. In many urban areas these trends have contributed to the phenomenon of “hollowed out” inner cities with serious social problems, and the creation of “walled-off” and more wealthy suburbs. A concentration of advanced corporate-service activities can now also be seen in a relatively small number of large cities. Moreover, major cities have also attracted many migrants fleeing political instability, and seeking economic opportunity. While certain urban dwellers have

benefited from the new global economic order, many others were hurt by economic restructuring or were excluded from the benefits. As a result, cities in North America and Europe have seen increasing poverty.

Also, urban areas in developing countries are characterized by increasing poverty. There is typically a large population of less affluent people residing in slums and squatter settlements. Squatters reside illegally on land, while slum residents have legal access to the land through ownership or lease. A slum can be broadly defined as a dilapidated shelter. The term “informal settlement” is used for, e.g., an illegal subdivision or a squatter settlement. Although economically and politically weak, squatters are important in the urban economy, since they provide inexpensive labor. Usually a squatter settlement is highly organized despite being illegal. There are clearly defined behavioral rules, spatial boundaries, methods of solving tenurial disagreements, and rules for selling and renting illegal housing as if it was legal. Asian informal settlements have evolved into real “informal cities” over the years. Important changes that have taken place in informal settlements are the development of trade, commerce, and manufacturing, and the emergence of leaders and activists representing the inhabitants of the settlements. Because of political expediency, informal settlements now sometimes have some basic form of services such as water, post offices, police stations, government clinics and schools. In most Asian cities over 50% of jobs are generated in the informal sector, and in certain cases this may be as high as 76%. When studying human settlements, it becomes clear that they are a reflection of a way of life of their inhabitants, and that they evolve continuously as societies and cultures change.

4.1Development growth patterns

There are four basic development growth patterns these are;

4.1aSocial Housing Development

Social Housing Development aims to promote and facilitate social housing, which is a housing option for low-to-medium income persons that is provided by housing institutions, and may exclude immediate individual ownership. This component assists with the preparation of plans, business plans and identification of suitable land for such development.

It also liaises with and co-ordinates other departments and local governments, promotes integrated social housing development, and monitors and evaluates the status of social housing initiatives.

4.1b Post Restitution Development

Restitution is the process by which land and other property that was forcibly removed from its owners is restored or compensation of equivalent value provided.

Post restitution development provides guidance to claimant communities in liaison with municipalities and other stakeholders with post settlement development where land is given back to communities as restitution.

Through this guidance, this component promotes sustainable development in relation to the local economy, social equity and the ecological environment.

4.1cSettlement Upgrading

Settlement Upgrading deals with the upgrade of informal settlements. It also co-ordinates emergency housing programmes providing assistance where housing needs are caused by natural and other disasters as well as people living under stressful conditions, like in floodplains.

4.1dSettlement Development

Settlement Development aims to encourage and facilitate integrated and sustainable human settlements. It also manages lawful settlement by monitoring unlawful occupation

4.1eInternational Attention for Human Settlements

The United Nations has played an important role in attracting international attention to the problems of human settlements, with conferences held in Vancouver, Rio and Istanbul. 2.1 International Conferences on Human Settlements The first United Nations Conference on Human Settlements (HABITAT I) was held in Vancouver, Canada, in 1976. The follow-up was HABITAT II, which took place in Istanbul, Turkey, in 1996, and resulted in the adoption of the Istanbul Declaration on Human Settlements and the Habitat Agenda. This conference focused on urban areas and cities and was, therefore, also called “the City Summit.” HABITAT II was a huge international event, attracting thousands of registrants and participants in both the formal conference, and in parallel events organized by NGOs or governmental organizations. The two main themes of the conference were “adequate shelter for all,” and “sustainable human settlements development.” To make progress in achieving the goals of adequate shelter and sustainable human settlements, a concerted global approach was considered a necessity, and a need to develop comprehensive and innovative strategies was put forward. One of the basic assumptions of HABITAT II was that human settlement problems are of a multidimensional nature. It was recognized that adequate shelter and sustainable human settlements are not isolated

from the broader social and economic development of countries, and that they cannot be set apart from the need for favorable national and international frameworks for economic development, social development and environmental protection. Another basic starting point was that critical differences regarding human settlements within and between different regions and countries need to be taken into account in the implementation of the Habitat Agenda. 2.2 The Istanbul Declaration The Istanbul Declaration on Human Settlements is a confirmation by the Heads of State or Government, and the official delegations of the 171 participating countries, of the need for adequate shelter, and for safer, healthier and more livable, equitable, sustainable, and productive human settlements. It also focuses on the interdependence of rural and urban human settlements, and the need to develop an integrated network of settlements, and minimize rural-to-urban migration. The well-being of humans is a core concern of the Declaration, with particular attention to the living conditions of women, children and youth. The eradication of poverty and discrimination, the promotion and protection of human rights and fundamental freedoms, and the provision of basic needs such as education, nutrition, health care and adequate shelter are considered important goals. The principles of partnership and participation are presented in the Istanbul Declaration as the most democratic and effective approach for the realization of its goals. Local authorities are considered the closest partners in the implementation of the Habitat Agenda and the need for cooperation with parliamentarians, the private sector, labor unions and nongovernmental and other civic society organizations is stressed. It is assumed that full and effective implementation of the Habitat Agenda will require the strengthening of the role and functions of the United Nations Center for Human Settlements. The Istanbul Declaration ends with a visionary statement in which the conference in Istanbul is considered a turning point leading to a new era of cooperation and a culture of solidarity. The results of the conference offer a positive vision of sustainable human settlements, a sense of hope for the future, and an exhortation to join a truly worthwhile and engaging challenge, that of building together a world where everyone can live in a safe home with the promise of a decent life of dignity, good health, safety, happiness and hope.

4.1f. Promoting sustainable human settlements by projects

The projects and sub-projects used for promoting sustainable human settlements are follows:
Eco-City planning approach
Identifying environmental effects
Integrating the protection of ecological balances
Creating an environment where coming generations can fulfill their needs

5.0. Constraints and Obstacles to Human Settlement and Development

Some major constraints and obstacles facing human settlement development generally are:
High population growth rate (2.7%) per annum) with due consequences for both human and socioeconomic development
Insufficient access to education, illiteracy and low levels of education inhibiting development
Low level of environmental awareness and poor understanding of the importance and relevance of scientific and technological concepts
Difficulty in getting people to adapt to and/or adapt informed technologies to raise productivity
Reduction of the people access to information, thus preventing them from actively participating in community level policy formulation and implementation

Large number of settlements lacking threshold population required for the effective and economical provision of services and facilities,

Spatial (rural/urban, north/south) imbalances and inadequate economic and social infrastructure provision which varies considerable between urban and rural areas-in the more remote areas, such infrastructure is virtually non-existent, but even in the main urban centres, many facilities are substandard and unreliable

Slow pace of decentralized administration engendering a top-down approach to development and its planning and thus staling efforts at accelerated growth

Poor financial resources make it difficult to mobilize resources for long term investment, including financial resources to carry out basic ground demarcation of town plans updating maps for plan making the resolution of conflicts in rapidly expanding towns' space etc

6.0SIGNIFICANCE OF STUDYING SETTLEMENTS

R.Y Singh has given the following significances for settlement studies:
1. Settlement studies provide a clear understanding of where, why and how people settle in temporal frame.
2. Provides a clear understanding of division of labour engaged with various types of production.
3. Provides an insight into the modernization needs of growing of communities and behavior of inhabitants.
4. Provides a better picture of the location and deployment of additional or new facilities.

5. Provides a better understanding of Pioneer, Secondary and other settlements.
6. Provide an understanding of the impacts of planned and improper settlements.
7. Provides an understanding of the; inter and intra-regional relationships for modeling the geospatial structure of the regional economy.
8. Provides information about socio-cultural values and ethics of people
9. Helps to search better conditions for improved quality of life with reference to housing, sanitation and environment.
10. Helps to develop industries and provide other amenities.

Settlement growth is a useful proxy for analyzing population growth and population distribution. settlements usually expands not only westward and southward—from the inland to the coast, but also from rural to urban areas, creating major villages, cities and towns.

7.0 SETTLEMENT HIERARCHIES

If we group and classify a number of settlements according to their size and shape, the result is settlement hierarchy.

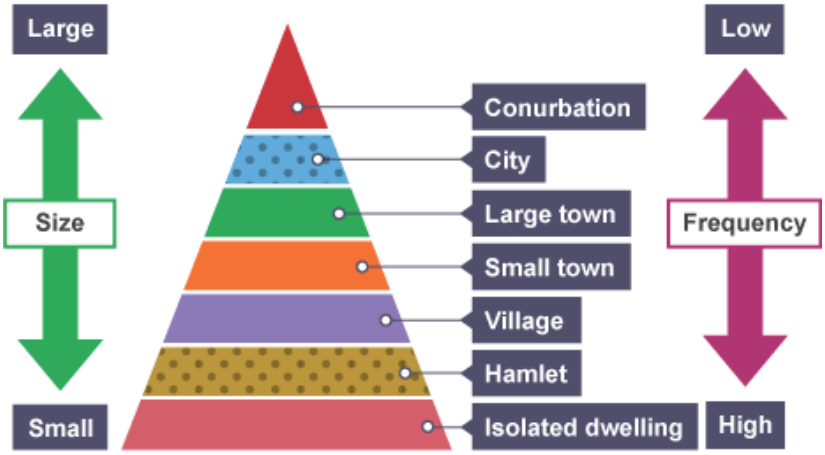


FIGURE 16: DIAGRAM DEPICTING SETTLEMENT HIERARCHY

As you move up the hierarchy, the size of the settlement and the distance between similar sized settlements increases. As you can see from the diagram above, there are more cities than conurbations, more towns than cities and more villages than towns. The number of services that a settlement provides increases with settlement size. Small settlements will only provide low-order services such as a post offices, doctors and newsagents. Large towns, cities and conurbations will provide low and high-order services such as leisure centers, chain stores and hospitals.

Larger settlements and conurbations have a much larger sphere of influence than smaller ones. This means they attract people from a wider area because of the

facilities they offer. Cities such as London have a global sphere of influence, whereas a small hamlet or village may only have a sphere of influence of a couple of kilometers.
Services such as departmental stores selling high order goods have a higher threshold than those selling low order goods such as newsagents. This means they need a higher number of people to support them and make them profitable, therefore they will only be found in larger settlements. It also means that there are fewer big department stores than small newsagents.
The range of a service or product is the maximum distance people are prepared to travel to purchase it. The range of a newspaper is much lower than an item of furniture for example.

8.0. SUMMARY

The earliest human societies consisted of hunters and gatherers. These are small groups or tribes with fixed territories, migrating regularly around them. Not many hunter and gatherer cultures remain today.

The United Nations has played an important role in attracting international attention to the problems of human settlements, with conferences held in Vancouver, Rio and Istanbul. 2.1 International Conferences on Human Settlements The first United Nations Conference on Human Settlements (HABITAT I) was held in Vancouver, Canada, in 1976.

9.0. CONCLUSION

Settlements are dynamic and grow with times and depending on the factors that either enhance or stagnate it. Many constraints also hinder the growth of human settlement development.

MODULE 1: UNIT 5: HUMAN DEVELOPMENT

1.0 Introduction
2.0 Objectives
3.0 Main content

INTRODUCTION

Human development is a multidimensional and complex concept, partly a result of the complexity of human nature, the way humans interact with each other as individuals and social groups, and partly a result of how humans view their role in the ecosystem and the way they treat their environment. Human development is defined as the process of enlarging people's freedoms and opportunities and improving their well-being. Human development is about the real freedom ordinary people have to decide who to be, what to do, and how to live. In the 1970s and 80s development debate considered using alternative focuses to go beyond GDP, including putting greater emphasis on employment, followed by redistribution with growth, and then whether people had their basic needs met. These ideas helped pave the way for the human development approach, which is about expanding the richness of human life, rather than simply the richness of the economy in which human beings live. It is an approach that is focused on creating fair opportunities and choices for all people.

2.0 OBJECTIVES

3.0 MAIN CONTENT

3.1 SCOPE OF HUMAN DEVELOPMENT

Human development grew out of global discussions on the links between economic growth and development during the second half of the 20th Century. By the early 1960s there were increasingly loud calls to "dethrone" GDP: economic growth had emerged as both a leading objective, and indicator, of national progress in many countries. The human development concept was developed by economist Mahbub ul Haq, at the World Bank in the 1970s, and later as minister of finance in his own country, Pakistan, Dr. Haq argued that existing measures of human progress failed to account for the true purpose of development—to improve people's lives. In particular, he believed that the commonly used measure of Gross Domestic Product failed to adequately measure well-being. The human development approach is anchored on human capabilities, often framed in terms of whether people are able to "be" and "do" desirable things in life. Examples include;

Beings: well fed, sheltered, healthy

Doings: work, education, voting, participating in community life.

Freedom of choice is central: someone choosing to be hungry (during a religious fast say) is quite different to someone who is hungry because they cannot afford to buy food.

The first Human Development Report, which was commissioned by the United Nations Development Programme, was worked on by Dr. Haq, Nobel Laureate Amartya Sen and other gifted economists and was published in 1990. Since then, there have been various modifcations about the scope and concept of human development.

Under the new paradigm, human development can be seen as a process of expanding the real freedoms that people enjoy. Human development provides better opportunities for all the people and contributes to the achievement of three essential objectives: a long and healthy life, access to knowledge, access to acceptable living standards. Other important aspects of human development involve political, economic and social freedom, creativity, mutual respect and respect for the fundamental human rights, the freedom of opinion, also called "the ability to communicate with others and to get out in the street without feeling a sense of shame". Human development focuses on the individuality of the human being: a person as beneficiary is both the subject and object of development his active participation in the political life of society, on equity and sustainability, indispensable components of freedom, which enable people to live the life they want and appreciate.

4.0 HUMAN DEVELOPMENT APPROACH

Three foundations for human development are to live a healthy and creative life, to be knowledgeable, and to have access to resources needed for a decent standard of living. These foundations are enshrined in the following core human development issues;

Capabilities—what people can do and what they can become-are the equipment one has to pursue a life of value. Basic capabilities valued by virtually everyone include: good health, access to knowledge, and a decent material standard of living. Other capabilities central to a fulfilling life could include the ability to participate in the decisions that affect one's life, to have control over one's living environment, to enjoy freedom from violence, to have societal respect, and to relax and have fun.
Our capabilities are expanded (or constrained) by our own efforts and by the institutions and conditions of our society. People with extensive, well-developed capabilities have the tools they need to make their vision of "a good life" a reality. Those poor in capabilities are less able to chart their own course and to seize opportunities. Without basic capabilities, human potential remains unfulfilled.

Choices: human development is, fundamentally, about more choice. It is about providing people with opportunities, not insisting that they make use of them. No one can guarantee human happiness, and the choices people make are their own concern. The process of development – human development - should at least create an environment for people, individually and collectively, to develop to their full potential and to have a reasonable chance of leading productive and creative lives that they value.

People: the human development approach focuses on improving the lives people lead rather than assuming that economic growth will lead, automatically, to greater opportunities for all. Income growth is an important means to development, rather than an end in itself.
Opportunities: human development is about giving people more freedom and opportunities to live lives they value. In effect this means developing people's abilities and giving them a chance to use them. For example, educating a girl would build her skills, but it is of little use if she is denied access to jobs, or does not have the skills for the local labour market.

Many other aspects are important too, especially in helping to create the right conditions for human development, such as environmental sustainability or equality between men and women. Once the basics of human development are achieved, they open up opportunities for progress in other aspects of life

5.0. BASIC PILLARS OF HUMAN DEVELOPMENT

There are six basic pillars of human development: equity, sustainability, productivity, empowerment, cooperation and security.

Equity is the idea of fairness for every person, between men and women; we each have the right to education and health care.

Sustainability is the view that we all have the right to earn a living that can sustain our lives and have access to a more even distribution of goods.

Productivity states the full participation of people in the process of income generation. This also means that the government needs more efficient social programs for its people.

Empowerment is the freedom of the people to influence development and decisions that affect their lives.

Cooperation stipulates participation and belonging to communities and groups as a means of mutual enrichment and a source of social meaning.

Security offers people development opportunities freely and safely with confidence that they will not disappear suddenly in the future.

6.0. THE HUMAN DEVELOPMENT INDEX

The state of the nation is often expressed through GDP (Gross Domestic Product), daily stock market results, consumer spending levels, and national debt figures. But these numbers provide only a partial view of how people are faring. However, the main problem in ensuring human development is to develop sustainable models for increasing production and consumption. This is necessary because a truly sustainable human development requires overcoming the interdependence between economic growth and environmental pollution. The Human Development Index was developed as an alternative to simple money metrics. It is an easy-to-understand, numerical measure made up of what most people believe are the very basic ingredients of human well-being; health, education, and income. This composite index has become one of the most widely used indices of well-being around the world and has succeeded in broadening the measurement and discussion of well-being beyond the important, but nevertheless narrow, confines of income.
The Human Development Index (HDI) is a statistic composite index of life expectancy, education, and per capita income indicators, which are used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income GNI (PPP) per capita is higher.

The basic indicator of human development is the Human Development Index (HDI), which is a measure in "human" terms of the synthetic performance of development:

• **The health index**, revealed by the **life expectancy** at birth, summarizes the combined influence of various factors on life, such as the evolution of the state of health of the individual, nutrition, living conditions, etc.;

• **The education index,** calculated as weighted arithmetic average of the literacy rate (two-thirds weight) and of the gross enrollment rate in all levels of secondary education (one third weight). Its meaning is to reflect the amount of knowledge the individual has, his skills and ability to communicate and participate in the activities of the society. The training rate is measured using data on the proportion of adults who are illiterate.

• **The living standard index**, evaluated through the Gross Domestic Product (GDP) per capita expresses the average resources that individuals have access to in order to have a decent living.

The formula defining the HDI is promulgated by the United Nations Development Programme (UNDP) In general, to transform a raw variable, say ***{x}***, into a unit-

free index between 0 and 1 (which allows different indices to be added together), the following formula is used:

$$\boldsymbol{xIndex}=\frac{\mathrm{x}-\mathrm{a}}{\mathrm{b}-\mathrm{a}}$$

where $\{\boldsymbol{a}\}$ and $\{\boldsymbol{b}\}$are the lowest and highest values the variable $\{\boldsymbol{x}\}$ can attain, respectively.

The Human Development Index (HDI) then represents the uniformly weighted sum with 1⁄3 contributed by each of the following factor indices:

Life Expectancy Index

$$\mathrm{LE}=\frac{\mathrm{LE}-25}{85-25}$$

Education Index (EI)

$$\mathrm{EI}=\left(\frac{2}{3}XALI\right)+\left(\frac{2}{3}XGEI\right)$$

Adult Literacy Index (ALI)

$$\mathrm{ALI}=\frac{\mathrm{ALR}-0}{100-0}$$

Gross Enrollment Index (GEI)

$$\mathrm{GEI}=\frac{\mathrm{CGER}-0}{100-0}$$

$$\mathrm{GDP}=\frac{Log(\mathrm{GDPpc})-Log(100)}{Log(40{,}000)-Log(100)}$$

With the paradigm shift the 2010 Human Development Report introduced an Inequality-adjusted Human Development Index (IHDI). While the simple HDI remains useful, it stated that "the IHDI is the actual level of human development (accounting for inequality)", and "the HDI can be viewed as an index of 'potential' human development (or the maximum IHDI that could be achieved if there were no inequality)". The index does not take into account several factors, such as the net wealth per capita or the relative quality of goods in a country. This situation tends to

lower the ranking for some of the most advanced countries, such as the G7 members and others. The UNDP thus began using a new method of calculating the HDI in which following three indices are used:

- A long and healthy life: Life expectancy at birth
- Education index: Mean years of schooling and Expected years of schooling
- A decent standard of living: GNI per capita (PPP US$)

Life Expectancy Index (LEI)

$$LE=\frac{LE-20}{85-20}$$

LEI is 1 when Life expectancy at birth is 85 and 0 when Life expectancy at birth is 20.

Education Index (EI)

$$EI = \frac{MYSI+EYSI}{2}$$

- Mean Years of Schooling Index (MYSI)
  $$MYSI = \frac{MYS}{15}$$
- Fifteen is the projected maximum of this indicator for 2025.

Expected Years of Schooling Index (EYSI)

$$EYSI = \frac{EYS}{18}$$

Eighteen is equivalent to achieving a master's degree in most countries.

Income Index (II)

$$II= \frac{In(GNIpc)-In(100)}{In(75{,}000)-In(100)}$$

- II is 1 when GNI per capita is $75,000 and 0 when GNI per capita is $100.

Finally, the HDI is the geometric mean of the previous three normalized indices:

$$HDI = \sqrt[3]{LEI.EI.II}$$

- LE: Life expectancy at birth
- MYS: Mean years of schooling (i.e. years that a person aged 25 or older has spent in formal education)

- EYS: Expected years of schooling (i.e. total expected years of schooling for children under 18 years of age)
- GNIpc: Gross national income at purchasing power parity per capita

7.0. SUSTAINABLE HUMAN DEVELOPMENT

The term sustainable human development is defined as development that promotes the integral human development of people today without compromising the integral human development of people tomorrow. (Gutiérrez 2011)

United Nations Development Programme (UNDP) has defined the sustainable human development as the pattern after Brundtland Commission and Amartya Sen presented its definition in the Human Development Report 2011. It is defined as the preservation, and whatever possible expansion, of the substantive freedom and capabilities of people today while undertaking reasonable efforts to avoid risks that would seriously compromise the capabilities of future generations to have similar or greater freedoms. Neag,(2018)also defined the sustainable human development as the development that promotes the integral human development of each and every human person today without compromising the integral human development of people tomorrow. Moşteanu et al, (2019) posits that sustainable human development is defined as "the development that maximizes capabilities of today's generations and maintains resources to maximize capabilities of future generations. It is a powerful instrument of economic growth and development as it is the source of the sustained human and social capital, leading to the sustained well-being.

The objective here is sustainable human development: how to create the conditions for every person on this earth to have a life free of hunger and want, to be able to be educated, have decent shelter and work, access to health services, and the genuine freedom to choose to live lives which they value. However, the human development always comes at a cost of environment. That is, the limited natural and environmental resources are normally exploited to promote the human development which is indeed unlimited. In other words, natural resources are consumed and pollutants are emitted during the process of economic growth and development which brings countries the human development. As a result, the human development without the environmental concern will not be sustained, causing the economic growth and development of countries to also be unsustained.

Such situation is likely to cause a detrimental impact on the well-being of the future's generation as they are likely to have the inappropriate resources for maximizing their well-being. Accordingly, the sustainable human development is required to achieve the sustained human well-being.

SUMMARY

Human development is about ensuring that individuals are assessed based on their standard of living and not on an impersonal criteria such as the Gross Domestic Product which does not take in a lot of factors.

• Human development on Earth is and will be subject to economic development, social development and environmental protection concepts underlying sustainable development.

• Human development focuses primarily on the active participation in the political life of society, on equity and moral guidelines, on human security, on the essential components of individual freedom, which together will enable people to live a better life inextricably based on sustainability models.

• The main problem of human development will be to develop and implement sustainable models of production growth and its correlation with consumption.

• The sustainable human development is that development that not only generates economic growth, but also distributes the benefits equitably, regenerates the environment instead of destroying it, and promotes people instead of marginalizing them.

CONCLUSION

Human development is the creation of a form of human environment in which certain conditions prevail for human beings. It is a vital instrument which helps to promote human and social capital of the countries, lead to the economic and social development and, of course, the human well-being of people in the countries. These conditions are safety, sufficiency, satisfaction, and stimulus. Safety: Society must be generally non-violent so that individuals are protected from victimization by the state or the police or each other. Sufficiency: There must be enough food, housing, clothing, health, and education in the society. All the material things that will make people realize their full potentials. Satisfaction: Life must be generally pleasant. Stimulus: People are kept aware of their intellectual, emotional, social or spiritual potentialities and encouraged to fulfill them.

MODULE 2: **FACTORS INFLUENCING HUMAN SETTLEMENTS**

UNIT 1: LOCATION

UNIT 2: LANDSCAPE DESIGNS

UNIT 3: PARKS AND RESERVES

UNIT 4: CLIMATE

UNIT 5: **ECONOMIC**

UNIT 1: LOCATION
1.0 INTRODUCTION
2.0 OBJECTIVES
3.0 MAIN CONTENT

INTRODUCTION

Throughout history, settlers have had to establish a variety of different ideal factors to determine the best course of action for establishing new settlements, which have changed drastically over time. Whereas most settlements in medieval times were established based on an availability of fresh water and good defenses, there are many more factors that now determine how well a settlement would do given its location. Climatic factors and traditional factors play a much larger role in establishing new cities and towns because physical and economic factors are typically worked out based on international or domestic relationships and controls — though elements of these such as availability of resources and proximity to trade ports do still play a major role in the establishment process.

2.0 OBJECTIVES
By the end of this unit, you should be able to:

- Understand how certain factors influence human settlements;
- Know why certain areas are located where they are and
- Its importance to development.

3.0 MAIN CONTENT
3.1SETTLEMENT SITE
A situation or site refers to the location of a place based on its relation to other places. In geography, statistics and archaeology, a settlement, locality or populated place is a community in which people live. The complexity of a settlement can range from a small number of dwellings grouped together to the largest of cities with surrounding urbanized areas. A settlement may have known historical properties such as the date or era in which it was first settled, or first settled by particular people. In the field of geospatial predictive modeling, settlements are "a city, town, village or other agglomeration of buildings where people live and work".
Settlements may include hamlets, villages, towns and cities and conventionally includes its constructed facilities such as roads, enclosures, field systems, boundary banks, and ditches, ponds, parks and woods, wind and water mills, manor houses, moats and churches.

In ancient times, environmental factors influenced people's choices of where to settle. Three important environmental factors were water, topography, and vegetation. Now, climatic factors and traditional factors play a much larger role in establishing new cities and towns because physical and economic factors are typically worked out based on international or domestic relationships and controls, though elements of these such as availability of resources and proximity to trade ports do still play a major role in the establishment process.

In order to better categorize which factors ultimately affect settlement, geographers have generally accepted four umbrella terms to describe these elements: climatic, economic, physical, and traditional.

Climatic factors such as wet or dry situations, availability and the need for shelter and drainage, and the necessity for warmer or cooler garb can all determine whether or not the situation is appropriate for settlement. Similarly,

Physical factors like shelter and drainage, as well as soil quality, water supply, ports, and resources, can affect whether or not a location is suitable for building a city.

Economic factors such as nearby markets for trade, ports for importing and exporting goods, number of available resources to account for Gross Domestic Product, and commercial route ways also play a large role in this decision, as do

Traditional factors such as defenses, hills, and local relief for new establishments in the location's region.

4.0. LOCATION OF SETTLEMENTS

There are many factors that can influence where settlements locate within a region. The site of a settlement is the actual land that the settlements are built upon. The situation is the location of a settlement in relation to the things that are around it. Town and cities all over the world have certain advantages of site and location, which have enabled them to grow. The location and growth of any settlement depends upon its site and situation. The settlement site is the actual place where people decide to locate their settlement and the growth and development of that settlement is then depended upon its situation in relation to accessibility and availability of natural resources. It is its topographical location. There are many reasons why a site might be chosen for the development of a settlement and some factors will be more important than others.

4.0. LOCATION OF SETTLEMENTS

5.0. Why are settlements established?

Most contemporary settlements exist primarily to serve economic functions, but earliest settlements probably were established for other reasons. The precise reasons for the formation of the first settlements are shrouded in mystery, as they occurred before recorded history. To understand the possible reasons for the creation of permanent settlements, picture the situation before they existed. Human beings were nomads, migrating in search of food and water. They obtained food by gathering wild berries and roots or killing wild animals. Why would the nomadic groups require permanent settlements? No one knows the precise sequence of events through which settlements were established, but analysts offer two types of explanations: cultural and economic.

Cultural Reasons: The earliest settlements may have been established for religious, educational, political, or military reasons.

Religion: The first permanent settlements may have served as places to bury the dead. After all, what could be more permanent than a grave? Nomadic groups may have had rituals honouring the dead, perhaps memorials services on the anniversary of a death. Having established a permanent resting place for the dead, the group might install priests at the site to perform the appropriate rituals. By the time recorded history began, one of the most permanent features of many settlements was the temple. In fact, until the invention of skyscrapers in the late nineteenth century, religious buildings were often the tallest structures in the community.

Home for women and children: The settlements may also have served as a place to house women and children, permitting the men to travel farther and faster in their search for food. Women made household objects, such as pots, tools, and clothing and children were educated in the settlements.

Political and military: The group‘s political leaders also choose to live permanently in the settlement, which may have been chosen for its strategic location to protect the group‘s land claims. Elaborate structures were built in the settlement to house the leaders. The settlement probably was also a good base from which the group could defend nearby food sources against competitors, so for protection, soldiers were stationed in the settlements. Walls may be erected to surround the settlement, strong enough to withstand attack. Settlement thus became citadels, centres of military power. The wall proved an extremely effective defence for thousands of years until the introduction of gunpowder and cannonballs that could destroy them.

Economic Reasons: The religious, military and political leaders and their dependents needed food, which was supplied by the group through hunting or gathering. There is

the need to store surplus food and thus the settlements acquired an economic role, as a warehouse to store an extra supply of food permanently. Settlement then became agrarian centre because the people realized that they can grow the wild vegetable they gathered and nursed them near them. People were able to produce most of the food through deliberate agricultural practices and no longer had to survive by hunting and gathering. In addition to food, people needed tools, clothing, shelter, and other objects. Settlement therefore became manufacturing centres. Men gathered the materials needed to make a variety of objects, including stones for tools and weapons, grass for containers and matting, animal hair for clothing, and wood for shelter and heat. Not every group had access to the same resources because the vegetation and animals varied across the landscape. The settlement therefore was likely to become a trading center. Several factors favoured the location and growth of cities and towns in a particular area. These include:

Fertile alluvial plain: Food and water are basic needs for human existence, hence a fertile alluvial plain traversed rivers is the best for raising food crops and maintaining a secure water supply. A level plain also facilitate the movement of people and goods. It is an ideal situation for the exchange of products and ideas, a center for communication and administration.

Coastal lowlands: Places where narrow coastal plains are bounded on the landward side by mountains, agriculture, transport and settlement have all to be concentrated on the lower land. Where there is a route through the mountain barrier (a pass), this naturally lead to the growth of a town.

Sheltered indentations on the coastlines: An indented coastline has calm waters and is sheltered from the waves of the open sea. It is an ideal location for a seaport where off-shore islands offer an added protection. Dakar (Senegal) is located in a sheltered bay, while Freetown (Sierra Leone) is sited in a large estuary sheltered from the sea. These ports are examples of the best natural harbours in West Africa.

Nodal Towns: By virtue of their geographical location in relation to the region, many towns assume prominence as centers of road, rail, or water communication. People congregate to provide commercial and social services that passing travellers can make use of. Examples of nodal towns ninth mile, Otukpo, Ibadan and Kano which owe much of their respective central locations in flourishing farming regions with trade routes both by rail and by roads converging on them.

Site for generating hydro-electric power: Waterfalls are natural sites for generating hydro-electricity. Where such sites occur, the availability of cheap power attracts

industrial concerns. These require labour and provisions, and a settlement is very likely to grow up. Examples include New Bussa, close Kainji Dam of Nigeria which is a new town built for the resettlement of the former inhabitants of Old Bussa, which is now submerged by the Kainji Lake. New Bussa has attracted new settlers and is growing rapidly. It is also becoming a tourist center taking the advantage of its Borgu Games Reserve nearby.

By the side of lakes and rivers: Lakes and river provide fish, water and a means of inland transport. Some of the best known tourist centres are located on or near lakes because of the scenic beauty and the recreational facilities. River-borne sites include a number of sites carved out by a river on its course from source to mouth.
a). Where a river passes through a gap. This is the lowest part of the region and it naturally carries many roads and railway routes e.g. Lincoln on the River Witham (U.K.), Toulouse on the River Garonne (France)
b). Where a river bends or meanders. A town may take the advantage of a change in the river‘s direction of flow e.g. Orleans on the River Loire, or a town may be sited on the inside of a bend, a defensive site almost surrounded by water e.g. Durham, England.
c). Where two rivers meet (confluence town): The volume of the river increases when two streams merge into one. The navigability of the river increased and a town may grow, e.g. St. Louis, at the confluence of the Mississippi and Missouri; Khartoum, at the meeting of the Blue and White Nile; and Lokoja, at the confluence of the Niger and Benue.

d). Where a river enters or leaves a lake on its course: A town may take the advantage of being near the two sources of water and two lines of communication, the river and the lake, e.g. Geneva, where the River Rhine leaves Lake Geneva, Detroit, where the St. Clair River enters Lake Eire.
e). Where a river enters or leaves a gorge: The gorge itself is too steep for any large settlement, but at the point where the river enters or leaves the gorge, the valley widens and there are better sites for settlements. e.g. Bingen, where the Rhine enters the Rhine Gorge, Bonn, where the Rhine leaves the Gorge.
f). The limit of river navigation or the head of ocean navigation: The point where the river becomes too shallow for river steamers to go any further upstream, or the point where big steamers begin sailing downstream towards the ocean, are important points. Oxford on the Thames is a river port at the upper limit of river navigation.

6.0. SUMMARY

Situations are typically defined by the physical elements of a location that helped determine it as good for settlement, which can include factors such as availability of

building materials and water supply, the quality of soil, the climate of the region, and opportunities for shelters and defense, for this reason, many coastal cities are formed due to their proximity to both rich agricultural land and trade ports. Of the many factors that help determine if a location is appropriate for settling, each can be divided into one of four generally accepted categories: climatic, economic, physical and traditional.

7.0. CONCLUSION

The location or site of a settlement is determined by certain factors which are deemed beneficial to their growth and development. These factors enable them to become established and grow in to recognizable towns and cities world over.

MODULE 2: UNIT 2: LANDSCAPE DESIGNS

1.0 INTRODUCTION

Landscape is not a single resource such as soils or vegetation. It is an integrative concept which is applied to a group of resources within a spatial area and which incorporates the human values associated with them. The extent of the spatial area may be defined by biophysical and/or perceptual/associative characteristics, but often relates to 'catchments' or locations/ areas/units that share particular landscape attributes.

Although there is considerable overlap between the concepts of natural character and landscape, "natural character is not the same as natural features and landscapes or amenity values". "Natural character" strongly emphasises natural ecological, hydrological and geomorphological processes, whereas "landscape" also takes into account the overall composition, spatial structure and aesthetic values of an area, together with its meanings and associations for different segments of society. This includes the sense of place and identity that communities attach to their local environs.

2.0 OBJECTIVES

Provide a basic understanding of the concept of a "landscape"

Review basic approaches for defining a landscape.

Highlight importance of landscape definition in resource management planning and analyses.

Landscape ecology by definition deals with the ecology of landscapes.

3.0 MAIN CONTENT

3.1. LANDSCAPE DEFINITION

There are several definitions of what constitutes a landscape, depending on context. In common usage however, a landscape refers either to all the visible features of an area of land (usually rural), often considered in terms of aesthetic appeal, or to a pictorial representation of an area of countryside, specifically within the genre of landscape painting. When people deliberately improve the aesthetic appearance of a piece of land—by changing contours and vegetation, etc.,it is said to have been landscaped, though the result may not constitute a landscape according to some definitions.

The Environment Court has suggested the following definition:

Landscape means the natural and physical attributes of land together with air and water which change over time and which is made known by people's evolving perceptions and associations [such as beliefs, uses, values and relationships] .

A landscape is the visible features of an area of land, its landforms, and how they integrate with natural or man-made features. A landscape includes the physical elements of geophysically defined landforms such as mountains, hills, water bodies such as rivers, lakes, ponds and the sea, living elements of land cover including indigenous vegetation, human elements including different forms of land use, buildings, and structures, and transitory elements such as lighting and weather conditions. Combining both their physical origins and the cultural overlay of human presence, often created over millennia, landscapes reflect a living synthesis of people and place that is vital to local and national identity.

4.1. The Landscape Concept

Landscape' is a concept which includes the physical environment and people's perception and appreciation of that environment. It is not restricted to the purely visual, but may comprise and encompass the ways in which individuals and communities perceive the natural and physical resources, as through traditions, lore, and legends that express the significant and memorable elements of a landscape. Regardless of the structure and function of how landscape is defined, the "concept" of a landscape is unequivocal.

All landscapes have a user-defined structure (pattern) that is hypothesized to influence its function (process). This interaction between spatial pattern and process defines the landscape concept.

4.2. Landscape structure

The structure of a landscape is defined by the particular spatial pattern being represented, and it consists of two components: composition and configuration. The composition of a landscape is defined by the spatial elements that are distinguished in the map and believed to be relevant to the landscape function under consideration. Composition represents the non-spatial aspect of a landscape, since only number and abundance of landscape elements is considered, not their spatial configuration. The configuration of a landscape is defined by the spatial character, arrangement and context of the elements. Configuration represents the spatial aspect of a landscape. Together these two components define the spatial pattern or heterogeneity of the landscape.

4.3. Landscape function

The function of a landscape is defined by the phenomena under consideration and can be a multitude of different things. In general, the services that landscapes provide to humans are functions and include things like providing for biological diversity, recycling nutrients, sequestering carbon, producing clean water, etc.

4.4. Landscape science

The discipline of landscape science has been described as "bringing landscape ecology and urban ecology together with other disciplines and cross-disciplinary fields to identify patterns and understand social-ecological processes influencing landscape change". A 2000 paper entitled "Geography and landscape science" states that "The whole of the disciplines involved in landscape research will be referred to as landscape science, although this term was used first in 1885 by the geographers Oppel and Troll". A 2013 guest editorial defines landscape science as "research that seeks to understand the relationship between people and their environment, with a focus on land use change and data pertaining to land resources at the landscape scale"

4.5. Integrated landscape management

Integrated landscape management is a way of managing a landscape that brings together multiple stakeholders, who collaborate to integrate policy and practice for their different land use objectives, with the purpose of achieving sustainable landscapes. It recognises that, for example, one river basin can supply water for towns and agriculture, timber and food crops for smallholders and industry, and habitat for biodiversity; the way in which each one of these sectors pursues its goals can have impacts on the others. The intention is to minimise conflict between these different land use objectives and ecosystem services. This approach draws on landscape ecology, as well as many related fields that also seek to integrate different land uses and users, such as watershed management.

Proponents of integrated landscape management argue that it is well-suited to address complex global challenges, such as those that are the focus of the Sustainable Development Goals. Integrated landscape management is increasingly taken up at the national, local and international level, for example the UN Environment Programme states that "UNEP champions the landscape approach de facto as it embodies the main elements of integrated ecosystem management".

5.0. LANDSCAPE DESIGN

Landscape design is the process of shaping the natural and built environment to create satisfying places for people to live, work and play and environments for plants and animals to thrive.

Landscape Design is the art of arranging these elements to make good outdoor space. It implies putting forward proposals for future developments of the landscape. This is done on the basis of understanding, but also of views, ideas and notions that are derived from all sorts of paradigm in this case a design theory.

Generally the art of design is a mental plan. It could be a scheme of attack, something to be achieved or adaptation of means to an end, a preliminary sketch, and delineation of pattern, artistic or literary groundwork or a general idea.
Landscape design is primarily a fine art whose important function is to create and preserve beauty in the surrounding of human habitation and in the broader natural scenery. It is also concerned with promoting comfort, convenience and health of the population. Landscape design is likened to environmental design because it embraces a wide field of activities within the ambit of the outdoor scene embodying those concept not only with the visual impact of man's immediate physical surrounding and the pattern with which they fit within the broad discussion of the landscape but also their psychological effects.

6.0. LANDSCAPE DESIGN ACTIVITIES

Design activities are concerned with the projection of images of things into the future. Design begins when an individual or team first think about the project. It includes many intangible elements such as institution, imagination and creativity of all of which are essential to research as well. Excellent design is created through the articulation of these elements. Landscape Designers influence Natural Processes, Social Processes and Aesthetic Processes.
In a very much professional approach, landscape design involves the designing, construction and management of space. It is an expressive or communicative activity and for it to be acceptable, it must conform with functional, structural and aesthetic satisfaction. Its success is measured by the number or importance of the people who responded to its message and by the continuity of this response overtime.

Typical activities include:

- Producing feasibility studies and site and context appraisals
- Preparing written advice and recommendations
- Coordinating and conducting community engagement and consultation with users/owners/managers other stakeholders
- Developing design solutions and proposals
- Preparing drawings and 3D visualisations to illustrate plans and proposals.
- Preparing detailed designs and working drawings to support tender documentation and site implementation
- Participation in the tendering process, contract administration and site inspections.
- Specifying plants, construction materials and other elements such as street furniture

- Specifying for construction of hard landscapes and the implementation of planting proposals
- Managing projects and contracts
- Providing advice on policy and strategy
- Resource and budget assessment and planning including the preparation of cost estimates
- Contributing to public inquiries and acting as an expert witness

6.1. LANDSCAPE DESIGN PLANNING

Planning design creatively mixes together ideas, drawing information and a good many other ingredients to create something where nothing was before. Planning design can also be seen as an ordered process in which specific activities are loosely organized to make decisions about changing the physical world to achieve identifiable goals. Planning design includes several analytical distinct elementary activities such as imaging, presenting and testing. Imaging is the ability to go beyond the information given which is often called real creativity. It involves forming a mental picture. Images are often visual, they provider designers a larger framework within which to fit specific pieces of a problem as they are resolved. Comparing a design against a mental image makes visible where the design can be improved and perhaps where the image itself might be modified.

6.2. LANDSCAPE DESIGN PRESENTING

Presenting involves the designers sketch, drawing of plans, building of models and taking photographs. It takes skill not only to present an idea well but to choose the mode of presentation best suited to a particular time in the design process. Designers present ideas to make them visible, so that they themselves or others can use and develop them. Presenting includes both the very important characteristic that for each design, one must choose and organize only some elements from a larger number.

6.3. LANDSCAPE DESIGN TESTING

Testing involve the process of appraisal, criticisms, judgments, comparism, reflections, review and confrontations. It means comparing tentative presentations against an array of information like the designer’s and client’s implicit images, explicit information about constraints or objectives, degree of internal design consistency and performance criteria: economic, cultural, technical and sociological. Testing is a feedback and feed-forward process, adjusting the relation between design products as it develops and the many criteria and qualities the product is intended to meet.

6.4. Basic considerations in landscape design

In an attempt to enhance the quality of the environment through design, certain important considerations are to be given special attention. Such considerations are taken care of by the designer irrespective of the size, location or the owner of the design. The most fundamental among other are the user's requirements, aesthetics, climate and environmental factors and construction and management cost.

User's requirements

Essentially, all design problems start off with client who has developmental programmes to be resolved through design. In landscape design, the requirements of the client should always be the uppermost in the mind of the designer. It is on this requirement(s) his design should be based and evolved. The client may either be single or group (comprising families, organization etc.), or private type who will use development themselves or public type representing a community or political sub-division of the community. There may however be a need for a compromise between the client requirements and professional ethics of the designer. According to Fairbrother (1974), the role of the designer is to evolve out of all conflicting claims, a landscape that will be pleasant for all users.

Aesthetic consideration

The concept of aestheticity is landscape design consideration has a lot of relationship with design, implementation and maintenance of the landscape. It is very important to evolve a rhythmic balance and unity in every design. The principle is to bring out the aesthetic value of the landscape in any design work. To maintain the aesthetic value of the landscape, well-structured maintenance schedule is important.

Climatic and environmental considerations

The impact of climate and other environmental factors such as the vegetation, water, topography, relief, drainage pattern, soil etc. are important in landscape design. They are the forces and processes of the world within which we live and work. While the user's requirements is the starting point of any landscape design, the physical arrangement of the landscape materials should be undertaken as a creative exercise evolving in the first place from the consideration of the interacting complex of climate, geology, vegetation, wildlife and all other elements in the natural scene.

Construction and management costs

This is a function of the first three considerations and it depends much on them. It relates to the total financial involvement of the client in installing, fixing the design on the ground and the cost of the maintenance of the final design. Consideration of construction and management costs is essential, though expensive and increasingly

hard to get your hands on. In any landscape scheme, the nature of maintenance in terms of cost and skills should be given top priority because it is a decisive factor in design.

A sustainable landscape is one that conforms to the environment surrounding it, requiring only inputs that are naturally available, with little or no additional support. It is self-sustaining over long periods of time. It embodies the three principles of reduce, reuse, and recycle, and exists in harmony with its local ecosystem. When a resident prepares to design or change an existing landscape, the eventual success of a design will depend upon keeping these principles in mind.

7.0. CHALLENGES IN LANDSCAPE MAPPING

Landscape has six main compositional elements: Landform, Vertical Structures, Horizontal Structures, Vegetation, Water and Climate.

Defining the Landscape

Once the analysis or management objectives have been established, the most critically important step in any landscape application is to define the landscape in a manner that is relevant to the phenomenon under consideration given the objectives. Meeting these challenges is immensely important because any quantitative or qualitative measures of landscape pattern-process relationships are ultimately constrained by the definition of the landscape. If the landscape is not defined properly (in terms of its content, scale and context) relative to the phenomenon under consideration and the stated objectives, then no amount of quantitative assessment of landscape pattern-process will reveal meaningful relationships.

This step has several major challenges:

- Choosing a conceptual model of the landscape structure consistent with the objectives
- Selecting the appropriate thematic content and resolution
- Selecting the appropriate spatial scale (grain and extent)
- Dealing with potential fragmenting features
- Considering the landscape boundary and context

Conceptual model.–The most important challenge in defining a landscape is choosing an appropriate conceptual model of the landscape consistent with the stated objectives. Essentially, this involves determining how to best represent the landscape in map form. In this regard, there are many different ways to model or represent landscape structure corresponding to different perspectives on landscape

heterogeneity: (1) point pattern model; (2) linear network model; (3) patch mosaic model based on categorical map patterns; (4) landscape gradient model based on continuous surface patterns; and (5) graph-theoretic model.

Thematic content.–One of the biggest challenges in defining any landscape is determining the appropriate thematic content.

For example, if we are working on a Forest. Vegetation attributes may be relevant thematic material in many cases, but determining which vegetation attribute or attributes to represent is often very challenging. In addition, while vegetation may be meaningful in many cases, it may not be the best thematic content in others. For example, soil organisms are likely to be more sensitive to soil characteristics (e.g., depth, texture, wetness, organic matter, pH, etc.) than to vegetation. For these organisms, we might classify the landscape based on soil properties. There are in fact many other legitimate frameworks for classifying the landscape. The key point here is that there are many ways to "slice" the landscape and therefore the "best" thematic classification ultimately depends on the phenomenon under consideration and the availability of data.

Thematic resolution

Beyond the thematic content, one of the greatest challenges in representing a categorical landscape mosaic is determining the appropriate thematic resolution. Briefly, the thematic resolution refers to how finely the map classes resolve differences in the underlying environment.

In practice, data availability is often the limiting factor in determining the thematic resolution, since often our desire to resolve thematic differences exceeds our ability to do so with existing data. Thus, the final thematic resolution is usually a compromise between the ideal number and types of classes from the perspective of the focal phenomenon and the number and types of classes that can be resolved accurately with existing data.

Spatial grain

To the extent possible, the grain of the data should represent a balance between the desire for accurate calculations of landscape pattern, computational efficiency, and the desire to scale patterns appropriately for the chosen landscape extent. On the one hand, the grain should be kept as fine as possible to ensure that small and narrow, yet meaningful, features of the landscape are preserved in the data model. On the other hand, the grain should be increased in relation to the extent so that unnecessary detail is not confused with the important coarse-scale patterns over large spatial extents. This may be achieved by increasing the minimum mapping unit above the resolution

set by the grain. In practice, these decisions are often guided by technical considerations owing to the source of the data and the data processing software available. At a minimum, the scope and limitations of the analysis given these scaling considerations should be made explicit.

Spatial extent

To the extent possible, the extent of the landscape should be meaningful ecologically given the scale at which the target phenomenon operates. For example, the local range of a focal species or of a local population or metapopulation, or the range of a focal community within an ecoregion may be suitable as a basis for delineating the landscape. In many cases, however, there will be practical considerations that must be taken into account. For example, the landscape extent may have to correspond to a specific project planning area (e.g., timber sale area), a timber or wildlife management unit, a watershed, or an administrative unit (e.g., ranger district or national forest). If the landscape extent is small relative to the scale at which the phenomenon operates, then it is likely that patterns in the broader surrounding landscape (i.e., the landscape context) will have as much (or more) effect on the phenomenon as patterns within the specified landscape. At a minimum, the scope and limitations of the analysis given these scaling considerations should be made explicit.

Fragmenting features

An important issue in establishing both the thematic and spatial scale for a categorical landscape is deciding which landscape elements to consider as fragmenting features. This entails deciding what constitutes a meaningful boundary for a patch. This is an issue for linear landscape elements in particular, such as roads and streams. For example, does a small forest road bisecting contiguous forest constitute a fragmenting feature and split the forest into two distinct patches? What if the road is an expressway? How about a small first-order stream, or a larger river? These and other linear landscape elements are often important features of the landscape, but whether they function to disrupt the physical continuity of landscape enough to warrant treatment as patch boundaries or not depends on the phenomenon under consideration. The specification of linear fragmenting features has practical implications for the measurement of landscape pattern based on conventional approaches, which we discuss in subsequent lecture. One final point regarding fragmenting features. The issue of fragmenting features is limited to the categorical model of habitat in which habitat patches form the basic spatial unit under consideration. However, in the gradient model of landscape structure, where heterogeneity is viewed as a continuously varying property, patches per se are not delineated. Thus, patch-based metrics are not relevant.

Landscape boundary and context
Landscapes do not exist in isolation. Landscapes are nested within larger landscapes, which are nested within larger landscapes, and so on. In other words, each landscape has a context or regional setting, regardless of scale and how the landscape is defined. The landscape context may constrain processes operating within the landscape. Landscapes are "open" systems; energy, materials, and organisms move into and out of the landscape. This is especially true in practice, where landscapes are often somewhat arbitrarily delineated. That broad-scale processes act to constrain or influence finer-scale phenomena is one of the key principles of hierarchy theory and 'supply-side' ecology. The importance of the landscape context is dependent on the phenomenon of interest, but typically varies as a function of the "openness" of the landscape. The "openness" of the landscape depends not only on the phenomenon under consideration, but on the basis used for delineating the landscape boundary.

For example, from a geomorphological or hydrological perspective, the watershed forms a natural landscape, and a landscape defined in this manner might be considered relatively "closed". Of course, energy and materials flow out of this landscape and the landscape context influences the input of energy and materials by affecting climate and so forth, but the system is nevertheless relatively closed. Conversely, from the perspective of a bird population, topographic boundaries may have little ecological relevance, and the landscape defined on the basis of watershed boundaries might be considered a relatively "open" system.

8.0. LANDSCAPE TERMINOLOGY

There are several words that are frequently associated with the word landscape:
Scenery: The natural features of a landscape considered in terms of their appearance, espcially when picturesque: spectacular views of mountain scenery.
Setting: In works of narrative (especially fictional), it includes the historical moment in time and geographic location in which a story takes place, and helps initiate the main backdrop and mood for a story.
Picturesque: The word literally means "in the manner of a picture; fit to be made into a picture", and used as early as 1703 and derived from an Italian term pittoresco, "in the manner of a painter". Gilpin’s Essay on Prints (1768) defined picturesque as "a term expressive of that peculiar kind of beauty, which is agreeable in a picture"
A view: "A sight or prospect of some landscape or extended scene; an extent or area covered by the eye from one point".
Wilderness: An uncultivated, uninhabited, and inhospitable region.[1] See also Natural landscape.

Cityscape (also townscape): The urban equivalent of a landscape. In the visual arts a cityscape (urban landscape) is an artistic representation, such as a painting, drawing, or photograph, of the physical aspects of a city or urban area.
Seascape: A photograph, painting, or other work of art which depicts the sea, in other words an example of marine art.

9.0. SUMMARY

So what are landscapes? Surprisingly, there are many different interpretations of the term “landscape.” The disparity in definitions makes it difficult to communicate clearly, and even more difficult to establish consistent management policies. However the definition variant depends on the research or management context or depending on the phenomenon under consideration.
The important point is that a landscape is not necessarily defined by its size; rather, it is defined by an interacting mosaic of patches relevant to the phenomenon under consideration (at any scale). It is incumbent upon the investigator or manager to define landscape in an appropriate manner.
The essential first step in any landscape-level research or management endeavor is to define the landscape, and this is of course prerequisite to quantifying landscape patterns.
Landscape architects working in landscape design use their spatial design expertise to develop creative solutions to practical and aesthetic challenges relating to the landscape. Using man-made and natural materials, they design and implement solutions that reflect the identity and qualities of place while meeting the current and future needs of stakeholders in a sustainable and aesthetically coherent way.

10.0. CONCLUSION

The sense of a broad expanse is common to the term “landscape.
The character of a landscape helps define the self-image of the people who inhabit it and a sense of place that differentiates one region from other regions. It is the dynamic backdrop to people's lives. Landscape can be as varied as farmland, a landscape park or wilderness. The Earth has a vast range of landscapes, including the icy landscapes of Polar Regions, mountainous landscapes, vast arid deserts landscapes, Islands and coastal landscapes, densely forested or wooded landscapes including past boreal forests and tropical rainforests, and agricultural landscapes of temperate tropical regions. The activity of modifying the visible features of an area of land is referred to as landscaping.

MODULE 2: UNIT 3: PARKS AND RESERVES

1.0. INTRODUCTION

The concept and practice of protecting areas for the purposes of conservation has been at the heart of conservation policy since its inception in the 19th Century. The idea that intervening to protect areas from human activity is an effective way of conserving species and habitats and preventing habitat loss and species extinction is arguably as pervasive today as it was when the first protected areas (PAs) were established (MEA 2005). The central place of PAs in the conservation movement has been reflected in the increase in both the number of PAs and the area of land and sea placed under protection. The proportion of total area of land under some form of protection has now reached nearly 13%.

2.0. OBJECTIVES

At the end of this unit the student should be able to;
Define what a protected area is
Explain the scope and context of PAs
Understand the objectives of PAs
Understand the IUCN's classification of Protected Areas (PA)
Understand the Challenges to managements of PAs

3.0 MAIN CONTENT

3.1. Parks and Reserves

Natural reserves and parks are areas of land or water set aside by governments or private groups to preserve them from uncontrolled development and exploitation. In international discussion, the term protected areas is used to denote all types of land and ocean areas where access and development are restricted in ordered to protect, at least partially, the natural character of that area. Not all protected areas are pure wilderness; in some cases, human settlements remain within the boundaries of the area.

4.0. Historical Background and Scientific Foundations

4.1. The Wilderness Ideal and the World's First Parks

The setting aside of parks and other protected areas for the sake of preserving their original or natural character is historically recent. Until the nineteenth century, a landscape set aside as a park was generally a private or royal land on which deer and other wild animals were kept for recreational hunting by the ruling classes. These landscapes were not intended for public use, or to pre-serve wild landscapes as such. For centuries, the penalty for illegal hunting in a European royal park was typically death.

The colonization of North America brought Europeans into sustained contact with a less-tamed land than could be found anywhere in Europe, including vast forests, lakes, mountain ranges, and rivers. Although Native American practices had modified many of these ecosystems, their influence was minor by modern standards or even by those of the early European settlers, who brought with them plow-based agriculture, livestock herds, and logging. With the gun, steel ax, and steel plow—tools not yet available to Native Americans—the settlers shaved off whole forests, caused widespread soil erosion, drove indigenous species such as the wolf and deer out of New England, and made other drastic changes. The earliest Puritan settlers did not look kindly on wilderness, as they saw the relatively unmodified landscapes inhabited by Native Americans, and did not wish to preserve it. On the contrary, they viewed the wilderness as raw, meant for conquering, cultivating, and transforming into a new Eden.

By the mid-nineteenth century, even after two centuries of taming and exploitation, much wilderness still remained in North America, and the early Puritan aversion to wilderness was being replaced by admiration. The literary and artistic movement known as Romanticism, which began in Europe in the late 1700s, called attention to the moods and beauties of nature and was an influence on American naturalists. In 1832, the artist George Catlin (1796–1872) suggested that some of the Great Plains region of the American West be set aside as a "nation's park" in order to preserve Indian culture and the buffalo (an animal unique to the New World). In 1862, in his essay "Huckleberries," Massachusetts native Henry Thoreau (1817–1862) became the first person to express the modern ideal of the wilderness park when he wrote, "Each town should have a park, or rather a primitive forest, of five hundred or a thousand acres, where a stick should never be cut for fuel, a common possession forever, for instruction and recreation." At that time, such an idea was radical; publicly owned land set aside and kept wild for the sake of its wildness did not yet exist.

Wilderness tourism began to flourish in the mid-nineteenth century, as ordinary citizens and families from cities and towns sought out wild areas for amusement and relaxation. Admirers of nature, joined by entrepreneurs who hoped to exploit the business potential of what would now be called eco-tourism, urged that the Yosemite Valley of California be set aside as public land. In 1864, President Abraham Lincoln (1809–1865) granted the valley to the State of California "for public use, resort and recreation." There was as yet no thought of preserving the wild character of the region for its own sake. Business leaders also moved Congress to set aside the Yellowstone region of what is now Wyoming in 1872, creating the world's first national park. Scottish immigrant John Muir (1838–1914), naturalist and lover of

wilderness, agitated successfully for the creation of a larger, nationally owned park around the Yosemite valley, which Congress did in 1890. These were the beginnings of the world's first national park system.

4.2. The Global Picture

During the twentieth century, the concept of the national park became global. By the early 2000s, over 90 countries had set aside areas of wild land as national parks. The creation and scientific management of protected areas is encouraged by the International Union for Conservation of Nature (IUCN), an international group whose members include over 1,000 governments and private organizations. The IUCN, which is headquartered in Geneva, Switzerland, and works closely with the United Nations Environment Programme (UNEP), states that its mission is "to influence, encourage, and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable."

According to the 2003 United Nations List of Protected Areas, as of 2003 there were at least 102,102 protected areas in the world covering 7.3 million square mi (18.8 million square km). The United States contained about 8% of this protected area. Excluding marine protected areas, about 6.6 million square mi (17.1 million square km) of land were protected; some 11.5% of the world's land surface, an area almost as large as South America. The IUCN defines a protected area as "an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means" (2003 UN List). Biological diversity (also called biodiversity) is defined by the Convention on Biological Diversity, a 1992 treaty ratified by 189 countries (not including the United States) as "the variability among living organisms from all sources… 'including' diversity within species, between species and of ecosystems." Slowing the global loss of biodiversity is one of the main priorities of most groups managing protected areas today.

4.3. Geographic Variation and Gaps in Protected Area Coverage

The expansion of protected areas has been highly variable among world regions. World Conservation Union (IUCN) and the UN Environment Programme's World Conservation Monitoring Centre (WCMC) revealed that the largest areas of land were added to North and South American protected area systems (1,283,914 km2 and 1,148,567 km2 , respectively), whereas the largest percent increases occurred in Middle America (composed of Mexico, Central America, and the Caribbean) and Western/Mediterranean Europe (i.e., western Europe and the http://www.unaab.edu.ng European side of the Mediterranean), 10.38% and 10.28%, respectively. Russia, Central and South Asia, and Australia were among the regions lagging behind in

protected area coverage. The unevenness of protected area coverage has a number of possible explanations. Some posit that wealthy countries devote more land to parks because many of their citizens hold post materialist values about protecting nature. Related research highlights the political relationships shaping the geography of biodiversity investments. He suggests that countries more closely aligned with the West (especially the United States) receive more funding for environmental activities and thus set aside more land in protected areas.

As already mentioned reserves and parks span a range of wildness, from monuments to pristine wildernesses. The IUCN recognizes six main categories of protected area:

IUNC Categories	Nature of PA
Category Ia	Strict Nature Reserve
Category Ib	Wilderness Area
Category II	National Park
Category III	Natural Monument or Feature
Category IV	Habitat/Species Management Area
Category V	Protected Landscape/ Seascape
Category VI	Protected area with sustainable use of natural resources

Ia Strict nature reserve: Strictly protected for biodiversity and also possibly geological/ geomorphological features, where human visitation, use and impacts are controlled and limited to ensure protection of the conservation values.

Ib Wilderness area: Usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, protected and managed to preserve their natural condition.

These two are usually managed mainly for science or wilderness protection.

II National park: Large natural or near-natural areas protecting large-scale ecological processes with characteristic species and ecosystems, which also have environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities usually managed mainly for ecosystem protection and recreation.

III Natural monument or feature: Areas set aside to protect a specific natural monument, which can be a landform, sea mount, marine cavern, geological feature such as a cave, or a living feature such as an ancient grove usually managed mainly for conservation of specific natural features.

IV Habitat/species management area: Areas to protect particular species or habitats, where management reflects this priority. Many will need regular, active interventions to meet the needs of particular species or habitats, but this is not a requirement of the category usually managed mainly for conservation through management intervention (rather than, say, by direct exclusion of certain activities, such as logging or fishing).

V Protected landscape or seascape: Where the interaction of people and nature over time has produced a distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values usually managed mainly for landscape or seascape conservation and recreation.

VI Protected areas with sustainable use of natural resources: Areas which conserve ecosystems, together with associated cultural values and traditional natural resource management systems. Generally large, mainly in a natural condition, with a proportion under sustainable natural resource management and where low-level non-industrial natural resource use compatible with nature conservation is seen as one of the main aims. They are usually an area managed mostly for sustainable exploitation of natural ecosystems (for example, a national forest).

The category should be based around the primary management objective(s), which should apply to at least three-quarters of the protected area – the 75 per cent rule.

The management categories are applied with a typology of governance types – a description of who holds authority and responsibility for the protected area. IUCN defines four governance types.

Governance by government: Federal or national ministry/agency in charge; sub-national ministry/agency in charge; government-delegated management (e.g. to NGO)

Shared governance: Collaborative management (various degrees of influence); joint management (pluralist management board; trans boundary management (various levels across international borders)

Private governance: By individual owner; by non-profit organisations (NGOs, universities, cooperatives); by for-profit organsations (individuals or corporate)

Governance by indigenous peoples and local communities: Indigenous peoples' conserved areas and territories; community conserved areas – declared and run by local communities

4.4. Goals of Park Management

The goals of park and nature preserve management can be summarized as follows:

- Preservation of unique wonders of nature such as Niagara Falls, Obudu Hills, Erin-Ijesha waterfall etc.;
- Preservation of nature without human interference (preserving wilderness for its own sake);
- Preservation of nature in a condition thought to be representative of some prior time period (e.g. prior to urban settlement);
- Wildlife conservation, including conservation of the required habitat and ecosystem of the wildlife;
- Maintenance of the wildlife for hunting;
- Maintenance of uniquely or unusually beautiful landscapes for aesthetic reasons;
- Maintenance of representative natural areas for the entire country;
- Maintenance of outdoor recreation, including a range of activities from viewing scenery to wilderness recreation (hiking, cross-country skiing, rock climbing), to tourism (car and bus tours, swimming, downhill skiing, camping etc.) and
- Maintenance of areas set aside for scientific research, both as a basis for park management and for the pursuit of answers to fundamental scientific questions.

5.0. Protected Areas (Nature Reserves)

Throughout the tropics, the expansion of agricultural commodity production threatens native habitats and the biological diversity they harbour. In most contexts, formal protected areas remain the optimal mechanism for safeguarding natural habitat. Although national parks face many management challenges, they generally are an effective form of protection against hunting, logging, grazing, fire, and especially land clearing. Despite ubiquitous shortfalls in park budgets and a daunting array of land use pressures, formal protected areas have proven to be the single most reliable instrument for the prevention of agricultural encroachment on habitat. Therefore, changing the land-use status of an area to habitat protection in perpetuity and then enforcing that status is the most direct way to protect priority areas that lie in the path of expanding agricultural frontiers. However, there are contexts in which establishment of formal protected areas presents legal, political, and financial difficulties, and the process of creating a new national park may take an inordinate amount of time.

Given the alarming rate at which commodity production is destroying habitat in some biodiversity hotspots, other means for rapid implementation of direct protection also

will be necessary, in some cases as an interim step towards creating permanent protected areas.

5.1. IMPORTANCE OF PROTECTED AREAS

- Protected areas are important tools for the conservation of biological diversity and are cornerstones of sustainable development strategies. Aside from their environmental benefits, they can also generate significant economic resources.
- Protected areas are the critical tool to conserve biodiversity in the face of the global crisis of species extinction and the loss of the world's natural capacity to support all life and human existence. At the same time, the protected resources are often essential to assuring healthy communities.
- Protected areas provide for life's essentials. They protect natural resources that are critical to many people on earth. Within these areas, genetic diversity is permitted to evolve in response to natural selection pressures. These genetic resources are a source of many new products. As well, they serve to protect major ecosystem services essential to us all. Water, food, clothes, shelter, transport, and medicines are thus available within and beyond the borders of protected areas.
- Protected areas provide for life's diversity in safeguarding species and habitats. Each species is a product of millions of years of evolution. Each species contributes to the extraordinary variety of living creatures on earth. The wonder of the plant world and the intrinsic values of each living thing are but one aspect of the need to protect - there is also the ethical obligation of humankind towards other species. Moreover, protecting the awe inspiring features of the earth—the great mountain ranges, glaciated landscapes, volcanoes, canyons, river systems, lakes and vast wetlands, deserts and vast grasslands along with the world's oceans, islands reefs and atolls—are central to the global tourism industry.
- Protected Areas act as life's buffers while serving as sanctuaries and strongholds of species in the face of climate change. Retaining the full complement of species keeps diseases in check and curbs the expansion of pests. Managing resources by taking in the whole ecosystem into consideration is a key way of ensuring ecological resilience.
- Protected landscapes shelter humans from tsunamis, landslides and hurricanes that are subject to increased intensity brought on by climate change. Sound natural systems resist damaging erosion, soil loss, or water quality loss.
- Protected areas are economic engines. They provide for life's jobs and livelihoods as a traditional destination for the global tourism industry. Outdoor equipment industries have sprung up and are critical to regional economies. Significant employment is dependent on parks and protected areas. At the same

time these areas protect resources of immense economic value such as water and fisheries. The pharmaceutical industry has benefited greatly from the genetic diversity of species and safeguarding species in protected areas will ensure the possibility of discovery of future medicines. As well the economic spin- offs from literature, film and television adds to the positive side of the ledger of the values of protected areas.

- Globally - protected areas serve as indicators of achievement of the Millennium Development Goals. At the local level, protected areas contain landscapes with a sense of place and meaning to nations and its people. They offer opportunity for involvement with restoration and other conservation activities. Such activities enhance social outcomes, sometimes dramatically, when delinquent youth are transformed into engaged community members.
- Protected areas provide the settings for healthy outdoor living and recreation. Exploring a protected area offers not only the opportunity to understand nature but also for exercise and education. They provide a sense of adventure and challenge, including self-discovery. Achieving personal development goals increases the mental well-being of humans. Much evidence has been accumulated on the recuperative force of nature on recovering patients.
- Most importantly, protected areas are the setting for providing some of life's most joyous moments. It is within these areas that our spirits can soar and our soul can be replenished. We can feel joy in the beauty of the place, from the feeling of solitude, or from having an interaction with wildlife. Protected areas are places where one has time to relax and unwind and to share a special moment or adventure with family and friends. These joyous experiences become embedded as a memorable moment and for many, they can be a life-transforming event.
- The joy of being in a special place has inspired human creativity from ancient to modern times. Many paintings, carvings, fabrics, decorations, and sculpture derived from an experience in a protected area enrich our lives. These areas have equally inspired writers, poets, and philosophers to produce books, movies, and documentaries.
- Not to be overlooked is the spiritual and heritage value of protected areas. Areas with sacred places yield a reverence for place and the associated species or the ecosystem enveloping the sacred site. Cultural landscapes forged by repetitive human practices often results in a symbiotic relationship of species that are dependent on the practices. The cultural richness and layers of meaning of these areas yield intertwined stories of humans and nature living in harmony.
- Protected areas bring tremendous cultural, ecological, spiritual, and scientific benefits to society. They are critical to preserving global biodiversity and

stemming the extinction crisis. Today there are more than 100,000 protected areas worldwide comprising about 12 percent of the Earth's surface.

- The development of a network of protected areas throughout the world is one of the greatest conservation achievements of the twentieth century, yet coverage is inconsistent across countries and ecoregions, and many areas are facing major threats to their viability. For example, the world's coastal and ocean environments are among the most threatened areas, yet only a small proportion of them are protected.
- As the world's population grows and the demands on natural resources increase, protected areas become both more important and more threatened. Whether or not these areas are well protected—and many are not—they increasingly face external threats that are difficult or impossible to control. These include climate change, development beyond their boundaries, water limitations and pollution, invasive species, and interrupted wildlife migration corridors. These threats will only intensify in the decades.

5.2. Difference between a park and a reserve

Parks are as old as civilization. The old French word parc referred to an enclosed area for keeping wildlife to be hunted. These areas were set aside for nobility, excluding the public. A park is an area set aside for the use by people whereas a reserve (nature preserve) although may be used by the people has as its primary purpose the conservation of some resource, typically a biological one.

One of the important differences between a park and a truly natural wilderness is that a park has definite boundaries. These boundaries are usually arbitrary from an ecological viewpoint and have been established for political, economic, or historical reasons not related to the natural ecosystem.

Every park or reserve is an island of one kind of landscape surrounded by different kind of land use. Reserves maybe of various types depending on what is being conserved

Games reserve: Also known as wildlife preserve can be a privatively or /and publicly owned and managed piece of land within the sole focus of preserving wild animals (fauna) in those natural habitats. Controlled hunting not poaching is allowed here.

Forest reserve: Here the focus is on the preservation of plants and trees (flora)

Nature reserve is focused on preserving all life forms both flora and fauna within a specific area.

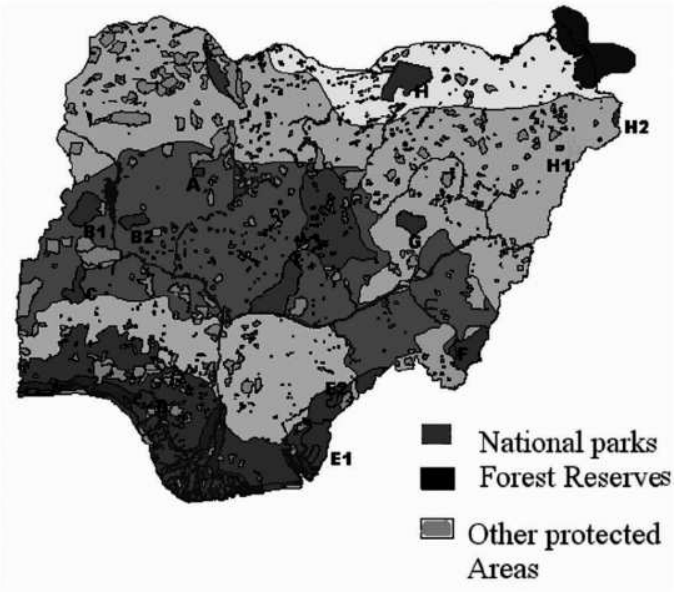
6.1. Protected Areas in Nigeria

The protection of wildlife began with the creation of Nigeria, soon after the amalgamation of the northern and southern parts of the country in 1914. Regional

game laws were enacted, initially by eastern Nigeria in 1916 and later by the western and northern regions in 1928 and 1963, respectively. The three categories of protected area recognized within the wildlife sector are strict nature reserve, game reserve and national park, all of which were formerly reserved forest. In the late 1980s, the Federal Natural Resource Conservation Council (NRCC) was created. This Council is chaired by the President with representatives from a number of Ministries and from the Nigerian Conservation Foundation. This Council provides coordination for the conservation of natural resources, develops policies, can take direct measures to secure the status of species and sites, monitors conservation activities within the forestry and wildlife sectors, and provides funds for conservation and research work. At the national level, the mandate for wildlife conservation and protected areas management is the responsibility of the Federal Department of Forestry in the Ministry of Agriculture, Water Resources and Rural Development. Within this Department, is the Division of Wildlife and Conservation, which is responsible for wildlife development and extension, and the enforcement of international wildlife conventions. In Nigeria there are also 966 Forest Reserves. According to United Nations Environmental Programme (Unep)-wcmc (2020) the protected areas in Nigeria are classified thus;

Protected Area	**Number**
National parks	12
Forest reserve	933
Wildlife sanctuary	2
Strict nature reserve	5
Game reserve	35
Community forest	1

Nigerian Protected Areas Network



A - Kamuku, B1 - Kainji Lake (Borgu sector), B2 - Kainji Lake (Zugurma sector), C - Old Oyo, D - Okomu, E1 -Cross River (Oban Division), E2 -Cross River (Okwango Division), F -Gashaka Gumti, G - Yankari (now reverted to state control as a game reserve) H - Chad Basin (Hadeija-Nguru Sector), H1 - Chad Basin (Sambisa sector), H2 - Chad Basin (Chigurme-Duguma sector).
Source: Federal Government of Nigeria 2001.

6.2. CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

There are five categories of protected areas recognized in Nigeria, namely:

National Parks

These are ecologically and culturally important areas where human habitation is largely disallowed and tourism is encouraged. There are currently eight national parks in different biogeographic zones of the country. Hunting and other human activities that affect biodiversity are completely forbidden in all the parks. Together the national parks cover about 22,592 km2, which is about 2.5% of the country. National Parks are assets of the Federal Government and the agency responsible for their management is the National Parks Service, an agency of the Federal Ministry of Environment.

Game Reserves

These are areas set aside by state governments for the protection of wildlife. Included here are Wildlife Parks and Wildlife Sanctuaries. Poaching is often widespread despite state edicts prohibiting illegal off-takes from the reserves. Game Reserves are often very poorly managed because of inadequate staffing, poor funding, and lack of equipment and poor remuneration of staff. Many states in the south, where human population densities are high, do not have game reserves. State Ministries of

Agriculture and Natural Resources often manage game Reserves. Well-managed Game Reserves may be considered for upgrading to national park status.

Forest Reserves
These are areas set aside by state governments for the protection of timber, fuel wood and other forest resources in their domains. Some Forest Reserves in the northern parts of the country double as livestock grazing areas. Natural vegetation has been replaced in some reserves with monocultures of exotic tree species. Harvesting of resources is usually allowed under permit or as special concessions to local people. Poor management often results, however, in a lack of control of resource utilization and conflicts among resource users. Only a few Forest Reserves, located in remote, difficult to access or sparsely populated areas, are still in a good undisturbed condition. Each of the 36 states has at least one forest reserve, managed by state Ministry of Agriculture and Natural Resources.

Biosphere Reserves and Strict Natural Reserve (SNR)
Are specially designated areas within forest reserve for scientific and educational purposes and all human activities including hunting and fuelling include fuel wood gathering are prohibited.

Special Ecosystems and Habitats
These include sacred groves, streams and lakes or other sites that are revered by local communities for their spiritual, recreational and other socioeconomic values. The commonest of these unique sites are sacred groves; small forest blocks, usually no more than a few hectares, set aside by some rural communities, mostly in the south, as homes of local deities, e.g., the Oshogbo Shrine in Osun State. With increasing urbanization and the spread of modern religions, sacred forests and other distinctive habitats are fast disappearing. Conservation of the biological resources of these in these small ecological islands is usually through traditional belief systems of superstitions and taboos.

6.2.1. In--Situ Conservation in Forests, Game Reserves and National Parks

The aims of In-situ conservation are as follows:

- To establish an integrated protected area system with all terrestrial habitats represented and covering approximately 25 per cent of Nigeria‘s land area.
- To strengthen the Federal Ministry of Environment, the main agency for Environmental Protection and Natural Resources Conservation including biodiversity

- To strengthen Institutions and Departments, custodians of Forest, Fish and Wildlife Resources
- To gain local support for biodiversity conservation through buffer zone projects and involvement of local communities and NGOs.
- To develop appropriate and sustainable strategies for funding the management of Forest Reserves, Game Reserves and National Parks

6.2.2. Ex Situ Conservation in Forests, Game Reserves and National Parks

The aims of Ex-situ conservation are as follows:

- To strengthen ex-situ collections as a supplement to in-situ conservation in botanical gardens, gene banks, germplasm collections and plant breeding centres.
- To Minimize mean kinship
- To Avoid loss of genetic diversity
- To Avoid adaptations to captivity
- To Managing genetic disorders

6.3. Goals of Conservation in Nigeria

- Nigeria, as a country aims to conserve biodiversity for the present and future generations. In order to achieve this aim, the strategic direction of conservation in the country is as follows:
- Promote and enhance measures for both in-situ and ex-situ conservation through identification, evaluation, monitoring, research, education, public awareness and training.
- Increase understanding of the status, genetic diversity and ecological relationships of species and populations
- Expand and strengthen the network of protected areas to include all the major ecosystems: Savanna, High forests, Wetlands, Mangrove, Montane, Coastal and Marine vegetation.
- Restoration and establishment of grazing reserves and stock routes for nomadic pastoralists
- Protect watersheds along all intra and interstate watercourses to protect the water bodies and aquatic biodiversity.
- Establish migratory corridors where practicable for isolated species and populations.
- Identify genetic resources at the species level based on their present or potential socio-economic value and their conservation status.
- Assess the conservation status of target species and their population.

- Identify specific conservation requirements or priorities at the population level for single species and at the ecosystem level for groups of species.
- Encourage the development of ex situ facilities including rescue and breeding centres to protect threatened species.
- Develop and implement restoration/rehabilitation plans in degraded ecosystems.
- Conserve biological resources that are essential to agriculture, industry, domestic animals, plants and microbes and their wild relatives.
- Develop and promote programmes that encourage beneficial co-existence of biodiversity in agricultural farms.
- Establish reserves to conserve freshwater, brackish water and marine biodiversity
- Establish and maintain gene and clone banks for plants and animals genetic diversity.
- Implement measures to eliminate or reduce environmental pollution that adversely affect biodiversity

6.4. CHALLENGES FACING PAs IN NIGERIA

The implementation of the policy has not achieved the desired result of properly conserving the country's biodiversity; a variety of plants and animals in the country are seriously threatened today. Various problems have been identified as obstacles and/or threats to effective conservation in the country. These obstacles and/or threats can be broadly classified into two major groups; Direct and Indirect threats

6.4.1. Direct threats

They comprise of the proximate human activities or process that impact on wildlife (in the past, present or future) such as unsustainable agriculture and agricultural expansion, fishing and logging, as well as wild fires and poisoning of wildlife. Thus direct threats are synonymous with sources of stress and proximate pressures.

6.4.2. KEY DIRECT THREATS TO CONSERVATION

Availability of funds for PAs

Funding is a critical limiting factor for all the PAs. The existing low level of financial support for biodiversity in West Africa is mirrored by a low capacity level in the management of PAs. The lack of capacity to manage wildlife has led to a general underestimation of the value of wildlife within government. The final result was the development of an operating strategy for natural resources that did not incorporate an improved management of wildlife.

Under-resourcing is the most important constraint acting on management effectiveness. The PAs do not have enough staff, resources, equipment and infrastructure to ensure the control of conservation areas (including anti-poaching measures and bio-monitoring) and to develop community-based supporting activities in the buffer zones. This results in degradation and encroachment of the PAs, which can ultimately lead to their degazettement.

Investments in wildlife conservation in West Africa must be orientated in a variety of activities: building PA management capacity, protecting endangered species, improving communication about the values of biodiversity, improving the monitoring of biodiversity, and tackling corruption and illegal trafficking. The only hope for West African biodiversity is to restore the fundamentals of conservation and to bring about sustainability in the uses of natural resources.

Institutional governance of PAs

In Nigeria, the state is the owner of the land and of the natural resources. In the past, governments established numerous and large protected areas, and classified forests and game reserves. To manage the various conservation aspects, the governments created centralised institutions for forestry, parks or wildlife and more recently for the environment.

The indirect drivers such as population growth, increased poverty, government budget reductions, increased democratisation and decentralisation, and sectorial approaches render ineffective many aspects of direct centralised management of wildlife and protected areas by the state. Also their institutions are ill adapted to cope with rapid structural changes in the countries. Protected area agencies are seen by governments as a relatively low priority, and until now tend to be too centralised. Their staff structures are often out of date, staff training is inadequate, and their enabling legislation is too restrictive.

Illegal wildlife trade income and corruption

Given the decline in the purchasing power of salaries over the past 30 years and the increased incomes possible from illegal wildlife trade, corruption has spread and it is growing at all levels with the involvement of populations, local and central government bodies, including forest rangers and officers, police, army and justice. Poaching levels have increased since. The issue of bush meat hunting is highly politicised and the commercial circuits are well organised to supply the urban areas where it is consumed. The high rate of bush meat harvest, combined with habitat loss and alteration, has led to very severe population declines. It has already resulted in widespread local extinctions. The forests and savannahs with no large animals are

known as the ‘empty forest’ or ‘savannah syndrome’. The large and small antelopes of West Africa can be considered amongst the most beautiful in the continent (including giant eland, roan antelope, major hartebeest and zebra duiker) but they are targets for black-market traders who will smuggle live animals into wealthy countries.

Poaching is high, and increasing throughout the country. For example, ivory trafficking through Nigeria is the major illegal wildlife trade in West Africa. Nigeria is the country with the largest flows of illicit ivory smuggling. Most of this ivory appears to originate in Central Africa, but Nigeria was also identified as the destination of major shipments of ivory from Kenya, suggesting that ivory from as far away as Eastern Africa may now be moving through this country. The increasing involvement of Chinese buyers in Nigeria, as well as the involvement of organised crime syndicates in the illegal wildlife trade and in deforestation for cannabis cultivation, means that Nigeria is playing an increasingly important role in biodiversity loss.

Weak planning, management effectiveness and monitoring of PAs

The quality of PA management effectiveness is poor many states, and in some cases very poor. There is a lack of planning, monitoring, adaptive management and proactivity. Inadequate resources and weak capacities to implement the management processes lead to the general loss of biodiversity and a loss of ecosystem services provided by the PAs. Though major parks and reserves are highly degraded, they can still be recovered.

Specific projects are needed to preserve important or endemic species. In a few degraded protected areas, the administration still provides an institutional presence in the hope of a possible recovery of the area at some later date. The general tendency, however, is to reduce the conservation areas because of lack of funds and the capacities to manage them.

6.4.2.1. Possible global solutions to direct threats

As planning, management and monitoring are closely linked, integrated solutions must be found the following general solutions are recommended:

- Improving information to build a more effective monitoring and decision-support system in order to facilitate (i) legitimacy, accountability and fairness in park management, and (ii) adaptive management and proactivity;
- Emphasising the role of stakeholders and rights-holders, local, national and international NGOs, private sector and other non-traditional partners with a view to improving management effectiveness over a broader landscape which includes the PAs and buffer zones;

- Strengthening institutional capacities (and providing training opportunities) to govern management frameworks and for multi-scale management of protected areas at local, national and regional levels;
- Integrating 'species-based' and 'habitat-based' approaches;
- Protecting the original ecosystem is generally less costly than ecosystem restoration;
- Integrating in situ and ex situ conservation of genetic diversity, which can serve the needs of restoring ecosystems and PAs

6.4.3. Indirect threats

They are the ultimate drivers of biodiversity decline such as human population growth, poverty increase and government budget reductions. Indirect threats to conservation have been defined as the ultimate factors, usually social, economic, political, institutional or cultural, that enables or otherwise adds to the occurrence or persistence of proximate direct threats.

Halting biodiversity loss (or reducing it to a minimal level) requires tackling the combined effect of human activities. The indirect drivers of biodiversity loss are related to economic, demographic, socio-political, cultural and technological factors. Also, indirect drivers affect biodiversity loss differently from direct drivers.

6.4.3.1. KEY INDIRECT THREATS TO CONSERVATION

Fragmentation, reduction and isolation of protected areas in the landscape

As land outside protected areas is exploited more and more intensively in Nigeria, the increasing isolation of protected areas in the landscape poses a serious threat to the long-term viability of many wildlife populations.

The primary effects of isolation of protected areas are:

- Habitat loss (pastoral and forested lands converted to agriculture);
- Disturbance from human infrastructures (wildlife abundance increases with distance from human settlements);
- Overhunting (widespread along protected area boundaries);
- Disease (transmission from livestock, domestic animals and humans)

Coup d'états, rebellions, civil unrest and religious fundamentalism and refugee crises

Nigeria has suffered from political instability, conflicts, civil unrests, conflicts linked with religious fundamentalism and refugee crises. Breakdowns in law and order generally have devastating effects on PAs. Protected areas and their natural resources become targets for everyone for the following purposes;

- Populations for land, grazing, wood, bush meat, etc;

- Illegal traders who target the most precious woods and wildlife;
- Armies who use wildlife and natural resources as sources of money and food;
- Rebels and religious fundamentalist movements who use PAs as places of refuge and sources of funding

Protected areas are still suffering greatly from these effects. However in cases where there are decentralised systems, and where NGOs and community groups are involved, the PA management and governance have proved better able to partially save conservation areas.

Negative economic trends

Between 1960 and 2002, declining national economies and steady population growth in Nigeria meant that the combined effect of servicing international debts and providing education and health care for the burgeoning populations resulted in a reduction of funding for protected areas. Poverty has led to increasing levels of poaching and illegal activities in the PAs, and is also threatening the economic recovery.

The situation for PAs has remained unchanged. PA staff are poorly paid and equipped, materials and equipment are totally inadequate, and infrastructure is poorly maintained. Illegal grazing, woodcutting, agriculture and poaching in PAs continue, sometimes with the complicity of the PA rangers.

Policy and sectorial approach

Investment in the primary sectors like agriculture, pastoralism, forestry, wildlife conservation or in sectors such as mining operations or energy infrastructure all affect the socio-economics of the country, raising a range of political, administrative, economic, industrial, environmental, infrastructural and energy issues. Many states in Nigeria, with the support of donors and private funds, implement their policies, strategies and projects with a sectorial approach without the inter-sectorial coordination and collaboration that is essential to ensure the mainstreaming of natural resource conservation and management issues.

Governments and populations continue to regard PAs as unproductive areas to be exploited on a short time base (unsustainable exploitation) rather than as important economic and spatial elements of the landscape. Consequently pressures on PAs are increasing and resulting in biodiversity loss and the degradation of many ecosystem services.

6.4.3.2. Possible global solutions to indirect drivers

People make decisions concerning biodiversity based on a range of values related to their well-being, including the use and nonuse values of biodiversity and ecosystems. The well-being of local people must dominate many responses, including those

relating to protected areas, governance and wildlife management. Thus responses to indirect drivers with a primary goal of conservation should include:

- Managing protected areas for a wide range of sustainable uses;
- Designing and managing PA systems in the context of an ecosystem approach, with due regard to the importance of corridors and interconnectivity of PAs, if possible;
- Conservation of mainstream natural resource and ecosystem services in all the primary sectors such as agriculture, pastoralism, forestry, fisheries, mining and in energy. Approaches should be explored to promote greater use of environmental safeguards that seek to minimise ecological and social problems arising from development projects;
- Adopting inter-sectorial coordination and collaboration in order to ensure the mainstreaming of biodiversity conservation and management issues;
- Capturing the benefits and reduce the costs of wildlife for local communities, especially the local opportunity costs in line with the principle of equitable sharing;
- Increasing transparency and accountability of government and private-sector through involvement of concerned stakeholders and rights-holders in decision-making on biodiversity;
- Increasing coordination among multilateral environmental agreements and between environmental agreements and other international economic and social institutions;
- Raising the level of public awareness, information-communication and education

6.5. ACTION POINTS

In order to ensure that the direct and indirect threats are successfully tackled the following actions need to be taken;

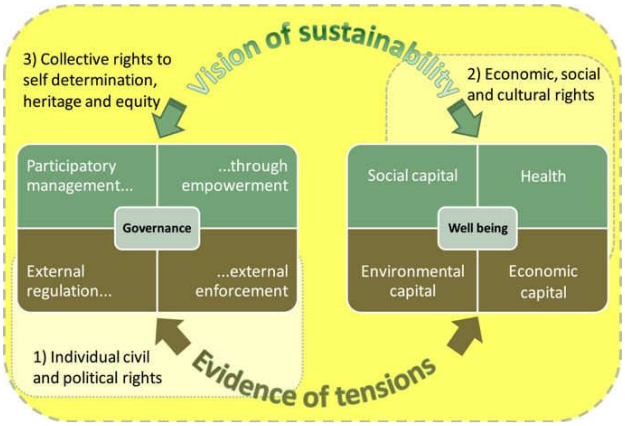
i. Survey of flora and fauna outside forest reserves including those in sacred groves, community lands, abandoned farmlands and homesteads and assist local people in the management of such sites on a sustainable basis.

ii. Strengthen the capability of communities, private industries, Universities, and NGOs to manage natural forests outside forest reserves on a sustainable basis.

iii. Carry out a study of the indigenous knowledge of timber and non-timber plant species and ascertain values from the utilisation of these plants and encourage local people to participate in joint research programmes.

iv. Conserve wild species that are of significance particularly those that have become almost lost or have gone extinct.

v. Conserve special ecosystems e.g. wetlands, arid lands and montane vegetation types.
vi. Review and up-date the marine coastal conservation strategy. Encourage oil exploration without the destruction of natural vegetation (especially the mangrove).
vii. Encourage local communities to participate in natural regeneration of wetlands and arid zone vegetation.



Framework for structuring the qualitative synthesis between humans and PA

6.6. Park Effectiveness

By global mandates, protected areas are now supposed to do far more than conserve biological diversity. These areas are charged with improving social welfare, guarding local security, and providing economic benefits across multiple scales, objectives traditionally relegated to the development sector. These goals are vitally important and are founded on the truth that amidst desperate poverty the long-term prospect for biodiversity conservation is poor. However, public discussions regarding the effectiveness of protected areas sometimes resemble the familiar blind-men-observing-an-elephant parable. This is because evaluating the effectiveness of protected areas is difficult, especially given the poor availability of data on ecological and social conditions and their change over time. Evaluating park effectiveness is also a politically fraught endeavour given the ambitious and disparate agendas imposed on protected areas. For example, a conservation biologist may label a protected area as a conservation success only if the full suite of native wildlife species is present in viable populations, including large and rare carnivores. An anthropologist viewing the same protected area may deem it a failure if local citizens 'rights or livelihoods were undermined when the park was established.

7.0. SUMMARY

Protected areas are important tools for the conservation of PAs and are cornerstones of sustainable development strategies.
Aside from their environmental benefits, they can also generate significant economic resources.
A major shortcoming in Nigeria's protected area system is the non-inclusion of any part of the country's coastal area into the protected area system. Other problems in PAs conservation include but are not limited to;
Massive deforestation, desertification and large-scale erosion continue in various parts of the country;
Inadequate data on the status of biodiversity;
Uncoordinated land-use policy;
Inadequate allocation of funds and manpower
High rate of rural and urban poverty in the country, which makes enforcement difficult
Various measures suggested to promote better PAs conservation include improving the legal frameworks for conservation management in the country and expanding research into forest biology and economics. Other solutions proffered are the provision of basic education on conservation for the general population and the proper funding of protected areas and conservation programmes in the country.

8.0. CONCLUSION

Throughout the history of protected areas the common thread is the focus on providing for life now and into the future. The intrinsic values of biodiversity are arguably reason enough for safeguarding life through protected areas.

MODULE 2: UNIT 4: CLIMATE

1.0. INTRODUCTION

Next to clothing, shelter against atmospheric vagaries is one of the oldest technological inventions of mankind. No part of the world is safe from adverse or even dangerous weather events. The list is long and the threats to millions of people and their dwellings compelling. Nowadays, floods, hurricanes (typhoons, cyclones), tornadoes, severe thunderstorms and blizzards are no longer considered inevitable acts of an angry deity, but calculable and predictable risks that can and must be incorporated into planning for housing and settlements. Included in the functions of the Meteorological Services' of the world are the issue of timely warnings against weather hazards and advice on safety measures to be taken for appropriate building and housing construction. Weather and climate are all-pervasive. They control the comfort of people as well as the efficiency of workers. Housing needs to be designed to optimize health and comfort conditions indoors. Urban areas exercise their own effects on the atmosphere, some of them quite undesirable. These have to be taken into account in planning new towns and in modernizing old cities. Energy needs for heating and cooling are governed directly by the atmospheric environment which, in turn, may eventually furnish a substantial proportion of the energy needed through use of solar radiation and wind power. Weather is similarly pervasive in the pursuit of recreation. Outdoor sports such as skiing, sailing, camping and swimming are all affected.

2.0. OBJECTIVES

3.0. MAIN CONTENT

3.1. CLIMATE AND HUMAN SETTLEMENTS

3.2. CLIMATE

Climate is the average weather in a given area over a longer period of time or conditions of the atmosphere at a particular location over a long period of time. A description of a climate includes information on elements such as solar radiation, temperature, humidity, precipitation (type, frequency, and amount), atmospheric pressure, and wind (speed and direction).Also a description of the (chance of) extremes is often included.

The World Meteorological Organization (WMO) describes climate "normals" as "reference points used by climatologists to compare current climatological trends to that of the past or what is considered 'normal'. A Normal is defined as the arithmetic average of a climate element (e.g. temperature) over a 30-year period. A 30 year

period is used, as it is long enough to filter out any inter-annual variation or anomalies, but also short enough to be able to show longer climatic trends.
The Intergovernmental Panel on Climate Change (IPCC) 2001 glossary definition is as follows:
Climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years.(With the classical period being 30 years, as defined by the World Meteorological Organization (WMO).) These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

The transition from nomadic life to farming and settlements began thousands of years ago, in areas with favorable weather and tolerable seasons. Since then, and with independent developments in other favorable places around the globe, settlement, i.e. agrarian lifestyles, have expanded with increasing populations into more marginal areas, those with poorer soil, less available water, starker growing seasons. You could sum this up by thinking of an area as having a “carrying capacity”, an idea of how much of a given form of life it will sustain.
Shifts in climate will perhaps create newly favorable areas for settlement, and will decrease the carrying capacity of others, especially those at the margins.

3.3. CLIMATE CHANGE

Climate change, periodic modification of Earth’s climate brought about as a result of changes in the atmosphere as well as interactions between the atmosphere and various other geologic, chemical, biological, and geographic factors within the Earth system. It is a long-term change in the average weather patterns that have come to define Earth’s local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the term.

3.4. GLOBAL WARMING

The term is frequently used interchangeably with the term climate change; though the latter refers to both human- and naturally produced warming and the effects it has on our planet. It is most commonly measured as the average increase in Earth’s global surface temperature.
It is the long-term heating of Earth’s climate system observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth’s atmosphere, raising Earth’s average surface temperature.
Since the pre-industrial period, human activities are estimated to have increased Earth’s global average temperature by about 1 degree Celsius (1.8 degrees

Fahrenheit), a number that is currently increasing by 0.2 degrees Celsius (0.36 degrees Fahrenheit) per decade. Most of the current warming trend is extremely likely (greater than 95 percent probability) the result of human activity since the 1950s and is proceeding at an unprecedented rate over decades to millennia.

4.0. HUMAN SETTLEMENT AND CLIMATE

Human settlements are affected by climate change in one of three major ways:
1. The economic sectors that support the settlement are affected.
2. Some aspects of physical infrastructure, buildings, urban services, and specific industries may be directly affected.
3. Populations may be directly affected.
According to the IPCC's second assessment report (SAR), the most vulnerable communities include:
1. Poor coastal and agrarian communities in arid areas
2. Settlements built on hazardous sites (such as wetlands or steep hillsides) in or around urban areas in developing countries.

4.1. Human settlement and sea-level rise

A major challenge for human settlements is sea level rise, indicated by ongoing observation and research of rapid declines in ice-mass balance from both Greenland and Antarctica. Estimates for 2100 are at least twice as large as previously estimated by IPCC AR4, with an upper limit of about two meters. Depending on regional changes, increased precipitation patterns can cause more flooding or extended drought stresses water resources. A 1m sea-level rise is likely to cause major problems on the intensely utilised and densely populated coastal plains - producing coastline recession of up to several kilometres, displacing coastal villages and depriving many people of their land and resources.

4.2. Human settlement flooding and landslides

The most widespread direct risk to human settlements from climate change is flooding and landslides. Floods are already a major ongoing concern of many developing countries and this problem may be exacerbated by global climate change. Some climate model projections suggest that the greenhouse effect will enhance both ends of the hydrologic cycle, producing more instances of extreme rainfall as well as increased drought. Thus, floods may become an even greater threat as the world warms. In some instances, the expected rise of sea-levels may aggravate the vulnerability of coastal countries to floods.

4.3. Human settlement and tropical cyclones

As sea surface temperature rises, the ocean area which can spawn tropical cyclones (typhoons, hurricanes etc) is expected to increase. Although the area of sea having temperatures over this critical value will increase as the globe warms, the critical temperature itself may increase in a warmer world. Tropical cyclones would become more destructive in a warmer climate as a result of warmer oceans. Damage by tropical cyclones is a major impediment to economic development and can be expected to become an even larger factor if storm damage increases. Tropical cyclones also pose major threats to industrialised nations, as occurred when Hurricane Hugo in September 1989 wreaked havoc along the Carolina coast of the US.

4.4. Human settlement and thawing of the permafrost

Climate models have generally projected that arctic and subarctic areas are likely to warm more rapidly than the average global temperature increase. Such a rapid warming could result in a significant thawing of the permafrost in the subarctic, producing major disruption to buildings, roads and bridges, adversely affecting the stability of some existing structures and forcing changes in construction practice. Infrastructure in permafrost regions is vulnerable to warming.
Permafrost melting could lead to increased landslides, loss of foundation stability and increased damage from freeze-thaw cycles.

4.5. Human settlement and drought or water shortages

Global warming may be expected in some regions to lower the groundwater level, decrease the surface of many lakes or inland waterways, and drop the water level of such bodies. Settlements in water-deficient regions of the world would face even higher demands for water if the climate became warmer. Poverty and hunger resulting from drought may cause migration and degradation, or change of diet. Land degradation may produce either abandonment of the land or, where investment capacity and knowledge are available, change in cultivation practices to improve yields and arrest land degradation.

4.6. Human settlement, loss of biomass and vulnerable resources

A major threat to developing countries posed by global warming may be acceleration of depletion of biomass cover as a result of increased drought. This could be an especially severe problem in countries where energy supply for 40-odd oil importing countries comes from biomass. Majority, whom depend on biomass also for housing, furniture, implements, utensils etc, could experience greater scarcity for such uses. Cities and towns that are very dependent mainly on agriculture, forestry, or fisheries (directly affected by climate) are particularly vulnerable.

4.7. Intensification of the urban heat-island effect

The rapid urbanisation of many developing countries is transforming the landscape of many cities. The continuing explosive growth of such cities and many other urban megalopolises is likely to effectuate a profound alteration in the local climate. Concentrations of populations and industry with buildings, rooftops and roads, produce an urban environment that develops what is known as an ‘urban heat island effect’. More energy from the sun is absorbed and released by these urban surfaces which increase the average overall or ambient temperature for the urban area. This ‘urban heat island effect’ can raise the air temperature in a city by 1- 4 C degrees. Heat-stress impacts on health, human discomfort and aggravation of urban air-pollution problems, such as smog, are all possible consequences of an additive heat-island and greenhouse warming. The vulnerability of human settlements to climatic events is particularly great in developing countries, where high population densities and growing urban congestion are likely to increase the sensitivity to and potential magnitude of natural disasters.

4.8. Migration, resettlement and climate change

Migration and resettlement may be the most threatening short-term effects of climate change on human settlements. People may decide to migrate in any of the following cases:

- Loss of housing (because of river or sea flooding or mudslides);
- Loss of living resources (like water, energy and food supply or employment affected by climate change);
- Loss of social and cultural resources (loss of cultural properties, neighbourhood or community networks, particularly in the case of a devastating flood).

In developing countries, changes in commodity prices or foreign trade practices may trigger large scale migration.

Migration may occur following a decline in living standards or a total loss of livelihood following land degradation or a major 'natural' disaster like flooding or drought.

4.9. Human settlement and health problems associated with climate change

Climate change may threaten the health of large numbers of people. Flooding and storm surges associated with sea-level rise could increase the incidence of water-borne diseases. Opportunistic diseases could afflict those weakened by famine or malnutrition. Wide-scale disruption of communities could include psychological stress among environmental refugees. Degradation of water quality or sanitation faculties could put more pressure on public health faculties. Many cities in the world have huge squatter settlements and crowded neighbourhoods with poor shelter. Heat waves would have a more severe effect on human health and productivity, and would have

the greatest influence on the weakest part of the population (including the old, chronically ill and very young).

The consequences of warming, extreme weather and sea-level rise to human settlements in general are summarised in the table.

Climate change impacts on human settlements.

Climate change phenomenon	**Consequences for human settlements**
General warming – more frequent and intense hot days and nights, fewer and less intense cold days and nights	Intensified heat island effect. • Increased energy demand for cooling. • Declining air quality in cities. • Reduced energy demand for heating.
Extreme weather – heat waves and drought	• Increased water demand. • Water quality problems. • Increased risk of heat-related mortality, especially for the elderly, chronically sick, very young and poor. • Reduction in quality of life for people without appropriate housing.
Extreme weather – intense precipitation events and severe storms	• Adverse effects on quality of surface and groundwater, contamination of water supply. • Increased risk of death, injury, loss of property, and disease (infectious, respiratory, skin, water- and food-borne). • Displacement of people and distress migration to urban areas. • Pressures on urban and rural infrastructure, resulting in power outages, disruption of public water supplies and transport.
Sea-level rise and storm surges	• Decreased freshwater availability due to salt-water intrusion. • Increased risk of death and injury by drowning and migration-related health effects. • Loss of property and livelihoods and withdrawal of risk coverage in vulnerable areas by private insurers. • Permanent erosion and submersion of land.

5.0. SUMMARY

Climate change is any systematic change in the long-term statistics of climate variables such as temperature, precipitation, pressure, or wind sustained over several decades or longer. Climate change can be due to natural external forcings (changes in

solar emission or changes in the earth's orbit, natural internal processes of the climate system) or it can be human induced.
Human settlement is a *place* where *people* live. It refers to the totality of human community with all the social, material, organizational, spiritual, and cultural elements that sustain it. Any form of human dwelling, from the smallest house to the largest city, where group of people reside and pursue their life goals, can be understood as settlement. Human settlements come in many forms and can be permanent and temporary, rural and urban, mobile and sedentary, disseminated and agglomerated

6.0. CONCLUSION

Climate change impacts on human settlements arise from a number of climate change-related causes, notably sea level changes, impacts on water resources, extreme weather events, food security, increased health risks from vector home diseases, and temperature-related morbidity in urban environments. Some coastlines and river deltas have densely populated low-lying areas, which would be affected by a rise in sea level. Other coastal settlements will be subjected to increased coastal erosion.
An overwhelming scientific consensus maintains that climate change is due primarily to the human use of fossil fuels, which releases carbon dioxide and other greenhouse gases into the air. The gases trap heat within the atmosphere, which can have a range of effects on ecosystems, including rising sea levels, severe weather events, and droughts that render landscapes more susceptible to wildfires.

MODULE 2: UNIT 5: ECONOMIC

INTRODUCTION

During the early man period, humans settled on trees and inside caves. Today they build houses. The places where we build houses are called settlements. River valleys were the first settlements for human dwelling, the reason being their fertile lands and availability of water. As people in that era were mostly dependent on agriculture, they settled in places which would support beneficial farming. They learned new skills to become self-sustained. From growing crops to making houses they changed the environment according to their needs. Gradually when people started trading and earning through commercial establishments, they started settling according to their interests of trade and earnings. With the advent of modern skill in humans, settlement flourished to places other than river valleys.

2.0. OBJECTIVES

3.0. MAIN CONTENT

3.1 PRINCIPLES AFFECTING ECONOMIC DEVELOPMENT AND GROWTH OF SETTLEMENTS

Human settlements have always been created by man's moving in space and defining the boundaries of his territorial interest and therefore of his settlements, for which he later created a physical and institutional structure. In terms of shaping and growth of settlements, man has always acted in obedience to five economic principles.

The first principle

It is about the maximization of man's potential contacts with the elements of nature (such as water and trees), with other people, and with the works of man (such as buildings and roads). This, after all, amounts to an operational definition of personal human freedom. It is because of this principle that man considers himself imprisoned, even if given the best type of environment, if he is surrounded by a wall without doors. In this, man differs from animals; we do not know of any species of animals that try to increase their potential contacts with the environment once they have reached the optimum number of contacts. Man alone always seeks to increase his contacts.

The second principle

It is about the minimization of the effort required for the achievement of man's actual and potential contacts. He always gives his structures the shape, or selects the route, that requires the minimum effort, no matter whether he is dealing with the floor of a room, which he tends to make horizontal, or with the creation of a highway.

The third principle

It is about the optimization of man's protective space, which means the selection of such a distance from other persons, animals, or objects that he can keep his contacts with them (first principle) without any kind of sensory or psychological discomfort. This has to be true at every moment and in every locality, whether it is temporary or permanent and whether man is alone or part of a group. The walls of houses or fortification walls around cities are other expressions of this third principle.

The fourth principle

It is about the optimization of the quality of man's relationship with his environment, which consists of nature, society, shells (buildings and houses of all sorts), and networks (ranging from roads to telecommunications). This is the principle that leads

to order, physiological and aesthetic, and that influences architecture and, in many respects, art.

The fifth principle

Here, man organizes his settlements in an attempt to achieve an optimum synthesis of the other four principles, and this optimization is dependent on time and space, on actual conditions, and on man's ability to create a synthesis. When he has achieved this by creating a system of floors, walls, roofs, doors, and windows which allows him to maximize his potential contacts (first principle) while minimizing the energy expended (second principle) and at the same time makes possible his separation from others (third principle) and the desirable relationship with his environment (fourth principle), we speak of "successful human settlements".

3.2 ECONOMIC FACTORS THAT AFFECT HUMAN SETTLEMENT DEVELOPMENT

Historically, settlers often came in search of places to start farms, and later they came to cities to look for jobs. This could be attributed to the fact that if economies in a settlement collapse, it can drive people into leaving that settlement to more viable settlements which in turn would lead either to, creating their own settlements or increasing the size of existing ones. Economic development and growth are influenced by four board factors: human resources, physical capital, natural resources and technology which are further broken to individual factors that make them up. These factors which can act as either push or pull factor are often times responsible for the birth or death of human settlements. In the major economic factor affecting settlement growth and decline is infrastructure. It is determined by the availability of varied economic factors including but are not limited to;

Physical capital

- Infrastructure
- Capital accumulation.

Natural resources

- Natural resources
- Agricultural surplus.
- Power and energy resources.

Human resources

- Available labor force.
- Government policies.
- Social conventions.
- Insecurity.

Technology

- Transportation
- Communications.
- Technological resources.

3.2 PHYSICAL CAPITAL

3.2.1. Infrastructure

Infrastructure is crucial for the development, functioning and prosperity of settlements. It provides the underlying foundation for them to thrive. Adequate infrastructure— in terms of improved water and sanitation, reliable and sufficient power supply, efficient transport networks and modern information and communications technology— contributes to the sustainability and economic growth of settlements, promotes the competitiveness of local businesses, enhances the investment climate in of settlements, improves the productivity of workers, and contributes to the overall attractiveness of settlements. The growth and hence prosperity of settlements will depend on the extent to which infrastructure is adequately provided, upgraded and maintained. Physical infrastructure such as road network, power and communication facilities all enhance mobility, which is essential for economic growth and poverty reduction.

Infrastructure affects the following variables which in turn affect settlement development and is manifested in either the push or pull factor that makes or mars human settlements. These variables are;

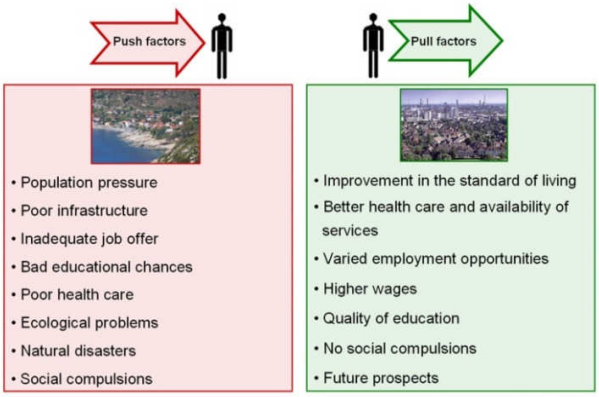
Demographic characteristics

Socioeconomic conditions

Transportation accessibility

Natural amenities

Land use and development



The negative effects of deficient infrastructure can be as large as those of crime, bureaucracy, corruption and financial market constraints. Settlements that fail to provide to adequate infrastructure will be adversely affected on many fronts; they are

less likely to be prosperous and sustainable in terms of balancing economic and social development, and environmental protection.

3.2.2. Capital resources and accumulation

Capital resources are people-made products utilized in creating goods and services. (Producers are people who provide such goods and services.) Capital resources are used to generate profits or income. They can also be defined as goods "used to make other goods and services. A capital resource is a type of good. "Goods can often be classified as either consumer goods or capital goods. For example, when a person buys a truck for personal use, the truck is a consumer good. When a business buys a truck to transport products, the truck is considered a capital good.

Capital accumulation, or financial profits and investments acquired by settlements, influence its ability to pay wages and hire labor. The more capital settlements have the more jobs it can create. In contrast, low capital settlements may have a low living wage and high unemployment. Improvements and increased investment in physical capital – such as roadways, machinery and factories – will reduce the cost and increase the efficiency of economic output. Factories and equipment that are modern and well-maintained are more productive than physical labor. Higher productivity leads to increased output. Labor becomes more productive as the ratio of capital expenditures per worker increases. An improvement in labor productivity increases the growth rate of the economy.

3.3 NATURAL RESOURCES

3.3.1. Natural resources

Natural resources are the physical resources naturally available within settlements. A lot of settlements are located near natural resources that are necessary for human livelihood. The quantity and availability of natural resources affect the rate of economic growth. This includes trees, soil, water, minerals, coal, oil, and anything else existing within a country. Natural resources can help settlement develop by creating jobs and increasing their wealth through the sales. The value of natural resources depends on the international interest in the resources.

The effectiveness of a settlement at utilizing and exploiting its natural resources is a function of the skills of the labor force, type of technology and the availability of capital. Skilled and educated workers are able to use these natural resources to spur the growth of the economy

3.3.2. Agricultural surplus

Similar, but not identical, to natural resources, this factor relates to settlements that have significant amounts of arable land, to the extent that they produce far more than they need to consume. This is generally applicable to settlements with moderate

climates and smaller populations. Where a settlement has more food to sell than it has to consume, it will be likely to have a more positive economic outcome.

3.3.3. Power and energy resources

Power and energy resources include natural and manmade resources that produce power or energy. Natural resources that produce power and energy, such as oil, gas, and water, are of particular value because they serve a dual purpose of being natural, which can be mined and sold relatively quickly, and they are important for producing power and energy within settlements, which is essential for all settlements to operate within the global economy. Manmade power and energy resources, such as nuclear power, electricity, and solar power are necessary for industrializing and modernizing a settlement. This power enhances the farming and industrial capabilities within a settlement. Further, available power increases the quality of life within a nation.

3.4. HUMAN RESOURCES

3.4.1. Available labor force

The skills, education and training of the labor force have a direct effect on the growth of an economy. Available labor force considers the number of skilled laborers within the settlement and the need for laborers. A skilled, well-trained workforce is more productive and will produce a high-quality output that adds efficiency to an economy. A discrepancy in either education or number of needed laborers can be a deterrent to economic growth. An under-utilized, illiterate and unskilled workforce will become a drag on an economy and may possibly lead to higher unemployment. Equally too many laborers and not enough work means high unemployment. Too few laborers and too much work means there will be a lack of efficiency and inability to support the economy's outputs.

3.4.2. Government policies

The government’s land policies can also have a lasting effect on settlement patterns others as Settlements are being planned according to human preferences and desires. Today many governments enforce zoning rules, controlling the growth of settlements by allowing people to live in some areas.

3.4.3. Social conventions

When a country has very conventional or conservative social, it will generally be less inclined to globalize and more inclined towards insularity. It will also refuse to associate or trade with countries that have different political or social outlooks, which can limit income. If a settlement is politically and socially liberal, it will be better able to receive income from a wide range of sources.

3.4.4. Insecurity

Insecurities have long existed from the evolution of settlements. Examples can be drawn from the Industrial Revolution in Great Britain, which modernised the urban environments as economic engines, yet the negative side of such endeavour in the

history of human settlements development was crime and violence purported by the unemployed in efforts to survive in a competitive urban environments. With the high rates of evolution of settlements, crime and violence is increasingly becoming an issue that requires the attention. The increase in crime is mainly attributed to the fact that as settlements rapidly evolve, failure to cope with complexities that arise such as growing populations, scarcity of employment opportunities, poor provision of infrastructure and service provision for basic survival contribute to increase in crime and violence within the rapidly evolving settlement.

3.5. TECHNOLOGY

3.5.1. Technological resources

Technological resources refer to the use of and ability to use advanced technologies within settlements. This includes computers, cell phones, and other devices which increase business capabilities and the quality of life. Improvements in technology have a high impact on economic growth. As the scientific community makes more discoveries, managers find ways to apply these innovations as more sophisticated production techniques. The application of better technology means the same amount of labor will be more productive, and economic growth will advance at a lower cost. When settlements have an advantage over others in terms of the level of technology it can produce, this means its economic development will be accelerated beyond that of other settlements. Technological advancement is a factor that can increase the rate of productivity and the amount of wealth generated by exported product. Settlements with low technological resources are not prepared to play an active role in the global economy because they either don't have the technology or they don't know how to use it.

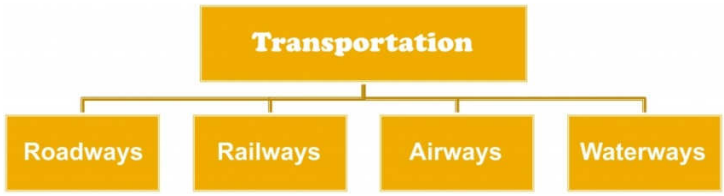
3.5.2. Transportation systems

A transportation system can be as simple as a trail people can walk on or as sophisticated as the advanced very-high-speed. Trade depends on transportation, whether by camel caravan or cargo container ship or rocket. Transportation systems depend on reliable communication networks, as do economic activities. Advances in communications generally point to economic advances as well, a circumstance that has been amply demonstrated with the development of global communication networks and the rise of global trade.

Strong, reliable communication and transportation systems play a major role in the economic development of settlements. In areas where both communication networks and transportation systems are efficiently integrated, the ability to swiftly communicate, move people, and transport goods provides a strong base for the growth of trade and hence is a crucial factor in developing a stronger economy. By contrast, if a settlement does not have strong communication and transportation networks, trade and the economy are less robust.

There is a spatial component to the location and use of transportation and communication systems and this is closely tied to a particular economic system's form and success. As early as the 18th century, political economist Adam Smith wrote that coastal areas, with their ports and easy access to sea trade, would be more prosperous than inland areas.
Access to facilities, services and socio-economic opportunities plays a critical role in the growth and decline of human settlements.
Accessibility generally describes “the degree to which a product, device, service, or environment is accessible by as many people as possible” or, from the point of view of community residents, their “ability to reach desired goods, services, activities and destinations”.
Remoteness can be defined as the inverse of relative accessibility. The concept of remoteness, and hence accessibility, is an important dimension in human settlement development. Lack of adequate infrastructure hinders, basic services that is necessary to ensure an acceptable and reasonable quality of life and which, if not provided, would endanger public health, safety and the environment and act as a factor that may lead to the death of settlement.

3.5.3. Means of transportation



Transport is the means by which people and goods move from one place to another and is an important element in the sustainability of human settlements.
Settlement patterns have always been affected by the technology available to settlers, and especially by methods of transportation. In the past, when boats were the best way to transport goods and people, most major settlements were located next to the sea or rivers. In fact, the world’s biggest cities today are still located next to water.
Travelling in early days could take months to years. Before the invention of wheels, people used to travel with mules or donkeys to carry items of luggage and the absence of conveyance in early days made travelling the most arduous of works. With the invention of the wheel, travelling became way more easy and fun and was no longer regarded as a task to do.
With the passage of time, human beings developed different means of transport. The modern means of transports like railways, flights, and roadways saves time and energy both. Depending on the various modes of transport, we categorize the different means

used for travelling. However there are four mean of transport, these are: Airways; Railways; Roadways; Waterways

3.5.3.1. Roadways

The most used means of transport especially for short distance are road. Roadways join various settlements to one another. With these roads, you can travel from one place to another effortlessly. Roads are present everywhere. From deserts to mountains, they serve as an important means of transportation. Roads like the flyovers and expressways are present above the ground level. Similarly, Subways are underground roads that help manage the growing levels of traffic.

3.5.3.2. Railways

Railways carry people and heavy goods through long distances. Initially, these used coal and steam. But today trains run with the help of diesel and electricity. They are not expensive.

3.5.3.3. Waterways

Waterways are the most ancient mode of transportation. They are the cheapest way of carrying heavy and bulky goods over long distances. Waterways are the cheapest mean of transport. They are of three types:
Inland waterways: navigable rivers and lakes are used as inland water ways.
Sea routes: sea routes and oceanic routes are mostly used for transporting merchandise and goods from one country to another.
Ports connect these routes for international transaction. Some of the important ports are Singapore, Mumbai, Los Angeles, Rio De Janerio, and Capetown.

3.5.3.4. Airways

It is most expensive mean of transport as it needs a lot of fuel and fuel is expensive. It cannot carry heavy goods. It is the fastest mean of transport. Perishable goods will be

better if we take them by airways. Air traffic is adversely affected by bad weather like fog and storms, etc. It is the only mode of transport to reach the most remote and distant areas especially where there are no roads and railways.
Aeroplanes and Helicopters are the best examples of Airways vehicles. These help us reach the most distant and remote areas.
Aeroplanes generally carry goods and passengers.
Helicopter is extremely useful in most inaccessible areas and in time of calamities for rescuing people and distributing food, water, clothes, and medicines. And they can be in air without moving for a long time.
Air Services are of two types: -
(1) **Domestic airways:** Fly within the boundaries of a country.
(2) **International airways:** Fly abroad and connects major cities of the world.

3.5.4. COMMUNICATION

Communication is the process of conveying messages to others. It is the imparting or exchanging of information by speaking, writing, or using some other medium. It is the process of conveying messages to people living in distant places. With the development of technology humans have devised new and fast modes of communication. The invention of printing press, radio, television; development of satellites, radar and computers has greatly revolutionized the communication system.

There are two types of communication they are: Mass communication Personal communication

3.5.4.1. Mass communication

It is the process of imparting and exchanging information through mass media to a large segment of the population. It is usually understood
Mass media refers to a diverse array of media technologies that reach a large audience via mass communication. Mass media means technology that is intended to reach a mass audience or the general public, providing both education and entertainment. The most common platforms for mass media are newspapers, magazines, radio, television, and now the Internet.

3.5.4.2. Personal communication

In personal communication we can communicate only with one person at a time. Postal and telegraph services, telephones, e-mails, etc are personal means of communication.

Wireless telephonic communications through cellular phones have become very popular today. Equally, satellites help in faster communication about natural happenings, resources, and disaster warnings. Internet not only provides us with worldwide information and interaction but has also made our lives more comfortable.

Strong, reliable communication and transportation systems play a major role in the economic development of settlements. In areas where both communication networks and transportation systems are efficiently integrated, the ability to swiftly communicate, move people, and transport goods provides a strong base for the growth of trade and hence is a crucial factor in developing a stronger economy. By contrast, if settlements do not have strong communication and transportation networks, trade and the economy are less robust.

SUMMARY

It's the basic human nature that despite varying interests, people tend to live together. Humans due to the settlement, transport, and communication are regarded as the most social creatures on Earth. Early man was solely dependent on nature for his basic needs of food, shelter and clothing, but as the time paced humans developed their own system of shelter and living. The dominant economic group always occupied the key part of territory and allowed other, non-dominant economic groups of men and women; to settle on land given to them order to carry out their socio-economic activities within its organizational framework. Thus territory formation was the first step in the process of setting at lower level. Due to this there has been a strong link between settlement pattern and economic activity.

CONCLUSION

Economic development and growth are influenced by four board factors: human resources, physical capital, natural resources and technology. Settlements that recognize the importance of the four factors that affect economic growth will have higher growth rates and improved standards of living for their people. Technological innovation and more education for workers will improve economic output which leads to a better living environment for everyone. Increases in labor productivity are much easier to achieve when investments are made on better equipment that require less physical work from the labor force.

MODULE 3: RURAL, URBAN LAND USE AND ENVIRONMENTAL QUALITY

MODULE 3 UNIT 1: FUNCTIONS OF SETTLEMENTS

CONTENTS

INTRODUCTION

Understanding the spatial point pattern of human settlements and their geographical associations are important for understanding the drivers of land use and land cover change and the relationship between environmental and ecological processes on one hand and cultures and lifestyles on the other. Consequently, human settlement acts as the most fundamental link between people and Earth, and reflects the interaction of people with the surrounding environment. Settlement locations are determined by local amenities, economic factors, communications, and are always subject to food availability and production capacity. They are thus influenced to a large extent by topography, water accessibility, and transportation proximity. As a result, the locations of human settlements are unevenly distributed across various spatial scales. Analyzing the spatial patterns of settlements can contribute to greater understanding of land use changes, ecological processes, cultures and lifestyles, etc. The spatial pattern of human settlements is influenced by landscape heterogeneity and natural resource availability, with river networks playing a central role in enabling access and mobility.

2.0 OBJECTIVES

- Explain the patterns of settlement
- Describe and explain the factors which may influence the sites, growth and function of settlements

- Give reasons for the hierarchy of settlements and services
- Describe and give reasons for the characteristics of, and changes in, land use in urban areas
- Explain the problems of urban areas, their causes and possible solutions
- Identify and suggest reasons for rapid urban growth
- Describe the impacts of urban growth on both rural and urban areas, along with possible solutions to reduce the negative impacts

3.0 MAIN CONTENT

3.1. EKISTICS

We cannot acquire proper knowledge about our villages, towns and cities unless we manage to see the whole range of the man-made systems within which we live, from the most primitive to the most developed ones - that is, the whole range of human settlements. This science, termed Ekistics, takes into consideration the principles man takes into account when building his settlements, as well as the evolution of human settlements through history in terms of size and quality.

The primary aim of studying human settlement is to acquaint ourselves with the spatial land structural characteristics of human settlements under varied environmental conditions.

Ekistics is the science of human settlements. Human settlements can be studied systematically. Study of Human settlements will certainly help to create the cities of the future.

Ekistics deals with;

(1) The principles man takes into account when building his settlements and

(2) The evolution of human settlements through history in terms of size and quality.

Human settlements have a very wide range from the most primitive to the most developed ones.

There are five elements concerned with human settlements these are; Nature, Man Society, Shells (Buildings) and Networks

There are natural social and manmade elements which deal with the economic, social, political, technological and cultural perspectives of settlements in a region.

DEVELOPING FUNCTION

Territory formation is the initial stage was not usurpation of a region but the occupation of virtually virgin or thinly populated land by a group of people on a small scale. Such an area had enough scope for expansion of settlement and development of socio-economic and political institution with a view to ensuring peaceful existence and defence.

During the course of land occupancy and actual settling process, emotional and historical ties developed among the inhabitants, which tended to bind them to live together in a territory. Such a territorial occupation required autonomy for the occupants to function as a viable unit. Many cultural institutions such as shrines, market, fairs and places associated with gods and godlings came up in the course of the settling process and these made the inhabitants feel that some places were vital for, the wellbeing of the group and must be defended. The occupied land, the shrine, the family burial ground and sites of local festivals also generated a sense of belonging to the territory among the settler which was shared by the non-corporate group with those of the corporate political group. As such, the territory becomes a complex symbol of possessiveness, means of sustenance and wellbeing and security and culture evolved over a period of time.

What are the functions of a settlement?

At the time of original occupancy there was no fixed territory system. However, later, these territories developed as clan-based republics headed by their chief. As time progressed these territories began to evolve into complex entities and began to specialize in many functions by which they came to be known by.

The functions of a settlement are the activities that take place there. Settlements typically have a number of functions but one is often more important than the others. Settlement functions can be grouped into a number of categories, such as residential, recreational, retail, government, entertainment and industrial.

When settlements first formed, they often had one main function. These functions included:

- port – This was the original function of settlements such as Liverpool and Hull. Both are still ports but the importance of the port has reduced and they are now multifunctional settlements.
- market town – Originally, Watford was a market town. The market continues today but the area is now a multifunctional centre.
- resort – Coastal locations such as Blackpool, Southport and Scarborough benefit from tourism, their main function is as a coastal resort.
- Natural resources in the area led to Sheffield developing as an important centre for iron and steel production. Although the iron and steel industry has declined over time the city is now multifunctional.

- Many settlements around the world have found that their functions have had to change over time. One such example is that of small farming villages finding that their residents are moving out to find jobs in the cities.
- This leaves the village empty, apart from the older population. The village then may become a retirement centre, or commuters may move in and it could become a commuter village. Two good examples of the changing functions of a settlement can be seen in Benidorm (Spain) and the South Wales mining towns.

The spatial distribution of populations and settlements across a country and their interconnectivity and accessibility from urban areas are important for delivering healthcare, distributing resources and economic development. However, existing spatially explicit population data across Africa are generally based on outdated, low resolution input demographic data, and provide insufficient detail to quantify rural settlement patterns and, thus, accurately measure population concentration and accessibility.

SUMMARY

Historically, humans have followed river networks during migrations in the early phases of settlement and have preferentially built settlements close to rivers, for the purpose of navigation, water supply, and trade. Over time, these established settlements gradually developed into towns and cities that attracted more people and even grew into megacities with unprecedented population size with accelerating urbanization. Quantitative regularities from empirical studies, including city size distribution and universal urban scaling theory have improved our understanding of urban growth dynamics and social organization and also the environmental impact of urbanization. However, how such striking regularities are reflected in spatial patterns embedded within river networks remains elusive.

MODULE 3 UNIT 2: RURAL LAND USE

CONTENTS

1.0 INTRODUCTION

we live in a transitional era and often we become confused about the nature and extent of human settlements, confusing them with their physical structure ("the built-up area is the city") or their institutional frame ("the municipality is the city"). All settlements perform certain useful functions to justify their existence. Most of them have several functions. London, a city of over nine million people has several functions. It is an administrative centre (being capital of the United Kingdom), likewise Abuja in Nigeria. It is also a port (with highly specialized docks and wharves), a financial centre (the Bank of England is the central bank of the Sterling Area), and industrial centre (highly sophisticated luxury goods are made, a cultural centre (with the University of London, art galleries, museums and theatres).

2.0 OBJECTIVES

The students should be familiar with rural land use
Understand the different types of rural land uses
The importance of rural development

3.0 MAIN CONTENT

3.1. RURAL SETTLEMENTS

Historical settlements were rural as the populations were mainly dependent on fishing and gathering fruits. Shelter was mainly basic and in form of caves, tents made from animal skin, huts made out of woods, leaves and grass.
The development of farming brought with it the need for permanent settlement. The small nucleated settlements of hunters and gatherers became dispersed settlements as farmers needed more rooms for field and other farming operations.
Rural settlements, especially communal lands tend to have linear settlements as their predominant pattern. Rural settlements are those in which the population is mainly engaged in agricultural activity. The type, shape and pattern of rural settlements depend on the type of agricultural practices. Rural settlements are generally of a permanent kind because the land has to be tended over a period of time.

In villages, the population size is quite small and the way of life is simple. Since ancient times, be it a temporary settlement of shifting cultivators, nomadic hunters and gatherers or more-settled, permanent agricultural villages, the settlements are highly dependent on few factors.

3.3. Factors that brought about Sites favourable for rural settlements dwellings

i. Water Supply:

Water is considered the elixir of life. Humans are largely dependent on water for life, thus, the supply of water has been a strong factor that determines the location of settlements. People are willing to face other adverse conditions in order to fulfill their need for water, for example, on islands and low-lying swampy areas.

Water is required not only for drinking, cooking and washing, but also for economically important activities such as irrigation, transport, etc. Water also forms a kind of natural defence to these settlements. Such sites are mainly along riverbanks. However, in water scarce areas, water resources deserts, springs and wells serve as the main sources of water.

ii. Land:

Land, that is suitable for agriculture, is an important factor. Since rural settlements are predominantly agricultural in nature, level plains and fertile lands needed for traditional crops are highly preferred.

iii. Dry Land:

Land, not threatened by floods, is usually chosen as a site for settlements. Thus, high lying areas that provided water while being relatively dry and free from floods are chosen. Such areas include outer bends of meanders, river terraces or levees, and foothills. In some parts of the world like Malaysia and Indonesia, houses are built on stilts to get a protection from floods and also from animals and insects. In equatorial countries, such houses are also found to be much cooler.

iv. Housing:

Availability of materials to build houses is another factor that influences the development of a settlement. For example, easy availability of materials such as wood from forests, stone from surrounding rocks, mud bricks and ice blocks, etc., serve the purpose of housing.

The type of construction of the houses is in accordance with the climatic conditions of the area. In northern hemisphere, the south-facing slopes of mountainous areas facing sunlight are chosen; whereas in southern hemisphere, it is the north-facing slopes.

Dwellings are also built in a fashion to prevent heavy winds, unhealthy mists, frosts, waves and tides.

v. Defence:
In the past, strategic positions like hills, islands, etc., were chosen to establish settlements in order to cope with the high political instability and hostility among ethnic clans, or tribes. The examples of this can be the sites on Inselbergs (Nigeria) and in places close to royal palaces as were chosen for protection and help during the times of emergency.

vi. Planned Settlements:
Planned settlements need food, water and shelter as pre-conditions. Settlements are reorganized or restructured according to plans of governments or landlords, in order to facilitate agricultural production. Mostly, it is the spreading of settlement into new areas that needed planning. Such planned settlements are seen in the US and Canada, which followed a gridiron pattern.

Types of Rural Settlement Patterns:
The pattern of rural settlements is influenced by the physical environment and socio-cultural factors like caste, religion and functional needs of people.

3.4 The different types of rural settlement patterns depending on their shape are as follows:
a. Rectangular Pattern:
This is the most common pattern observed in rural settlements. Rectangular settlements are developed over flat, fertile, alluvial plains and wide valleys. The streets in rectangular settlements are straight and at right angles to each other.

b. Linear Pattern:
The houses are aligned along the sides of a road, railway line, river, canal or valley. The physical restrictions associated with these sites give rise to the linear pattern.

c. Circular and Semi-circular Pattern:
Settlements along seacoasts, around lakes, over mountain-tops and along meandering rivers, develop circular or semi-circular pattern

d. Star-shaped Pattern:
At places where roads converge, radial or star-shaped settlements develop. The new parts of settlement grow along the roads in all directions.

e. Triangular Pattern:
Points, such as meeting place of rivers give rise to a triangular pattern of settlements.

3.5 Based on the population, we have different sizes of rural settlements.
i. Isolated Settlement:
In extensive rural areas, with very less population, there are isolated individual buildings or group of buildings housing one family. Such isolated settlements are located generally on extensive farms, owned by a single owner. These farms are widely scattered, and every farmer usually builds his farmhouse on his own farm. The example of isolated settlement can be vast ranches in the US, Canada or Australia. Isolated settlements can be spotted as widely dispersed dots on the landscape.

ii. Hamlets:
These are a small group of dwellings. These dwellings may be in the form of buildings or farmhouses. Hamlets are commonly found in sparsely populated areas, for example, the Pennines of northern England. A hamlet normally consists of few houses with a post office or church that serves the hamlet and a few farms or houses that lie nearby. Hamlet is only slightly bigger than an isolated settlement and covers a larger area.

iii. Village:
This is the most common type of rural settlements. It consists of houses, farms and public buildings like a village hall, temple and few shops. A village is, thus, bigger in size and has greater population than the other kinds of rural settlements. The size of a village may vary depending on other factors.

Population size is one such main factor. The larger the population size, greater will be the number of houses and area covered by the village. The population size, in turn, depends on the nature of land. When the population size becomes more than the capacity of land, a new village is formed. Planned villages are of a fixed size with fixed population, as seen in Malaysian oil and rubber plantations.

3.6 Other Forms of Rural Settlement Patterns:
i. ‘Shapeless cluster’ or agglomerate with streets not forming an integral part of design. These may be again divided into massive and dispersed types.

ii. ‘Linear cluster’ or assemblage with a regular open space or straight street provided between parallel rows of houses.

iii. ‘Square or rectangular cluster’ or agglomerate with straight streets running parallel or at right angles to one another.

Many factors influence the origin and character of a rural settlement. Wherever possible, these factors should be considered while classifying the settlement patterns. Let us now deal in detail with the above-mentioned village settlement patterns.

i. Shapeless Clusters:
In such type of villages, one can notice a tortuous or irregular road, which is not a part of the original design but emerged as a result of local requirements and convenience of the village people. Such shapeless clusters are enclosed with stonewall or wooden palisade, which is meant for the purpose of defence. If a cluster lies on the top of a narrow ridge of a mountainous area, such palisade or stonewall may take an elongated form. Linear clusters may also grow as the population increases in the village.

Parallel streets and roads set at right angles may be added to the existing streets that may eventually form a square, which may appear from a distance as a shapeless cluster. The presence of open streets as an integral part of the design and occurrence of simpler linear forms in the same neighborhood, when the settlement is of small size, would help us in regarding the square genetically related to linear and unrelated to massive cluster, which may by accident approximate to a square.

ii. Linear Clusters:
Linear settlement patterns consist of open space or straight streets provided between the parallel rows of houses.

iii. Square or Rectangular Clusters:
These types of clusters are formed with straight streets running parallel or at right angles to one another. Such square clusters also result in the development of linear clusters.

iv. Migratory Agricultural Villages:
In these villages, people live in fixed abodes only for a few months.

v. Semi-Permanent Agricultural Villages:
People reside in such villages for a few years and then migrate to other places due to the loss of fertility of the soil or due to soil erosion. These villages are again classified into nucleated and dispersed. In nucleated villages, the farmers inhabit in a single village site, due to which they develop a compact style of life; whereas in dispersed

villages, the farmers reside separately in their respective farms. The social life of the inhabitants of these villages assumes a different form due to their separate habitats.

vi. Permanent Agricultural Villages:

In permanent agricultural villages, villagers are settled and live in the same village for generations and even for centuries. These villages are also classified on the basis of social differentiation, mobility and land ownership pattern.

3.7 QUALITY OF RURAL LIFE

Rural human settlement is a significant indicator of the living standards of rural residents, and its improvement can contribute to promoting the positive interaction between inhabited environment and the social, economic, and resource environment in the countryside. Rural accessibility remains a priority for poverty reduction and economic development in Africa. Contemporary, detailed and regularly updated information on the spatial distribution of populations and settlements across a country and their interconnectivity and accessibility from urban areas are important for understanding a variety of social, economic, and political issues, for planning interventions and providing policy recommendations.

Improving the accessibility of rural populations though transport system development is an important priority for achieving many of the Millennium Development Goal (MDG) targets, including

(i) eradicating extreme poverty and hunger through improving access to inputs and markets,

(ii) (ii) achieving universal primary education and gender equality through eliminating time constraints for all children to participate in education

(iii) improving child health and maternal mortality through providing an affordable access to health facilities for all households, and

(iv) Building a global partnership for development through reducing transport costs to access global markets. Accessibility is a notion that is still rarely measured at a fine resolution, even if it is widely recognized as a fundamental indicator of economic potential. Traditionally, accessibility measures are either aggregated nationally or by administrative unit or point-based using individual-level data. With advances in GIS however, better accessibility measures have been developed such as friction surfaces that allows the production of largescale gridded accessibility maps.

Geography plays a significant role in the development process. Three spatial features influence the economic development of a region: the density (e.g., agglomeration, scale economies), the distance (e.g., spatial mobility and access) and division (e.g. the spatial integration of economies). Improving access to people and markets is a key driver for development and plays an important role in poverty reduction. Development among rural populations depends on access to markets for buying and selling goods, to water and fuel, and to various social and economic services such as education, healthcare or banking and credit. The lack of a reliable transport system forces rural populations to spend a significant amount of time in travelling to meet basic needs and increases the transport costs incurred to access these services. These factors often mean that isolation is seen as the main contributor to poverty according to the poor people themselves. The proximity of a major settlement provides business for isolated populations, and connectivity with international and regional markets creates economic opportunities

3.8 Rural-urban linkages

Rural-urban linkages in many settlements are hampered in part by deficient transport networks, poor electricity, and limited or non-existent coverage of information and communications technology.

Since urban and rural development are interdependent, improved infrastructure can be instrumental in increasing rural productivity and facilitating access to markets; and in the process, promote economic integration of urban and rural areas as a basis for achieving inclusive growth and shared prosperity in both urban and rural areas.

This has been witnessed in the Asia-Pacific region where improvements in transport and communication have brought urban and rural areas much closer together.

Where there is often a mismatch between the infrastructure requirements of fast-growing settlements and the ability to provide the requisite financial resources, cuts in infrastructure spending will exacerbate the problem of livability and have leave settlements in a state of dilapidation through the proliferation of slums and informal settlements, unsanitary environmental conditions, inadequate water and electricity supply and traffic congestion among others.

In order to avoid such a situation, settlements will need to;
Invest in infrastructure as a means of achieving inclusive growth and sustainable urbanization.

Provide infrastructure that anticipates the rapid growth and expansion of settlements Examine the context of the role that infrastructure can play in driving the prosperity of settlements.

Provision of infrastructure with respect to improved water supply, road network and information and communications technology enhance settlement growth through: increased productivity; facilitating mobility; enhancing access to health and education; improving the quality of life; guiding settlements growth; enhancing environmental sustainability; improving slum conditions and reducing poverty; as well as reducing spatial disparities.

SUMMARY

Economic and cultural factors influence modern location and siting of rural settlements. Roads, railways, canals, dams, factory point, places of tourist interests, temples, church, masque and social traditions are few things which attracted the settlers. Sometimes industrial villages are located at favorable site for industry Socio-economic factors such as land use pattern, agricultural pattern and density of population influence on compactness or dispersion of rural settlement

MODULE 3 UNIT 3: URBAN LAND USE

INTRODUCTION

Urbanization is a global phenomenon that is transforming human settlements. The shift from primarily rural to more urban societies is evident through the transformation of places, populations, economies, and the built environment. Urbanization is a process that involves simultaneous transitions and transformations across multiple dimensions, including demographic, economic, and physical changes in the landscape. Each of these dimensions presents different indicators and definitions of urbanization. Any empirical analysis of urban and rural areas, as well as human settlements, requires clear delineation of physical boundaries. However, it is not a trivial or unambiguous task to determine where a city, an urban area, or human settlement physically begins and ends.

2.0 OBJECTIVES

The students should be familiar with urban land use
Understand the different types of rural land uses
The importance of rural development

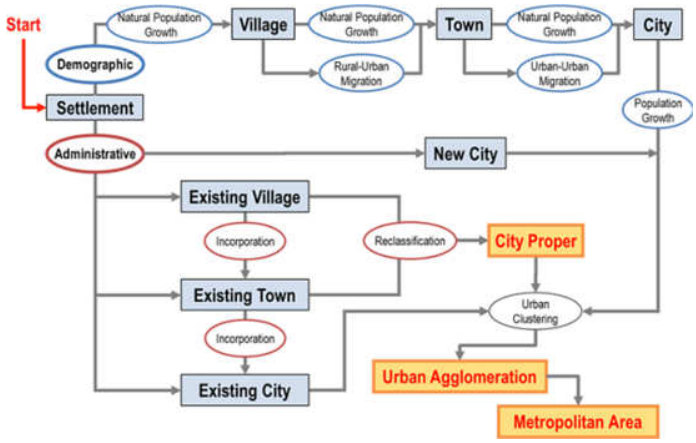
3.0 MAIN CONTENT

3.1 DETERMINANTS OF SETTLEMENT GROWTH

Settlements grow and become cities for three reasons:

1. A settlement is **reclassified** as a city
2. **Natural increase** (birth rate is higher than death rate) causing the settlement to grow into a city
3. **Migration** into a settlement makes it grow into a city

these changes however must be consistent in living standards and with expectations of an emerging framework known as settlement scaling theory that specifies relationships between human aggregation, social connectivity and material outputs.



Methodologies of classifying urban areas. Source: UNPD, 2018.

These three issues are shown in the diagram below from the United Nations Population Division. The diagram shows how settlements grow in a variety of ways.

3.2 SETTLEMENT FUNCTIONS

When settlements first started to grow, most had only one distinct function, and others developed as the settlement grew.

Most large settlements are multifunctional and perform a range of functions such as retail, education and industry.

3.2.1 Examples of functions

- Port
- Market town
- Resort
- Natural resources in the area enable settlements to develop as important centers

However, most towns have just one function and therefore we can classify towns according to their functions as:

Market Towns: Centre of goods and services. They are the collection centres for local products. E.g. London, Lagos, Accra, Kumasi, Kano, Ibadan, Onitsha

Industrial Towns: Processing of raw materials into finished products. They normally have certain advantages as industrial sites, such as proximity to power, minerals, raw materials, labour or markets, and are well served by a good network of communications. Examples include Leeds (UK) specializing in textiles, Pittsburgh in USA specializing in steel.

Commercial Towns: These are the centres of commerce and finance, where trade is the primary concern. London is the financial headquarter of the Commonwealth, New York, with business concentrated on Wall Street, is the financial centre of USA, Frankfurt (Germany).

Mining Towns: The mining towns can be located in very unusual places provided there are sufficient mineral resources. Some of the more outstanding mining towns are Newcastle (UK) and Enugu (Nigeria) (coal), Johannesburg (South Africa) (gold); Jos (Nigeria) (tin); Lubumbashi (D.R. Congo) (copper).

Administrative Towns: Headquarters of governments and capital cities or centres of local administration. They deal with the organization and administration of the nation or of a division within the country. Examples include Geneva (international capital but not the capital of Switzerland), Washington D.C. (capital of USA), Abuja (capital of Nigeria), Addis Ababa (capital of Ethiopia and OAU).

Cultural and educational Towns: These are towns in which we found world-renowned universities e.g., Oxford, Cambridge and London in UK; Heidelberg in Germany, Lund in Sweden and Leiden in the Netherlands.

Ecclesiastical Towns: These are historical and religious centres and are frequented by pilgrims from other parts of the world. They include Jerusalem (Judaism, Christianity), Mecca and Medina (Islam), Benares (Hinduism). There are smaller ones e.g. Canterbury (U.K.), Lourdes (France).

Royal Towns: These are traditional residences of monarchs, kings and queens, sultan and their consorts. They may have beautiful palaces and are visited by foreign dignitaries e.g. Copenhagen (Denmark), Kuala Lumpur (Malaysia).

Holiday Resorts, hill resorts and health resorts: Located on favourable geographical surroundings. They include coastal resorts for bathing and yachting e.g. Brighton (UK), Miami (USA), Obudu Cattle Ranch (Nigeria).

Port: These are landing places for steamers, and river crafts and usually have deep waters, warehouses and international transport arrangements, including custom offices and banking and insurance services. They include:
Seaports e.g., Lagos,
Entreports
River Port e.g., Port Harcourt, Sapele and Onitsha (Nigeria).

Three common types of boundaries include:

1. **Administrative boundaries**, which refer to the territorial or political boundaries of a city (Hartshorne, 1933; Aguilar and Ward, 2003).
2. **Functional boundaries**, which are delineated according to connections or interactions between areas, such as economic activity, per capita income, or commuting zone (Brown and Holmes, 1971; Douglass, 2000; Hidle et al., 2009).
3. **Morphological boundaries**, which are based on the form or structure of land use, land cover, or the built environment. This is the dominant approach when satellite images are used to delineate urban areas

It is necessary to note that the importance of many of these functions, however, diminish as technological advances enable people to overcome difficulties. With modern settlements, decisions about location and situation can be made by planners, but their priorities may differ from those that determined the location of a historical settlement. For example, a modern settlement does not need to be close to a river because drinking water is now piped to our homes and waterways are no longer important for transport.

3.3 THE CITY AS A UNIT OF STUDY

The initial challenge confronted when building an explanatory framework for any urban phenomena is the seemingly innocuous question of how to define a city. Such a definition must be grounded in principles of what a city is and how it operates. Louis Wirth (1938) proposed that a city is a large and permanent settlement of heterogeneous individuals living and working at high population densities. Richard Sennett (1977: 39) suggested that ‘a city is a human settlement where strangers are likely to meet’. Architectural historian Spiro Kostof (1991) observed that ‘cities are places where a certain energised crowding of people takes place’. More recently, the urban economist Edward Glaeser (2011) described cities as ‘the absence of physical space between people and companies. They are proximity, density, closeness.’ O’Sullivan (2011) defines cities as geographical areas with concentrations of individuals and activities that are higher relative to the surrounding area. These various characterisations illustrate the general principle that the essence of urbanism is not physical space per se, but frequent and intense social interactions among a diversity of individuals and organisations within a given space (Smith, 2019). Researchers confront different challenges when operationalising this view in contemporary versus archaeological contexts.

3.4 CONTEMPORARY CITIES

Operationalising a view of cities as spatially embedded social networks requires the self-consistent identification of spatial units that capture their relevant social and

economic aspects. Owing to the mobility of urban dwellers, this task is far from trivial, even when large volumes of data are available. Measures of density and interaction are typically used, but each has its associated problems. Measuring population density pre-supposes a relevant physical space within which people are counted. Such spaces can be defined using residential densities, but because of commuting the resulting units may not capture actual patterns of daily interaction – where people work, shop and socialise – that are at the core of the city as a social entity. And it is even more difficult to directly observe and measure the totality of social and economic interactions which generate and define urban life. We emphasise two observations that facilitate the definition of cities as integrated socio-economic units. First, movement entails costs: social interactions in space have, throughout history, involved travel, which carries monetary, energy and time costs. Second, human effort is bounded – for any given transportation technology, humans can only move so much per unit time and spend so much time in transit. Together, these two assumptions justify drawing the boundaries of urban areas as containing the space around built-up infrastructure (homes, roads, workplaces, shops), which can be traversed within about a day's movement effort (Marchetti, 1994). The prevalent interpretation of urban areas, or functional cities, in contemporary urban studies is thus of a spatial object whose outlines contain daily flows of people, goods and information within one or more adjacent residential centres (Pumain, 2000). How much distance can be covered in a day, and at what energy and monetary cost, is strongly dictated by available technologies and infrastructure and their local implementations.

This perspective leads to a variety of ways whereby one might delineate a functional city as an entity bounded by density and movement. Arguably the most consistent definition is the Metropolitan Statistical Area (MSA), developed by the US Census Bureau in the 1960s and updated annually. An MSA consists of a core county or counties in which lies an incorporated city (a politico-administrative entity) with a population of at least 50,000 people, plus adjacent counties having a high degree of social and economic integration with the core counties as measured through commuting ties.

Essentially, MSAs are unified labour markets revealed by daily commuting flows. These flows are interpreted as reflecting the frequent exchange of goods, labour and information, which in turn is a proxy for intense socio-economic interaction (Glaeser et al., 1995). Because of its unique socio-economic relevance, the concept of the metropolitan area has been more recently adopted by the OECD, the EU and by various other major national statistical offices including those of China, Brazil, South Africa, Mexico, Chile and Colombia. Some authors have questioned the emergent global consensus around metropolitan area definitions, expressing concerns that the documented empirical characteristics of cities may be unduly influenced – or even

determined – by the choice of spatial unit of analysis. This issue is often referred to as the Modifiable Areal Unit Problem (MAUP): '. the areal units (zonal objects) used in many geographical studies are arbitrary, modifiable, and subject to the whims and fancies of whoever is doing, or did, the aggregating' .It is of course true that different spatial units will have different analytical consequences. But this only reinforces how essential it is that the chosen spatial units encapsulate the phenomenon of interest, which in the case of a city is a network of social interaction embedded in space. The MSA definition does this, whereas alternative urban spatial units, such as areas defined by local density thresholds or contiguous built areas, need not. Still, a fundamental issue with regard to the definition of contemporary cities is the complex relationship between built space and daily patterns of social mixing. Below, we show that this issue is much less severe for pre-industrial settlements.

3.5 ARCHAEOLOGICAL CITIES AND SETTLEMENTS

Archaeologists conduct fieldwork to locate and study artefacts (objects made or used by humans) and features (fixed constructions) that are the physical remains of past human behaviour. Archaeological 'sites' are spatial concentrations of such artefacts and features, ranging in scale from small artefact scatters to large expanses of numerous features. The archaeological concept of the settlement has been codified as the physical locale or cluster of locales where the members of a community lived, ensured their subsistence, and pursued their social functions in a delineable time period' (Chang, 1968: 3). Archaeologists have subsequently linked the settlement concept to the notion of the place-based community: a group of people who live in close proximity within a geographically limited area, who have faceto-face interaction on a regular basis, and who share access to resources in their local sustaining area (Murdock, 1949; Varien, 1999). Ancient settlements are thus locations where human interactions were concentrated in space. While the most detailed information about individual sites comes from excavation, surface remains and, increasingly, remote sensing and geophysical prospection provide sufficient evidence for studying demography, wealth and other aggregate properties (Drennan et al., 2015; El-Qady and Metawaly, 2018; Johnson and Millett, 2012). The identification of settlement extent is crucial for studying how humans enact social processes in physical space. In settings where current ground-cover reveals ancient house remains, but not associated artefacts – such as Classic-period Maya sites – archaeologists draw site boundaries based on the distribution of house remains, using conventions such as an empty zone of at least 100 m to mark settlement boundaries (Hutson et al., 2008). More commonly, house remains are buried, but surface artefacts become visible when brought to the ground surface by ploughing and other modern disturbances. In these situations, site boundaries are identified from the spatial distribution of potsherds and other non-perishable artefacts deposited by human activity

3.6CONCEPTUALIZING THE PROSPERITY OF CITIES

Prosperity implies success, wealth, thriving conditions, wellbeing or good fortune. When applied to settlements, a key question that arises is: what are the essential conditions and elements that are required for settlements to thrive, or for an settlements to be described as successful, or for the wellbeing of its citizens? Put differently, what are the manifestations or outcomes of a prosperous settlements? Taking a critical look at this question, several elements come to mind. First, a prosperous settlement should be productive and have an economy capable of contributing to growth, generating income, and providing employment in order to allow its citizens to earn a decent income and to enjoy a certain standard of living in order meet their various needs.

Urban areas by virtue of their unique characteristics are crucial for national development. Most of a country's wealth is created in its cities, hence the maxim that: cities are the engines of economic growth and development. Cities account for about 80% of global GDP (World Bank, 2015). Creating and nurturing employment can play a major role in resolving the multidimensional problems confronting cities, and unemployment is a major concern particularly as urbanization intensifies, requiring the need to generate sufficient economic growth to provide jobs for the rapidly growing labour force (Glaeser, 1998). Second, a prosperous city should have the necessary infrastructure, including adequate water, sanitation, power supply, roads, information and communications technology to sustain urban living and productivity.

The implication being that the prosperity of cities will depend, not only the extent to which infrastructure is adequately provided, upgraded and maintained, but also on the equality of access by urban citizens. Furthermore, the provision of adequate infrastructure can reduce the health burden suffered by low-income groups and enhance environmental quality. Third, prosperous cities should provide the necessary social services— education, health, recreation, safety and security in order to improve the quality of life of their citizens and enable them to attain their full potential by developing their intellectual capacity and ability to lead full, productive, healthy, and fulfilling lives. Quality of life can be viewed from the perceptive of access to public spaces and enhanced safety and security. When a city invests in public spaces it is promoting collective values, community cohesion, resilience, and civic identity. Fourth, a prosperous city should be equitable and socially inclusive, guaranteeing equality of access and outcome of urban opportunities. Functional and accessible infrastructure can bridge urban inequality and alleviate poverty. A prosperous city should seek to enhance gender equality, protect the rights of minority and vulnerable

groups, and ensure civic participation by all in the social, political and cultural spheres. The failure of cities to fully integrate excluded groups into their decision-making process creates and reinforces inequality and exclusion. With few exceptions, income inequality across the world has been increasing.

Closely associated with income inequality are key exclusionary factors which pertain to unequal access to employment, education, healthcare and basic infrastructure. The benefits associated with prosperous cities should be equitably distributed. The search for equity is not only fundamental to poverty reduction and inclusion, it is also underpins progress and development. Finally, the process by which cities create and distribute prosperity should not destroy the environment, but should seek to protect the environment and contribute to the goals of sustainable urbanization. Prosperity cities and environmental sustainability should be mutually reinforcing. Environmentally sustainable cities are able to strike a balance between economic growth and the environment, and facilitate prosperity and resilience in the process. Environmental sustainability and its long-term relationship with the prosperity of cities are crucial. This is due to the close dependence of urban areas on environmental resources such as water, food forestry, building materials, open spaces etc. A key feature of environmental sustainability is that it limits the consumption of nonrenewable resources and encourages low carbon investment. Based on the foregoing, the following five dimensions of a prosperous city can be identified:
Productivity;
Infrastructure development;
Quality of life;
Equity and social inclusion; and
Environmental sustainability

The spokes provide the basis for defining what constitutes a prosperous city. In most cases, the spokes interact and influence each other through various policy-driven linkages along the periphery or outer rim. For instance, as a city develops its infrastructure, it will also enhance productivity and economic growth, which in turn will lead to improved standards of living. Similarly, when a city pursues pro-poor and egalitarian policies, this will also improve the quality of life and productivity, as well as enhance environmental sustainability. Interactions between the spokes can also occur at the centre of the wheel, where they are more policy determined. In an ideal situation, these five domains of prosperity should be interrelated. However, these linkages do not occur automatically. The interrelatedness of the five dimensions of prosperity is in part facilitated by policy, planning and efficient institutions. This in part involves prioritization of actions, selection of interventions through appropriate

decisions, and monitoring activities. This strategic synchronization of actions contributes to improving the long-term economic, social and environmental health of the city.

SUMMARY

On the most basic level, the interaction of human settlements on the environment is that they extract non-renewable natural resources on the one hand and on the other, produce waste products and pollution that has to be absorbed by the natural environment

MODULE 3 UNIT 4: *RURAL, URBAN LAND USE AND ENVIRONMENTAL QUALITY*

INTRODUCTION

Settlement is the occupation of land by humans, typically referring to patterns of residential use, from dispersed to concentrated, along a continuum from rural to village to suburb to city. The term may also include infrastructure and commercial land-use patterns. Types of settlement include urbanization, suburbanization, rural agriculture, and rural subdivision. Settlement often includes simplification of the landscape; modification of disturbance patterns; changes in soil and water quantity and quality; and altered movement of nutrients, organisms, and other elements of ecological systems. Changes through settlement can be dramatic, such as paving over land to construct a shopping mall and parking lots, or less drastic, such as fragmenting the landscape by subdividing agricultural lands.

2.0 OBJECTIVES

The students should be familiar with rural, urban land use and environmental quality
Define environmental quality
Understand what environmental quality is all about
The importance of rural development

3.0 MAIN CONTENT

3.1 LAND USE

While human activities like farming result in land transformation over great spatial extent, few alterations of the land surface are as profound as human settlement. Globally, only a relatively small amount of land conversion takes place through urbanization and suburbanization. However, the increase in human population, especially in settlements, is gaining momentum in both the developed and developing countries and worldwide.

By 1900, only 14% of the world‘s population lived in urban communities, however 38% of the global population was urban by 1975, and 45% was by 1995; that figure is projected to increase to 61% by 2025 by the World Resource Institute (WRI 1997). In the decade from 1982 to 1992, 2.1 million ha of forest land, 1.5 x 106 ha of cultivated cropland, 0.9 million ha of pasture land, and 0.8 million ha of rangeland came under urban uses in the United States (WRI 1997). The same pattern of urbanization occurs in the developing world as well. In many developing countries, urban-population

growth rates outstripped rural-population growth rates between 1990 and 1995 (WRI 1997).

Rapid urbanization, the concentration of the urban population in large cities, the sprawl of cities into wider geographical areas and the rapid growth of mega-cities are among the most significant transformations of human settlements. It was estimated that by the year 2005 the majority of the world's population were living in urban areas, and approximately 40 per cent of them were children. Urban areas strongly influence the world of the twenty-first century, and urban and rural populations are increasingly interdependent for their economic, environmental and social well-being. Among the economic and social factors influencing this process are:

- ✓ population growth and voluntary and involuntary migration,
- ✓ real and perceived employment opportunities,
- ✓ cultural expectations,
- ✓ changing consumption and production patterns and
- ✓ serious imbalances and disparities among regions.

3.2 FACTORS THAT IMPACT ON LAND USE

The impacts of human population growth might be even greater than they are today if the population were dispersed rather than concentrated in cities. The major anthropogenic causes of change in land cover and land use include population and associated infrastructure; economic factors, such as prices and input costs; technological capacity; political systems, institutions, and policies; and socio-cultural factors, such as attitudes, preferences, and values. Human population growth can be considered an ultimate cause for many land-use changes. However, population expansion is affected by many factors, such as political dynamics and policy decisions that influence local and regional trends in suburbanization, urbanization, and colonization. Moreover, local demography and variability in per capita resource consumption can modify the effects of population. In Brazil, for example, one of the highest rates of deforestation currently occurs in the state of Rondônia, where a high rate of land-cover changes results from road establishment and paving and government policies that have allowed colonists to immigrate, clearing forests so farms can be established. The rate of natural-resource exploitation also depends on technological advances in resource extraction and enhancement such as logging, mining, hydroelectric power, fertilizers, pesticides, and irrigation. The relative importance of these factors varies with the situation and the spatial scale of analysis.

3.3 GROWTH MODELS OF CITIES

3.3.1 Central Place Theory

Origin of the Theory

The theory was first developed by the German geographer Walter Christaller in 1933 after he began to recognize the economic relationships between cities and their hinterlands (areas farther away). He mainly tested the theory in southern Germany and came to the conclusion that people gather together in cities to share goods and ideas and that communities—or central places—exist for purely economic reasons.

Before testing his theory, however, Christaller had to first define the central place. In keeping with his economic focus, he decided that the central place exists primarily to provide goods and services to its surrounding population. The city is, in essence, a distribution center.

Christaller's Assumptions

To focus on the economic aspects of his theory, Christaller had to create a set of assumptions. He decided that the countryside in the areas he was studying would be flat, so no barriers would exist to impede people's movement across it. In addition, two assumptions were made about human behavior:

1. Humans will always purchase goods from the closest place that offers them.
2. Whenever the demand for a certain good is high, it will be offered in close proximity to the population. When demand drops, so too does the availability of the good.
3. **An even (flat) terrain** – A hilly and uneven terrain poses difficulty in development thus a flat area which promotes the growth of the town
4. **Evenly distributed population** – residents are not concentrated at one particular place and no preference exists for a particular town
5. **Evenly distributed resources** – no place has an advantage of resources, all placed will compete under perfect market conditions
6. **Similar purchasing power** – along with the population and resources, wealth is also fairly distributed. Because of this people have similar purchasing power
7. **Preference for the nearest market** – people will buy products from the nearest market and avoid the long commute. This keeps price constant as per other assumptions
8. **Equal transportation cost** (proportional to distance) – the cost incurred in transporting of goods is equal for all and is proportional to the distance

9. **Perfect competition** – price is decided on basis of demand and supply. People will buy at the lowest price which market has to offer; no seller has an advantage over another seller.

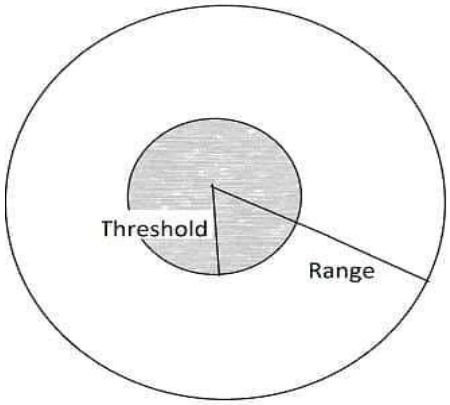
These assumptions when combined results in place offering different services. In these places in which **people enjoy the perfect market and purchase from the nearest place** to save on money and time. Different services locate themselves on the basis of **the threshold population**. The minimum number of people required to sustain that service/activity. In addition to this, there is no preference for a particular shop. All people have access to equal resources and do not enjoy any advantage over its competitor. The demand for goods consumed & used on daily basis will be used more and vice versa.

1. A Central Place is a settlement which provides one or more services for the population living around it.
2. Simple basic services (e.g. grocery stores) are said to be of low order. Specialized services (e.g. universities) are said to be of high order.
3. Having a high order service implies there are low order services around it, but not vice versa.
4. Settlements which provide low order services are said to be low order settlements.
5. Settlements that provide high order services are said to be high order settlements.
6. The sphere of influence is the area under the influence of the Central Place.

3.3.2. Two main concepts of Central Place Theory

Central Place Theory is based on 2 fundamental concepts which are “Threshold” and “Range”

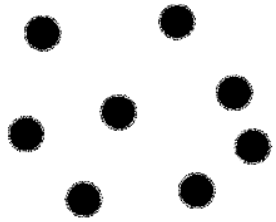
Threshold – The **minimum population** needed to make a service viable at a particular place. If this size is not reached then a particular activity will not start or it will be closed down.



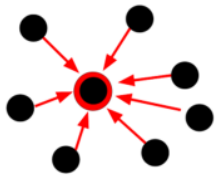
Range – This is the **maximum distance a consumer is willing to travel** to purchase good or avail a service, beyond this distance consumer will not travel as the distance traveled for good/service will outweigh the benefit.

3.3.3 Concepts of Central Place Theory

Imagine a location in which settlements are close together, like in the diagram below. Some functions of settlements are too specialised to happen in each settlement, and so will only happen in one of the settlements. These functions are 'high order' functions – things like having the main government buildings, or the headquarters of banks, or the main shopping district selling specialized products for the entire area. This means that one settlement will grow bigger than the others. Which settlement would be most likely to grow?

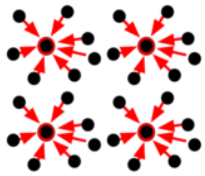


In the real world, the answer would depend on lots of factors – which one has the best water supply, the best transport links, the lowest chance of flooding and so on. But, imagine that each settlement is identical. Which would be the most likely now?

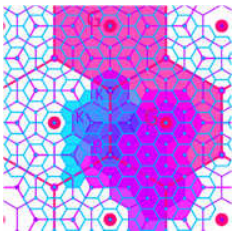


The settlement in the centre will be the largest, because it is the easiest to access from all the other settlements. This is the basic feature of 'Central Place Theory'. Now,

imagine that these are not the only settlements – in fact, there are many more settlements. They will also be arranged with central places as shown below.



In the Central Place Theory created in 1933 by Walter Christaller, there is an ever-overlapping set of central places. Christaller was a German Geographer who was studying places in the south of Germany. He identified that urban settlements can be placed into a hierarchy and that the spacing between each settlement appeared to be uniform. This is commonly shown in diagrams using a series of hexagons, as shown in the diagram below. Major settlements are represented by the large pink dots; the next largest by smaller purple dots, and even smaller settlements by blue dots.



Each settlement is separated from the other settlements in its category by the same distance, resulting in the hexagon shapes showing how each settlement is ‘central’ within the hexagon. Settlements within each hexagon of the next largest settlement will use that larger settlement to access services and markets.

This is known as the ‘market principle’. It explains why some settlements grow and others don’t. If two settlements are close together, only one of them will become the ‘central place’: the competition between the two settlements will result in one winning and becoming larger, because people from the other settlements in the area will gather towards it. The other settlement will remain small and not grow.

Christaller’s model helps to explain why some settlements grow, even without any deliberate attempt at planning.

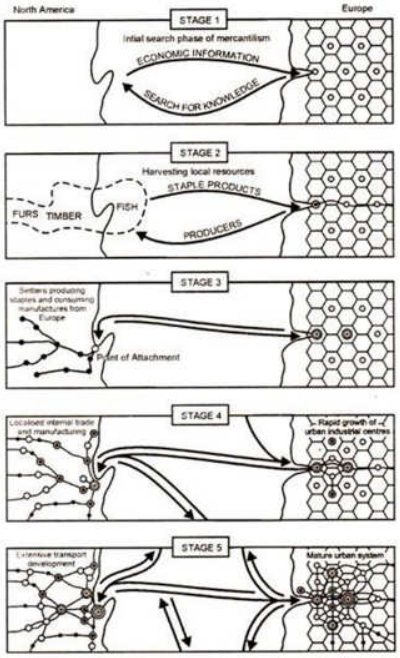
3.4 Losch’s Central Place Theory

In 1954, German economist August Losch modified Christaller's central place theory because he believed it was too rigid. He thought that Christaller's model led to patterns where the distribution of goods and the accumulation of profits were based entirely on location. He instead focused on maximizing consumer welfare and creating an ideal consumer landscape where the need to travel for any good was minimized, and profits remained relatively equal, regardless of the location where goods are sold.

3.5 Vance's Model

In 1970, James Vance published his book 'The merchant's world: the geography of wholesaling' in which he suggested how transport networks develop over time. His ideas have also been used to give a more practical – meaning less theoretical – view of why some settlements grow. He based his ideas on a series of historical events that took place between Europe and North America, starting with the earliest stages of colonisation. In his model, the settlement distribution in the eastern seaboard of the United States is dependent not on central places but on transport routes. Settlements needed to trade through coastal ports, so transport networks developed in an east-west pattern to provide easy access, which in turn allowed these settlements to grow even more.

Figure 3.6
Vance's Mercantile Model



- *Vance's 1970 'mercantile model' of transport networks, which can also be used to explain settlement patterns. Source; Raghav, n.d.*

Over time, north-south transport links were also developed, but by this point the settlement pattern was set and is maintained to this day. (Look at a map of the north-east USA, and it is clear that Boston, New York, Philadelphia and other settlements do not conform to an obvious central place pattern.)

3.6 BALANCING LAND USE

The living and working conditions in all human settlements, including regional urban centres, rural service centres, rural hamlets, rural communities, market towns and villages, must be improved, with particular emphasis on shelter, social and physical infrastructure, and services. The maintenance and the development of rural settlements require sustainable agriculture and forestry activities and improved agricultural technologies, economic diversification, and expanded employment opportunities created by encouraging appropriate and environmentally sustainable investment in industry and related economic production and service activities.

In order to mitigate the unbalanced geographical development of human settlements, and to effectively reinforce the creation of a dynamic economy, Governments at the appropriate levels should create partnerships with relevant interested parties to encourage the sustainable development and management of cities of all sizes and should create conditions that ensure that these different cities provide employment opportunities and services in the process of securing economic development, social welfare and environmental protection. They should devise strategies and support measures that address the issues relating to the movement of population which leads to extreme population concentration in some areas, pressure on fragile ecosystems such as coastal areas, and loss of population in other areas.

Depending on the context and the needs of the cities, towns and villages in each country and region, special attention should be paid to the most critical issues, such as changing production and consumption patterns; energy efficiency; sustainable resource and land-use management; poverty eradication; population and health; water supply, sanitation and waste management; disaster prevention, mitigation, preparedness and management; cultural, natural and historical heritage; environmental protection; industry; infrastructure; and basic services such as health and education facilities and services. Habitat II provides an opportunity to focus on the effect that current patterns of human settlements development will have on the ability to achieve the objectives established at recent United Nations conferences. Close attention to trends in urban development is essential to the viability of sustainable human settlements development in rural and urban areas alike.

3.7 Urbanization, Urban Environment and Land Use

Urbanization has been the dominant demographic trend, not only in the Nigeria, but also in the entire world, during the last half century. With the high pace of social and economic development in Nigeria and the resulting growth of city and town population, lack of infrastructure, congested traffic, environmental degradation and a housing shortage became the major issues faced by cities and towns in their sustainable development. Over the past half century, a great rural-to-urban population

shift has occurred and the process of urbanization (the concentration of people and activities into areas classified as urban) is set to continue well into the 21st century. Major demographic evidence has indicated that already the many areas in the country like other areas of the world are well advanced in the transition from predominantly rural to predominantly urban societies.
It is projected that some of the big countries of the region like China, Indonesia and Pakistan where current urbanization levels are below 50 per cent, will cross this figure by the next quarter of the century. There is a strong positive link between national levels of human development and
urbanization levels, while cities spearhead their countries 'economic development, transforming society through extraordinary growth in the productivity of labour and promising to liberate the masses from poverty, hunger, disease and premature death. However, the implications of rapid urban growth include increasing unemployment, lack of urban services, overburdening of existing infrastructure and lack of access to land, finance and adequate shelter, increasing violent crime and sexually transmitted diseases, and environmental degradation.

The economic opportunities cities offer compared to those offered by rural areas are the gravitational force that has attracted an inflow of residents into urban and suburban areas. However, only a fraction of immigrants have been able to find formal employment, while the rest have had to make do with occupations in the informal sector, such as begging or carrying out some sort of street activity (e.g., watching parked cars and washing windows). As a consequence, a large share of population lacks a reliable source of income and often struggles to survive in very unsafe environments characterized by degraded residences, exposure to diseases due to the lack of sanitation and public services related to environment and health (water supply, sewerage, and solid waste disposal), difficulty in accessing public support services for families and youth, and the spread of crime and violence.

3.7.1 Urban Housing Problems

The major housing problems in urban areas include:
Lack of affordability: poor people are unable to buy or rent housing in secure urban areas with an adequate provision of water, sanitation, and solid waste services. Moreover, poor people cannot afford to live in areas accessible to good transport systems. Therefore, the poor end up living in inadequate conditions, either on the periphery or in downtown urban areas.
Informality in housing ownership or rental arrangements: frequently, poor people own places without having legal titles or rent from informal landlords. The insecurity of land tenure implies that poor people are permanently at risk of eviction and other legal

problems. Informal settlements that are unregulated are often not planned and lack adequate provision of essential services and infrastructure.
Poor housing conditions: low-income people are likely to live in dilapidated housing that is often built with low-quality materials and under improper conditions. They are also likely to live in overcrowded buildings that negatively impact living conditions and the quality of life.

Inadequate public services: the inadequacy of infrastructure and utilities generate inappropriate living conditions. This problem is present both in peripheral slum areas and in downtown areas. In the peripheries, people tend to live without water or sanitation, waste collection, and appropriate transportation systems. Poor people usually crowd in old buildings that lack adequate sanitation and infrastructure services. In this case, the improvement and adjustment of existing infrastructure to deal with the higher occupation density are needed. According to a joint MIT and World Bank (2001: 1) resource book on upgrading urban communities, ―the resulting exposure to microbiological pathogens due to unsafe drinking water, inadequate sanitation, and poor waste management is one of the most serious environmental health threats in developing countries. Rapid rates of urban population growth strain the capacity of national and local governments to provide basic services. Often the resulting inability to keep pace causes human suffering, environmental damage and unsustainable patterns of development.

3.8 Challenges of Urbanization

It should be noted that urban growth has a number of positive impacts on the environment and human well-being, i.e. higher population densities man lower per capita costs of providing energy, health care, infrastructure and services. Also, urbanization has historically been associated with declining birth rates, which reduces population pressure on land and natural resources. Despite all these positive impacts, almost all major cities of the region are increasingly plagued by environmental problems. Some major aspects are as follows:

a) As a direct result of urbanization, great threat to health and safety in cities comes from water and air pollution, especially at the households and community levels. While ambient air pollution impairs the health of almost all urban residents in many cities, indoor air pollution is particularly hazardous for women and children of low-income households who are regularly exposed to higher concentrations of air pollutants from cooking and heating sources in poorly-ventilated housing. Waterborne diseases are found most commonly in low-income neighbourhoods as a result of inadequate sanitation, drainage and solid waste collection services. Health risks, especially to the poor, are also posed by pesticides and industrial effluents.

b) The productivity of many cities is adversely affected by traffic congestion and water pollution. The loss in productivity includes the total productive time wasted in traffic and the associated increase in the costs of operating and maintaining vehicles. The rising costs of treating polluted water for industrial and domestic purposes are damaging the productivity of urban economies. Fisheries are also being severely harmed by water pollution.

c) Uncollected and improperly handled solid waste can have serious health consequences. They block drainage systems and contaminate groundwater at landfill sites. In many cities, particularly those in Pacific Island countries; it is difficult to secure land for waste disposal facilities, especially onshore landfill sites. Most cities in the region are also
unable to manage the increasing amounts of hazardous wastes generated by rapid industrialization.

d) Conversions of agricultural land and forest, as well as reclaiming of wetlands, for urban uses and infrastructure, are associated with widespread removal of vegetation to support urban ecosystem and put additional pressure on nearby areas that may be even more ecologically sensitive. Groundwater overdraft has led to land subsidence and a higher frequency of flooding, particularly in the lowest-lying and poorest areas.

e) Urbanization in coastal areas often leads to the destruction of sensitive ecosystems and can also alter the hydrology of coasts and their natural features such as mangrove swamps, reefs and beaches that serve as barriers to erosion and form important habitats for species.

Urbanization does not have only local environmental impacts but also large so-called ecological footprints beyond their immediate vicinity. Intensive and extensive exploitation of natural resources to support urban economy includes excessive extraction of energy resources (including fuelwood), quarrying and excavation of sand, gravel and building materials at large scales, and over-extraction of water. These all contribute to degradation of the natural support systems and irreversible loss of critical ecosystem functions, such as the hydrological cycle, carbon cycle and biological diversity, in addition to conflicts with rural uses of such limited resources. Other effects can be felt further afield such as pollution of waterways, long-range air pollution that impact on human health as well as on vegetation and soils at a considerable distance.

The growth of large cities, particularly in developing countries, has been accompanied by an increase in urban poverty which tends to be concentrated in certain social

groups and in particular locations. Pollution especially affects the poor live at the urban periphery, where manufacturing and processing plants are built and where environmental protection is frequently weak. Environmental sensitive sites such as steep hillsides, flood plains, dry land or the most polluted sites near solid waste dumps and next to open drains and sewers are often the only places where low-income groups can live without the fear of eviction. The poorest groups thus suffer the most from the floods, landslides or other disasters that increasingly batter the cities of developing countries.

Waste generation in urban areas continues to increase world-wide in tandem with concentration of populations and increase in living standards, and has reached to unmanageable levels in many localities. High proportion of the waste could be recycled, not simply to reduce the amount of waste to be disposed of. The practice also provides an opportunity to generate income for the urban poor, to prevent environmental damages of waste dumping, and further to demonstrate less material- and energy-intensive consumption patterns. Promotion of sustainable consumption should have the far-reaching benefit of fostering domestic enterprises and pushing the production sector towards sustainable pathways. There is a need to develop an integrated approach where the public, private and community sectors work together to develop local solutions promoting sustainable waste management of material recycling.

4.0 ENVIRONMENTAL QUALITY

4.1 What do we mean by environmental quality?

When we think of "environment," the picture that often arises is one of woods, hills, seashores, meadows, and streams, with few, if any people around. That's certainly one aspect of what we mean by environment – the wild places that are left to the workings of nature, and that we enter only as visitors. But our environment also encompasses city streets, farms, factories, parks, mines, office buildings, and houses, among other things.

When we talk about environmental quality, then, we're talking about the quality of our total environment, not just the natural environment. Environmental quality is a measure of the health of that environment itself (including the plants and animals it supports), and of the effects it has on the health, comfort, and psychological state of the people that inhabit it.

In the broadest terms, our environment consists of the air, water, and land that make up the planet and the plants and animals that live on or in them. In addition, we have

to consider the built environment – the environment we create for ourselves – and how it affects our health and comfort and the health of the natural environment; the natural resources we depend upon to sustain that built environment; the recreational possibilities that the natural environment provides; and aesthetics – the role that natural beauty plays in our relationship with the natural environment.

All of these come into consideration when we examine protecting environmental quality.

4.2 Why protect environmental quality?

The reasons for protecting environmental quality span a broad range.

- **To preserve the health of the community and its members**. Clean air, water, and soil, adequate open space, abundant resources – all of these, as well as other environmental factors, ensure the health of individuals and contribute to building a healthy community.
- **To preserve community resources**. Making sure that the community's water supply, for example, and the streams, swamps, and other bodies of water that feed it, are kept clean is not just a matter of environmental quality, but one of necessity.
- **To create a more pleasant and better quality of life**. The physical attractiveness of the community and its recreational and relaxation opportunities, make life more pleasant for community residents. A pleasant environment reduces stress and encourages interaction, leading ultimately to a better quality of community life.
- **To enhance the aesthetic character of the community**. Living amidst natural and man-made beauty contributes to health and the quality of life, and also stimulates pride in and a sense of ownership of the community. It encourages people to maintain the community both physically and socially, and gives them hope.
- **To attract new, environmentally-friendly business and sustain economic health**. A community that cares for its environment is an attractive place to live and work, especially for "green" businesses (those that care about, or whose business itself is concerned with, environmental preservation).
- **To attract visitors and new residents**. Visitors, who come to settle often seek out places where environmental quality is high for their scenic and recreational value. People seeking new homes, whether for retirement or for other reasons, look for pleasant and attractive communities.
- **To preserve community history.** Protecting historic buildings or districts, and the sites of old settlements or battlefields, or preserving untouched the spot

from which the original settlers first viewed the community, can be important to community pride and to the maintenance of social memory.

- **To protect the community from environmental disaster**. These disasters could be flooding, landslides, consequences from deforestation and indiscriminate burning
- **To prevent people from taking actions they'll later regret.** If you allow building in a floodplain or on an eroded slope, sooner or later you'll be sorry.
- **To protect endangered species**. Protecting environmental quality can also protect habitat and help preserve endangered or threatened animals and plants.
- **To maintain ecosystems**. Disrupting ecosystems – the interrelated stable systems of landscape, plants, animals, resources, and climate that interact with and sustain the character of the environment in a particular place – generally leads to unforeseen (usually negative) consequences, such as global warming, erosion, and the disappearance of species.
- **To be good stewards of the planet.** Earth is, at least for the foreseeable future, the only home we have, and it is both our duty and, in our self-interest, to take as good care of its natural environment as possible. If our own species is to survive, we have to pass the planet on to our descendants in at least as good a condition as we found it.

4.3 When should you protect environmental quality?

- **When it's specifically threatened**. When the last patch of green space in town is proposed for development, when an important wetland is likely to be polluted by an industrial plant – these are times to point out the consequences of ignoring environmental concerns.
- **When there's a community development initiative**. Rather than having to react to a danger to environmental quality, this is a time to get in on the ground floor and build environmental protection into the development plan.
- **When there's a new commercial, industrial, or housing development beginning**. A developer can be convinced – through incentives and/or regulations to incorporate environmentally-friendly principles into site selection and preparation, building design and materials, and other aspects of the development.
- **When there's an environmental crisis**. When aquifers start to run dry, when global warming actually begins to show its effects, when local air quality becomes dangerous, or when torrential rains have caused the sewers to back up into the water supply, people tend to be willing to look at environmental quality issues.

- **When there's a publication or media event that calls attention to the environment**. The publication of Rachel Carson's book *The Silent Spring* in 1962 called attention to the dangers of pouring chemicals into the environment, and essentially started the modern environmental movement in the U.S.
- **When money is available**. When local, state, or federal agencies or private foundations offer funding to protect land, start environmental initiatives, or do environmental research, you may be able to realize a long-held intention or to begin a new project related to environmental quality.

4.4 Who should protect environmental quality?

The ideal answer is, of course, "everyone," but it's often not that simple. It can take a great deal of convincing when there are conflicting interests – for instance, between environmental quality and financial profit or simply making a living. With the right tools – common sense, respect for the other's position, incentives, regulations, sanctions, enforcement, etc. – you can persuade most people and groups to cooperate in maintaining the environment, at least to a certain extent.

- **Local, state, and federal officials**. There are state and federal agencies in most countries that are responsible for the protection of environmental quality. Their effectiveness depends upon their level of funding and upon the level of political support they receive from the government in power. Since most developed, and many developing, countries are quite concerned about the environment, these agencies and officials may be important allies.
- **Local and national and international environmental organizations**. Local organizations usually understand the local situation, and know what the real issues are and what tactics are likely to be effective. Larger organizations, such as the Sierra Club, Greenpeace, Friends of the Earth, or the World Wildlife Fund generally have legal departments, access to funds, and the resources to take on long battles for environmental quality.
- **Community activists**. Although it may be only one of many areas these folks are interested in, they can be strong guardians of environmental quality when the issue arises.
- **Those directly affected by environmental quality**. This category can include people with very different approaches to the environment.

    - ✓ *Those whose living depends on it.* Although loggers and commercial fishermen, for example, are sometimes seen by activists as enemies of the natural environment, they have as much stake in environmental quality as anyone. If they understand clearly why protecting the environment

protects their livelihood – keeping fish stocks healthy, for instance – they can become as concerned about environmental quality as the most avid environmentalist.

- ✓ *Those whose business is environmental quality or the study of the environment.* Wildlife biologists, botanists, and other life scientists, foresters, hydrologists (water experts), public health professionals, etc. usually care deeply about environmental quality, and are often in a position to provide valuable information about it.
- ✓ *People who use the natural environment for recreation and spiritual support*. Hunters and fishermen, birders, hikers, skiers, and others who enjoy the outdoors generally have a strong desire to preserve wilderness and to protect the quality of the natural environment.
- ✓ *Architects and environmentally conscious developers*. these folks are concerned with both the built and natural environment, and are the leaders in encouraging green building and using open space well.

- **Businesses and corporations**. Some businesses and corporations are environmentally conscious, and try to support environmental quality and to pay attention to it in their own operations. Others are induced by incentives or forced by regulation to pay attention to it. Whatever the reason, if you can make common cause with the business community, or at least parts of it, they can be strong and useful allies.
- **Anyone who is conscious of the effects of environmental quality – or the lack of it – on their lives**. With the proper education, this includes virtually everyone. Not everyone suffers from environmentally-related conditions, but everyone has to drink water, breathe air, and eat food that is raised in particular conditions. The cleaner and purer the air, water, soil, and built environment are, the more attention is paid to sustaining resources over time, the better off people dependent on them are.

4.5 How do you protect environmental quality?

Protecting environmental quality can mean:

- Acting before the fact, in order to seize a potential environmental benefit, or to prevent a real or possible threat to environmental quality (e.g., recruiting a "green" developer to develop a blighted urban site, gaining conservation easements on many acres of wild land, preventing a polluting industrial plant from being built).

- Acting in an ongoing situation, to ensure that an environmental benefit continues, or to stop something that is actually or potentially harmful to environmental quality (working to continue current funding for environmental preservation and research, for instance, or forcing a factory to stop illegal dumping of industrial waste).
- Acting after the fact, to repair environmental damage, and restore environmental quality.

SUMMARY

The quality of a community's environment affects the health and well-being of everyone in that community. Environmental quality is inseparable not only from the health of individuals, but from the availability and quality of resources, the safety of the food and water supply, and the psychological and social well-being of the community as a whole. Protecting environmental quality certainly means, in many cases, preserving open space and stopping or preventing pollution, but it also means addressing habitat reduction for plants and animals, conserving resources (including food stocks, such as fish populations), seeking alternative energy sources, practicing sustainable development and agriculture, building according to environmentally-responsible principles – in other words, paying attention to environment quality in everything we do. It also means working – through both political advocacy and direct action – for policies, laws, and regulations that take all these into account, as well as the spiritual, recreational, and aesthetic benefits of open space and wilderness. And it means continuing to maintain environmental protection and continuing to work to ensure that future generations enjoy adequate resources and a healthy environment.

MODULE 3 UNIT 5: IMPACT OF HUMAN SETTLEMENT AND DEVELOPMENT ON THE ENVIRONMENT

INTRODUCTION

Human settlements require natural resources to cover their needs for shelter, food, water, etc., which creates environmental impacts. On the most basic level, the interaction of human settlements on the environment is that they extract non-renewable natural resources on the one hand and, on the other, produce waste products and pollution that has to be absorbed by the Human settlements. As the population grows, urbanizes and consumes more, the impact of human settlements on the natural environment increases. The relationship between human settlements and the natural environment or ecological systems is complex, iterative and continually changing. The natural environment provides the basic elements which human beings need to survive such as food, water and shelter. In the process of harvesting the natural resources, human beings impact on the environment by overuse or exploitation of non-renewable resources and through the production of waste materials and pollution e.g. greenhouse gasses, ozone-depleting substances and hazardous materials. This leads to a degradation of the very environment that human beings depend on. The impact of human settlements on the environment increases with population growth, settlement expansion, economic growth and increased consumption. All indications are that the impact of human settlements on environmental resources is increasing.

2.0 OBJECTIVES

At the end of this unit, you should be able to explain the impact of human development on the environment
Explain the pros and cons that settlement has on the environment.

3.0 MAIN CONTENT

3.1 Urban Agglomeration

With the expansion of the global economy, the man has raised his capability to annex growing portions of the world to support a limited number of industries and places. Cities also have a pronounced effect on traditional rural economies and their long-standing cultural adaptation to biological diversity. Rural populations increasingly become consumers of products produced in the industrial economy, one much less sensitive to biological diversity. The rural condition has evolved into a new system of

social relations, one that does not work with biodiversity. These developments all signal that the urban condition is a major factor in any environmental future. Through this enormously distinctive presence that is urbanization, we are changing a growing range of ecological systems from the climate to species diversity and ocean purity and we are creating new environmental conditions of heat islands, desertification, and water pollution. We have entered a new phase in human ecological history. For the first time humankind is the major ecological factor on the planet, in a way it was not in the past. Massive urbanization over the last few decades has created a set of global ecological conditions never seen before. But is it urbanization per se or the particular types of urban systems and industrial processes we have instituted? That is to say, are these global ecological conditions the result of urban agglomeration and density or are they the result of the urban systems for transport, waste disposal, heating and cooling, food provision, and the industrial process through which we extract, grow, make, package, distribute, and dispose of all the foods and services we use?

The scale and the increasingly global and private character of these investments suggest that citizens, governments, NGOs, all lack the power to alter these investments patterns. The geography of economic globalization is strategic rather than all-encompassing and this is especially so when it comes to the managing, coordinating, servicing and financing of global economic operations. The fact that it is strategic is significant for a discussion about the possibilities of regulating and governing the global economy. There are sites in this strategic geography where the density of economic transactions and top-level management functions come together and represent a strategic geography of decision-making. We can see this also as a strategic geography for demanding accountability about environmental damage. It is precisely because the global economic system is characterized by enormous concentration of power in a limited number of large multinational corporations and global financial markets that makes for concentrated (rather than widely dispersed) sites for accountability and for changing investment criteria. This leaves out a whole range of less central and powerful economic factors responsible for much environmental damage, but are more likely to be controllable through national level regulatory interventions.

Because they are at the centre of the environmental future, urbanization and the city also must be understood and used as potentially containing the solutions to many of these problems. As has been much documented, cities have long been sites for innovation and for developing and instituting complex physical and organizational systems. It is within the complexity of the city that we must find the solutions to much environmental damage and the formulas for reconfiguring the socio-ecological system

that is urbanization. Cities contain the networks and information loops that may facilitate communicating, informing, and persuading households, governments, and firms to support and participate in environmentally sensitive programs and in radically transformative institution building.

Urban conditions can be conceptualized as a socio-ecological system in that it creates a whole new set of interrelations between, on the one hand, its constructed features and material practices and, on the other, various ecological systems. In the current stage, the systemic characteristics of this inter-relation are mostly in the form of environmental damage. They also entail systems of social relations that support the current configuration. Beyond adoption of practices such as waste recycling, it will take a change in this system of social relations itself to achieve greater environmental sensitivity and efficiency. For instance, a crucial issue is the massive investment around the world promoting large projects that damage the environment. Deforestation and construction of large dams are perhaps among the best-known cases.

A crucial issue raised by all the above is the question of the scales at which damage is produced and intervention or change should occur. These may in turn differ from the levels and sites for responsibility and accountability. The city is, in this regard, an enormously complex entity. Cities are multi-scalar systems where many of the environmental dynamics that concern us are constituted and in turn constitute what we call the city, and where different policy levels, from the supra- to the sub-national, get implemented. Further, specific networks of mostly global cities, also constitute a key component of the global scale and hence can be thought of as a network of sites for accountability of global economic actors.

3.2 Urban socio-spatial change

The issue of how global economic change in the last few decades has impacted on socio-spatial change in towns and cities has received much attention, along with the qualification that both local and broader processes have shaped these changes. In essence, however, planners and urban managers have found themselves confronted with new spatial forms and processes, the drivers of which often lie outside the control of local government and urban planning. The nature of spatial change in cities has been described as a shift from “uniplex” to “multiplex” ‘cities. This mean a shift from cities as relatively self-contained and focused on a central node or CBD (central business district), with radial transport systems feeding coherent community neighbourhoods, to “multiplex” cities: this emphasizes the dynamic and relational nature of cities, the complex interactions between cities and their inhabitants and their

regional and global settings, and the emergence of multi-nodal, mixed use places where movement patterns and economic linkages are complex and multi-directional. Movement patterns have become far more complex and extended, and administrative boundaries of urban areas far less meaningful in terms of defining the spatial extent of social and economic relations. The term _megalopolis ‘has been used to describe multi-city, multi-centred urban regions with a high proportion of low-density residential areas and complex networks of economic specialization to facilitate the production and consumption of sophisticated products and services.

Socio-spatial change seems to have taken place primarily in the direction of the fragmentation, separation and specialization of functions and uses in cities, with labour market polarization (and hence income inequality) reflected in major differences between wealthier and poorer areas. We can contrast up-market gentrified and suburban areas with tenement zones, ethnic enclaves and ghettos; and areas built for the advanced service and production sector, and for luxury retail and entertainment, with older areas of declining industry, sweatshops and informal businesses.
In many poorer cities, spatial forms are being driven by private-sector property developments and increased rental markets, in response to which low-income households are being pushed further out and into marginal locations. In some parts of the world, new urban(***ruralopolitan***) forms are emerging as the countryside itself begins to urbanize, as in vast stretches of rural India, Bangladesh, Pakistan, China, Indonesia, Egypt, Rwanda and many other poorer countries.

As well, large cities spread out and incorporate nearby towns leading to continuous belts of settlement and as the poor seek a foothold in the urban areas primarily on the urban edge. It is these sprawling urban peripheries, almost entirely unserviced and unregulated, that make up the bulk of informal settlement, and it is in these areas that the most urban growth is taking place. These kinds of areas are very costly to plan and service in the conventional way, given the form of settlement, and even if that capacity did exist, few could afford to pay for such services. In fact, the attractiveness of these kinds of locations for poor households is that they can avoid the costs associated with formal and regulated systems of urban land and service delivery.

Because of this, however, it is in these areas that environmental issues are particularly critical, both in terms of the natural hazards to which these settlements are exposed and the environmental damage that they cause. These urban forms do not simply indicate the failure of traditional master plans to be implemented. Rather, planning facilitates and promotes inequality and exclusion through criminalizing certain forms of informality (such as informal settlements) and sanctioning others (developer and

middle-class driven property development and speculation). Both may be in violation of the plan, but those who have access to state power will prevail.

The sustainability of the global environment and human life will not be achieved unless, among other things, human settlements in both urban and rural areas are made economically buoyant, socially vibrant and environmentally sound, with full respect for cultural, religious and natural heritage and diversity. Urban settlements hold a promise for human development and for protection of the world's natural resources through their ability to support large numbers of people while limiting their impact on the natural environment. However, many cities are witnessing harmful patterns of growth, of production and consumption, of land use, of mobility and of degradation of their physical structure. Such problems are often synonymous with soil, air and water pollution, waste of resources and destruction of natural resources.

SUMMARY

Some human settlements are also subject to limited water supply, sanitation and drainage and to dependency upon toxic and non-renewable energy fuel sources and irreversible loss of biodiversity. Many of these trends are aggravated or accelerated by high population growth and the magnitude of rural-to-urban migration. Demographic factors, combined with poverty and lack of access to resources and unsustainable patterns of production and consumption, particularly in industrialized countries, can cause or exacerbate problems of environmental degradation and resource depletion and thus inhibit sustainable development. Therefore, a largely urbanized world implies that sustainable development will depend very largely on the capacity of urban and metropolitan areas to manage the production and consumption patterns and the transport and waste disposal systems needed to preserve the environment.

MODULE 4: CULTURE AND ENVIRONMENT: PATTERNS, HEALTH AND SAFETY

MODULE 4 UNIT 1: CULTURE

1.0 INTRODUCTION

There is a general recognition that cities share a number of organisational, social and economic characteristics and play similar functional roles in human societies regardless of size, geography, time or culture. However, different human cultures have had varying effects on their environments. Some cultures, particularly hunter-gatherer and small-scale agricultural societies, have little environmental impact. Urban and industrial societies have the greatest effect on the environment, using great amounts of resources to fuel their activity. In some places, the local culture and laws have emphasized environmental protection, and in others this has not been a concern. The results of these policies are often obvious: Some areas have low pollution despite industrial activity, while other areas with similar activity are highly polluted.

2.0 OBJECTIVES

- At the end of this unit, you should be able to define Sequent Occupance
- You should be able to explain the relationship between culture and environment
- Explain what culture is all about

3.O MAIN CONTENT

3.1 WHAT IS CULTURE?

Humans are social creatures. Since the dawn of *Homo sapiens* nearly 250,000 years ago, people have grouped together into communities in order to survive. Living together, people form common habits and behaviours—from specific methods of childrearing to preferred techniques for obtaining food.

Almost every human behaviour, from shopping to marriage to expressions of feelings, is learned. Behaviour based on learned customs is not a bad thing. Being familiar with unwritten rules helps people feel secure and “normal.” Most people want to live their

daily lives confident that their behaviours will not be challenged or disrupted. But even an action as seemingly simple as commuting to work evidences a great deal of cultural propriety. Culture represents the beliefs, practices and artifacts of a group, while society represents the social structures and organization of the people who share those beliefs and practices.

3.2 TYPES OF CULTURE

Material culture refers to the objects or belongings of a group of people. Metro passes and bus tokens are part of material culture, as are automobiles, stores, and the physical structures where people worship.

Nonmaterial culture, in contrast, consists of the ideas, attitudes, and beliefs of a society. Material and nonmaterial aspects of culture are linked, and physical objects often symbolize cultural ideas.

A metro pass is a material object, but it represents a form of nonmaterial culture, namely, capitalism, and the acceptance of paying for transportation. Clothing, hairstyles, and jewellery are part of material culture, but the appropriateness of wearing certain clothing for specific events reflects nonmaterial culture. A school building belongs to material culture, but the teaching methods and educational standards are part of education's nonmaterial culture. These material and nonmaterial aspects of culture can vary subtly from region to region.

Cultural universals. Often, a comparison of one culture to another will reveal obvious differences. But all cultures share common elements. **Cultural universals** are patterns or traits that are globally common to all societies. One example of a cultural universal is the family unit: every human society recognizes a family structure that regulates sexual reproduction and the care of children.

Subculture. A **subculture** is just as it sounds—a smaller cultural group within a larger culture; people of a subculture are part of the larger culture, but also share a specific identity within a smaller group. Some subcultures are formed by members who possess traits or preferences that differ from the majority of a society's population.

Countercultures. They are a type of subculture that rejects some of the larger culture's norms and values. In contrast to subcultures, which operate relatively smoothly within the larger society, countercultures might actively defy larger society by developing their own set of rules and norms to live by, sometimes even creating communities that operate outside of greater society. Cults, a word derived from culture, are also considered counterculture groups. They are usually informal, transient religious groups or movements that deviate from orthodox beliefs and often, but not always, involve allegiance to a charismatic leader.

3.3 ELEMENTS OF CULTURE

Values are a culture's standard for discerning what is good and just in society. Values are deeply embedded and critical for transmitting and teaching a culture's beliefs.
Values help shape a society by suggesting what is good and bad, beautiful and ugly, sought or avoided.
Values often suggest how people should behave, but they do not accurately reflect how people do behave.
Values portray an **ideal culture**; the standards society would like to embrace and live up to. But ideal culture differs from **real culture**, the way society actually is, based on what occurs and exists.
Values are not static; they vary across time and between groups as people evaluate, debate, and change collective societal beliefs. Values also vary from culture to culture.
Beliefs are the tenets or convictions that people hold to be true. Individuals in a society have specific beliefs, but they also share collective values.
Rituals We have rituals throughout our society that can be daily, weekly, monthly, or annually or even longer. Rituals, in many cases, are one-off special events such as a graduation or wedding that marks the start of a new chapter. Many Americans attend a religious service daily or weekly or have a special meal. Rituals are essential and valued as ways to connect and relate and to celebrate life together in various ways. Rituals contribute to our culture and the "norms" that we expect of each other, leading us to our next element.

Norms

Norms are the way we describe the standards or expectations for how we live and can be either formal and informal. For example, formal norms are laws and regulations, such as paying our taxes and not robbing a bank. These norms are set for us. On the other hand, informal norms, also known as customs, are those that exist throughout our culture and have developed over time. These may include a gentleman holding the door open for a lady or saying thank you after someone does something kind. These are customs that have evolved and will continue to do so. For example, with Covid-19 forcing us to keep our physical distance, shaking hands may become a thing of the past!

Symbols

Symbols take on incredible importance in our culture and can manifest both in objects, such as the American Flag as a symbol of patriotism, as well as gestures such as the peace or "ok" hand sign. Symbols can be extraordinarily powerful in conveying a message without words and may have negative or positive connotations depending on the culture it is within. For example, the Swastika, the most known symbol of the Nazi party and the devastation it caused, was originally an Indian symbol of spirituality. Especially before we had the power of the internet, video, or even photographs, symbols were and continue to be a powerful way to identify culture.

Language
Language is perhaps one of the most common ways we relate to culture. Language bonds us with the essential ability of communication. Before language, humans had very primitive ways of communicating with hand gestures and drawings. Through the power of language, we introduced the power of storytelling, which enabled humans to pass down oral history and eventually led to written language. With this new way of communicating, we can document our history, send messages to faraway lands, and ultimately capture our learnings and entertainment in books and now directly through the internet.

Artifacts
These are the physical embodiment of the other cultural aspects. Whether this is the Nigerian flag, badge, artifacts are the items that we look back on and identify with a particular culture, period, or civilization. For example, the pyramids of Egypt are a giant artifact from an ancient civilization, in the same way, that a cannon was a weapon associated with a specific time of human history. While artifacts often relate to or complement other elements of our culture, they are unique in that they are the material hints we leave behind for future generations.

3.4 SEQUENT OCCUPANCE

It is the notion that successive societies leave their cultural imprints on a place each contributing to the cumulative cultural landscape. A geographic area that includes cultural and natural resources associated with interactions between nature and human behaviour. According to the Sequence Occupance Theory, the cultural imprint of each civilization is never completely lost and its traces can be seen to the present day. This is a historical phenomenon that occurs in the same region or space, but at different times. Sequent Occupance regards each region as a pattern of many cultural layers laid upon each other, where each layer can be attributed to a particular civilization or culture, which overlaps the ones before it.

Sequent Occupance Cultural Ecology is an important sub-discipline within Human Geography. Stemming from anthropological studies concerned over how human societies are affected by changes to the environment they live in, Cultural Ecology is the “theoretical perspective common to cultural geography and derived from anthropology that focuses on the relationship between human activity and environmental conditions.” This sub-discipline had its most influential figure in Carl Sauer (1889–1975) who, in his seminal work The Morphology of Landscape, called for a more refined approach to the study of the impact humans have on the environment. Sauer applied a cyclical idea to Geography according to the notion of “landscape-as-history” rather than the “landscape-as-nature” approach.

According to Denevan (2009) “Sauer transferred Spengler’s line of thought about the cyclical nature of civilizations to the landscape. In that line of thinking, each place (i.e., landscape) formed a stage on which a succession of different cultures through time had left subtle traces on the land as in a palimpsest.” Hanks, (2011) summarized Sauer’s thoughts in “that cultures are the unique result of a collection of influences, but especially are shaped by those cultural patterns that were previously present in the landscape.” Hanks goes on to say that “Sauer became the most influential figure in American cultural geography, and his emphasis on a particularist approach to the study of landscapes remains at the heart of the discipline today.

An important component of Cultural Ecology is the concept of Sequent Occupance. Whittlesey, strongly influenced by Sauer’s teachings, proposed that in fact, the distribution of people and of their activities over the surface of an earth of varied forms, conditions, and resources, is conceded to be the major premise of anthropogeography, human geography, or chorology, as it is variously called. These spatial concepts remain purely descriptive, however, unless they are treated dynamically, i.e., unless the time factor is cognized. The view of geography as a succession of stages of human occupance establishes the genetics of each stage in terms of its predecessor.

Hanks (2011) defines Sequent Occupance as “the notion that landscapes are shaped over time by the sequential settlement, or at least sequential use, of that landscape by various groups who occupy the land. Thus, according to the proponents of this approach to landscape study, a place can be understood only through an examination of the historical impact of such occupation, and a comprehension of the nature of the culture at each stage of occupation.” Hanks also recognizes the importance of Sequent Occupance in Historical Geography and that “in some cases the historical patterns of settlement of a place may be partially revealed through a study of the local toponymy, which frequently carries clues to the history of previous cultural occupants as well as to a place’s former function on the landscape.” Meyer (1944) is among the first researchers to highlight the significance of Toponymy in Sequent Occupance studies. In his article on the place names of the Calumet region in Northwest Indiana-Northeast Illinois, he states: “There occurred to us the idea that a toponomic (sic) study might take on increasing geographic significance if we attempt a partial chronologic-chorographic treatment of place names in addition to merely identifying place nomenclature, thus contributing to our knowledge of the progress of regional settlement and economic development.”

3.5 DIFFUSION AND GLOBALIZATION

The integration of world markets and technological advances of the last decades have allowed for greater exchange between cultures through the processes of globalization and diffusion. Alongside the process of globalization is diffusion, or, the spread of material and nonmaterial culture. While globalization refers to the integration of markets, diffusion relates a similar process to the integration of international cultures.

Hybridity in cultures is one of the consequences of the increased global flows of capital, people, culture, and entertainment. Hybrid cultures refer to new forms of culture that arise from cross-cultural exchange, especially in the aftermath of the colonial era. On one hand, there are blendings of different cultural elements that had at one time been distinct and locally based: fusion cuisines, mixed martial arts, and New Age shamanism. On the other hand, there are processes of indigenization and appropriation in which local cultures adopt and redefine foreign cultural forms. The classic examples are the cargo cults of Melanesia in which isolated indigenous peoples "re-purposed" Western goods (cargo) within their own ritualistic practices in order to make sense of Westerners' material wealth. Other examples include Arjun Appadurai's discussion of how the colonial Victorian game of cricket has been taken over and absorbed as a national passion into the culture of the Indian subcontinent (Appadurai 1996). Similarly, Chinese "duplitecture" reconstructs famous European and North American buildings, or in the case of Hallstatt, Austria, entire villages, in Chinese housing developments (Bosker 2013). As cultural diasporas, or emigrant communities, begin to introduce their cultural traditions to new homelands and absorb the cultural traditions they find there, opportunities for new and unpredictable forms of hybrid culture emerge

SUMMARY

There is a general recognition that cities share a number of organisational, social and economic characteristics and play similar functional roles in human societies regardless of size, geography, time or culture. However, different human cultures have had varying effects on their environments

MODULE 4 UNIT 2: CULTURE AND ENVIRONMENT

1.0 INTRODUCTION

The manner in which we are our environment depends largely on what we are looking for in it. But what we look for is not just an individual or idiosyncratic matter-it depends on our cultural conditioning, our accustomed social roles, and our definition of the situation from which we relate to the environment. Any environmental feature (a river, a stretch of open land, a mountain, a city) can be looked upon in a variety of ways. These various ways are known as "environmental orientations." Environmental orientations by providing different perspectives on the environment leads man to act in many different ways and by which such action the relationship between man and his environment and eventually the ecological system itself are differentially shaped and modified.

3.0 MAIN CONTENT

3. 1 CULTURE AND ENVIRONMENTAL ORIENTATION

The study of human cultures as they occur in physical space and in relation to the physical landscape is important for understanding the evolution of society. Every aspect of our cultures occurs within a physical context, and when you stop to think about it, that context can actually be pretty important. If you saw someone dancing in a graveyard or mourning in a dance hall, you might be confused. So, our relationship with our physical surroundings matters, and can determine a lot about how various cultures interact within sometimes-shared spaces. The basic theory is that many cultures leave their mark on a landscape, which will be used by new cultures that replace them or change them. Over time, you build up a complex cultural landscape that has contributed to numerous societies over generations and generations.

3.2 NATURE AND CULTURE

Nature and culture converge in many ways that span values, beliefs and norms to practices, livelihoods, knowledge and languages. As a result, there exists mutual feedback between cultural systems and the environment, with a shift in one often leading to a change in the other. For example, knowledges evolve with the ecosystems

upon which they are based, and languages contain words describing ecosystem components. If plants or animals are lost, then the words used to describe them are often lost shortly afterwards, and this changes the way the natural environment is shaped by the practices of those human communities. Nature provides the setting in which cultural processes, activities and belief systems develop, all of which feedback to shape biodiversity.

3.3 THE MAJOR LINKS BETWEEN NATURE AND CULTURE

There are four key bridges linking Nature with culture: beliefs and worldviews; livelihoods and practices; knowledge bases; and norms and institutions.

3.3.1 Beliefs and worldviews

Culture can be understood as systems by which people interpret the world around them. These meanings and interpretations are most diverse in their linkages to the natural world, with the most conspicuous links often found in traditional resource-dependent communities. Whereas many traditional communities do not seem to differentiate between Nature and culture, many modern societies perceive them as separate or even opposing entities. E. O. Wilson, however, has said that all humans, no matter their culture, have an innate connection with Nature based on our common histories as hunter-gatherers and agriculturalists (the biophilia hypothesis). With the coming challenges of climate change and peak oil, it is conceivable that those with industrialised livelihoods may have to undergo substantial transitions in the near future.

3.3.2. Livelihoods and practices

As a set of practices, cultures shape biodiversity through the selection of plants and animals and the reworking of whole landscapes. Such landscapes have been described as anthropogenic Nature, as their composition is a reflection of local culture and a product of human history. Growing archaeological and ethnographic evidence tells us that many habitats previously thought to be pristine are in fact an emergent property of resource-dependent livelihood practices. For instance, some North American landscapes were sustained through periodic burning and grazing regimes. These landscapes represent ecological profiles shaped by localised cultural practices. This has now been acknowledged with the naming of our era as the anthropocene.

This has led, amongst other things, to a split in attitudes to the concept of wilderness. Some wilderness societies are passionate advocates of its values (often without a clear idea of the role of traditional societies in shaping the ecology), while for traditional

societies the term often causes anger because of the implication that traditional societies played no role in the shaping of their ancestral landscapes.

3.3.3. Knowledges about Nature

If diverse cultural practices and worldviews are central to the management of biological diversity, then the key link between Nature and culture is knowledge. How people know the world governs behaviours, understandings and values that shape human interactions with Nature. Knowledge of Nature, variously called traditional, Indigenous, local or ecological, is accumulated within a society and transferred through cultural modes of transmission such as stories and narratives. Cultural understandings of the environment not only give rise to sustainable management practices, but also to knowledge of species requirements, ecosystem dynamics, sustainable harvesting and ecological interactions. This culturally engrained knowledge can enable people to live within the constraints of their environment in the long-term.

3.3.4. Norms and institutions

Ecological knowledge also gives rise to socially embedded norms and regulations. These govern human interactions and behaviours towards the natural environment, and have often co-evolved to sustain both people and Nature. They often take the form of common property rules that govern the use of resources from forests to fisheries. These rules define access rights and appropriate behaviours, and maintain the productivity and diversity of socio-ecological systems – which is ultimately in the best interests of the community.

There has been an unparalleled shift towards both landscape and human monocultures in recent years, and many of the reasons are common. Some pressures have arisen from capitalist economies that stress unrestrained economic growth. The result is a shift in consumption patterns, even in traditional societies that interact with the capitalist economy, the globalisation of food systems, and the commodification of natural resources. These pressures are at their most damaging when they lead to rapid and unanticipated periods of socio-economic change, which jeopardises both cultural and ecosystems resilience. They are also likely to have destructive health outcomes, particularly for young people if they spend less time in Nature. Time spent directly experiencing Nature improves psychological health and wellbeing, as well as increasing physical activity levels. But disconnection leads to feelings of biophobia and a fear of the outdoors, perceiving it to be a wild and unfamiliar environment. This extinction of experience seems to be producing a new lost generation who are

disconnected to any place in particular and unable to feel innate relationships with Nature.

3.4. STRATEGIES FOR SUSTAINABILITY THROUGH CULTURE

The pressures on the environment are also paving the way to wider cultural monocultures, as a result of cultural extinctions caused by assimilation, language loss and knowledge loss. Rural communities are migrating to urban areas, cultural knowledge transmission between generations is declining, oral knowledge is being replaced with written knowledge (just as classrooms are replacing direct experience), and traditional livelihoods are being replaced by modern occupations, all at the expense of cultural diversity. This comes at a cost to human societies as a decline in knowledge causes a decline in the possible solutions that humanity holds to future global challenges.

The need for effective policies in biodiversity protection has long been understood. But the importance of cultural protection is only just emerging. Since many common drivers exist between biological and cultural diversity, policies should now target both in a new approach for conservation. Locally, efforts could include local recovery projects, revitalisation schemes, culturally appropriate education schemes, and language revitalisation. Other approaches include the revival of culturally appropriate healthcare systems, the protection and careful commercialisation of traditional food systems, and the greening of businesses.

Larger-scale movements include fair trade and the recognition of land rights so that the integral relations between Nature and culture can be realised. Investment into community-based conservation and the dissemination of power to grassroots initiatives and institutions can strengthen mechanisms that favour social and environmental sustainability.

To conserve global diversity effectively, policy efforts need to be internationally driven, geographically targeted, multi-level and inclusive. Policies emphasising political empowerment, self-governance and territorial control at grassroots levels have the potential to provide a solid platform from which communities can play a central role in biodiversity conservation whilst retaining their own cultural distinctiveness and connectedness to the land.

The degree to which the diversity of the world’s ecosystems, upon which we as humans depend, is linked to the diversity of its cultures is only beginning to be understood. Ironically, it is precisely as we come to understand this linkage that many cultures are receding towards extinction.

Relationship between cultural and natural environment:

(a) Culture gives a new shape to natural environment but is also influenced by the latter.

(b) Culture relates itself to the efficiency and skill of human beings to exploit their natural environment according to their requirements.

(c) People have constructed roads in difficult terrains like deserts and hills.

(d) Uncultivable (or non-fertilizer lands) have been converted into fertile and cultivable lands

(e) Different types of instruments, tools and appliances have been invented in enormous volume and continue to be improved upon, whether these are means of transport and communication or comfort and decoration.

(f) The natural environment determines the material part of culture. The architecture of house buildings differs from place to place across geographical variation. The houses are built of wood in one place, bricks in another and yet stones in another Examples: (a) The Eskimos (of Tundra Region) make snowwhouses called 'Igloo'. They us sledge (Cart without wheels) for transportation when snow is hard. (b) The bullock-cart u plains cannot be used in desert where only camel are the most convenient means of transportation.

(g) The human beings like other animals, adapt to the existing natural environment and in the process of adaptation create and develop culture for the maintenance of their life

SUMMARY

In the past, the emphasis of environmental action has most often been on wilderness, wildlife, endangered species, and the impact of pollution on natural landscapes outside cities. It is now the time to turn more attention to city environment because majority of the people now live in urban environments and have suffered from their decline. There is the need for more studies on the urban ecosystem looking at the cultural and environmental patterns that affect the health and safety of the city dwellers.

As a consequence, if the environment of a city declines, almost certainly the environment of the surroundings will also decline. The reverse is also true: if the environment around a city decline, the city itself will be threatened.

Because the city changes the landscape, it also changes the relationship between the biological and physical aspect of the environment. Such changes aspects of pollution, water management, or climate.

CONCLUSION

The concept of landscape is often studied in a cultural context because it is a spatial entity perceived and influenced by human activity over time. However, inherent in this holistic and dynamic concept is the recognition that landscapes are seamlessly related to ecological function. The local cultural values and ideals that respond to and evolve landscapes also directly determine the structure, function, and change of the ecosystems therein and those linked at a coarser or finer scale. As with the idea of landscape, ecological function can vary in relation to time and space.

MODULE 4 UNIT 3: PATTERNS

1.0 INTRODUCTION
2.0 OBJECTIVES
3.0 MAIN CONTENT

1.0 INTRODUCTION

Environmental patterning refers to the non-uniform spatial and temporal distribution of resources and abiotic conditions that influence man and his interaction with the environment. Such patterning is pervasive in nature and is known or hypothesized to affect many ecological processes and phenomena, including population dynamics, life histories, dispersal, foraging behavior, patterns of natural selection, coexistence of species, predation, and species diversity. The study of environmental patterning involves descriptions of the spatial distributions of both resources and abiotic conditions. When environmental variables are discontinuous among arbitrarily, environments are said to consist of patches. A patch is defined as a discontinuity in environmental character states where the discontinuity matters as a "bounded, connected discontinuity in a homogeneous reference background" or as any place in the environment where the abundance of either resources or organisms is high or low relative to its surroundings. The distribution of settlements and patterns by resources may not reflect a community's use of the environment. Simply identifying the existence of patchiness does not mean that the patchiness is important for a particular process.

3.0 MAIN CONTENT

3.1 CITY AS AN ECOLOGICAL AGGLOMERATION

Worldwide we are becoming an increasingly urbanized species, for instance in the USA, about 70 % of the people live on 3 % of the land area and 75% live in urban-suburban areas. One of the ways we can improve on the management of the city environment is to analyze the city as an ecological system. It should be noted that like

any life-supporting system, a city maintains a flow of energy, provide necessary material resources, and have ways of removing waste. These ecosystem functions are maintained in a city by transportation and communication with outlying areas. It is not a self-contained ecosystem as it depends on other cities and rural areas. A city takes in raw materials from the country-side: food, water, wood, energy, mineral ore and everything that a human society uses. It in turn produces and export material goods and if it is truly a city, export ideas, innovations, inventions, arts, and the spirit of civilization. Having a large number of cities with multimillion populations is a new condition in our history, as is the urbanization of over half the people in the world. Urban agglomerations are today the engines of consumption of the world's environment: they occupy only 2% of the world's land surface, but use over 75% of the world's resources. Humans now consume nearly half of the world's total photosynthetic capacity, and cities are the major factor in this. Further, more economic activity that takes place outside cities is geared towards cities.

3.2 URBAN SCALING

This approach builds on research in urban economics, geography and complex systems that has identified relationships between urban scale and economic productivity, innovation rates, energy use and infrastructure needs. Such relations are known as scaling relations. For this reason, the systematic study of such relationships has come to be known as urban scaling. Over the past decade, a formal theory of urban scaling has begun to emerge (Bettencourt, 2013).

The fundamental process at the core of this theory is the concentration of social, economic and political interactions in space and time, subject to constraints imposed by environmental conditions, technology and institutions (Bettencourt, 2014; Schla¨pfer et al., 2014). These processes, which are the microlevel foundations upon which the explanatory framework is built, are very general and are not tailored to the specific characteristics of modern cities, or more broadly, settlements, of a certain size. As a result, it potentially applies to settlements and settlement systems in any context.

3.3 SETTLEMENT SCALING THEORY (SST)

The existence and development of cities as the result of the interplay between centripetal and centrifugal 'forces', which in turn result from socioeconomic advantages of concentrating human populations in space and account for associated costs. These are known as agglomeration or scaling effects and constitute the foundational concepts for explaining the formation and persistence of cities anywhere. Urban agglomeration effects are based on the observation of systematic changes in average socio-economic performance, land-use patterns and infrastructure

characteristics of all cities as functions of their size. Such relations are known across the sciences as scaling relations, which relate macroscopic properties of a system—here a city—to its scale (size). For this reason, the systematic study of such relationships in cities is known as urban scaling

It provides an explanatory framework which illustrates the scope of its applicability, and shows that its extension to archaeological contexts allows for a truly comparative study of urbanisation. The explanatory framework is based on first principles of how the spatially embedded social interactions among agglomerated individuals generate several of the most salient properties of settlements (including cities). SST does not seek to explain all aspects of cities but does seek to account for the effects of scale for their extensive properties. Importantly, the theory makes clear quantitative predictions for the values of posited observables that can be tested (and falsified) against settlement data from any given era. It suggests that there should be empirical regularities for important attributes of cities common to urban systems that arose and evolved independently across time, culture and levels of technology. Explanations for such regularities should invoke social processes that are also common to cities of all times and places.

In the same way that Darwin argued that a good theory for the variety of biological forms should apply to the fossil record as well as contemporary life, an adequate explanation for the variety of settlements and urban forms should apply to the archaeological record as well as contemporary cities. But what features of cities and urban systems are common across eras? What can be measured, compared and predicted? What common underlying processes generate these regularities? Answering these questions necessitates several epistemological components. First, it requires methods for defining socio-spatial units in the contemporary world, and from material remains of the past, in such a way that these units capture similar social functional entities (not just similar physical forms). Second, it pre-supposes an explanatory framework that is general enough to encompass urban systems that vary substantially with respect to social, political and technological details. It cannot simply be a projection of contemporary social and economic arrangements backwards in time as such a framework would break down as soon as modern political institutions and economic markets ceased to apply. Third, such an explanatory framework must identify salient properties of cities that can be captured by common measurements, the empirical foundation of any truly comparative approach. Finally, the explanatory framework, or theory in a manner defined below, must generate specific predictions that can be tested using data from a variety of settlement systems. Here, we present an approach that meets these requirements and can ground the examination of urban systems across eras

Spontaneous city growth

Spontaneous city growth usually refers to growth that isn't planned, especially the 'footprint' of the urban area. (No government has total control over population movements and growth rates; therefore, there is an element of spontaneous population growth in all cities.) In Abuja, we have Kubwa, Mpape squatter settlement. And many others.

Planned city growth

Most governments today do not allow settlements to grow spontaneously; although they might not control the population movement and growth directly, they do control the way in which land is allowed to be used. This means that governments do plan the growth of settlements to an extent.

Most governments in HICs and MICs enforce laws that state whether new building is allowed or not. 'Planning permission' is often granted on the edge of settlements to accommodate the increasing population. This permission is often given for a few hundred homes at a time.

In LICs, the laws may be present but it is harder to enforce because of a lack of funds and, often, greater pressure from rural to urban migration. In all countries there are areas where new building is rarely allowed, such as in national parks.

Sometimes there are much larger urban projects, such as new towns, edge cities and planned city extensions.

New towns

New Towns are settlements that have been created 'brand new' and do not have a history as a large settlement. They are entirely planned.

The New Town movement began in Europe in the early 20th century as existing cities became crowded and polluted. Entirely new settlements were designed on the outskirts of cities such as London. They were often designed with attracted green environments (trees, parks and so on) with wide streets and good transport links. After World War Two, New Towns became increasingly popular in the United Kingdom as a way to rehouse the large numbers of people whose homes had been destroyed by bombing. Examples include Welwyn Garden City, Stevenage and Milton Keynes.

New Towns also exist in other parts of the world. Town such as Olgiata near Rome in Italy, Ma On Shan in Hong Kong and Barra da Tijuca near Rio de Janeiro in Brazil have all been developed with decisive government planning.

Planned city extensions

As cities grow, it is important to plan the expansion. A planned city expansion takes place where the authorities deliberately allow an area to grow, and ensure that it contains suitable transport, energy, water and sanitation infrastructure, as well as the 'soft' infrastructure of healthcare, education and so on.

The United Nations Habitat agency's mission is "to promote socially and environmentally sustainable human settlements development and the achievement of adequate shelter for all" (UN Habitat, 2012). UN Habitat's analysis of historic planned city expansions shows that successful planned city extensions often involve the following (UN Habitat, 2015):

- Initial planning on a street grid system
- Planning needs to be flexible and change according to how the city then grows
- Some regulation is needed to prevent speculation (people buying land in the hope that it rises in value)
- The regulations should include provision for mixed-use land use, by allowing some mixing of residential, commercial and leisure spaces
- Variety is key interesting, vibrant cities arise from departing from a planned grid system occasionally and including parks, diagonal streets on the grid, and allowing natural topographical features such as hills, rivers and coastlines to become main features of the urban area

SUMMARY

While human activities like farming result in land transformation over great spatial extent, few alterations of the land surface are as profound as human settlement. Globally, only a relatively small amount of land conversion takes place through urbanization and suburbanization. However, the increase in human population, especially in settlements, is gaining momentum in both the developed and developing countries and worldwide.

MODULE 4 UNIT 4: HEALTH AND SAFETY

1.0 INTRODUCTION

All humans rely on the environment and natural resources to fulfill needs and sustain health. People have the greatest impact on the environment in the ways that they exploit natural resources and dispose of waste. If these activities are not managed carefully, environmental damage can affect people, animals, plants, waterways, and other parts of the natural world.

3.1 ENVIRONMENTAL HEALTH

Environmental health is a two-way street. Our environment, in the largest sense, is the complex network of physical, chemical, biological, and ecological components that make up the natural world. How clean and unpolluted the air, water, and soil of this environment are can affect the health of human beings. On the other hand, the way people treat the environment in their professional, industrial, and recreational activities helps determine how clean and safe it will be. In short, the environment affects the health of human beings, and human beings affect the health of the environment. All of the issues that evolve out of the interaction between people and the environment fall under the umbrella of environmental health.

Governments, companies, and individuals have a responsibility to preserve and promote environmental health. Government agencies, like the Environmental Protection Agency (EPA), regulate industry to limit pollution that can damage the environment. The EPA's mission is to protect public health and the quality of the natural environment. Groups outside the government, such as the World Wildlife Foundation, also work to identify and control threats to the environment that will endanger the food, water, and homes of plants and animals.

Everyone must make choices about how and where to live. Whether people are watching television in their living rooms, working at an office, eating at a restaurant, swimming at a beach, bicycling in a park, or sitting in a classroom, they should be aware of the condition of the environment around them. Good environmental health means having a safe, clean environment so that everyone can be healthy and productive within it.

3.2. ISSUES AND IMPACTS

Today, the types and severity of pollution vary greatly around the world. Some of this can be attributed to the kinds of activities and resources available in an area, and some to cultural attitudes and practices regarding the environment. A vivid example is the extensive deforestation of

For example; The extensive pollution produced by industrial activities in modern China highlights some cultural differences between developing countries and the west. In China and other developing nations, many residents do not consider pollution as a problem, or consider it to be less serious than outside observers do. Others argue that today’s developed countries attained their status by creating pollution, therefore developing countries deserve that same right.

3.3 PARAMETERS OF A HEALTHY ENVIRONMENT

The paramters of a healthy environment include;

(i) A high-level health status as measured by usual public health status as measured by usual public health indicators.
(ii) Efficient health services easily accessible to all the city residents.
(iii) A high quality of the physical environment including housing.
(iv) Sustainable ecosystems
(v) Highly supportive communities
(vi) Each inhabitant is provided with its basic living needs
(vii) Intensive social interaction
(viii) Diversified and self-reliant economy
(ix) Intensive cultural life

(x) Urban planning patterns compatible with the nine parameters listed above.

SUMMARY

Environments on Earth are always changing, and living systems evolve within them. For most of their history, human beings did the same. But in the last two centuries, humans have become the planet's dominant species, changing and often degrading Earth's environments and living systems, including human cultures, in unprecedented ways. Contemporary worldviews that have severed ancient connections between people and the environments that shaped us – plus our consumption and population growth – deepened this degradation. Understanding, measuring, and managing today's human environmental impacts – the most important consequence of which is the impoverishment of living systems – is humanity's greatest challenge for the 21st century.

CONCLUSION

People, in contrast, have become ecosystem engineers on a whole new scale in time and space. Human effects since the Industrial Revolution – including many that may be invisible to a casual observer – are recent and outside the evolutionary experience of most organisms. Moreover, such effects unfold faster and, on a scale, far greater than any effects of past ecosystem engineers. As a result, over the past two centuries – barely more than two human lifetimes – humans have disrupted living and nonliving systems everywhere. Understanding the nature and consequences of humans' environmental impacts – and managing these impacts to protect the well-being of human society and other life on Earth – is humanity's greatest challenge.

MODULE 4 UNIT 5: SUSTAINABLE PRACTICES

INTRODUCTION

A critical challenge for land use and management involves reconciling conflicting goals and uses of the land. The diverse goals for use of the land include resource-extractive activities, such as forestry, agriculture, grazing, and mining; infrastructure for human settlement, including housing, transportation, and industrial centres; recreational activities; services provided by ecological systems, such as flood control and water supply and filtration; support of aesthetic, cultural, and religious values; and sustaining the compositional and structural complexity of ecological systems. These

goals often conflict with one another and difficult land-use decisions may develop as stakeholders pursue different land-use goals. For example, conflicts often arise between those who want to extract timber and those who are interested in the scenic values of forests.

3.0 MAIN CONTENT

3.1ECOLOGICAL SUSTAINABILITY

A development process that is ecologically sustainable is one in which the level of resources use and waste generation are such that the limits beyond which environmental capital would be jeopardized or depleted are not exceeded (Ogu 1998). Environmental capital include the finite stock of non-renewable resources, non-renewable natural sink capacity, the finite capacity of ecosystems to provide sustainable levels of renewable resources and the renewable sink capacity of ecosystems to break down the biodegradable waste.

Ecological sustainability implies the need for some limits on the use of scarce resources and on the potential to generate wastes, particularly biodegradable ones. It is about development process that is self - sustaining and does not jeopardize the natural resources base required for present and future development.

3.2 ECOLOGICAL SUSTAINABILITY AND HUMAN SETTLEMENTS

Ecological sustainability in our discussion of sustainable human settlements pushes sustainable development beyond conventional concerns such as the improvement of social conditions, basic services, housing and environmental standards within their entity to new concerns. These concerns include:

(i) The environmental impact of urban - based production and consumption activities on the welfare of people, both within the city and beyond;

(ii) An understanding in the local, national and international contexts of the limited capacities of ecosystems to absorb wastes and of the finite nature of many natural resources (Mitlin and Satterthwaite, 1995).

Natural resources are crucial to the function of urban and rural settlements. Among other, fuel, food and fresh water are critical to the survival of their inhabitants. Production and consumption activities would rapidly grind to a halt without continued access to renewable resources. Urban settlements are centres of production and consumption and they generate enormous waste materials. Arrangement has to be made and policies drawn up to check and to reduce the level of waste in order to avoid the pollution of land and water bodies and other forms of environmental damage to the city and the surround regions.

Many urban centres rely on their surrounding hinterland for fuel wood, timber for building construction, etc. especially in developing countries. The exploitation of these

and other forest resources with little or no plans and programmes to replenish them would certainly lead to unsustainable development.

Deforestation destroys the ecological diversity of tropical forests, leads to disequilibrium in the ecological balance of a region and hastens the problems of erosion and flooding. In regions where forest products make substantial contribution to the local economy, like Benin City and the surrounding rural areas, urban demand induced deforestation could further the ecological imbalance it causes, reduce the capacity of hydroelectric stations and lead to poor farm yields. If a river catchment area is involved in the deforestation, the resultant soil erosion could encourage devastating flood down - stream. Both urban and rural settlements could suffer from the environmental damage emanating from unsustainable exploitation of forest resources.

In many developing countries, ecological destruction is assuming a catastrophic dimension. The ecological impacts of urban centres in these countries may be broadly divided into three, namely: (a) uncontrolled physical expansion; (b) solid and liquid waste disposal; and (c) air pollution (Hardoy et al, 1993). Other ecological problems include (d) water pollution (e) desertification and (f) land degradation.

(a) Uncontrolled Physical Expansion

The urbanization trend in many developing world cities is the uncontrolled expansion of urban physical infrastructure into peripheral semi-urban and rural areas. One consequence is that agriculture may lose out to other sectors competing for land such as industrial and commercial ventures. Uncontrolled urban expansion encourages unplanned residential settlements, which are usually characterized by lack of environmental facilities and services (UNCHS, 1989, 1996; Ogu 1992). Under the pretext of illegal developments, these areas are often officially denied environmental services. This has implications for environmental quality and health of inhabitants (Ogu 1998).

(b) Solid and Liquid Wastes

Environmental pollution resulting from liquid, gaseous and solid wastes is common, especially in urban centres. Waste water from residential areas, untreated sewage and industrial effluents have often polluted water bodies such that the water bodies are stagnant. The ecological cost of such pollution, not only in terms of destruction of aquatic life, but also in terms of real and potential health risks are without doubt enormous. Liquid wastes resulting from the use of oil and lubricants in the automobile, manufacturing and related industrial ventures nave worsened environmental degradation as there are often no existing regulations on the disposal of these.

(c) Air Pollution

The atmosphere is a natural laboratory in which various gases, solid particles and sunlight are involved in many chemical processes. Often, the natural state of the atmosphere IS compromised by the bye-products of the chemical processes, including those resulting from the injection of various contaminants into the air by man.

Air pollutants arising from urban - based industrial activities could cause damage to agriculture, forests and soils in neighboring regions. Notorious pollutants in 'this respect include sulphur dioxide, oxides of nitrogen and ozone. Acid precipitation is also a worrying source of environmental pollution which damage crops and plants in several urban and rural areas. The principal sources of atmospheric pollutants have been characterized to include industrial processes, fuel combustion, including fuel wood burning, bush fires and gas flaring, waste disposal by burning, road traffic and other abrasive forces which raise dust from the ground as well as other natural pollutants such as pollen, spores and bacteria (NEST, 1991).

Fumes emitted from vehicles are also noted for health hazards. For instance, petrol engines emit a mixture of hydrocarbons, carbon monoxide, oxides of nitrogen and lead, etc. In some instances, complete photochemical reactions can occur between the components of exhaust gases, giving rise to toxic compounds which endanger the health of individuals.

Urban centres are also characterized by car horns being blasted through the streets indiscriminately and with loud speakers blaring deafening wises from music shops scattered all over the major streets and slum areas. Prolonged exposure to noise is said to be capable of altering blood cholesterol and plasma cortisol levels to .the detriment of human health (Afimah, 1996).

(d) Water Pollution

Water is the most common and most precious 0:substances on earth. Not only does every living thing require water to sustain life, it is equally important to improve the quality of life (Olokesusi, 1990). Unfortunately, many urban and rural settlements in developing countries lack adequate supply of safe water for their inhabitants.

In addition to inadequate water supply, the practice of indiscriminate disposal of wastes of all types in our cities and rural villages, and the increasing use of agricultural chemicals suggest that there is widespread pollution of streams, rivers, lakes and lagoons which are major sources of water in these communities.

The effects of water pollution are many and varied. ranging from health hazards to high infant mortality rate and low life -expectancy rate. Several people without access to safe water have been infected by communicable and parasitic diseases, such as filariasis, dysentery, schistosomiasis, etc. Indeed, water pollution has serious implications for human and environmental security.

(e) Desertification

Desertification is a land degradation process caused by variations in climate, drought and human impacts, such as excessive grazing, firewood collection, poor farming practices, etc. (IUCN, 1991). Drought results from a partial or total lack of water, and it affects agricultural production and water supply, in many ways. It causes desertification also. The most obvious impacts of desertification on human settlements are degradation of range lands, decline in food production, poverty, starvation, destruction of trees and shrubs as well as depletion of surface and ground water.

(f) Land Degradation

Land degradation involves loss of Fertility, decline in crop yields, etc. resulting from deforestation and increased soil erosion by agents of denudation. Land degradation is a very serious human security issue as the productivity of large areas declines when populations are increasing rapidly (UNCED, 1992). The unsustained exploitation of non - renewable natural resources controlled by the state to attract international capital, coupled with the weak enforcement of natural environmental laws and regulations also cause degradation of the environment (Richards and Tucker, 1988; Lambin et al. 2000). One of the major challenges facing urban and rural communities in developing countries is how to maintain ecosystem and ecological processes and increase food production to keep pace with rapid population growth without irreparable damage to the environment.

SUMMARY

Ecological sustainability in our discussion of sustainable human settlements pushes sustainable development beyond conventional concerns such as the improvement of social conditions, basic services, housing and environmental standards within their entity to new concerns

MODULE 5: ENVIRONMENTAL ETHICS

MODULE 5 UNIT 1: STATE OF THE ENVIRONMENT
MODULE 5 UNIT 2: ENVIRONMENTAL ETHICS
MODULE 5 UNIT 3: ENVIRONMENTAL EDUCATION
MODULE 5 UNIT 4: SUSTAINABLE DEVELOPMENT
UNIT 5: CASE STUDIES, EXAMPLES OF SIGNIFICANT HUMAN SETTLEMENTS AND DEVELOPMENT PROJECTS AND THEIR ENVIRONMENTAL IMPACTS

MODULE 5 UNIT 1: STATE OF THE ENVIRONMENT

The term State of the Environment normally relates to an analysis of trends in the environment of a particular place. This analysis can encompass aspects such as water quality, air quality, land use, ecosystem health and function, along with social and cultural matters

State of the environment

The state of the environment in this day and age is recognised as a worldwide predicament in need of global address, through the undertaking of a synchronised and integrated approach by the international community. A healthy and clean environment is essential for sustainable development, and can be attained through the efficient use of energy sources. The decision makers in each nation have the important role of ensuring the generation of safe and clean energy in their countries for the greatest benefit of a wide range of stakeholders, which includes those outside the national boundaries. Governments, as representatives of nation states, possess the means to decide which energy technologies people can choose and/or access. Setting of policy inside countries is the domain of governments through the principle of state sovereignty in international law. However, the rights of governments are constrained by their commitments to various international commitments invoking ethical principles relevant to energy and environmental issues, especially in the event where their decisions give rise to environmental or security risks either within their own nation states or to other nation states. Other stakeholders already have important roles in the process, including the private sector and civil society. However, full representation of the community in decision-making requires the involvement of all groups, and not all countries have managed to ensure that all persons are represented in this process

State of the environment as at 2021 in Nigeria.

Nigeria is one of the countries facing huge environmental challenges. From Lagos to Sokoto, Akwa Ibom to Borno, Adamawa to Kwara, or Lagos to Akwa Ibom, the world's largest black nation is contending with issues of air pollution arising from gas flaring, water and soil pollution from oil spills; and deforestation and desert encroachment.

There are also the issues of flooding arising from massive reclamation of wetlands; and waste disposal. Uncleared drains filled with heaps of plastic bottles are common sights in metropolis and urban areas like the state capitals. The Niger Delta is one of the most polluted places on earth. The Niger Delta is Africa's most important oil-producing region. For five decades, unprecedented oil spills have been damaging the environment and devastating lives in this area, making the region one of the most

polluted in the world. It is estimated that while the European Union experienced 10 incidences of oil spills in 40 years, Nigeria recorded 9,343 cases within 10 years, according to Wikipedia.

Reportedly, the resultant environmental degradation from gas flaring, dredging of larger rivers, oil spillage and reclamation of land due to oil and gas extraction across the Niger Delta region costs about US$758 million every year. Regrettably, 75 per cent of the cost is borne by the local communities through polluted water, infertile farmland and lost biodiversity. These challenges have been worsened by the prevailing COVID-19 Pandemic. Professor Phil-Eze, said there is need to take positive actions that will restore the ecosystems not only to support the economy to cope with the challenges of Covid-19 global pandemic in Nigeria but also for our sustainable well-being. The essence is to acknowledge the urgency of preventing, halting and reversing the degradation of ecosystems worldwide.

Professor Enete 'The year 2020 was a year of reckoning, facing multiple crises, including a global pandemic and the continued crises of climate, nature and pollution. In 2021, we must take deliberate steps to move from crises to healing; and in so doing, we must recognise that the restoration of nature is imperative to the survival of our planet and the human race. Reviving natural carbon sinks – such as forest and peatlands could help close the climate emission gap by 25% by 2030. Replanting with native tree species can also help buffer some of the expected devastating effects of a warming planet, such as increased risk of forest fires. Currently, 3.2 billion people, that is, 40% of the world's population, suffer from continued degradation of ecosystem, for example by losing access to fertile soil or safe drinking water.

The ecosystems of the world including Nigeria have been severely degraded by human activities. In particular, the Nigerian case has been accentuated by the impact of Covid-19 global pandemic to a frightening level. This is because "the output of the functional mechanisms of the ecosystems manifests as the renewable bioresources humanity depends upon and underpin economic growth, sustainable development and human wellbeing. The societal concern is that degradation of ecosystems continues unabated resulting in serious reduction in ecosystem goods and services, negatively impacting economic prosperity and environmental sustainability. Overexploitation of natural resources throughout the lockdown period of Covid-19 pandemic widely disrupted the equilibrium within ecological systems, driving changes of ecosystems worldwide and in Nigeria. Nigeria's ecosystems were highly degraded as a result of

damage, unsustainable harvest of resources and a failure to invest and reinvest in their productivity, health and sustainability.

“The well-being of the Nigerian population in the coming decades has been severely compromised and will to a great extent depend on conservation and restoration of ecosystems to maintain and enhance biodiversity and ecosystem services in order to contribute to sustainable support of the economy battered by Covid-19 global pandemic while reducing environment-related risks. In order to mitigate this ecosystem restoration which means assisting in the recovery of ecosystems that have been degraded or destroyed, as well as conserving the ecosystems that are still intact must be given cognizance in order to have Healthier ecosystems, with richer biodiversity, yield greater benefits such as more fertile soils, bigger yields of timber and fish, and larger stores of greenhouse gases. Restoration can happen in many ways – for example through actively planting or by removing pressures so that nature can recover on its own. It is not always possible – or desirable – to return an ecosystem to its original state. We still need farmland and infrastructure on land that was once forest, for instance, and ecosystems, like societies, need to adapt to a changing climate.

“Between now and 2030, the restoration of 350 million hectares of degraded terrestrial and aquatic ecosystems could generate US$9 trillion in ecosystem services. Restoration could also remove 13 to 26 gigatons of greenhouse gases from the atmosphere. Ecosystem restoration can also provide significant societal benefits, through the enhanced provision of ecosystems services such as carbon sequestration, flood regulation, clean air and water. The economic benefits of such interventions exceed nine times the cost of investment, whereas inaction is at least three times more costly than ecosystem restoration.”

A 20-point action plan to save and restore ecosystems by Professor Phil-Eze (2021) to restore all kinds of ecosystems include;

- ✓ Reduce pressure that initiated ecosystem degradation in the first place
- ✓ Key into existing multilateral protocols to which Nigeria is a signatory and ratified
- ✓ Formulate a SMART goal or policy to drive the process
- ✓ Involve all parties and stakeholders no matter how tangential their
- ✓ Identify and rank ecosystems at risk of severe degradation

- ✓ Identify aspects of the ecosystem structure most vulnerable and at the brink of extinction.
- ✓ Announcing an ambitious restoration project or policy initiative, whether at local, regional or national level – tell the world what role you will play in a ten-year push.
- ✓ Volunteering for an existing restoration effort.
- ✓ Cleaning up a lake, beach, park or other natural area
- ✓ Greening your home, business, school, or a public space with indigenous trees or plants.
- ✓ Join an ecosystem restoration camp. It is a great way to give back to the planet and make a positive impact in your local region or while travelling abroad. The camps offer a range of short to long-term volunteering programmes where everyone is welcome!
- ✓ Pledging a donation or other support for restoration or conservation initiatives.
- ✓ Halting purchases of products and services that are not certified as sustainable.
- ✓ Starting a new diet or catering policy based on seasonal, sustainable and plant-rich products.
- ✓ Putting on or participating in an exhibition of posters, photos or art showing the beauty of local ecosystems
- ✓ Holding a discussion about the value of ecosystems and the threats they face.
- ✓ Staging an online campaign to draw attention to climate change, nature loss and what can be done to reverse these trends.
- ✓ Writing a letter to your local newspaper about need to restore degraded ecosystems
- ✓ Form Ecosystem Restoration Clubs in schools, Colleges and universities.
- ✓ Other ways of Ecosystem restoration includes Growing trees, greening cities, growing gardens, changing diets or cleaning up rivers and coasts.

If implemented, he said these 20 action point for ecosystem restoration will significantly put Nigeria's ecosystem on the part of recovery in support of the economy to cope with the Covid-19 global pandemic.

MODULE 5 UNIT 2: ENVIRONMENTAL ETHICS

1.0 INTRODUCTION

Environmental ethics is a branch of ethics that studies the relation of human beings and the environment and how ethics play a role in this. Environmental ethics believe that humans are a part of society as well as other living creatures, which includes plants and animals. These items are a very important part of the world and are considered to be a functional part of human life.

3.0 MAIN CONTENT

3.1. What is Environmental ethics?

Environmental ethics is a branch of applied philosophy that studies the conceptual foundations of environmental values as well as more concrete issues surrounding societal attitudes, actions, and policies to protect and sustain biodiversity and ecological systems. Therefore, it is essential that every human being respected and honor this and use morals and ethics when dealing with these creatures. In environmental philosophy, environmental ethics is an established field of practical philosophy "which reconstructs the essential types of argumentation that can be made for protecting natural entities and the sustainable use of natural resources." The main competing paradigms are anthropocentrism, physiocentrism (called ecocentrism as well), and theocentrism. Environmmental ethics exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and environmental geography. Global warming, global climate change, deforestation, pollution, resource degradation, the threat of extinction is few of the issues from which our planet is suffering. Environmental ethics are a key feature of environmental studies that establishes the relationship between humans and the earth. With environmental ethics, you can ensure that you are doing your part to keep the environment safe and protected.

3.2 CLASSICAL ETHICAL PRINCIPLES

The three classic ethical principles of justice, sufficiency and solidarity can be traced back to many different sources: Greek philosophy, religious teachings, and reflection on human experience. In the face of any decision involving environmental ethics, we should ask how each of these ethical principles - also known as ethical norms - can be applied to the situation at hand. Ethical principles are standards or benchmarks against which we can evaluate our actions. They are also signposts to orient us toward the difference between right and wrong, especially in conditions where there are multiple problems, and the interests of more than one party. Ethical principles are different from scientific principles in that they are generally not as hard and fast. They are less likely to give us one correct answer, but can be used to evaluate conflicting claims, a decision-making process, or the outcome of a decision.

3.2.1. Justice and Sustainability

The classic formal principle of justice is that equals should be treated equally unless there is a sufficient reason to treat anyone (or anything) unequally. It is clearly relevant in the field of ethics called environmental justice, but this principle cuts across many issues. Environmental justice is concerned with the inequitable access to environmental resources (clean food, air and water) and the injustice of greater pollution that often characterize lower-income communities - not wealthy suburbs. The notion of justice underlies concern about animal welfare. On the basis of what values are other animals considered different from the human animal, and thus subject to consumption by humans? Recent advances in biology have shown that the differences between humans and other animals are much less than many of us might think. Does the equality of humans and animals as living creatures require far more humane treatment of animals? Or even the total non-use of animals? To apply justice to an environmental decision, we should ask:

1. Are all human beings involved in this situation being treated equally and, if not, why not?
2. Are all living creatures involved in this situation being treated equally and, if not, why not?

Sustainability extends justice into the future. Sustainability can be defined as meeting the needs of the present generation without compromising the ability of future generation to meet their own needs. We are consuming or degrading many resources (such as fossil fuel energy, topsoil and water) today faster than they can be naturally replenished, which means they will not be available to people in the future. The ethical principle of justice is at play because it underpins the need to equitably balance the needs of those alive today (the rich and poor) with future generations. Thus, environmental ethics takes the notion of fundamental fairness and stretches it to include those yet to be born. To apply the principle of sustainability to an environmental decision, we should ask:

1. What are the immediate and long-term effects of the problem before us?
2. Who - humans and otherwise - is affected today by the problem before us and who will likely be affected by this problem in the future?

3.2.2. Sufficiency and Compassion

The principle of sufficiency mandates that all forms of life are entitled to enough goods to live on and flourish. The principle also means no one should waste or hoard resources intended for the sufficiency of all. Upholding the norm of sufficiency makes demands upon individuals - to share, to live more simply, to think creatively - and on

human communities: to ensure that everyone has access to the goods that they need to live a life of dignity. The ethical norm of sufficiency is closely tied to the notion of moral significance, which means that something is worthy of our ethical concern. This means that we include the needs of others in our consideration of what is important, or worthy of our concern. When we consider the needs of others, such as poor individuals in our society or poor countries in the world, we are asserting the moral principle of sufficiency. This principle helps us think about whom else we need to consider, to whom we have moral duties. It underlies the practice of empathy. This principle can conflict, at least in some people's minds, with the notion that the Earth does not have sufficient goods to meet everyone's needs. To apply the principle of sufficiency to an environmental decision, we should ask:

1. Will the decision permit all those involved, especially the poor, to have enough resources on which to live and flourish?
2. Is there any aspect of the decision that indicates the presence of waste or excess? Or a failure to be creative?

Compassion extends the notion of sufficiency to the Earth. Environmental ethics asserts that other animals, plants, and the elements (such as water, soil or air) are morally significant, and that humans have responsibilities to act so that their needs are met too. Some environmental ethicists, such as Deep Ecologists, assert that non-human forms of life have moral significance equivalent to humans. Most people, however, believe that other forms of life have some moral worth, but that humans are of greater moral significance. Even if you think animals are far more worthy of your concern than plants or elements, recognize that all animals depend, either directly or indirectly on plants for food, and that no creatures can live without sufficient clean water. To assert that any wild animal is worthy of our moral concern begins the process of learning about the interdependence of all creatures on the habitat and food resources provided by other creatures in an ecosystem. It is simply impossible to consider the well-being of one other creature in isolation from their environment. Ultimately, the future of humans is tied to the well-being of all other creatures. To apply the principle of compassion to an environmental decision, we should ask:

1. What duties do we have to the other creatures likely to be affected by our actions?
2. What does sufficiency mean for other creatures, especially those threatened with extinction?
3. What would it mean to extend the principle of compassion to non-human creatures?

3.2.3. Solidarity and Participation

The principle of solidarity invites us to consider how we relate to each other in community. It assumes that we recognize that we are a part of at least one family - our biological family, our local community, or our national community - but then challenges us to consider the full range of relationships with others. In a globalizing economy, we participate in a vast, international economic community, one in which goods and services are provided for us by those on the other side of the world. Solidarity requires us to consider this kind of extended community, and to act in such a way that reflects concern for the well-being of others. To apply the principle of solidarity to an environmental decision, we should ask:

1. Who are all the human stakeholders involved in this situation?
2. Who are all the natural stakeholders?
3. Is there a community of life (ecosystem) involved?
4. Are there any stakeholders - human and non-human - who are especially vulnerable?

Participation extends the idea of solidarity to make it practical. The demands of solidarity point us to the principle of participation, so that those affected by an environmental decision can shape how it is made. Many, many environmental problems stem from decisions being made by private individuals or companies that have wide-ranging implications. In some cases, in this country and others, governments make environmental decisions without fully securing the consent of the public. Often, those most affected are unaware of the decisions or the long-term effects on their health and the well-being of their environment. The ethical principle of participation requires us to recognize all of the parties - human and non-human - likely to be affected by a decision, and to recognize that all parties should have a say in how the decision is made. Genuine participation requires transparency, meaning that each individual has access to the same information that everyone else has. To apply the principle of participation to an environmental decision, we should ask:

1. Do all stakeholders in this decision actually have a say in how the decision is going to be made?
2. Are there any stakeholders who cannot represent themselves? Or who have little power? How will their interests be represented in the decision-making process?

3.3. Modes of Ethical Reasoning about the Environment

We now come to the "what" of environmental ethics, in other words, to the kinds of ethical reasoning that uses standards for environmental behavior or decisions. If we reflect on how we already think, we can see several common modes of ethical

reasoning. For the sake of simplicity and by using a sort of short-hand, let's consider these modes as three: moral reasoning about commands, consequences, and character. Whenever we consider an ethical problem, we usually find ourselves reasoning along one or more of these lines. And this is as much the case in environmental ethics as in any other kind of ethics.

Commands. We can use the notion of "commands" as a shorthand way for referring to those things that we ought to do, no matter what the consequences. This kind of reasoning is also associated with such ethical categories as commandments, laws, rights, and justice. In terms of environmental ethics, perhaps the classic command is one of the classic commands in all of ethics, "Do no harm." That is, our first general duty toward the environment is to do no harm. Moreover, we are reasoning in a command mode when, for instance, we think that animals have rights and, therefore, that justice requires that we not harm them; this is often the ethical conviction behind those who do not eat meat.

Consequences. The ethical notion of consequences is most often associated with the philosophical school of utilitarianism. According to this mode of ethical reasoning, commands are not sufficient in themselves to tell us what we ought to do. Instead, we need to think carefully about the consequences of our actions. Thus, we can determine the correct ethical action by choosing the one that will produce the greatest balance of good consequences over bad consequences. This kind of reasoning helpfully invites us to consider the totality of a situation and to identify its positive and negative aspects. More to the point, in this kind of reasoning, commands or laws or rights can be overridden if doing so will yield a greater balance of benefits over harms. This means, for instance, that something like the rights of animals can be overridden for the sake of some perceived human benefit. In consequential reasoning, it is often difficult to specify what qualifies as a "benefit" and a "harm" or, similarly, a "benefit" and a "cost," or "good" and "bad," etc. Frequently in environmental cases, costs and benefits are considered only in monetary terms. But while the assessment of such financial costs is an essential part of many ethical analyses, it cannot be the whole of such analyses. And it is important to try to name what else constitutes harm and benefits. One way of doing this might be to say, for instance, that harm is constituted by things like premature death, undue pain, or the violation of human economic or political rights. An environmental action that leads or very likely will lead to such harms would be ethically problematic. Working to protect the full diversity of life on Earth is an example of ethical action with a positive consequence.

Character. When we speak of "character," we are not doing so precisely in the way that we often hear the word: As referring to a role in a play or movie. Rather, we are

referring more to the notion that "he or she has got good character" or to the notion that "he or she is a person of conscience." In the face of a situation of environmental ethics, we are asking: What does this particular action that may affect the environment mean for my character? Or, similarly, what kind of person am I becoming by engaging in these actions in relation to the environment? Am I becoming more just, more humble, more generous? This mode of ethical reasoning invites careful and honest self-reflection. It can also be a kind of reasoning used very well by a group. The fact is, we become what we do - whether what we do involves only other people or also involves the natural world. This is explored further in the lesson on environmental virtue ethics.

3.4. Environmental Ethics and Its Principles

There are several approaches or principles to determine how we are to value our environment. It is such a huge field, and it is so vast that it is difficult for one principle to cover all the ground. Many theories have emerged over the years, and each one has stressed on various principles of environmental ethics. The list below states all the principles that have been predominantly found in those theories.

1. Anthropocentrism

It suggests that human beings are the most important beings. All other living beings are but accessories that would assist in their survival. Now, there are two further divisions of anthropocentrism. They are weak anthropocentrism and strong anthropocentrism. While weak anthropocentrism believes that human beings are the centre because it is only through their perspective that environmental situations can be interpreted. Strong anthropocentrism, however, believes that human beings are at the centre because they rightfully deserve to be there. Peter Vardy made this distinction.

2. Non-Anthropocentrism

As opposed to anthropocentrism, non-anthropocentrism, this principle gives value to every object, every animal in nature. It is a principle that believes in everything that sustains itself in nature.

3. Psychocentrism

Psychocentrism is the principle that believes that human beings hold more value in the environment since their mental capacities are better developed and far more complex than any other element in the environment.

4. Biocentrism

It is a term that holds not only an ecological but also a political value. It is a philosophy that imparts importance to all living beings. In terms of environmental ethics, biocentrism is the principle that ensures the proper balance of ecology on the planet.

5. Holism

The term holism had been coined by Jan Smuts in his book called *Holism and Evolution* (1926). Holism considers environment systems as a whole rather than being individual parts of something. It considers these environment systems to be valuable.

6. Resourcism

The principle of resourcism says that nature is considered to be valuable only because it has resources to provide with. Thus, nature ought to be exploited.

7. Speciesism

The principle of speciesism justifies the superiority of the human race. Thus, it also justifies the exploitation and maltreatment of animals by humankind.

8. Moral Considerability

This, too, is an important principle of environmental ethics. Intrinsic value is added to every being, which makes us consider being moral. Moral considerability towards a being means that we agree that all our interactions whatsoever with the being is bound by moral laws.

9. Instrumental Value

The instrumental value is the value imparted to a being as long as it can serve us with resources.

10. Intrinsic Value

Intrinsic value is the value attached to a being just for itself and not only for its resourcefulness.

11. Aesthetic Value

Aesthetic value is imparted to a being by virtue of its looks or its beauty.

12. Animal Liberation or Animal Rights

As is evident from its name, animal liberation or rights try to secure animal life and ensure their welfare by enforcing certain laws.

3.5. Types of Environmental Ethics

With the emergence of several theories, several environmental ethics have emerged. While some protect human beings, others protect plants, animals and other elements of nature. The types include:

- Social ecology, which is the study of human beings and their relation to their environment.
- Deep ecology promotes that all beings have an intrinsic value.
- Ecofeminism is a branch of feminism that helps us look at earth as a woman so that we can respect it in a better way

4.0 SUMMARY

Ethics plays an important role in our society today, and environmental ethics must be considered as it builds on scientific understanding by bringing human values, moral principles, and improved decision making into conversation with science

MODULE 5 UNIT 3: ENVIRONMENTAL EDUCATION

Introduction

Environmental education is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. As a result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions. Environmental education is concerned with those aspects of human behaviour which are more directly related to man's interaction with bio-physical environment and his ability to understand this interaction.

One of the most glaring problems which the world faces today is the environmental pollution. Man has exploited nature excessively at the cost of the environment. There is an immediate need to make people aware about environmental degradation. Education and public participation may change and improve the quality of environment.

3.0. Main Content

3.1 What is Environmental Education?

Environmental education is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. As a result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions.

'Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality.' (IUCN, 1970)

Environmental education is rooted in the belief that humans can live compatibly with nature and act equitably toward each other. Another fundamental belief is that people can make informed decisions that consider future generations. Environmental education aims for a democratic society in which effective, environmentally literate citizens participate with creativity and responsibility." (NAAEE, 2000)

Environmental education does not advocate a particular viewpoint or course of action. Rather, environmental education teaches individuals how to weigh various sides of an issue through critical thinking and it enhances their own problem-solving and decision-making skills.

3.2. THE AIM OF ENVIRONMENTAL EDUCATION

What is the aim of environmental education?

The goal of environmental education is to develop a world population that is aware of, and concerned about, the environmental and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current problems and the prevention of new ones (The Belgrade Charter, UNESCO, 1976).

. . the world's first intergovernmental conference on environmental education adopted the Tbilisi Declaration in 1978. This declaration built on the Belgrade Charter and established three broad goals for environmental education. These goals provide the foundation for much of what has been done in the field:

To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;

To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;

To create new patterns of behavior of individuals, groups and society as a whole towards the environment.

3.3. THE COMPONENTS OF ENVIRONMENTAL EDUCATION

The components of environmental education are

- **Awareness and sensitivity** to the environment and environmental challenges
- **Knowledge and understanding** of the environment and environmental challenges
- **Attitudes** of concern for the environment and motivation to improve or maintain environmental quality
- **Skills** to identify and help resolve environmental challenges

- **Participation** in activities that lead to the resolution of environmental challenges

3.4. DIFFERENCES BETWEEN ENVIRONMENTAL EDUCATION AND INFORMATION

Environmental Education	**Environmental Information**
• **Increases public awareness and knowledge of environmental issues**	• Provides facts or opinions about environmental issues
• **Does teach individuals critical-thinking**	• Does not necessarily teach individuals critical-thinking
• **Does enhance individuals' problem-solving and decision-making skills**	• Does not necessarily enhance individuals' problem-solving and decision-making skills
• **Does not advocate a particular viewpoint**	• May advocate a particular viewpoint

3.5. GUIDING PRINCIPLES OF ENVIRONMENTAL EDUCATION:

These are as follows:

1. Resource Principles:

(a) Resource use demands long-term planning if we are to achieve truly sustainable development.

(b) Rationale utilization of a renewable source is a sensible way of preserving the resources while obtaining maximum benefits from it.

(c) A mode of life heavily dependent upon rapidly diminishing nonrenewable energy sources (i.e. fossil fuel) is unstable.

2. Soil Principles:

(a) The protection of soils and the maintenance of sustainable agriculture are essential factors into the survival of civilizations and settlements.

(b) Soil erosion is the irreversible loss of essential resources and must be prevented.

(c) A vegetation cover (grass, forest) is important for the balance of nature and for the conservation of soil, besides being exploitable natural resources.

3. Wildlife Protection Principles:

(a) Wildlife population is important aesthetically, biologically and economically.

(b) Nature reserves and other protected wilderness areas are of value in protecting endangered species because they preserve their habitats.

(c) The survival of humanity is closely linked to the survival of wildlife both being dependent on the same life-supporting systems.

4. Environmental Management Principles:

(a) Sound environmental management is beneficial to both man and environment.

(b) Management of natural resources should be done in a rational manner.

(c; Elimination of wastes through recycling and the development of clean.

Technologies are important to modern societies to help reduce the consumption of resources.

(d) Human activities and technologies influence considerably the natural environment and may affect its capacity to sustain life, including human life.

5. Other Principles:

(a) The relations between humans and their environment are mediated by their culture i.e.

(b) Cultural, historical and architectural heritage are much in need of protection.

3.6. BENEFITS OF ENVIRONMENTAL EDUCATION

1. **Imagination and enthusiasm are heightened**
   EE is hands-on, interactive learning that sparks the imagination and unlocks creativity. When EE is integrated into the curriculum, students are more enthusiastic and engaged in learning, which raises student achievement in core academic areas.
2. **Learning transcends the classroom**
   Not only does EE offer opportunities for experiential learning outside of the classroom, it enables students to make connections and apply their learning in the real world. EE helps learners see the interconnectedness of social, ecological, economic, cultural, and political issues.
3. **Critical and creative thinking skills are enhanced**
   EE encourages students to research, investigate how and why things happen, and make their own decisions about complex environmental issues. By developing and enhancing critical and creative thinking skills, EE helps foster a new generation of informed consumers, workers, as well as policy or decision makers.
4. **Tolerance and understanding are supported**
   EE encourages students to investigate varying sides of issues to understand the full picture. It promotes tolerance of different points of view and different cultures.
5. **State and national learning standards are met for multiple subjects**
   By incorporating EE practices into the curriculum, teachers can integrate science, math, language arts, history, and more into one rich lesson or activity, and still satisfy numerous state and national academic standards in all subject areas. Taking a class outside or bringing nature indoors provides an excellent backdrop or context for interdisciplinary learning.

6. **Biophobia and nature deficit disorder decline**
   By exposing students to nature and allowing them to learn and play outside, EE fosters sensitivity, appreciation, and respect for the environment. It combats "nature deficit disorder" … and it's FUN!
7. **Healthy lifestyles are encouraged**
   EE gets students outside and active, and helps address some of the health issues we are seeing in children today, such as obesity, attention deficit disorders, and depression. Good nutrition is often emphasized through EE and stress is reduced due to increased time spent in nature.
8. **Communities are strengthened**
   EE promotes a sense of place and connection through community involvement. When students decide to learn more or take action to improve their environment, they reach out to community experts, donors, volunteers, and local facilities to help bring the community together to understand and address environmental issues impacting their neighborhood.
9. **Responsible action is taken to better the environment**
   EE helps people understand how their decisions and actions affect the environment, builds knowledge and skills necessary to address complex environmental issues, as well as ways we can take action to keep our environment healthy and sustainable for the future. Service-learning programs offered by PLT and other EE organizations provide students and teachers with support through grants and other resources for action projects.
10. **Students and teachers are empowered**
    EE promotes active learning, citizenship, and student leadership. It empowers youth to share their voice and make a difference at their school and in their communities. EE helps teachers build their own environmental knowledge and teaching skills.

3.7. CHARACTERISTICS OF ENVIRONMENTAL EDUCATION

The characteristics of environmental education include:

- It is a life-long process,
- It is interdisciplinary and holistic in nature and its application,
- It is an approach to education as a whole, rather than a subject,
- It concerns the inter-relationship and interconnectedness between human and natural systems,
- It views the environment in its entirety including social, political, economic, technological, moral, aesthetic and spiritual aspects,
- It encourages participation in the learning experience

- It emphasises active responsibility,
- It uses a broad range of teaching and learning techniques, with stress on practical activities and hands-on experience,
- It is concerned with local to global dimensions, and past/present/ future dimensions,
- It should be enhanced and supported by the organisation and structure of the learning situation and institution as a whole,
- It encourages the development of sensitivity, awareness, understanding, critical thinking and problem-solving skills,
- It encourages the clarification of values and the development of values sensitive to the environment,
- It is concerned with building on environmental ethic.

4.0. SUMMARY

The aim of environmental education is clearly to show the economic, social, political and ecological interdependence of the modern world, in which decisions and actions by different countries can have international repercussions. Environmental education should, in this regard, help to develop a sense of responsibility and solidarity among countries and regions as the foundation for a new international order which will guarantee the conservation and improvement of the environment.
The main aim of environmental education at the grass root level is to succeed in making individuals and communities understand the complex nature of the natural and the built environments. Further, to acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving social problems, and in the management of the quality of the environment.

MODULE 5 UNIT 4: SUSTAINABLE DEVELOPMENT

INTRODUCTION

The term “sustainable development” was brought into common use by the World Commission on Environment and Development (The Brundtland Commission) in 1987. The Commission's rep or: highlighted the need to simultaneously address developmental and environmental imperatives of human settlement (WCED, 1987). It advocated for development that "meets the needs of the present generation without compromising the needs of future generations.
The United Nations Conference on Environment and Development at its 1992 Earth's Summit held in Rio de Janeiro marked an important milestone in awakening the: world to the need for a development process that does no: jeopardize future generations. As the summit drew to a close, the message of sustainable development became clear: "without better environmental stewardship, development will be undermined, and without accelerated development in poor countries, environmental policies will fail". The Rio conference was a signal to policy makers of the crucial and potentially positive link between environmental quality and economic growth. It

emphasized the need for humanity to;
(1) live within the limitation environment as both a provider of inputs and a sink for waste;
(2) recognize that even if environmental degradation does not reach life-threatening levels, it can result in a significant decline in the quality of the world we live in;
(3) face its responsibilities to other species and protect biodiversity, and;
(4) find a way to enable all people, now and in the future, to enjoy clean water, clean sir, and fertile soils (Serageldin, 1993).

3.1. CONCEPT OF SUSTAINABILITY

Sustainable work has been undertaken in an effort to draw out the operational implications of the concept of sustainable development. Thus, there are many definitions of sustainable development. However, the most commonly cited is that derived from "Our Common Future", which defined sustainable development as "that which meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987).

The twin emphasis on the needs of existing and future generations puts economic activity into a new strategic context, requiring this generation to leave a constant stock of ecological capital for the next. (These questions the justification for the uncontrolled consumption of non-renewable resources in a world where: the total population continues to rise). The concept of intra and inter- generational equity means approaching current poverty from a position of equity, while ensuring that this does not compromise the right of future generations to have equal access to resources as the present generation. The conditions for achieving the long-term aim of sustainability require, that natural and capital stock, understood as all environmental resources' assets, should not decrease over time. Production therefore should not exceed resource productivity, so as to ensure that the resource base (natural capital stock such as water, soil and energy) does not decrease over time. Each generation therefore has to leave a constant stock of ecological capital for the next. Future generation will secure compensation through the inheritance of non declining natural capital stock.

Peace et al (1990) sees as a major problem the persistent trade-off between present and future needs and between the quality of resources and economic and social welfare. The idea of equity between generations only has value if subsequent generations are guaranteed livelihoods. If, for example, as a result of rapid population growth inheritance are too small to provide livelihoods for the next generation, inter-generational equity may be hard to establish. The concept of sustainable development gives a wider dimension to the problems of development than that of traditional strategies based on development economics. Morvaridid (1996) observed that the qualitative dimension of sustainability involves assessment of a society's long term ecological, social and cultural potential for supporting economic activity and structural change. The synthesis of these elements is a strategy aimed at making achievements last well into the future.

The concept of efficiency underlies most development concerns and is used in terms of sustainable development to refer to efficient use of resources (Markandya 1992). Efficiency alongside conservation is considered necessary to provide both equity and economic gains in the short and long-run. However, sustainability is not just about resource use. An important contribution of the various approaches to sustainable development is the recognition that environmental degradation, poverty and underdevelopment result in a process of cumulative causation (Sarbiar, 1987). Dealing with the problems of poverty is a goal in itself as well as a means to protecting the environment 'and increasing economic output. In terms of appraisal criteria, these interactions cannot be ignored. Chamber (1987) writes that;

> *"Poor people in their struggle to survive are driven into doing environmental damage with long-term losses. Their herds overgrazed; their shortening fallows on slopes and fragile soils and income drive them to cut and sell firewood and to make and sell charcoal and cultivate on marginal and unstable land".*

Chambers refers to the need to secure sustainable livelihoods, which means securing food and basic needs, resources and income. A minimum condition for sustainable development is that the environment is valued as an integral part of the socio-economic process.
The Concept of equity is also embedded in the sustainable development literature. Although sustainable development is a means to achieving resource conservation and environmental integrity, it is also a means of ensuring some accountability for social justice. As Buttle (1991) asserts "many resources conservation issues, for example cannot be resolved without addressing the grinding poverty and social marginality that desire rainforest destruction, land degradation and so on".

The need to involve local participation at a grassroot level is an integral part of most definitions of sustainable development, since economic and social impacts of resources use cannot be assessed in isolation from local people. Ecological knowledge is acquired by indigenous and local people over the generation through direct contact with the environment.
Gender relations and the division of labour impact on resources use is another focus of theoretical debate and reasoning of sustainable development. The concept of equity between social groups and generations has not been extended to include equity between the sexes. Women play a vital role in household production and reproduction and household decision - making on choice of household fuels and consumption patterns. Since women are usually the household members responsible for collecting firewood and drawing water for household consumption, any environmental conservation decisions' which will directly affect their work should involve them.

3.2 SUSTAINABLE DEVELOPMENT

―Humanity has the ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. - Brundtland Commission, 1987

Sustainable development contains within it two key concepts; the concept of ″needs″, in particular the essential needs, to which overriding priority should be given, and the idea of limitations imposed by the state of technology and social organization on the environment ‘s ability to meet present and the future needs. How can we meet the needs of today without diminishing the capacity of future generations to meet theirs? Sustainable development implies a
broad view of human welfare, a long term perspective about the consequences of today‘s activities, and global cooperation to reach viable solutions

Development is all about the utilization of natural resources to provide goods and services, a business activity for the betterment of mankind. Sustainability is ensured only upon striking a balance between living conditions and resource usage. When one sidelines the other the whole system collapses, in most cases, with irreversible environmental damages. The real transition from ―Development‖ to ―Sustainable Development‖ is possible only with changes in business attitudes and actions. Expansion and intensification of agriculture, uncontrolled industrialization, destruction of natural habitats, and

increasing urbanization to satisfy the needs of the growing population and economic development have been major threats to the regions rich heritage. The antagonism between population growth, resource depletion, and environmental degradation is being widely deliberated in the recent years. Arguments, most of the times, are between population growth as the main cause of increasing environmental pressures, economic development, unsustainable agricultural and industrial practices, and excessive or wasteful consumption.
Clearly an intrinsic relationship exists between population growth and environmental stress, but very little empirical evidence exists to prove or disprove it. Prescott-Allan, in his book The Wellbeing of Nations (2001), concludes that the countries where population is projected to grow fastest have some of the lowest income levels in the world. Eventually, these countries already rank high in terms of environmental stress. In the recent years, resource consumption patterns have significantly changed and moved to a use-and-throw state of mind. Such a style, in addition to posing significant threats on resource consumption, also increases the stress on the environment in the form of the disposed waste.

3.3 ECOLOGICAL FOOTPRINT AND BIOCAPACITY

Ecological Footprint measures humanity‘s demand on nature. The footprint of a country is the total area required to produce the food, fibber and timber that it consumes, absorb its waste and provide space for its infrastructure. In 2001, the global Ecological Footprint was 13.5 billion global hectares, or 2.2 global hectares per person (a global hectare is a hectare whose biological productivity equals the global average). This demand on nature can be compared with the Earth‘s bio-capacity, a measure of nature‘s ability to produce resources from its biologically productive area. In 2001, the Earth‘s biocapacity was 11.3 billion global hectares, a quarter of the planet‘s surface, or 1.8 global hectares per person. The global Ecological Footprint decreases with a smaller population size, lower consumption per person, and higher resource efficiency. The Earth‘s biocapacity increases with a larger biologically productive area and higher productivity per unit area. In 2001, humanity‘s Ecological Footprint exceeded global bio-capacity by 0.4 global hectares per person, or 21 per cent. This global overshoot began in the 1980s and has been growing ever since. In overshoot, nature‘s capital is being spent faster than it is being regenerated. If continued, overshoot may permanently reduce ecological capacity. (Source: WWF, 2005).

3.4 ECOLOGICAL PRINCIPLES AND THEIR IMPLICATIONS FOR LAND USE

Changes in technology and modes of production have fundamentally altered the relationship between people and natural ecosystems. When people were sustained by hunting and gathering, the availability and distribution of plant and animal foods limited human population abundance and distribution; hunter-gatherers were tightly integrated into natural food webs. The dependence of humans on natural stocks of plants and animals declined with the advent of agriculture, which allowed people to concentrate in areas with high productivity, areas where soils were fertile and rainfall was abundant. No longer was the spatial distribution of people limited by the availability of prey.‘‘ Augmentation of rainfall with irrigation, and addition of fertilizers to natural stocks of nutrients, further reduced the spatial dependence of human population centres on the biotic and abiotic properties of ecosystems. The advent of extensive transportation networks and the development of food-preservation technologies during the Industrial Revolution extended the habitable area by allowing population of areas remote from agriculture. These trends have reduced the interdependence of ecological and human systems, and the consequences of land-use decisions often are not felt immediately. Planning is needed to avert long-term or broad-scale harmful ecological effects resulting from unwise landuse choices.

3.5. ECOLOGICAL FOOTPRINT OF ENVIRONMENTS

The "ecological footprint" of an environment is a concept which has been identified to be useful to the understanding of the impact environments have on natural resources and ecosystem. Rees (1993) refers to this as the natural capital including the land area, on which an environment depends to sustain its inhabitants and their Production and consumption activities.
Urban environments rely heavily on surrounding rural environments or even distant hinterlands for goods, water, fossil fuels, raw materials etc. Generally, the bulkier materials such as brick, gravel and timber are drawn from areas nearby while light goods such as vegetable, fruit, certain manufactured products could be drawn from areas much further. In the case of resources drawn from areas surrounding the city, the degradational impacts are more easily recognized. For instance, the outskirts of our cities are characterized by clay pits, sand and gravel pits, quarries and polluted water bodies, and solid wastes. The pollution of streams, lakes and rivers usually emanate from unregulated discharge of waste water from industrial processes,' commercial and residential areas. The pollution of these water bodies compounds the problem of environmental quality in the urban centres.

The fact that urban environments draw on natural resources outside its built-up area is established. Hardoy et al (1993) pointed out that the more the population figure of a city and the richer the residents, the greater the demand for resources and the larger the area from which the resources are drawn. Rees '(1993) estimated that the areas of land that is required in order to sustain an urban environment is normally at least ten times or more greater than the built-up city areas or boundary. Douglas (1989) in his study on the long-term impact that Jarkata has on its wider region showed that among others, over-extraction of ground water to meet urban demand has resulted in salt water intrusion in hitherto potable water acquifers, while fanners have been pushed from agricultural land by urban expansion. Ogu (1998) opined that the demand for wood products in the cities of rich countries could be the major cause of deforestation and subsequent erosion in certain countries in the South. He further observed that the export of hazardous wastes to regions III the South and transfer of dirty industries to the developing countries are examples in which ecological costs could be passed on to developing nations by rich countries in the latter's : pursuit for ecological "sustainability' within their own entities. Hence, city based production and consumption activities could have ecological impacts on both surrounding and far regions.

3.6 GOALS OF SUSTAINABLE DEVELOPMENT

The goals of sustainable development as applied to urban centres are as follows:

(1) **Meeting the Needs** of the present generation. Such needs include:

(a) **Economic Needs:** This includes;
(i) access to an adequate livelihood or productive assets;
(ii) access to economic security when illness, unemployment, disabilities expose population to insecure livelihood.

(b) **Social, Cultural and Health Needs:** This includes;
(i) a shelter that is healthy, safe and affordable and secure, within a neighbourhood adequately provided with portable water, sanitation, drainage, transport, health care, education and child development.
(ii) A home, workplace and environmental hazards, including chemical pollution.
(iii) People's choice and control-including homes and neighbourhoods which they value and where their social and cultural priorities are met.

(c) **Political Needs:** This includes;

(i) freedom to participate in national and local politics and decision-making on the development of someone's home and neighbourhood within a broad framework which ensures respect for civil and political rights and the implementation of environmental legislation.

(2) Non-Compromise on the ability of future generations to meet their own needs. In order realize the goal and the objectives of development activities should include;

(a) Minimizing the use and waste of non-renewable resources; This in turn includes;
(i) minimizing the consumption of fossil fuels in housing, commerce, industry and transport.
(ii) Minimizing the waste of scarce mineral resources (through reduction in use, re-use, recycling and reclamation) e.g. cultural, historical and natural assets within cities that are irreplaceable, and the non-renewable historical districts and parks and natural landscape which provide space for play, recreation and access to nature.

(b) Sustainable use of finite renewable resources: This includes;
(i) cities drawing on freshwater resources at levels which can be sustained (with recycling and re-use promoted).
(ii) Cities keeping to a sustainable ecological footprint in terms of land area on which city-based producers and consumers draw for agricultural and forest products and biomass fuels.

(c) Biodegradable wastes not overtaxing the capacities of a river to break down biodegradable wastes, without ecological degradation.

(d) Non-Biodegradable wastes/emissions not overtaxing the (finite) capacity of local and global sinks to absorb or dilute them without adverse effects (e.g. persistent pesticides, green house gases and stratospheric ozone-depleting chemicals).

MODULE 5 UNIT 5: CASE STUDIES, EXAMPLES OF SIGNIFICANT HUMAN SETTLEMENTS AND DEVELOPMENT PROJECTS AND THEIR ENVIRONMENTAL IMPACTS

Human settlement planning and management in disaster-prone areas

Natural disasters are sometimes inevitable and can cause loss of life, disruption of economic activities and urban productivity - particularly for highly susceptible low-income groups, and environmental damage, such as loss of fertile agricultural land and contamination of water resources, and can lead to major resettlement of populations. Over the past two decades they are estimated to have caused some 3 million deaths and affected 800 million people. Global economic losses have been estimated by the Office of the United Nations Disaster Relief Coordinator to be in the range of $ 30-50 billion per year. There is an urgent need to address the prevention and reduction of man-made disasters and/or disasters caused by, inter alia, industries, unsafe nuclear power generation and toxic wastes

One of the objectives of Agenda 21 is the ―*Protection and Promotion of Human Health conditions*‖. The objective is to enable all countries, in particular those that are disaster-prone, to mitigate the negative impact of natural and man-made disasters on human settlements, national economies and the environment. Three distinct areas of activity are foreseen under this programme area, namely the development of a culture of safety

 pre-disaster planning and

 post-disaster reconstruction.

Develop a culture of safety

To promote a "culture of safety" in all countries, especially those that are disaster-prone, the following activities should be carried out:

Complete national and local studies on the nature and occurrence of natural disasters, their impact on people and economic activities, the effects of inadequate construction and land use in hazard-prone areas, and the social and economic advantages of adequate pre-disaster planning;

(b) Implement nationwide and local awareness campaigns through all available media, translating the above knowledge into information easily comprehensible to the general public and to the populations directly exposed to hazards; (c) Strengthen, and/or develop global, regional, national and local early warning systems to alert populations to impending disasters;

(c) Identify industrially based environmental disaster areas at the national and international levels and implement strategies aimed at the rehabilitation of these areas through, inter alia:

(i) Restructuring of the economic activities and promoting new job opportunities in environmentally sound sectors;

(ii) Promoting close collaboration between governmental and local authorities, local communities and non-governmental organizations and private business;

(iii) Developing and enforcing strict environmental control standards.

Pre-disaster planning

Pre-disaster planning should form an integral part of human settlement planning in all countries.

The following should be included:

(a) Complete multi-hazard research into risk and vulnerability of human settlements and settlement infrastructure, including water and sewerage, communication and transportation networks, as one type of risk reduction may increase vulnerability to another (e.g., an earthquake resistant house made of wood will be more vulnerable to wind storms);

(b) Develop methodologies for determining risk and vulnerability within specific human settlements and incorporate risk and vulnerability reduction into the human settlement planning and management process;

(c) Redirect inappropriate new development and human settlements to areas not prone to hazards;

(d) Prepare guidelines on location, design and operation of potentially hazardous industries and activities;

(e) Develop tools (legal, economic etc.) to encourage disaster-sensitive development, including means of ensuring that limitations on development options are not punitive to owners, or incorporate alternative means of compensation;

(f) Further develop and disseminate information on disaster-resistant building materials and construction technologies for buildings and public works in general;

(g) Develop training programmes for contractors and builders on disaster-resistant construction methods. Some programmes should be directed particularly to small enterprises, which build the great majority of housing and other small buildings in the developing countries as well as for the rural populations which build their own houses;

(h) Develop training programmes for emergency site managers, non-governmental organizations and community groups which cover all aspects of disaster mitigation, including urban search and rescue, emergency communications, early warning techniques, and pre-disaster planning;

(i) Develop procedures and practices to enable local communities to receive information about hazardous installations or situations in these areas, and facilitate their participation in early warning and disaster abatement and response procedures and plans;
(j) Prepare action plans for the reconstruction of settlements, especially the reconstruction of community life-lines.

Post-disaster reconstruction and rehabilitation planning

The international community as a major partner in post-reconstruction and rehabilitation should ensure that the countries involved derive the greatest benefits from the funds allocated by undertaking the following activities:
(a) Carry out research on past experiences on the social and economic aspects of post- disaster reconstruction and adopt effective strategies and guidelines for post-disaster reconstruction with particular focus on development focused strategies in the allocation of scarce reconstruction resources, and on the opportunities which post-disaster reconstruction provides to introduce sustainable settlement patterns;
(b) Prepare and disseminate international guidelines for adaptation to national and local needs;
(c) Support efforts of national governments to initiate contingency planning, with participation of affected communities, for post-disaster reconstruction and rehabilitation.