

Block

4

HUMAN SETTLEMENTS

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BLOCK 4: HUMAN SETTLEMENTS

This is the last block of the course. Till now you have studied about Fundamentals of Human Geography in Block 1 and Space and Society in Block 2. In the previous Block i.e. Block 3, we have discussed various aspects of Population namely distribution, growth, population characteristics, human migration and population-resources relationship. In this block i.e. Block 4, we will discuss about another important branch of human geography i.e. Human Settlements. This block like other three blocks has four units. Let us discuss in brief about each unit.

Unit 13 Human Settlements: These units being the first unit of the block define and trace the evolution of human settlements. In the concluding section of the unit we discuss about classification of settlements on the basis of size, forms and functions.

Unit 14 Rural Settlements: This unit will discuss about the factors affecting rural settlements. You will also learn about the morphology of rural settlements and various aspects of rural dwellings such as factors affecting house types, essential features of house types and rural house types.

Unit 15 Urban Settlements: As the name suggests, we will discuss about the various facets of urban settlements namely nature, evolution, classification and morphology of urban settlements.

Unit 16 Urbanisation: In this unit, we will discuss urbanisation and sub-urbanisation as a process as well as fringe development and its problems. This unit will also analyse trends of urbanisation in developed and developing countries. The concluding section deals with problems of urbanisation and urban growth.

We hope after studying this block, you will acquire an in-depth understanding about various aspects of Settlement Geography. Our best wishes are with you in this endeavor.

UNIT 13

HUMAN SETTLEMENTS |

Structure

13.1 Introduction

Expected Learning Outcomes

13.2 What is Human Settlement?

13.3 Evolution of Settlements

Origin and Growth of Settlements

Village, Town, City, Metropolis,

Megalopolis

13.4 Classifications of Settlements

Classification on the Basis of Size

Classification on the Basis of Forms

Classification on the Basis of

Functions

13.5 Summary

13.6 Terminal Questions

13.7 Answers

13.8 References and Further Reading

13.1 INTRODUCTION

Humans live in houses, which we call home. Some unfortunate humans may not have a home-called the homeless. Some others, such as the nomadic population live in homes that are temporary as they move from one place to another, while many live in permanent houses-called the dwellings. Dwelling means the place of residence. A cluster of dwellings ranging from a hamlet to villages and towns, big or small are called human settlements or habitations. The study of human settlements-their form, size, functions and relationships among them is called Settlement geography, which is an important branch of human geography. Thus settlement geography studies that part of the earth which is inhabited by humans. Human habitations or settlements, among others, are an important facet of human-environment relationship. As humans settle down at a place they gradually change the natural landscape according to their needs. So they not only build houses, but they also develop fields to raise crops, build water channels to irrigate their fields, construct streets, roads, places of worship, shops, schools, hospitals, theatres, factories, offices, parks, playgrounds and other public places of economic, social, cultural and political importance. Hence, human settlements constitute one of the central manifestations of human culture and civilization.

It is important, therefore, to ask as to why people live at places where they do? Why people have different kinds of houses and habitations? Why some habitations over time grow rapidly while some others slowly or even disappear? Why settlement forms, patterns and functions vary from one environmental setting to another? Why patterns undergo change with time as the social, economic and technological change takes place? We will try to develop our understanding and answer to these questions in this unit.

In this unit, we will learn about what human settlements are, how human settlements came into being, and what principles are followed by human beings while choosing sites for settlements and on what basis are human settlements classified and related issues.

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- ❖ define human settlements;
- ❖ describe various components that make up a human settlements
- ❖ analyse the evolution of settlements over time; and
- ❖ explain classifications of human settlements on the basis of size, forms and functions.

13.2 WHAT IS HUMAN SETTLEMENT?

Before discussing about various aspects related to human settlements, we should know how to define human settlements. A human settlement can be defined as a cluster of dwelling structures, put up with the intention of or used as habitation, and various other social/economic use, which forms a spatial unit for human interaction. People living in a place not only depend and interact with each other but also with those living elsewhere in different habitations- far or near, in order to fulfill a variety of socio-economic, cultural and political purposes. The process of interaction between and among habitations generates spatial relations which link people of one locality, place or region with their immediate neighbours as well as those living in distant places. The spatial relationships between and among settlements form the settlement system.

Thus, according to the United Nations' Declaration on Human Settlements (1976), "human settlements means the totality of the human community – whether city, town or village – with all the social, material, organizational, spiritual and cultural elements that sustain it".

Settlement System: Human settlements or the system of human settlements could be conceived as a complex whole consisting of physical as well as non-physical subsystems. thus human beings, society, government, built Environment and natural Environment are the subsystems. The systems of human settlements are in a continuous state of change because of changes in these five subsystems.

C. A. Doxiadis (Box 13.1) developed “**Ekistics**” or the science of human settlements, which studies the principles while building settlements, as well as the evolution of human settlements through history. The subject is a very complex system of five elements – nature, human, society, shells (that is buildings or houses) and networks (Fig.13.1). It is a system comprising natural and human-made elements which can be seen in many ways – economic, social, political, technological and cultural.

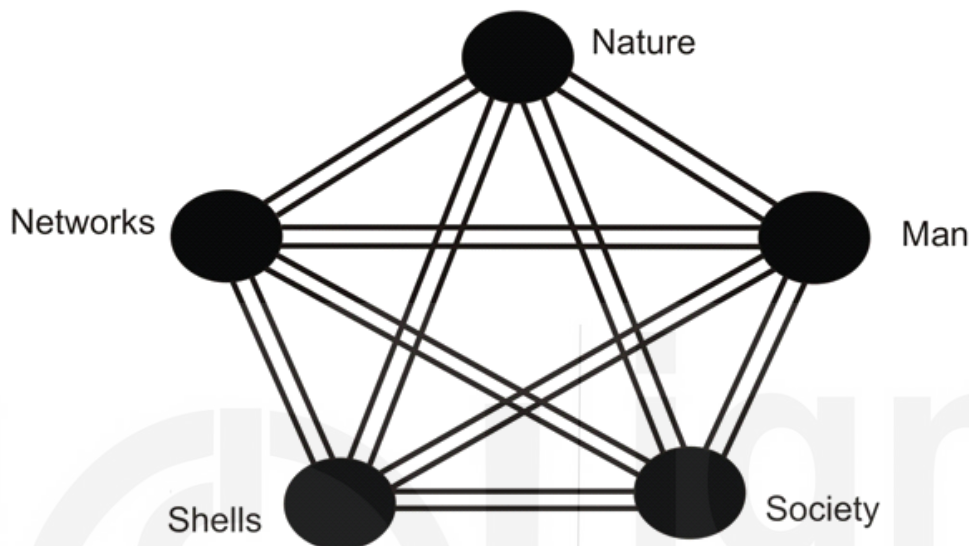


Fig. 13.1: Doxiadis' Concept of Human Settlement.

Box 13.1: C. A. Doxiadis

Constantinos Apostolou Doxiadis was a Greek architect and town planner. He became known as the lead architect of Islamabad, the new capital of Pakistan, and the initial proponent of Ekistics: the science of human settlements.

Born: May 14, 1914
Died: June 28, 1975

Human beings, while building homes and creating settlements have certain concerns and considerations, such as safety, security, survival and propagation of their collective group. These develop into principles. Some such principles are listed below.

- i) First Principle is maximisation of human being's potential contact with elements of nature (such as water and trees), with other people, and with man-made works (such as buildings and roads).
- ii) The Second Principle is minimisation of effort required for achievement of human being's actual and potential contacts. They give structures the shape or select the route, which requires minimum effort.
- iii) The Third Principle is of optimization of human being's protective space, which means the selection of such a distance from other persons, animals or objects that they can keep their contacts with them without any kind of discomfort.
- iv) The Fourth Principle is that of optimization of the quality of human being's relationship with his/her environment, which consists of nature, society, shells (buildings and houses of all sorts) and networks (from roads to telecommunications) this principle, leads to physiological and aesthetic order.
- v) Finally, the Fifth Principle, human beings organise their settlements in an attempt to achieve an optimum synthesis of the other four principles; and this optimization is dependent on time and space, and on man's ability to create synthesis.

Therefore, theories of settlement systems may be behavioural or normative. The behavioural theories attempt to explain the existing patterns of settlements in a region. On the other hand, the normative settlement theories are not concerned about the existing patterns rather attempts to define an ideal system of settlements. Behavioural theories are based on empirical findings of similar settlement patterns from different countries, for example Zipf's Rank Size Rule; while examples of normative theories of Settlement systems would be Central Place Theory. You will learn more about these theories in the unit on Urban Settlements.

SAQ 1

- a) What is human settlement?
 - b) What are the factors that human beings consider while setting up a settlement?
-

13.3 EVOLUTION OF SETTLEMENTS

Have you ever wondered how the village or town in which you live might have looked like at its inception? What factors made the original inhabitants of settlement decide on choosing the particular location? In this section, let us discuss about these issues related to evolution of settlement.

13.3.1 Origin and Growth of Settlements

The habit of men and women to live with their family and a number of inter-related families in large communal dwellings is a reflection of the gregarious nature of human beings. As human beings began to adapt a lifestyle which was not completely dependent on the bounties of nature, their dependence on associations like family and kinship grew. The interaction between and among individuals and groups, necessitated the creation of settlements.

When and where the first settlements had developed is still a matter of dispute, but through archaeological evidences, one can say that the first settlements developed in the Neolithic period. Earliest human beings did not settle anywhere as they wandered around in search of food. They did not have the skills to construct buildings and so lived in caves. Occasionally they also took shelter atop trees to protect themselves from wild animals.

Till 10,000 BC, humans lived in caves (Fig.13.2) and by rivers, lakes and springs. They preferred sites which were elevated or sites which were protected by river swamps. Caves were never their permanent dwellings since as or when food shortage occurred, they moved to new locations. The tree houses or '*machaans*' as they are called in India, were also used as dwelling places. In Andaman and Nicobar Islands, some tribes use such dwellings till date.



**Fig. 13.2(a): Tsanwaki Cave Dwellings,
New Mexico.**



**Fig. 13.2(b): Solnitsata Settlement,
Bulgaria.**

Between 10,000 and 5,000 BC, Human beings learnt the art of cultivation of plants. Cultivation of land made it easy for them to stay at one place and produce food. They began to settle near the fields they cultivated. They preferred to live near fertile lands with plenty of water and built huts with locally available material such as mud, bamboo and thatch. During 5,000 to 1,000 BC, earliest settlements began to take shape with groups of houses being built near the agricultural fields, with a shrine and a burial ground. People also began to get organised in communities under able leaders and thus the seeds of civilization were sown. But as the fertility of the agricultural land declined with successive crops, people tended to abandon their settlements and resettle in newer areas. Once they learnt to cultivate fields by rotation the necessity to practice shifting came to an end and people settled down in one place.

With acquiring skills of preparing manure, human beings could raise their food production. As food became abundant, the health of the people improved, birth rates began to rise and death rates declined. This led to the growth of population through natural increase of population. All these conditions enabled people to permanently settle by the land they cultivated.

Therefore, if we try to find out the probable conditions that led to selection of locations for permanent settlements then we can identify the following:

1. The environmental conditions had to be favourable for human existence and survival.
2. Climate had to be moderate and not harsh.
3. The region/area should be free from frequent epidemics.
4. Fertility of the soil had to be high to support cultivation of crops.
5. Potable water found in abundance.

River valleys were considered to be the best locations for settlement, since they provided fertile land, soft clay for construction of dwellings, and the river could be used as a means of transportation. The first settlements were thus found in India, China and Egypt near the river valleys, and areas known as the Fertile Crescent (modern Iraq, Syria, Jordan and Israel)

The earliest towns came into existence in the later part of the Neolithic period when the early farmers were able to produce surplus food, and thus allowing a part of the society to be free from tilling of the land. From 4000

BC onwards, wherever water for irrigation was available; e.g., Egypt, Mesopotamia and the Indus Valley, a part of the population got engaged in non-agricultural work. The non agricultural activities undertaken by them were hand manufacture, trade and community organisation. Groups of specialised artisans, merchants, officials and priests started forming. These groups along with a proportion of agricultural community gathered themselves in close knit societies which came to be known as first towns. Suitable geographical locations were chosen as sites so that transport facilities could be developed. Plain land was preferred for wheeled vehicles, and rivers were used for sailing. Examples of such towns were Memphis and Thebes in Nile Valley, Harappa and Mohenjo-Daro in Indus Valley, Lagash, Kish Ur and Nippur in Tigris and Euphrates valley. These towns were mostly walled for defence and had temples, pyramids and palaces. Apart from trading with the surrounding farmlands and towns, these towns also had trade links with distant places for commodities such as copper, paper making materials.

During the Bronze Age, new trading centres emerged. These settlements were able to benefit from sea trade through the Mediterranean Sea. A few caravan centres (e.g., Damascus) were established in the desert oases of Syria in the margins of the Fertile Crescent. In Wei Ho valley in Northern China too new towns emerged and the concept of the city dispersed to central and southern China.

Between 2000 BC and 1000 BC, Greek and Roman city-states appeared. The city states consisted of the city at the core and the rural area from which it obtained its supplies as its periphery. These city states were fully urbanised but sparsely populated. They rarely supported more than 50,000 people. They were hill-top sites and were closely connected to the sea. By 500 BC, examples of urban settlement types based on rectangular grid plan found in Harappa could also be found from Atlantic coast of Iberia to the Pacific coast of China. Iron tools had come into use, along with ships and land vehicles and these developments facilitated commercial contacts with overseas nations. The collapse of the Roman Empire and the coming of Barbarians with the setting in of Dark Ages in Europe led to decline in the growth of cities.

Between 1500 and 1750 AD, many cities in the previously urbanised parts of Europe expanded considerably as capitals under the impetus of the Renaissance voyages and the growing prestige of their rulers. This was the time when a few great cities began to tower over the rest as single rulers began to control large tracts of land and the growth of trade. Cities like Versailles, (Fig. 13.3) Nancy, Potsdam developed with straight wide avenues, grand palaces, formally designed grounds and art galleries and theatres.

As it was also the era of expanding sea trade, so ports through which Atlantic and Asiatic trade could take place like Antwerp, Lisbon and Amsterdam took over the role of Mediterranean ports such as Venice and Genoa. London as the capital of a great state and a leading commercial centre had the highest number of inhabitants. London had 700000 people by 1700 AD, more than the population of Paris, Moscow and Vienna. After the Industrial Revolution, a greater multiplication of towns and expansion of

the size of towns occurred. Improvements in roads, canals, invention of rail transport allowed settlements to develop as hubs of communication.



Fig. 13.3: Plan of Versailles in 1789 AD.

Box 13.2: Settlements as Cultural Entities

In India, one comes across settlements which occupy not only the physical space, but also are a part of the mythological and historical spaces and are more of cultural entities rather than simple settlements. Hence the 'story' of their origins has to be treated with deeper understanding of the spirit of the place that exists in the minds of its inhabitants.

Each settlement linked to the sacred geography which forms a part of the imagined landscape has a 'story' and is linked to the manifest eruptions of Divinity, i.e. the *svayambhu* sites like Thiruvannmalai in Tamil Nadu, or the settlement sites sanctified by *pratishtha* or *adhesion* of deities to those chosen places from where the deity would not move away. This led to the growth of the settlement. Examples of such settlements are Nathdwara in Rajasthan, Gokarna in Karnataka and Vaidyanath in Bihar.

The places known as *tirthas* (pilgrimage places) also mean 'fords' or 'crossings' where settlements have grown. Tirupati, Gaya, Kashi and Prayaga are examples of such settlements.

The four *dhams* located in the four cardinal directions of the country are considered as the dwelling place of divinity. These settlements are Badrinath in the North, Puri in the East, Rameshwaram in the South and Dwarka in the West.

Settlements also give its inhabitants a sense of belonging and offer a social identity. One finds surnames of people bearing the names of their settlements such as Junjhunwalas from Jhunjhunu in North India and in South India, names of one's birthplace appears as a prefix to one's name such as Madurai Shanmukhavadi Subbulakshmi.

13.3.2 Village, Town, City, Metropolis, Megalopolis

The model used to demonstrate the evolution of settlements shows how a small Hamlet evolves into a Metropolis. This model thus assumes that all settlements have humble beginnings as tiny simple hamlets, which with time expanded in size, grew into villages to towns, to cities, and diversified their functions to develop into a complex structure of a metropolis and finally a megalopolis. The characteristics and functions of the settlement forms during the evolutionary stages remained similar. We would now look at these various landmarks in a settlement's evolutionary path and identify characteristics that are typical to those stages.

- i) **Hamlet:** It is difficult to distinguish a village from a hamlet, since a hamlet has no specified minimum number of buildings. However in a hamlet, the buildings are fewer and more loosely clustered than in a village. Usually a homogeneous group occupy hamlets and are engaged in primary activities; like agriculture and fishing. Very rarely would you find a shop or school or an inn in a hamlet. The communication system would also be poor in a hamlet.
- ii) **Village:** A group of houses and associated buildings, larger than a hamlet and smaller than a town, situated in a rural area. A village is more closely related to its immediate surroundings than a town and where neither manufacturing nor commerce plays any significant role in its economy. The majority of the people in a village are engaged in farming. Apart from farming villages, there are forest villages, fishing villages, mining and quarrying villages which are named so according to the main economic activity the villagers perform
- iii) **Town:** Towns sometimes have been defined as "villages which succeed". But, not all towns began as villages. Some were planned as towns. In a town, human-made structures predominate over the natural landscape. Emrys Jones defines towns as a "physical agglomeration of houses and streets, a centre of commerce and administration. It is without any specific size or population density, but certainly the social and economic structure is more complex, occupations more heterogeneous." A town is more than a mere unit of settlement. It comprises of functionally distinct parts such as; middle class and working class residential areas, a factory zone, commercial and administrative sections. It provides trading facilities for rural dwellers; supports craftsmen like builders, repairers, tailors, mechanics, plumbers as well as men and women providing professional services, such as teachers, doctors, lawyers, bankers and accountants.
- iv) **City:** A city is regarded as a leading town, one which has outstripped its local and regional rivals. This means that a city surpasses its neighbouring towns in terms of population, areal size as well as economic production. For example, New Delhi in relation to other towns in the National Capital Region of India. These towns are Gurgaon, Faridabad, Ghaziabad, Sonapat, Panipat, Rohtak, Alwar, Jhajjar and Rewari. In Lewis Mumford's words, "the city is in fact the

physical form of the highest and most complex form of associative life". This means that the social and economic interactions among the population of a city are very complex. The social groups inhabiting a city are heterogeneous and perform various kinds of non- primary economic activities.

- v) **Metropolis:** The large city dominating a number of small towns and villages, and developing in a particularly favoured situation. Such a settlement is commonly occupied by cosmopolitan population, following many specialized occupations, and has a very wide sphere of influence. In a metropolis, the merchants and bankers wield power over the working classes. It also becomes difficult to integrate diverse cultural elements in a metropolis.
- vi) **Megalopolis:** Megalopolis is the bloated city, in which material wealth dominates life. Standardised products replace original art, size dominates form and the evils of bureaucracy intensify as seen in Second Century Rome, Eighteenth Century Paris and Twentieth Century New York.

In the present context, Megalopolis was first used to delimit the urban corridor in the north-eastern United States extending over 600 miles from Boston to Washington DC (Fig.13.4) comprising of 30 metropolitan areas. That area possesses the wealthiest and the largest urban population of United States and has a long and distinctive history in its role as the economic fulcrum of the country.



Fig. 13.4: Boston-Washington Megalopolis.

This coalescence of urban centres is not a unique feature of this part of the world alone. Similar megalopolises occur in Europe and Japan. In Japan, the Tokaido Megalopolis extends from Tokyo-Yokohama to Osaka-Kobe-Kyoto.

SAQ 2

- a) List the factors that were taken into consideration while choosing locations for permanent settlements.
 - b) What are the characteristic features of a Metropolis?
-

13.4 CLASSIFICATIONS OF SETTLEMENTS

Each settlement is unique, and builds a personality of its own. Villages often occupy similar sites, share same form and perform similar functions and may also occupy similar landscapes. You will read more about them in the following unit of this block i.e. Unit 14 which is on rural settlements. Cities and towns too exhibit some common attributes like individual buildings made out of similar materials. It is therefore possible to look at the similarities between settlements for a comparative treatment and then to arrive at some classification of settlements. In the study of settlements, it is important to take all aspects of size, form and function because they are closely dependent on one another. Let us discuss some of these attributes one by one.

13.4.1 Classification on the Basis of Size

The size of a village is determined by natural, social and economic environment. Flat areas, suitable for cultivation have bigger villages compared to areas where the ground is undulated and the soil is thin and infertile. Village sizes are small near desert areas where natural resources are less. If the inhabitants of the village are skilful in utilizing the natural resources the size of the village grow more than the surrounding ones.

The size of urban settlements depends on various complex reasons, but the most important reason is the function of the urban centre. The largest urban centres are the ones which are the largest business and financial centres.

13.4.2 Classification on the Basis of Forms

Settlements may develop taking up myriad shapes, forms and patterns. It may be broadly classified into three categories on the basis of their form- Compact Settlements, Semi Clustered Settlements and Dispersed Settlements.

- i) **Compact settlement:** In this type of settlement, the houses are close to each other. Inter building spaces are small. Such settlements are described as clustered, compact or nucleated. These settlements are generally found in highly productive alluvial plains, and where large hunting and gathering communities reside. Cape Town is one example (Fig. 13.5).



Fig. 13.5: Cape Town – A Compact Settlement.

- ii) **Semi clustered settlements or semi nucleated settlements:** These are the settlements which are in the process of becoming compact settlements. The reasons for this may vary in different environmental contexts but in fertile areas when population increases in small loosely nucleated/ pattern-less settlements, the number of houses increases. These new houses occupy the open spaces and the semi-compact settlement occupies the shape of a compact settlement.
- iii) **Dispersed settlements:** These settlements do not have a compact settlement site. Buildings are spread over a large area, and inter building spaces are large. These settlements are found in areas of extreme climates, hilly tracts, thick forests, grasslands and in areas of extensive cultivation. The below given figure depicts dispersed settlements of Tonami Plains, Japan (Fig. 13.6).



Fig. 13.6: Dispersed Settlements of Tonami Plains, Japan.

The form of a village is influenced by a number of factors, some geographical (like, position with respect to relief, rivers, roads), some historical (like, early need for defense), some economic (like, system of cultivation practiced when the village was first established). Most villages are nucleated settlements, but some have their buildings much closer than the others.

The form of urban settlements may be defined by the natural landscape during its inception, but as the settlement grows, its form and structure are determined by modes of production and social structure.

13.4.3 Classification on the Basis of Functions

Classification of settlements on the basis of functions is a more meaningful exercise. Functional classification attempts to categorize settlements on the basis of their economic function. Most functional classifications use employment and occupational data for this purpose.

In the villages, the inhabitants are engaged and dependent on various primary occupations, such as agriculture, dairying, cattle keeping, fisheries, forestry and mining. Of all these, agriculture is the main occupation. In towns and cities, one common function is trading and business. Towns also perform additional functions of trade, transport, industrial production, administration, defense, and entertainment. Towns and villages may change their functions in the course of time, and this may mean that the present function of a town may be unrelated to the function which led to its origin.

It is universally accepted that the major break in settlement system lies along rural urban division. While there is consensus on the existence of the two kinds of settlements, but there is lack of precision in distinguishing rural from urban. In unit 11 we will have a detailed discussion on functional classification of cities.

- i) **Rural:** Rural settlements are those where the inhabitants of the settlement, depend on exploitation of the natural resources for their livelihood. Exploitation of natural resources means engaging in agriculture, fishing, forestry and mining. It cannot be separated from the land the inhabitants use for their occupation. Often one finds that rural settlements are defined as settlements with attributes which are not found in the urban settlements.

Most of the rural settlements of the world are stable and permanent. The rural areas are dominated by open countryside. Administrative identification and delineation is more objective since the cluster considered as settlement by the villagers may be recognised as a unit by the administrators. The box given below illustrates various basis for delineation of rural settlements.

Box 13.3: Basis for Delineation of Rural Settlements

Rural settlements may be delineated on the basis of a number of factors. A few of them are being listed below.

1. **Presence of Village Deities:** In many parts of India, the Village Deity's sphere of influence marks the limits of a rural settlement. In North India rural settlements have Khetrapals as deities to protect the settlements and in the south similar deities named as Kaval-Deivams are responsible for keeping vigil over the rural settlements.

2. **Revenue Village:** The administrative delimitation for collection of revenue marks the limits of rural settlements.
3. **Census Village:** Mapping of village boundary by the Census operations form the basis of the limits of rural settlements.
4. **Panchayati Raj System Villages:** Villages which are under a Panchayat under the Panchayati Raj System, also form the basis of delimitation of rural settlements
5. **Resettlement Villages:** Natural Disasters and Development projects often result in resettlement of the population of the original destroyed settlements. A recent example of such a village may be found in Reusa block of Sitapur district in Uttar Pradesh where about 800 poor families have been living on roadside for the last two years. These families were displaced after River Sharda changed its course by seven kilometres, flooding and eroding their villages in the process.

The Rural Resettlement Colonies, around Haridwar and Dehradun in Uttarakhand are examples of resettlement of villages submerged by Tehri Dam Project.

6. **Displaced/ Abandoned Villages:** The Village **Kuldhara** in Jaisalmer district of Rajasthan is an extremely intriguing village which has been abandoned since early 1800s and is believed to carry a curse of the residents who migrated elsewhere. The fear of the curse stops the villagers from venturing into the village till date.
7. **Migratory/ Transhumance Villages:** The tribes who practice transhumance also live in rural settlements whether it is on the mountains during the summers which then remain desolate during the winters or the ones in the valleys during the winters which in turn remain depopulated during the summers. The Bhotia tribe travel to Gamshali in the winters and return to Chhinka in the summers in Chamoli district of Uttarakhand, and in Pithoragarh district the Bhotias travel to Milam glacier in the summer and return to Munshiyari in the winters.

- ii) **Urban:** Urban Settlements are those where the inhabitants of the settlement, depend on non-primary activities for their livelihood. These activities range from manufacturing, service and management function, retailing, wholesaling, banking, regional and national headquarter office activity and a host of other personal and professional services.

In India, according to the 1971 Census the definition for an urban area is as follows:

- a) all places with a Municipality, Corporation or Cantonment or Notified Town Area
- b) all other places which satisfied the following criteria:

- i) a minimum population of 5,000.
- ii) at least 75% of the male working population was non-agricultural.
- iii) a density of population of at least 400 sq. Km. (i.e. 1000 per sq. Mile)

The Director of Census of each State/Union Territory was, however, given some discretion in respect of some marginal cases, in consultation with the State Government, to include some places that had other distinct urban characteristics and to exclude undeserving cases.

SAQ 3

Fill in the blanks with suitable words:

- a) Bigger villages are found in areas.
 - b) Most common function of towns is &
 - c) Open country sides are a feature of Settlements.
 - d) In India, settlements should have a density of persons per sq. km to be qualified as an urban settlement.
-

13.5 SUMMARY

Human settlements mean the totality of the human community with all the social, material, organizational, spiritual and cultural elements that sustain it. C. A. Doxiadis developed "Ekistics" or the science of human settlements which takes into consideration the principles human takes into consideration while building his settlements, as well as the evolution of human settlements through history. The subject is a very complex system of five elements – nature, human, society, shells and networks. Theories related to settlement systems may be broadly grouped under behavioural or normative.

If we trace the evolution of settlements, when and where the first settlements had developed is still a matter of dispute. Through archaeological evidences, one can say that the first settlements developed in the Neolithic period. During 5,000 to 1,000 BC, earliest settlements began to take shape with groups of houses being built near the agricultural fields, with a shrine and a burial ground. The earliest towns came into existence in the later part of the Neolithic period when the early farmers were able to produce surplus food, and thus allowing a part of the society to be free from tilling of the land.

The model used to demonstrate the evolution of settlements shows how a small hamlet evolves into a metropolis. This model thus assumes that all settlements have humble beginnings as tiny simple hamlets and with time expand in size, grow into villages to towns, to cities, to metropolis and diversify its functions and develop into a complex structure of a metropolis and finally a megalopolis. Each settlement is unique, and builds a

personality of its own. It is therefore possible to look at the similarities between settlements for a comparative treatment and then to arrive at some classification of settlements. In the study of settlements, it is important to take all aspects of size, form and function because they are closely dependent on one another. Settlements may be broadly classified into three categories on the basis of their form-compact settlements; semi clustered settlements and dispersed settlements. On the basis of functions, settlements are broadly classified as rural and urban.

13.6 TERMINAL QUESTIONS

1. What are the various components that make up settlements?
2. Briefly trace the evolution of settlements from the Neolithic period to the present times.
3. What are Dispersed Settlements? In which geographical conditions are these settlements found?
4. Write short notes on (a) Rural Settlements; (b) Urban Settlements.

13.7 ANSWERS

Self-Assessment Questions

1. a) A collection of human-made structures, put up with the intention of habitation, establishment of shelter or social/economic use, which forms a spatial unit for human interaction.
b). Maximisation of human contact with elements of nature, other people and human-made structures; minimisation of the effort to reach them, optimizing the zone of safety or the protective space around the settlement and optimization of the quality of human being's relationship with his/her environment.
2. a) Permanent Settlements were located where the environmental conditions are favourable for human existence and survival like moderate climate; high fertility of the soil which can support cultivation of crops; abundance of potable water; and a region free from frequent epidemics.
b) A Metropolis is a large city dominating a number of small towns and villages. Such a settlement is commonly occupied by cosmopolitan population, following many specialized occupations, and has a very wide sphere of influence.
3. a) Flat
b) Trading and business
c) Rural
d) 400

Terminal Questions

1. Human settlements or the system of human settlements could be conceived as a complex whole consisting of physical as well as non-physical subsystems, besides human being. Human, society, government, built environment and natural environment are the subsystems
2. Historically, the first settlements came up in the Neolithic Period and natural shelters were converted into dwellings. During 10000 to 5000 BC, with growth of cultivation, huts were built close to fields. As food became abundant, earliest towns came into existence with non-agricultural activities such as trading and manufacturing gained importance. Between 1500 and 1750 AD, many great cities dominated over other cities and in the post Industrial Revolution period, improvement of communication led to multiplication of urban centres – a trend which continues till the present times.
3. In a Dispersed Settlement, buildings are spread over a large area, and inter building spaces are large. These settlements are found in areas of extreme climates, hilly tracts, thick forests, grasslands and in areas of extensive cultivation.
4.
 - a. Rural settlements are those where the inhabitants of the settlement, depend on exploitation of the natural resources for their livelihood. Exploitation of natural resources means engaging in agriculture, fishing, forestry and mining. It cannot be separated from the land, the inhabitants use for their occupation.
 - b. Urban settlements are those where the inhabitants of the settlement, depend on non-primary activities for their livelihood. These activities range from manufacturing, service and management function, retailing, wholesaling, banking, regional and national headquarter office activity and a host of other personal and professional services.

13.8 REFERENCES AND FURTHER READING

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Acknowledgements

Box 13.1: Constantinos Apostolou Doxiadis

Source: <https://www.facebook.com/776894952395008/photos/a.906798266071342/1069125336505300/?type=3&theater>

Figure 13.2(a): Tsanwaki cave dwellings, New Mexico

Source: <https://www.nps.gov/band/learn/photosmultimedia/tt-vt-stop-15.html>

Figure 13.2(b): Solnisata settlement, Bulgaria

Source: <http://forwhattheywereweare.blogspot.com/2012/10/claim-oldest-european-city-in-bulgaria.html>

Figure 13.3: Plan of Versailles in 1789 AD

Source: <https://www.flickr.com/photos/nat507/16609254677>

Figure 13.4: Boston-Washington Megalopolis

Source: <https://upload.wikimedia.org/wikipedia/commons/7/70/Boswash.png>

Figure 13.5: Cape Town – A compact settlement

Source: <https://pixabay.com/photos/cape-town-city-bowl-city-panorama-3545921/>

Figure 13.6: Dispersed settlements of tonami plains, Japan

Source: https://en.wikipedia.org/wiki/Tonami,_Toyama#/media/File:Aerial_photograph_of_Dispersed_settlement_in_Tonami_plain.jpg

RURAL SETTLEMENTS

Structure

14.1	Introduction	14.6	Rural Dwellings
	Expected Learning Outcomes		Factors Affecting House Types
14.2	Factors Affecting Rural Settlements		Essential Features of Houses
14.3	Types of Rural Settlements		Ground Plan and Layout of Houses
14.4	Patterns of Rural Settlements		Rural House Types
14.5	Morphology of Rural Settlements	14.7	Summary
	Socio-Economic Model	14.8	Terminal Questions
	Caste-Segregation Model	14.9	Answers
		14.10	References and Further Reading

14.1 INTRODUCTION

In the previous unit, we learnt about what are settlements, how they evolved and their types. In this unit, we will discuss exclusively about various aspects of rural settlements. Rural settlements are the mainstay of the world as they are the areas with which agriculture is linked with. While travelling on a bus, car or train have you ever noticed the differences between rural and urban settlements? In what ways they differ from each other? Since there is no clear-cut definition of what is rural, we generally identify it with the areas that are located outside the jurisdiction of urban areas with less dense population, smaller built-up area, open swath of land and with larger number of people engaged in agriculture and/or primary activities. Therefore, one can say that settlements that are not classified as urban are rural. But, it is possible to distinguish urban areas from the rural areas on the basis of their socio-economic characteristics, which we will learn later. All rural settlements are not the same but, they differ in location, shape, size, arrangement of houses and the activities the inhabitants perform.

In this unit, you will learn about the types and patterns of rural settlements along with the morphology of rural settlements. Since the dwellings in rural settlements vary in shape and size therefore, you will also learn about the types of rural dwellings.

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- ❖ describe the nature of rural settlements;
- ❖ identify the types and patterns of rural settlements;
- ❖ distinguish various types of rural dwellings;
- ❖ explain the factors responsible for various types of rural dwellings; and
- ❖ analyse the morphology of rural settlements.

14.2 FACTORS AFFECTING RURAL SETTLEMENTS

As discussed in the previous unit, rural settlements are the habitations in the countryside. These settlements are closer to the surrounding environment meaning, the inhabitants are more dependent on nature.

Agriculture and related activities are the main economic activities in which the population is engaged in. There are also settlements near or inside forests, settlements of fishing communities on the sea coasts or river banks, or mining settlements etc. You must be thinking that why people prefer a certain place to settle down. To understand it better we have to understand two key concepts i.e. site and situation. In fact, rural settlements are the function of site and situation.

Site: It refers to the actual location of the village. It is related to the physical surrounding. Rural settlements originate in the areas that have favourable physical environment such as, availability of water, relatively plain surface and fertile soil etc. Nature of advantageous site may differ from place to place depending upon the surrounding. For example, in desert areas, oasis or any other source of water acts as a favourable site for settlement. This is called **wet-point settlement**. In other words, these are the sites close to a supply of water. Contrary to this, in marshy areas, higher ground that is little away from water body can prove to be a favourable site. These are the sites that avoid the risk of flooding. This is known as **dry-point settlement**. Similarly, settlements are located in valleys in mountainous and hilly areas. These are called **spur-line settlement**. Since rural settlements are more dependent on their surrounding environment as compared to urban settlements, site plays an important role in their origin and survival.

Situation: It refers to the culture, economy and political set-up of the settlement. Therefore, situation covers the socio-economic and locational aspects of the settlement. For example, a cluster of houses may grow into a village at the junction of transport or trade routes. Situation affects the growth of a settlement but, since situation itself is dependent on the physical aspects of the locality, site appears to be the most important factor responsible for rural settlements.

Factors affecting origin of rural settlement

Taking into consideration site and situation, some important factors can be identified that affect origin of rural settlement. These are the following:

- (i) **Water supply:** Availability of water is one of the most important factors affecting origin of settlement. Water is the basic necessity of life. It is used for several purposes among which domestic and agricultural uses are the common ones. Water bodies are also used as modes of transportation in many parts of India and the world. Most of the settlements are located near any of the water bodies. You may recall that in the previous unit, we have already discussed about the location of settlements of early civilisation that had come up near the rivers.
- (ii) **Fertile land:** Fertile land is another important factor. Since agriculture is the mainstay of the rural population, fertile land acts as the basis for such settlement. All of the early civilizations namely, Harrapa and Mohenjodaro had also flourished in fertile valleys near rivers.
- (iii) **Dry land:** Those areas that are marshy or are flood-prone have settlements at higher grounds. Stagnant water results in difficulty in movement and also provides ground for growth of diseases like malaria. Dry-point settlements are the common features in such areas which we have already discussed in details in the previous section.
- (iv) **Building material:** In rural settlements only the locally available building material is used for the construction of houses. Therefore, availability of building material plays a role in settlement.
- (v) **Favourable climate:** It refers to equable or moderate climate which is neither very hot nor very cold. People generally avoid settling in windy and frost stricken areas and those that are prone to damp unhealthy winds.
- (vi) **Defence:** This factor was seen as an important one during ancient times. During this time, political instability and hostile neighbours motivated settlements to take place at defensive sites. For example, in India, forts and houses of important courtesans were located on a hilltop or surrounded by water body. In Nigeria, inselbergs prove to be a good defensive site.

SAQ 1

- a) What are the main factors that determine the origin and growth of rural settlements?
 - b) Differentiate between dry point and wet point settlement.
-

14.3 TYPES OF RURAL SETTLEMENTS

When we say type of settlements, it means the nearness or arrangement of the dwelling units with respect to others in a particular settlement. In

other words, type of settlement tells us how close or how far the dwellings are located in a rural settlement. Type of settlement is also called as **form** of settlement. In this section, we will discuss about four major types of settlements. These are compact, semi-compact, dispersed and farmstead. Let us discuss them one by one.

1. **Compact settlements:** In this type of settlement houses are closely located to each other. The density of houses is high. Streets are narrow and they connect the centre of the settlement to the fringes. Compact settlements are generally found in the areas of fertile land and river valleys. Such settlements are also known as **nucleated or clustered settlements** (Fig. 14.1A). For example, compact settlements are found in northern plains and coastal plains of India. In other parts of the world, compact settlements are also found in coastal plains of China, plains of Japan, Australia and the USA.
2. **Semi-compact settlements:** In semi-compact settlement the spacing between the houses is more than that of the compact settlement. The **core settlement** is linked with smaller settlements through footpaths or narrow roads (Fig. 14.1B).
3. **Dispersed settlements:** When the houses are located far from each other then such settlements are known as dispersed settlements. Houses are located apart from each other due to low sustainability of the land (Fig. 14.1C). Such settlements are characteristic features of regions of high relief, rugged terrain and desert areas. Examples of such type are Himalayan regions, foothills of Himalayas, Thar Desert and hills of Nilgiri and Vindhyachal. In the world, such settlements are also found in Sahel deserts of Africa and dry parts of USA.

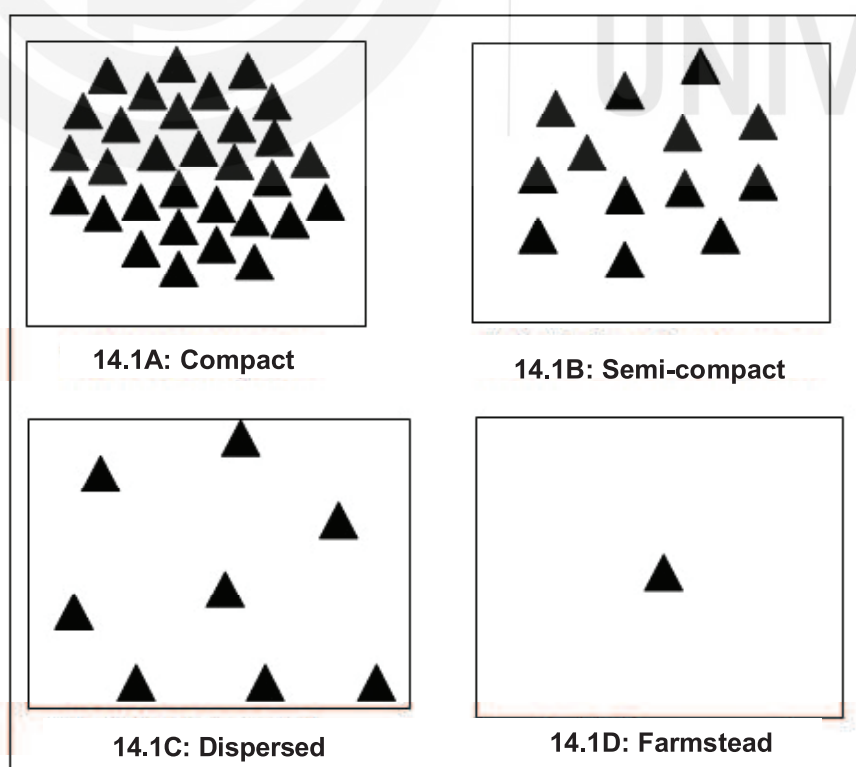


Fig. 14.1: Types of Settlements.

4. **Farmstead:** In areas with small population and large agricultural fields, each house is located far off from each other surrounded by their farms (Fig. 14.1D). Such settlements are known as farmsteads. Farmsteads are found in USA and South America and in Kerala (India).

Some classifications also have sprinkled (instead of dispersed) and semi-sprinkled types of rural settlement.

Box 14.1: Factors Affecting Nucleation and Dispersion

Factors affecting nucleation

- Lowland areas with rich soils where farmers can live within easy reach of their fields
- Areas with high carrying capacity
- Areas of localized water supply and defense consideration

Factors affecting dispersion

- Unfavourable physical conditions like, hilly, rugged areas, poor soil and desert etc
- Areas with ubiquitous water supply

Box 14.2: Albert Demangeon



Albert Demangeon was a French Geographer who attempted to classify rural settlements of France. He was born in 1872 and died in - 1940. He was an exponent of Human Geography. His main works deal with general questions of the geography, rural settlement patterns, and economic geography of France, Great Britain, Belgium, the Netherlands, and Luxembourg.

Some of the types of rural settlement found in different continents have been given in the table 14.1. It is a generalised picture of each continent.

Table 14.1: Distribution of Types of Rural Settlement in the World

Continent	Settlement types
Asia	Compact
North America	Dispersed
South America	Semi-sprinkled
Europe	Semi-compact
Africa	Semi-sprinkled
Australia	Semi-sprinkled

Source: Mandal R. B, (2001), *Introduction to Rural settlements*, Concept Publishing Company, New Delhi, p 205.

In order to understand, the type of settlement and measure the level of closeness and spread of houses in a settlement a statistical technique has been evolved. This is known as **coefficient of dispersion** and was devised by Albert Demangeon (Box 14.2). The following formula has been given:

$$C = \frac{E \times N}{T}$$

Where,

C is the co-efficient

E is the population of the settlement

N is the number of settlements excluding
the chief settlements

T is the total commune population

SAQ 2

Fill in the blanks with suitable words:

-,, and
are the four different types of rural settlement.
- type of settlement is found in northern plains of India.
- Mountainous and hilly regions have type of settlement.

14.4 PATTERNS OF RURAL SETTLEMENTS

How would you define pattern? In simpler terms we can say the geometrical shapes that the settlements possess are known as patterns of settlement. It refers to the arrangement of houses and streets.

Factors affecting pattern of settlement: Pattern of settlement is influenced by several factors that are following:

- Physical factors:** It includes position in accordance with relief, river or other water body and roads.
- Historical factors:** The need for defence during the earlier times can be a historical factor.
- Socio-economic factors:** It refers to the farming system practiced in a region or the shape of the fields, existence of community place, and occurrence of any important religious place.

Major Patterns of Rural Settlements: Some of the major patterns of rural settlements with examples are described below. You will have more clarity if you refer the figures given in Fig.14.2 while reading the description related to each pattern.

- Linear and double linear:** Such settlements get developed along the sides of a river or stream or canal and also along roads and railway lines in a linear manner. Settlement on one side of these objects is called linear whereas, when present on both the sides it is known as double linear.
- Rectangular:** Such settlements get developed especially in agricultural areas as shapes of fields are usually rectangular. Examples of such type of settlements are most villages of Northern plains in India and plains of U.S.A. and Canada.

3. **Square:** Square-shaped settlements are generally walled. Such settlements are found in Turkey.
4. **Circular and semi-circular:** Circular pattern of settlement is formed around hill, pond, lake and also around oasis in desert regions. Semi-circular pattern develops around ox-bow lakes. They are also known as **horse-shoe shaped** settlement pattern.
5. **Chess board or grid-iron:** Such settlements are found in the areas where several roads meet each other at right angles forming a mesh of roads. Settlement takes place in the spaces between the roads forming chess board pattern.

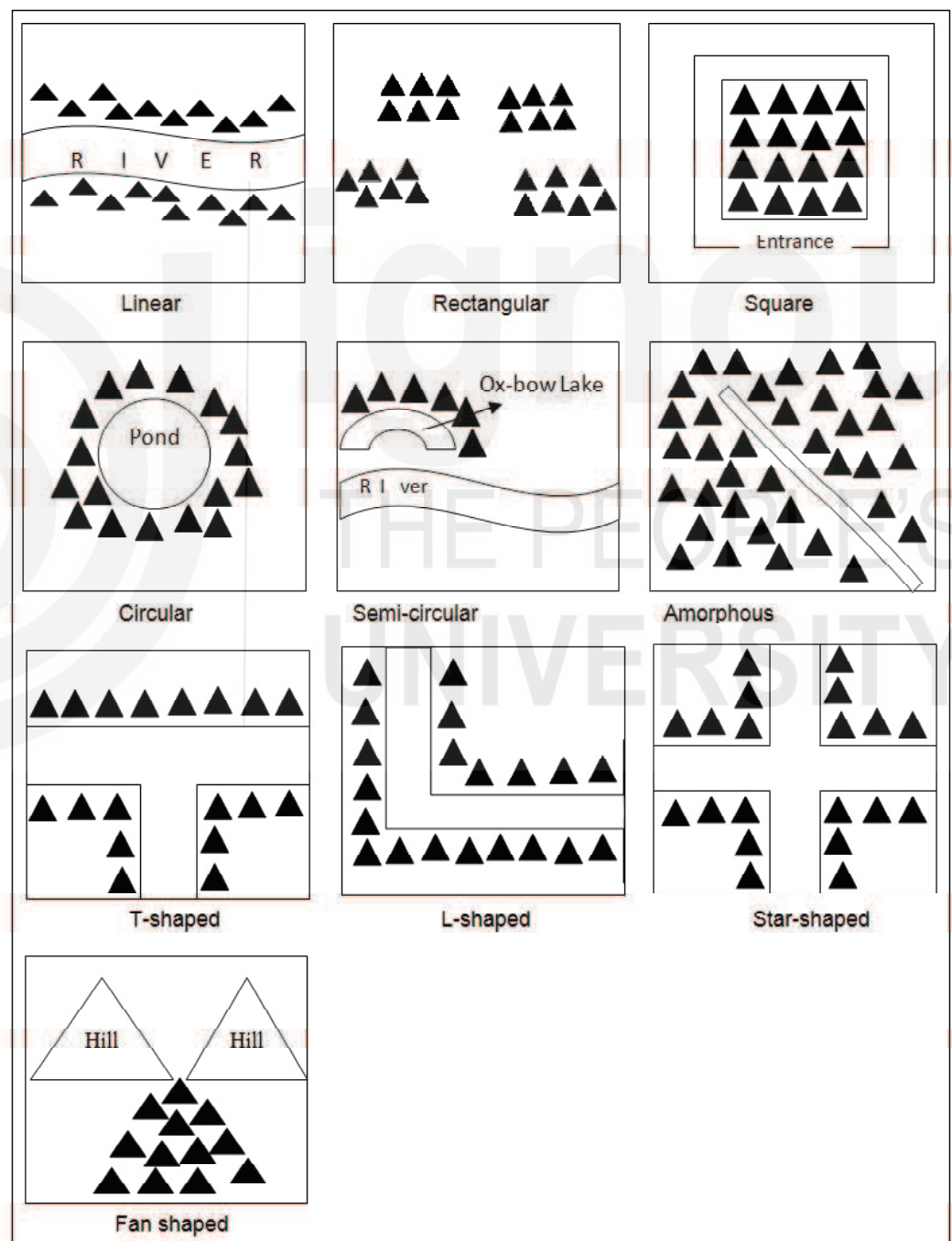


Fig. 14.2: Settlement Patterns.

6. **Amorphous:** When settlement grows at a fast rate and houses are constructed in any direction of the existing settlement haphazardly then

it is known as amorphous pattern. Such settlement is also formed where there is no important road or any important physical and cultural features. No clear shape can be determined for such settlements.

7. **Others:** It includes **T-shaped**, **Y-shaped**, **L-shaped** and **Star-shaped** settlement patterns depending upon the manner in which the roads meet each other. **Fan-shaped** settlement pattern is developed in the foothill of mountains in the shape of a hand fan.

Let us pause and find out whether we have understood the patterns of settlements or not by performing this exercise. Match your answer with the answer which is given at the end of the unit.

SAQ 3

Match the following settlements with their patterns:

Settlement	Pattern
A) On both sides of a river	i) Circular
B) Without any shape	ii) Rectangular
C) In agricultural areas	iii) Amorphous
D) Around hill or pond	iv) Double linear

14.5 MORPHOLOGY OF RURAL SETTLEMENTS

Morphology of settlement refers to the layout or the internal structure of the settlement. The morphology of rural settlement is governed by physical, socio-cultural, economic and political factors. Morphology refers to the spacing of dwellings, pattern of streets and the process of growth of settlement. Rural morphology is an expression of the social structure of village. In the below given sub-sections, we have discussed two models related to morphology of rural settlements specific to Indian context.

14.5.1 Socio-Economic Model

Many Indian villages are expressions of the existing socio-economic conditions of that region. According to this model, as the economic condition of the people becomes weaker, the location of houses goes farther from the centre. Therefore, houses of economically well-offs are located at the centre of the village whereas the poor people stay farther. The centre of the village can also be an important place such as, *panchayat* building, school or temple, mosque and church. The width of the streets also becomes narrower as one move from the location of richer houses to location of poor houses. In this model, the flow of services is directed towards richer people. In a small dispersed village, the location of houses is a simple arrangement with single lane but, in a compact village it is a more complex morphology. Northern India has many such morphological arrangements.

14.5.2 Caste-Segregation Model

Caste segregation is an important factor in determining rural morphology. The rigid caste structure has its expression in the settlement system also. In general, different caste peoples try to settle separately according to the traditional belief. For example, houses of the so called upper castes are located away from those of the scheduled castes or ex-untouchables. Multiple castes in a village give rise to a complex morphology whereas, smaller hamlet with one or two caste houses have simple morphology. After Independence the social attributes such as, caste has been changing. There has been loosening of these social structures and villages are experiencing much more dynamic morphological patterns.

SAQ 4

- a) What is morphology of settlement?
- b) Name the two models of morphology of rural settlements.
- c) Houses of rich people are located the centre or *panchayat* building.
- d) In Caste-segregation model, location of houses is determined by the of the household.

14.6 RURAL DWELLINGS

Do you know what a dwelling is? The smallest unit of settlement is a dwelling or house. It is one of the basic needs of human beings apart from air, water and food. Dwelling provides shelter to humans and protection from harsh climate and animals. It also provides the inhabitant security, privacy and a sense of comfort and satisfaction. As discussed in the previous unit, during prehistoric times, human being was a nomad and did not built houses. If s/he had to stay somewhere s/he used caves and bushes for shelter. Gradually, as s/he started settling down, construction of house started taking place with the help of wood, leaves, branches etc. Mud houses came later on, which can be still found in rural areas of India and the world.

14.6.1 Factors Affecting House Types

All dwellings are not the same all over the world rather they have different shape, size and layout. Even the materials that have been used in construction of houses also differ. Such variations are the product of several factors that affect house types and they are the following:

- i) **Physical factors:** It includes physical aspects like, relief, slope, climate and water supply. As mentioned in the earlier section, dwellings are constructed on higher ground in a plain area (site)

and in low lying areas in case of hilly regions. In the latter case, a house has taller wall facing the slope. The floors of the house are also according to the slope. Mud houses are very common in hot and humid climate like in eastern India as mud keeps the house cool. Similarly, regions experiencing heavy rainfall or snowfall have inclined roofs. Houses in desert areas with hot, dry and windy climate have small windows and doors. Houses in rural Rajasthan have small windows to prevent hot dust laden winds to enter house.

- ii) **Availability of building material:** Building material is a product of the surrounding physical environment. On the other hand, it is responsible for the type of dwelling. Those materials that are available locally and are found in abundant are generally used for construction of houses. The areas having large and dense forest tracts have wooden houses. In hilly and mountainous areas, stone blocks are the main source of building material e.g. houses in Himachal Pradesh use stone slabs even for roofs. Yellow sandstone is used as a building material in Jaisalmer district of Rajasthan. Similarly, mud or clay bricks are used in plain areas near river valleys such as in Bihar and West Bengal as the building material. Bamboo is largely used in North-east India as a building material due to its easy availability. However, today with ease in transportation building materials can easily be transported from far off places also. Therefore many houses use even those materials that are not locally available especially in urban areas and in houses of rich in rural areas. For example, granite and marble are used in many houses in Bihar and Uttar Pradesh which is otherwise not locally available.
- iii) **Socio-cultural factor:** It includes the economic, cultural and religious characteristics of the people residing in the house. Big cemented houses are the characteristic feature of those with higher economic status whereas, *kuchha* or mud or thatched houses are of poor people. Large families have houses with more rooms as compared to small and nuclear families. Many Muslim households have closed houses with smaller and lesser number of openings as the *purdah* system is quite evident there. Houses of south India generally do not face south as it is considered inauspicious.
- iv) **Administrative factor:** Houses provided under various housing schemes run by the government may have different shape and size of houses as compared to the other houses constructed in the region. The building material used may also be different from the rest.

14.6.2 Essential Features of Houses

A traditional Indian house consists of a courtyard or *aangan* at its centre. The courtyard is the central feature of the house and holds lots

of importance in the household. Rooms are located around the courtyard. These rooms are meant for storage whereas, courtyard is used for living. The roofless courtyard helps in getting access to the sunlight, rainwater and cool breeze. Courtyards have been an essential feature of the hot, humid and dry climate found in India. In hilly areas such as, Jammu and Kashmir, Himachal Pradesh, Uttarakhand or the deserts and in such other environmental situations, while the courtyard may be an important constituent of the dwelling its location may not necessarily be in the centre.

14.6.3 Ground Plan and Layout of Houses

Ground plan and layout refers to the manner in which the house is constructed. It includes the direction of house, location and arrangement of each unit of the house such as, rooms, kitchen, open space, toilet and granary.

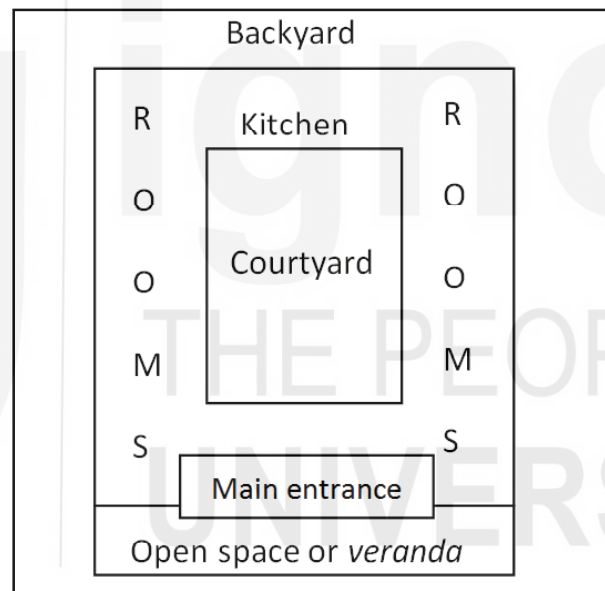


Fig.14.3: Ground Plan of a Rural House of India.

A rural house of India is a compact unit which has an open space outside the house called *veranda*. It is generally used for keeping livestock as well as for sitting and socialising of male members of the household. The veranda leads to the main door which leads to the courtyard or *aangan*. An east or north-facing house in Hindus, Jains, Buddhists, Sikhs and Christians is considered good and auspicious whereas, a west-facing house is considered good in case of Muslims. As mentioned above, courtyard or *aangan* is an essential feature of the rural houses in India which is used for variety of purposes. These include, getting access to the sunlight, water and breeze, drying clothes and grains, sitting and sleeping. In most of the households this is the main area where the head of the household and males spend their large part of the time. Surrounding the courtyard are rooms that are used for

staying of females, storing grains and keeping other essentials. Cooking space is either in the open occupying a corner in the courtyard with or without separating wall or separately in one of the rooms surrounding the courtyard. Cooking space is generally a space of the women where entry of males is restricted. Many rural houses in India still do not have their own toilets and they go to nearby fields for such purposes. If a toilet is there, then either it is located outside the house in the backyard or at one of the corners of the house, away from cooking and sleeping space. Space for keeping the religious idols or symbols and worshipping is in the courtyard or one of the rooms. The above description is typical of the conventional pattern of an agrarian, landowning agricultural or high caste house, which is undergoing changes and may not be valid in several areas of India.

14.6.4 Rural House Types

Rural houses show a close association with the surrounding physical environment. The building material, type of roof and wall, orientation, number and size of openings such as, windows and doors, colour etc are influenced by the local environmental and physical conditions. But, at the same time cultural factors also have a significant role to play.

Most of the rural houses of India is rectangular or square in shape with a small apace in front called *veranda* and a courtyard inside the house called *aangan*. Houses are generally single storey with windows located in the upper portion of the walls. In areas with hot summers and cool winters as in the northern and central India, houses are constructed to keep the inside cool during summers and warm during winters. For this thick mud walls are constructed as shown in Fig.14.4. The roof is thatched for poor households (Fig.14.5), made up of mud tiles for higher income groups (Refer Fig.14.7) and cemented for still higher income groups. The former two house types have inclined roof which is due to the material used whereas the latter has flat roof. In south India where it is a hot and humid climate throughout the year houses with mud walls with dome-shaped and conical thatched roof of coconut leaves are commonly seen. In the areas with heavy rainfall roof is generally inclined to allow rainwater to flow down. The plinth of the house is also raised in the areas of water retention or marshy areas, for example in West Bengal (Fig.14.8 and 14.9). In North-East, West Bengal and bordering areas of Bihar and parts of south India bamboo splits are widely used for the construction of walls as shown in Fig.14.6. wooden blocks (Fig.14.10) are used to construct houses to keep the inside warm in Himalayan region where there is cold climate. Stone blocks are also used for outer wall construction in hilly and mountainous areas (Fig.14.11).



Fig. 14.4: Mud House.



Fig.14.5: Brick and Thatch House.



Fig. 14.6: Bamboo Straws and Thatch House.



Fig. 14.7: Brick and Mud Slabs House.



Fig. 14.8: Raised Plinth and Thatch House.



Fig. 14.9: Raised Plinth (Sunderban) House.



Fig. 14.10: Wooden House
(Himachal Pradesh).



Fig. 14.11: Stone House
(Jammu and Kashmir).

Todas of Niligiri hills construct semi-circular houses as shown in Fig.14.12. Flat roofs are common in Punjab, Haryana and Uttar Pradesh due to semi-arid climatic type (Fig.14.13). In majority of the houses in West Bengal kitchen is separately constructed and every house generally has a pond near it. In Himalayas, houses are generally double storey where, the ground floor is meant for livestock (cattle and horse) and the first floor is for humans. The houses in these areas are constructed on different terraced contour intervals in linear shape. Conical roofs are commonly seen in areas with heavy snowfall to inhibit snow accumulation on roof. Boat houses are also found in the Dal Lake of Kashmir and the backwaters of Kerala as can be seen in Fig.14.14 and 14.15. Lack of space is an important reason for the former while dependence on the backwaters is the reason in case of the latter.



Fig. 14.12: Toda Hut.



Fig.14.13: Flat Roof (Punjab) House.



Fig. 14.14: Houseboat (Kerala).



Fig.14.15 Houseboat (Dal Lake- Jammu and Kashmir).

With the above examples, now you might have comprehended the relationship between the type of houses and the physical environment. The traditional cultural and religious practices are influenced by the local physical conditions of that place which in turn has an expression in the type of houses constructed, the layout of houses and the morphology of that area. Most importantly it is necessary to remember that there are significant differences and variations in the settlement patterns and house types across India and the world. The above descriptions and just a few examples.

SAQ 5

- Name the factors affecting rural house types.
- List the essential features of a rural Indian house.
- What is ground plan or layout of the house?
- Todas of Niligiri Hills construct houses.

14.7 SUMMARY

Rural settlements are the function of site and situation. There are several factors affecting origin of rural settlement and they are: availability of water, fertile land, dry land, building material, favourable climate and security.. Rural settlements are not the same everywhere but, they are of different types and possess different patterns. Type of settlement refers to the nearness of the houses in an area. There are four types-compact, semi-compact, dispersed and farmstead. On the other hand, pattern of settlement means the geometrical shape that the houses in a settlement acquire. Pattern can be- linear, rectangular, square, circular, amorphous, T-shape, L-shaped, star-shaped etc. Within the rural settlement the way houses of various communities are located give rise to a well-defined morphology. Morphology of settlement refers to the layout or the internal structure of the settlement. In India the morphology of rural settlement is governed by two main factors i.e. class and caste. Even each house has a ground plan of its own which refers to the way the rooms etc are located. Courtyard or *aangan* is the most essential feature of a rural house in India. Rural houses show a close association with the surrounding physical environment. But, at the same time they are also an expression of the cultural practices of the community.

14.8 TERMINAL QUESTIONS

1. Explain the role of site and situation in origin and growth of rural settlements.
2. Distinguish between types and patterns of rural settlements.
3. Explain in brief morphology of rural settlements in India.
4. Describe in brief various factors affecting house types.

14.9 ANSWERS

Self-Assessment Questions

1. a) Water supply, fertile land, dry land, building material, favourable climate and defence.
b) Wet-point settlements are the sites close to a supply of water. For example, in desert areas, oasis or any other source of water acts as a favourable site for settlement. Dry-point settlements are the sites that avoided the risk of flooding. For examples, in marshy areas, higher ground that is little away from water body can prove to be a favourable site.
2. a) Compact, semi-compact, dispersed and farmstead.
b) Compact Settlements
c) Dispersed Settlements

3. A) – iv); B) – iii); C) – ii); and D) – i)
4. a) The layout or the internal structure of the settlement.
b) Socio-economic model and Caste-Segregation model
c) near
d) social status
5. a) Physical, socio-cultural and administrative factors and availability of building materials.
b) An open space outside the house called *veranda* and the veranda leads to the main door which leads to the courtyard or *aangan*.
c) The way the rooms are located.
d) Semi-circular houses.

Terminal Questions

1. The position on the ground with relation to physical conditions is referred to as site. All settlements need some site advantage initially. This advantage is required more in case of rural settlements. Situation has a wider meaning than that of site. It covers economy, culture and political importance of that place. Situation affects the growth of settlements especially in case of urban settlement.
2. Type of settlement refers to the closeness of houses whereas pattern refers to the geometrical shape that the houses in a settlement make. Settlement types are compact, semi-compact, dispersed and farmstead while, patterns are linear, rectangular, square, circular, amorphous, L-shaped, T-shaped etc.
3. Morphology of settlement means the layout or internal structure of settlement. It explains how various houses are arranged in a settlement. In India class and caste are the two main factors determining morphology of rural settlements. These two aspects give rise to socio-economic model and caste-segregation model, respectively.
4. Factors affecting rural house types are physical, socio-cultural and administrative factors and availability of building materials. Physical factors include physical aspects like, relief, slope, climate and water supply whereas socio-economic factors include the economic, cultural and religious characteristics of the people residing in the house. Availability of building materials mean those materials that are available locally and are found in abundant are generally used for construction of houses. However, today with ease in transportation building materials can easily be transported from far off places also. Administrative factor include houses provided under various housing schemes run by the government may have different shape and size of houses as compared to the other houses constructed in the region.

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Acknowledgements:

Box 14.1 Albert Demangeon

Source: https://upload.wikimedia.org/wikipedia/commons/6/6b/Albert_Demangeon.jpg

Figure 14.4: Mud house

Source: https://upload.wikimedia.org/wikipedia/commons/6/6b/Mud_house_Restoration_in_west_bengal_India.jpg

Figure 14.5: Brick and thatch house

Source: https://upload.wikimedia.org/wikipedia/commons/5/58/House_made_of_mud_bricks_with_a_thatched_roof_in_Belo_%282%29.JPG

Figure 14.6: Bamboo straws and thatch

Source: https://www.researchgate.net/figure/Typical-agricultural-field-house-made-of-bamboo-and-thatch_fig17_308717582

Figure 14.7: Brick and mud slabs

Source: <http://kamat.org/picture.asp?Name=13219.jpg>

Figure 14.8: Raised plinth and thatch

Source: https://upload.wikimedia.org/wikipedia/commons/f/f5/Houses%2C_Tonle_Sap.JPG

Figure 14.9: Raised plinth (Sunderban)

Source: <http://www.indianwildlife.org/images/header/sundarbans-excursions.jpg>

Figure 14.10: Wooden house (Himachal Pradesh)

Source: <https://www.flickr.com/photos/simon-and-india/3053881436/in/photostream/>

Figure 14.11: Stone house (Jammu and Kashmir)

Source: https://upload.wikimedia.org/wikipedia/commons/4/41/Abandoned_House.jpg

Figure 14.12: Toda hut

Source: https://upload.wikimedia.org/wikipedia/commons/9/97/Toda_Hut.JPG

Figure 14.13: Flat roof (Punjab)

Source: <https://wondersofpakistan.files.wordpress.com/2012/10/villages-of-punjab-pakistan-2.jpg>

Figure 14.14: House boat (Kerala)

Source: <https://pixabay.com/photos/houseboat-kerala-alleppey-houseboat-2791119/>

Figure 14.15: House boat (Dal lake – Jammu and Kashmir)

Source: https://upload.wikimedia.org/wikipedia/commons/3/31/Houseboat_Dal_Lake%2C_srinagar_Kashmir.JPG

URBAN SETTLEMENTS |

Structure

15.1 Introduction

Expected Learning Outcomes

15.2 Definitions, Types and Characteristics of Urban Settlements

Definitions of Urban Settlements
types and Characteristics of
Urban Settlements

15.3 Evolution of the Urban Settlements

15.4 Classification of Cities

Classification by Age
Functional Classification
Classification by Size

15.5 Morphology of Urban Areas

Factors Affecting Morphology of Urban
Settlements

Theories of Internal Structure of Cities

The Dynamics of Urban Morphology

Urban Village

Slums and Squatters

15.6 Summary

15.7 Terminal Questions

15.8 Answers

15.9 References and Further Reading

15.1 INTRODUCTION

Till now, we have studied various aspects related to settlements in general and rural settlements in particular. In this unit, we will have a detailed discussion about urban settlements. As discussed in the Unit 13, urban settlements refer to human habitations and structures that are different in character and function from rural settlements. The essential nature of the physical form of an urban settlement relate to the density and type of structures. The built-up structures are more concentrated and there are multiple stories. The house-building materials do not always come from the local environment as for rural houses (like clay, leaves, straw, timber, stones etc.). We have already discussed these issues in details in previous two units of this block.

In this unit, we will discuss about various aspects related to the nature, evolution, classification and morphology of urban settlements.

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- ❖ define urban settlements and identify their nature and characteristics;
- ❖ describe the process of evolution of urban regions;
- ❖ classify urban settlements with the help of age, function and size criteria; and
- ❖ identify morphological characteristics of urban settlements by describing existing theories of internal structure of cities.

15.2 DEFINITIONS, TYPES AND CHARACTERISTICS OF URBAN SETTLEMENTS

In this section we will discuss definitions of urban settlements. We will also discuss about types and characteristics of urban settlements.

15.2.1 Definitions of Urban Settlements

If you look for definitions of urban areas, you will find different definitions adopted by different countries. Therefore, there is no standard and universal definition of urban settlement. However, urban settlements are generally associated with human activities other than primary production, namely secondary, tertiary and quaternary occupations. They are essentially characterised by higher proportion of land devoted to built-up area, higher population densities and greater economic diversity than rural settlements. The United Nations (1959, pp. 60-62) has made an attempt to classify various definitions used by the member countries. All these countries were grouped under five categories. These categories are as follows:

Category I: It consists of those countries where urban settlement is defined on the basis of **historical, political and administrative status** like *shi*, *municipios*, district and communes.

Category II: It consists of those countries which use a statistical criterion, mostly **minimum size of population**, to grant urban status. But the minimum number varies from country to country.

Category III: It consists of those countries where urban status is granted to settlements if these settlements have **some form of local self government** like municipality, borough, chartered town etc.

Category IV: It consists of those countries which grant urban status on the basis of **physical layout** and availability of amenities.

Category V: It consists of those countries where a settlement is classified on the basis of function i.e. a specific proportion of **population engaged in non-agricultural sector**.

As mentioned under category II, most of the countries define their settlement as urban on the basis of minimum size of population. But, as stated earlier, the minimum number varies from country to country. However, some of the criteria like function, administrative status, layout and amenities are also combined with minimum size of population. Let us take

the case of India as an example where minimum size of population combined with administrative status, function and density of population determine the status of urban settlements.

Definition by the Census of India: In the Indian context, the Census is the most important and authentic source of information, although the Census organisation has changed its criteria from time to time since 1901. The Census of India, in 1981, defined urban places with the help of these criteria:

- i) Any place with a municipality, corporation or cantonment or notified town area
- ii) Any place which satisfied the following criteria:
 - a) A minimum population of 5000
 - b) At least 75% of the male working population non-agricultural and
 - c) A population density of at least 400 per square kilometers.

Settlements having a population of more than 5000 may therefore be designated as “urban”. The urban settlements were further defined according to population size (Table 15.1) in the following manner:

Table 15.1: Classification of Towns by the Census of India on the basis of the Size of Population

Town Class	Population
Class I	>1,00,000
Class II	50,000 – 1,00,000
Class III	20,000 – 50,000
Class IV	10,000 – 20,000
Class V	5,000 – 10,000

Class I towns are really the cities and “metropolitan area” is designated by a population of more than 1 million.

15.2.2 Types and Characteristics of Urban Settlements

The urban settlement cannot be interpreted adequately unless it is viewed as an organic whole, which is composed of the interrelationship between and among the economic, social, cultural and political aspects. The geographer, however, is concerned with the relationship between these relationships and the four key functions of dwelling, work, recreation and transport and how these affect the physical and social structure of the town.

Based upon their stages of evolution and associated characteristics, urban settlements may be identified as towns, cities, metropolis or conurbations. A settlement that passes through each stage of evolution would usually emerge from a hamlet, to a village and then move on to evolving as a town depending upon the nature of services and functions, and subsequently to a city. All cities do not move to the stage of “metropolis” – it is mostly dependent upon the nature of the urban economy and its “pull

factors". However, a typology of cities necessitates the understanding of the stages of evolution of urban settlements along with the major characteristics, as discussed below:

- a) **Towns** emerge in two primary ways; firstly, they often evolve from large villages which have gradually acquired urban characteristics. Secondly, towns may be planned as industrial towns, satellite towns etc. The characteristics of towns mark the first level of transition from villages. Some of the characteristics are as follows:
- they support higher densities of population
 - a higher proportion of population is occupied in non-agricultural activities
 - there are higher densities of built-up structures,
 - slightly higher number of metalled roads that imply better connectivity with other nodes and service centre
 - a more diverse market, having a variety of shops selling durables
 - a higher level of infrastructure provisions like a district hospital, a number of secondary schools, a college, a newspaper office etc.
 - places for recreation like parks, cinemas and hotels
- b) **The City**, as defined by Lewis Mumford (1938) is the physical form of the highest and most complex types of associative life. It exemplifies the dominant elements of towns to a much greater extent. Cities are characterised by economic and cultural components. It has been emphasised by that cities form the core of most civilisations and innovations which are then diffused across different pathways. They signify the key elements of the economic and cultural realms of the region where they are located and usually display the best works of art and architecture in its built-up spaces and forms. With gradual progress in urbanisation, cities become more complex and attain the status of a metropolis.
- c) **Metropolis:** The metropolitan area is more spread out. The region surrounds the core of the city, i.e., its single or multiple central business districts and incorporates adjoining urban regions which have formed due to continuous amalgamation of urban functions and services. Functionally, the metropolitan area serves as the effective unit for urban planning.
- d) **Megalopolis:** The megalopolis is defined by its poly-nuclear characteristic, where, large cities are joined by a continuous chain or complex of cities. The best example is that of Boston-New York in the USA where the 240 kms in between the two cities consist of several cities with population over one million, while others are over one lakh. This region comprising 38 million was first named megalopolis by Jean Gottman. The Japan-Tokaido Megalopolis is another prominent megalopolis in the world that has a continuous built-up area along the coast for about 500 kms between Tokyo and Kobe. This megalopolis

initially consisted of six million cities namely, Tokyo, Yokohama, Nagoya, Osaka, Kobe and Kyoto.

- (e) **Conurbation** was the term invented by Patrick Geddes to describe constellations of cities sprawling together.

SAQ 1

- a) Define city as given by Lewis Mumford.
- b) Name any two prominent megalopolises in the world.
-

15.3 EVOLUTION OF THE URBAN SETTLEMENTS

Rural ones, may emerge by taking locational advantages (both natural and economic), but its further growth and expansion into a more complex form may be due to local enterprise, planning and management. The factors that lead to the evolution of urban settlements may, therefore, be the following:

- a) **Site and situation factors:** While site means the precise features of the terrain, situation is usually taken to mean physical conditions over a much wider area (Dickinson). The reason behind selecting a natural site (like proximity to source of water or fertile land) for locating an urban settlement, however, may not be relevant in cases where rural settlements grow and agglomerate to form urban settlements. In such cases, economic factors are more relevant in explaining their evolution.
- b) **Economic factors:** expansion and growth of a settlement largely depend upon the factors that attract people and activities towards it. The availability of surplus and the ensuing growth of the market were the first determinants which gave rise to trade centres that were the first urban centres. *“America’s oldest cities were the mercantile outposts of areas rich in resources whose exploitation was organised by the developing metropolitan system of Western Europe”* (Berry and Horton, 1970).

The earliest examples of urban development originated on the banks of Tigris and Euphrates between 5000 to 3000 B.C. Several implements like the wheeled cart, ox-drawn plough, boat, canal irrigation, pottery and use of metals brought about changes in the economic and social organisation. Agricultural productivity increased and improved transportation allowed surplus to be distributed and stored. Assemblage of surplus, its distribution through markets, and its storage in economically efficient locations all contributed to towns being the centre of multiple activities.

Though the beginnings were due to economic factors, urbanisation itself was a social and cultural process that developed due to long distance trade and specialisation of occupations and division of labour. Development of writing, crafts, art, accounts and record keeping, calculation skills and the beginnings of science marked urban development by the end of the Early Dynastic period in history.

The urban way of life had initially spread to ancient Egypt, eastern Mediterranean, the Indus valley, China and South-East Asia.

There are some stages of evolution that can be generalised as clearly distinguishable. Across the world, the urban settlements first depended upon agrarian resource, then industrial production depending upon mineral resources and subsequently the contemporary cities depend upon service functions and amenity resources. Based on markets created by these resources, the urban settlement evolved from the centre of settled agriculture to the trade centre to industrial / manufacturing centre to a much diversified global market centre of today. The dominant effect of the mineral resource based economy continued to accumulate in regions due to the process of “cumulative causation” and helped the West European and American cities experience high rates of economic growth. High per capita growth rates were also seen in Middle East regions because of their control over petroleum resources. The strong linkages between industrialisation and urbanisation continued well into the Twentieth century.

It is important to note that it is surplus that initiated the formation of urban settlements in two important ways: firstly, surplus agricultural produce helped support higher densities of population and secondly, surplus also allowed a section of the population to be freed from food production activities and take up non-agricultural work – the non-agricultural workers and artisans formed the essential element of the first urban communities.

The evolution of an urban place from town to city to metropolis usually implies addition of functional diversities, population (both in numbers as well as occupational characteristics) and a general expansion of the built-up area. The changing use of technology having an impact upon social organisation also contributed to evolution, as stated by Mumford (1934).

However, one crucial fact to be noted here is that, no singular pattern or direction of evolution cannot be assigned universally to every city. There are also cities that have developed due to specific and singular functions like education (Oxford, Cambridge) and also due to religious functions, such as Varanasi.

SAQ 2

Fill in the blanks with suitable words:

- a) and factors led to the evolution of urban centres.
- b) The earliest examples of urban development originated on the banks of and river.

15.4 CLASSIFICATION OF CITIES

According to Mayer and Kohn (1967), classification of cities involves the development of a taxonomy (grouping of the cities into some system of arrangement based on similarities with regard to at least one aspect). Several attempts at developing the classificatory scheme for cities exist in urban literature.

As early as 1840, the Committee on the Health of Towns in Britain identified five groups of towns, namely, (a) the metropolis, (b) manufacturing towns (c) populous sea port towns (d) great watering places and (e) county and inland towns, not being centres of particular manufacture. This classification was made as a pre-requisite for their assessment of health of towns.

In this section we will discuss in brief about the classifications of urban settlements on the basis of age, function and size criteria. Let us discuss them one by one.

15.4.1 Classification by Age

Among the first attempts at classification, Lewis Mumford, in 1934, visualised towns as a social phenomenon based upon the evolution of technological innovations and identified phases as Eotechnic, Palaeotechnic, Neotechnic and Biotechnic. Later, in 1966, Mumford proposed six stages of rise and fall of urban places, based upon Geddes' pioneering work in 1949, thereby identifying Eopolis, Polis, Metropolis, Megalopolis, Tyrranopolis and Nekropolis. The last two stages in this classification refer to the fall or decline of a city. This scheme may also be seen as "evolutionary" in its conceptual basis.

Taylor, in 1949 recognised stages as infantile, juvenile, maturity and senility, much like the stages of growth and decline of a human being.

15.4.2 Functional Classification

While discussing the classificatory scheme, the geographer has been specifically interested in distinguishing cities by their functional characteristics. Of the renowned propositions, it is important to consider those by Auroousseau (1921), Harris (1943) and Nelson (1955).

I) Classification by M. Auroousseau

In his 1921 paper "the distribution of population, a constructive problem" Arousseau evolved a six-fold classification scheme, which was sub-divided as follows:

1. Class I: Administration

- Capital cities
- Revenue towns

2. Class II: Defence

- Fortress towns
- Garrison towns
- Naval bases

3. Class III: Culture

- University towns
- Cathedral towns

- Art centres
- Pilgrimage centres
- Religious centres
- 4. **Class IV: Production**
 - Manufacturing towns
- 5. **Class V: Communication**
 - A. Collection
 - Mining towns
 - Fishing towns
 - Forest towns
 - Depot towns
 - B. Transfer
 - Market towns
 - Fall line towns
 - Break of bulk towns
 - Bridgehead towns
 - Tidal limit towns
 - Navigation head towns
 - C. Distribution
 - Export towns
 - Import towns
 - Supply towns
- 6. **Class VI: Recreation**
 - Health resorts
 - Tourist resorts
 - Holiday resorts

The major criticism of this scheme is the confusion between functional and geographical-locational factors, e.g., “tidal limit towns” cannot be distinguished by their functionality.

II) Classificatory Scheme of Chauncy D. Harris

Harris proposed the “Functional Classification of Cities in the United States” by use of a “*quantitative method of functional analysis*”. Here the main basis of classification was the type of economic activity measured in terms of occupation and employment in which the residents are engaged. The criteria were made meaningful by applying different ratios for different functions on the basis of empirical evidence. The classificatory scheme developed by Harris is elaborately defined and are given below:

Criteria used for nine-fold classification of cities are as follows:

1. **Manufacturing cities (M)** – Principal criterion adopted for this classification was that employment in manufacturing to be at least 74% of total employment in manufacturing, retail and wholesale whereas secondary criterion was that manufacturing and mechanical industries contain at least 45% of gainful workers.
2. **Manufacturing cities (M)** – Employment in manufacturing equals at least 60% of total employment in manufacturing, retailing and wholesaling. Also, manufacturing and mechanical industries usually contain between 30-45% of gainful workers.
3. **Retail cities (R)** – Employment in retailing is at least 50% of the total employment in manufacturing, wholesaling and retailing and at least 2.2 times that in wholesaling alone.
4. **Diversified cities (D)** – Employment in manufacturing, wholesaling and retailing is less than 60%, 20% and 50% respectively, of the total employment in these activities
5. **Wholesale centres (W)** – employment in wholesaling is at least 20% of the total employment in manufacturing, retail and wholesale and at least 45% as much as in retailing alone.
6. **Transportation centres (T)** – Transportation and communication contains at least 11% of the gainful workers and they equal at least one third the number in manufacturing and mechanical industries and two-thirds the number in trade.
7. **Mining towns (M)** – extraction of minerals account for more than 15% of the gainful workers.
8. **University towns (E)** – enrolment in schools of collegiate rank (universities, technical schools, Liberal Arts College and teachers colleges) equalled at least 25% of the population of the city.
9. **Resort and retirement towns (X)** – no satisfactory statistical criterion was found (Source: Harris, C.D., in eds. Mayer and Kohn, 1967.)

III) Howard Nelson's classification

Nelson published his propositions in the journal *Economic Geography* (Volume XXXI, Clarke University). To propose his classificatory scheme, he studied 897 American cities by their occupational structure as per the 1950 census to find that the average employment in each activity group determined the functional differences.

Table 15.2: Employment in each Activity Group Determining the Functional Differences

Activity Groups	Percentage of employment
1. Manufacturing	27.02
2 Retail	19.23
3 Professional Service	11.09
4 Wholesale	3.85
5 Personal Service	6.20

6	Public Administration	4.58
7	Transport and Communication	7.12
8	Finance, Insurance, Real estate	3.19
9	Mining	1.62

He plotted the frequency of settlements against the percentage of labour force and further located the mean and standard deviations on each. Classification depended upon deviation from mean.

15.4.3 Classification by Size

As early as 1913, Averbach noted the relationship between the city size and their rank. The concept was crystallised by G.K.Zipf who attempted to study distribution of cities by population size and thereby evolve a ranking of urban places. On the basis of this analysis, ordering of settlements was possible which helps in classification by size into lower order and higher order settlements. Rank size ordering helps emerge with the following types, namely, low order trade centres, high order trade centres, regional capital etc. According to Zipf, population of cities tend to descend regularly according to their rank. The second ranking city is usually has half the population of the first, the fourth a quarter and so on. This inverse relationship between the city's population and its rank is termed "Rank Size Rule". Often it is seen, however, that the second city has one third or one quarter of the population of the first, but in other cases, Zipf's empirical basis holds good.

SAQ 3

- Name the six stages of rise and fall of urban places as proposed by Mumford.
- What were the bases adopted by Harris for functional classification of cities?

15.5 MORPHOLOGY OF URBAN AREAS

This has been a traditional area of interest to urban geographers. According to Hartshorne (1980), it was Carl Sauer's essay entitled "*Morphology of Landscape*" that became the benchmark on the subject, as researchers influenced by him carried out studies in American cities in the 1930's and 1940's in this tradition. The "site and situation" aspect, however, was just one aspect. The other aspect that became increasingly important was the "internal structure of the city" (or morphology). Much of this area of study was conducted in the University of Chicago and the study area too was Chicago. Though the Chicago School was necessarily called "Ecological School" because of its focus upon urban ecology, the classical models of urban morphology also evolved here.

15.5.1 Factors Affecting Morphology of Urban Settlements

Morphology of urban settlements is based upon the specialised uses of land and their geographical arrangement. The spatial patterns of uses of land are defined by some key factors:

- i) **History of growth:** As the urban area evolves; the nature and characteristics of uses of land evolve with it. Settlements differ in nature according to their original functions. While some urban areas emerge with single uses and diversify only later (a mining town may later have residential and commercial uses as the town evolves), there are others which evolve from rural settlements (here a local service centre may be upgraded to the town centre and other uses surround it according to convenience and accessibility factors.)
- ii) **Land Values:** Land values (rent) determine land use regions within the city. It is generally found that the areas with highest land values are also subject to intensified use (e.g., commercial or CBD areas have a greater concentration of high rise buildings to maximise use of space, large open grounds will generally be found in areas of lower land value, high rent areas will also not sustain slums nor remain dilapidated). The process of gentrification, which is a common urban process aims at bridging the rent gap, i.e., attempts to upgrade housing, infrastructure and other neighbourhood characteristics and thereby increase the value of land.
- iii) **Accessibility:** This is a key factor in the location of usage of land. The Central Business District tends to take up the space having maximum accessibility. While primary schools need greater accessibility, Universities are found in the outskirts. While the chemists shop needs to be highly accessible, super-speciality hospital projects are taken up in the fringes. Hotels need greater accessibility to airports or tourist attractions.

15.5.2 Theories of Internal Structure of Cities

The study of internal structure of the city which defines the morphological patterns is primarily based upon land use theory. Urban land use theories have found its roots in the propositions of the Agricultural Land Use Model proposed first by J.H. von Thunen in 1826. You will read this theory in details in your Course on Economic Geography. The term “land rent” which is equivalent to the classical economics concept of economic rent was used by von Thunen to identify values of different categories of land used by the farmer. The three classic descriptive models of urban morphology developed by the ecological school are given below.

A. The Concentric Zone Theory

The model proposed by E.W. Burgess, (the ecological view) called the Concentric Zone Theory was based upon Robert Park's essay on human ecology where analogies were drawn between nature and the urban space. A

distinctive spatial pattern of activity zones could be identified in Chicago based upon principal land use zones which Burgess defined as follows (Table 15.3 and Fig. 15.1).

Table 15.3: Zones and their Nomenclature and Associated Land Use

Zones	Nomenclature	Functions / Description of land use
I	Loop	The central business district/ commercial
II	Zone in Transition	Factories, ghettos, areas of crime and vice (blight)
III	Zone of Worker's Homes	Lower income working peoples' residential areas
IV	Residential Zone	Upper income residential area
V	Commuters Zone	Commuting

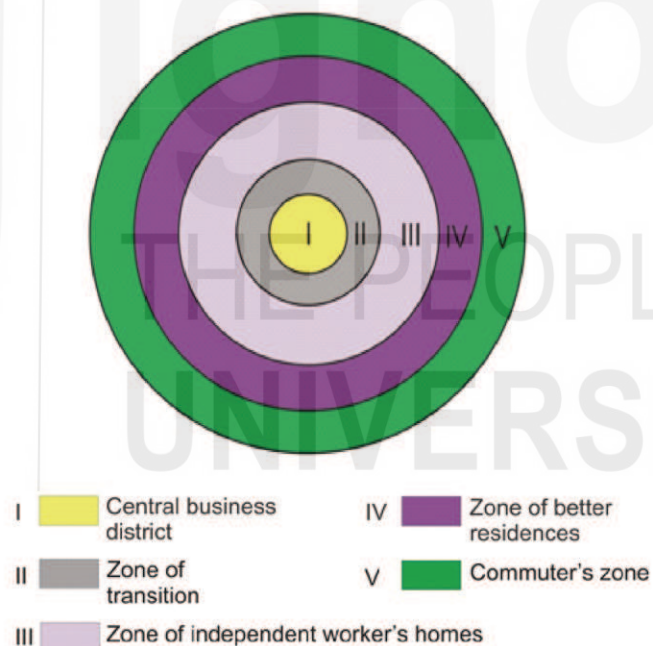


Fig. 15.1: The Concentric Zone Model.

The model has its deficiencies. As Berry and Horton (1970) state that the model is crude and unrefined, it does seem to be too simplistic, considering that such clearly defined concentric circles are far from the real ground situation. Burgess himself identified several pockets within his defined zones, which were identified as e.g. Black Belt (on the basis of race), Little Sicily (on the basis of ethnicity) or Roomers Underworld, Second Immigrant Settlements etc. However, according to Hartshorne (1980), the model's *"elegance and simplicity have stood the test of time"*.

B. The Sector Model

This model was developed by Homer Hoyt. Hoyt was a land economist and his paper entitled *"The Structure and Growth of Residential Neighbourhoods"*

in American Cities” published in 1939, was a study of 142 cities for which eight variables were mapped by blocks. He concluded that once an activity evolved in a particular area, it extends along the same direction as the expansion of the city (Fig. 15.2). This is easy to understand as in reality, too, functions tend to grow in alignment with railways, roadways etc. Choice of land along arterial features, high grounds away from flood-prone areas etc, results in a sectoral layout.

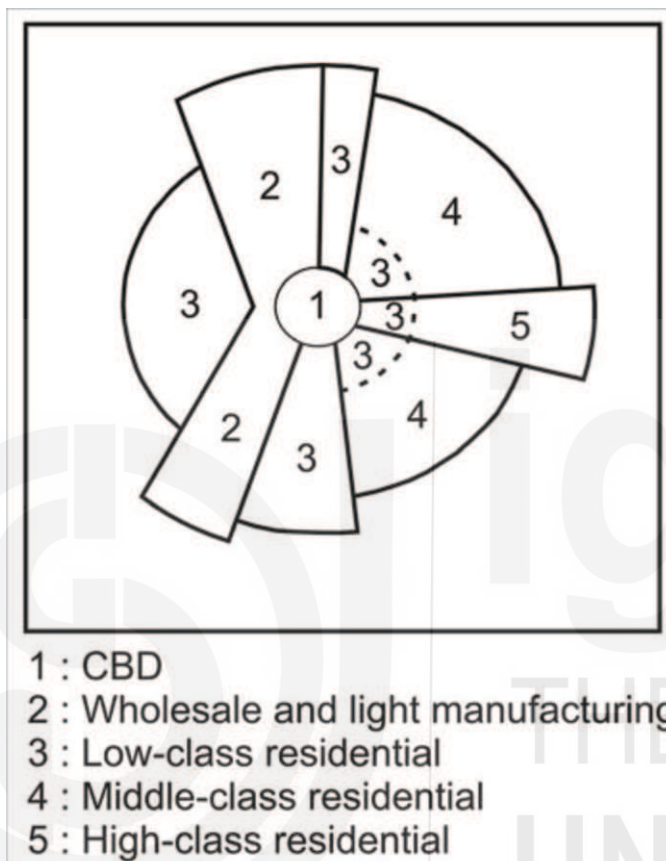


Fig.15.2: The Sector Model.

However, the model is critiqued by Berry and Horton (1970) as being a partial view of the city as Hoyt “*is constrained by his narrow focus of interest on housing characteristics in general and rent in particular. He gave little consideration to the characteristics of the inhabitants who occupied the structures.*”

C. Multiple Nuclei Theory

Chancy Harris and Edward Ullman (1945) proposed the multiple nuclei model in their paper “*The Nature of Cities*”. The model is an alternative which is closer to the ground reality in comparison with the concentric zone or sector models. It proposes that the urban form does not depend on a single core, but has multiple nodes or focal points. The CBD therefore is not necessarily always at the centre. The model recognises that accessibility is important and differs for different land uses. Commercial uses may develop around a cultural complex or an academic complex. It also helps identify with mixed landuses which are characteristic of most urban places of today (Fig. 15.3).

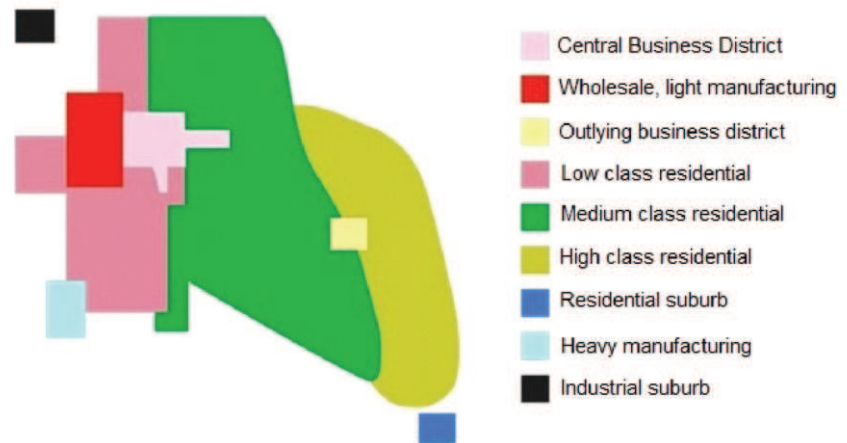


Fig. 15.3: The Multiple Nuclei Model.

The authors also stated that none of the three classical models are universally applicable. Much later, social area analysis studies helped establish that each urban centre in fact was a mix of all three models, instead of any one exclusively.

15.5.3 The Dynamics of Urban Morphology

Having discussed the classical models describing the different uses of land and its morphology, it is of utmost importance to know the nature and characteristics of some of the major land uses to be able to identify and understand the categories while observing a map of the city or undertaking a field work in the city or even preparing an urban land use map.

A. The Central Business District

The centre of the city has a unique set of characteristics which gives it a clear identity. The term “Central Business District” has been commonly noted in geographical literature to identify the central area. In common parlance, it is known as the “downtown”. It is primarily characterised by retailing of goods and services, office activities and major service providences. Although the same activities are also found in other parts of the city, the intensity is usually highest at the centre. The CBD is also characterised by centrality as the key to its locational context, and “often form the historical core of a city” (Johnson, 1967). Accessibility is the most important feature of the CBD, being most easily accessible from any part of the urban sphere of influence. Most specialised products and services tend to be located here so as to provide access to particular sections of consumers. Head offices of important firms, chains, retailers, service providers tend to locate here because of the access it can provide. The region also provides the opportunity to all these offices to interact and serve as a cluster – e.g., banks, insurance companies, stock market and commodity exchange together forms the cluster that constitute the financial hub of a city. The severe competition for land here leads to very high land values, which in turn leads to high intensity of land use. Also residential use is at its lowest here and may even be absent in some cases.

B. Retail, Wholesale and Commercial Area

Till the Second World War, manufacturing, retail and wholesale had a tendency of being linked to the downtown areas in the western world. The process of decentralisation started only with an increasing awareness of the pollution, clutter, crowding and adverse conditions of the environment around manufacturing centres. Ever since, decentralisation of activities has occurred along major transport routes, primarily the railways, as manufacturing has always preferred locations where movement of goods is easiest. According to Hartshorne (1980), by the 1960's, entire metropolitan areas began reporting losses in manufacturing employment in their central areas while the truck-auto-freeway trilogy contributed to mighty suburban expansion. Increasingly, one found that industrial parks, technology parks, business parks, warehousing and wholesaling moved outward. As wholesale activities moved outward, taking advantage of railways and highways, break-of-bulk points, retail moved towards the consumer and into major streets within the city.

C. Residential Areas

The areas comprising housing facilities and the supporting infrastructure include different aspects of healthy living and basic amenities of life. Residential areas are likely to have markets, schools, health centres, entertainment facilities, parks and open spaces. Basic amenities like electricity, roads, adequate transport facilities and everything else that facilitate decent standard of living are included in this zone. The formation of residential areas depends directly on need of the people and the pattern of rent (value of land). Again, rent is often determined by factors external to individual consumers. The housing market in any given city emerges over time and keeps changing as well, mostly determined by the internal structure of the city. Some patterns of segregation of residential areas may be recognised in every city, though not always very clear. Such segregation almost always has a clear historical context, whereby, causes of segregation can be identified to a certain extent. Clearly, the situation of a factory and surrounding workmen's homes or *row houses* would be easily identified as *low income residential area*, as compared to zones characterised by single homes, well designed architectural specimens with gardens and/or plenty of open spaces that may be identified as *high income residential area*. The bases of residential segregation are well known, i.e., socio-economic status, family status, ethnic status and migrant status are the most important determinants.

D. Industrial Areas

The nineteenth century is characterised by industrial urbanisation. According to Berry (1973), "*a new kind of city emerged.....built on productive power, massed population and industrial technology.*" Industrial areas were central to cities that emerged in this period. By the twentieth century however, the factory sites were identified as the most undesirable locations due to the resulting pollution, crowding, squatter development and crime. Environmental regulation sought the relocation of industrial areas to

the suburbs and outskirts or the city to enable the citizens to live a healthy life. As cities have expanded to merge with industrial areas, these have been further shifted outward. Newer industries seek suburban locations with a view of creating as much distance from the city as possible or feasible. The industrial land use remains a critical one, as the occupational shift of the nineteenth century from the primary to secondary sector depended upon it. Today, it has lost its relevance to the service sector as the growth of the service sector determines the stage of development of the city.

15.5.4 Urban Village

The rural-urban fringe is an area of transition between clearly identifiable urban land uses and the area dominated by agriculture. It undergoes phases of transition from rural to urban as urban expansion takes place. According to Ramachandran (1989), the fringe villages undergo a process of change that ultimately results in their complete absorption within the physical city and this process leads them through the following important stages:

- a) these villages first experience agricultural land use change and diversity
- b) the next stage is that of occupational change, whereby, the village population responds to employment opportunities in the city
- c) this stage is followed by growth in urban land use as real estate development, industrial sites begin to develop and land values increase substantially
- d) the ultimate stage in the transformation of the fringe village is the “urban village”

The term “urban village” was first used by Pahl in 1968 to describe the characteristics of London’s East End in the Victorian times. He also referred to Boston, Delhi and Mexico City of having urban villages as comprising people living in the city but are not of the city. This implies people living in rural areas which are really part of the urban system, implying the existence of a social organisation of inhabitants which was different from the typical urban way of life as distinguished by Wirth (1938) as having impersonal, superficial, transitory and segmented social relationships.

In the Indian context, Delhi has several urban villages which are surrounded by highly urbanised pockets characterised by high income residential areas. The urban village itself may be an area of poor housing quality having slums and squatters, where the urban poor often seek a dwelling place. According to Ramachandran (1989), the urban village continues its degraded and slum-like existence until “redevelopment” of the site takes place.

15.5.5 Slums and Squatters

Urban growth in the Third World has a serious consequence – the growth of slums and squatters. Squatters account for a substantial share of city populations throughout the developing countries. In Latin America they are “barrios”, “favelas”, “ranchos”, in India, “bustees”, “gecekondus” in Turkey, “kampongs” in Malaya and “barung-barongs” in Philippines. They constitute the uncontrolled peripheral settlements, whose growth remains outside the purview of planning, and therefore has limited or no infrastructure in terms of adequate housing, electric connections, and water supply and sewage facilities. The notion of slums and squatters being essentially physically decrepit, lacking in basic amenities, chaotic and disorganised, qualifies them as obstacles to good civic design among the urban planning community (Berry, 1973). There are constant attempts to relocate, dislocate and evict the population residing in such spaces in order to bring about development or beautification of the urban landscape. UN-HABITAT defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following:

1. Durable housing of a permanent nature that protects against extreme climate conditions.
2. Sufficient living space which means not more than three people sharing the same room.
3. Easy access to safe water in sufficient amounts at an affordable price.
4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.
5. Security of tenure that prevents forced evictions.

Berry (1973) quotes the United Nations official Juppenlatz (1970) as describing them as “*spreading malady*” associated with mounting social disorder and weakening and breaking down of the administrative discipline due to land grabbing and disrespect for property rights. Such views have been supported by many scholars like Lewis (1959) who proposed that these entities are a subculture identified as the *culture of poverty*, which transcends national and regional boundaries. Lewis was criticised by many scholars who highlighted the alternative interpretation of slums as playing an important functional role. The historical and political context was referred for this explanation – as slums may form due to gradual accretion, invasion or governmental apathy towards provisioning for low-income housing. Other scholars like Crooks (1971) felt that they are better called “*transitional urban settlements*” which demonstrated the possibility of finding genuine ways of improving their living conditions. Colin Rosser identified that the bustees of Calcutta (now Kolkata) performed six functions, namely:

1. They provide housing at lowest rents within the means of lowest income groups.
2. They act as reception centres for migrant populations, assisting in adaptation to urban life.

3. They provide a wide variety of employment in marginal and small-scale informal enterprise.
4. They provide a means for finding accommodation near the workplaces
5. Their community and social organisation provides social support during unemployment and other difficult situations.
6. They encourage and reward small scale private entrepreneurship in the field of housing

Over the years, the attitude towards slums and squatters has undergone a transition, whereby, every nation has formulated more “inclusive” plans for their urban slums and squatters. Provisions of low-cost housing, subsidies in payments for infrastructure like water taxes and electricity have gradually emerged as key mechanisms for supporting the transitional settlements. Prior planning for provisions of space for slums and squatters have today revolutionised the attitudes towards them. The consistent understanding of the welfare approaches and social justice, has led to the appreciation of the fact that eviction is not an acceptable option and that planning mechanisms have to be evolved to include, support and facilitate these settlements.

SAQ 4

- a) What are the factors affecting urban morphology?
 - b) State any four features of slums and squatters.
-

15.6 SUMMARY

Most of the countries define their settlement as urban on the basis of minimum size of population combined with some of the criteria like function, administrative status, layout and amenities. In case of India minimum size of population combined with administrative status, function and density of population determine the status of urban settlements. Based upon their stages of evolution and associated characteristics, urban settlements may be identified as towns, cities, metropolis or conurbations. If we look at the evolution of urban centre historically, across the world, the urban settlements first depended upon agrarian resource, then industrial production depending upon mineral resources and subsequently the contemporary cities depend upon service functions and amenity resources. Based on markets created by these resources, the urban settlement evolved from the centre of settled agriculture to the trade centre to industrial / manufacturing centre to a much diversified global market centre of today. The factors that lead to the evolution of urban settlements may therefore be site and situation and economic factors. Classification of cities involves the development of taxonomy. Several attempts at developing the classificatory scheme for cities exist in urban literature. The mostly cited classifications are based function, age and size. Morphology of urban areas

has been a traditional area of interest to urban geographers. Apart from site and situation aspect, the other aspect that became increasingly important was the internal structure of the city. Morphology of urban settlements is based upon the specialised uses of land and their geographical arrangement. The spatial patterns of uses of land are defined by some key factors namely history of growth, land values and accessibility. The study of internal structure of the city which defines the morphological patterns is primarily based upon land use theory. The three classic descriptive models of urban morphology developed by the ecological school are The Concentric Zone Theory by E. W. Burgess, The Sector Model by Hoyt and Davies and The Multiple Nuclei Theory by Harris and Ullman. None of the three classical models are universally applicable. Much later, social area analysis studies helped establish that each urban centre in fact was a mix of all three models, instead of any one exclusively. Therefore, it is of utmost importance to know the nature and characteristics of some of the major land uses to be able to identify and understand the categories while observing a map of the city or undertaking a field work in the city or even preparing an urban land use map. Some of the major land use categories in a city are the Central Business District, retail, wholesale and commercial area, industrial area and Residential area. Apart from these major land uses urban village and slums and squatters are major land uses particularly in developing countries.

15.7 TERMINAL QUESTIONS

1. State any five salient features of a town.
2. Explain various stages of evolution of urban settlements in the world.
3. Describe the functional classification of cities given by C. D. Harris
4. Explain in brief nature and characteristics of the Central Business District in a city.
5. Describe the process of transformation of a fringe village to an urban village as suggested by Ramachandran.

15.8 ANSWERS

Self-Assessment Questions

1. a) The physical form of the highest and most complex types of associative life. It exemplifies the dominant elements of towns to a much greater extent.
b) (i) Boston-New York and (ii) Japan-Tokaido
2. a) (i) Site and situation and economic
b) Tigris and Euphrates

3. a) (i) Eopolis, (ii) Polis, (iii) Metropolis, (iv) Megalopolis, (v) Tyrranopolis and (vi) Nekropolis.
b) The type of economic activity measured in terms of occupation and employment in which residents are engaged.
4. a) History of growth, land values and accessibility.
b) Uncontrolled peripheral settlements, whose growth remains outside the purview of planning, physically decrepit, chaotic and disorganised, limited or no infrastructure, lacking in basic amenities. (Any four)

Terminal Questions

1. Characteristics of towns are: (i) they support higher densities of population; (ii) a higher proportion of population is occupied in non-agricultural activities; (iii) there are higher densities of built-up structures; (iii) slightly higher number of metalled roads that imply better connectivity with other nodes and service centre; (iv) a more diverse market, having a variety of shops selling durables; (v) a higher level of infrastructure provisions like a district hospital, a number of secondary schools, a college, a newspaper office etc. (vi) places for recreation like parks, cinemas and hotels. (Any five)
2. There are some stages of evolution that can be generalised. Across the world, the urban settlements first depended upon agrarian resource, then industrial production depending upon mineral resources and subsequently the contemporary cities depend upon service functions and amenity resources. Based on markets created by these resources, the urban settlement evolved from the centre of settled agriculture to the trade centre to industrial / manufacturing centre to a much diversified global market centre of today.
3. Basis of classification was the type of economic activity measured in terms of occupation and employment in which residents are engaged. The criteria were made meaningful by applying different ratios for different functions on the basis of empirical evidence and are as follows: (i) Manufacturing cities (M') - employment in manufacturing to be at least 74% of total employment in manufacturing, retail and wholesale whereas secondary criterion was that manufacturing and mechanical industries contain at least 45% of gainful workers; (ii) Manufacturing cities (M) - Employment in manufacturing equals at least 60% of total employment in manufacturing, retailing and wholesaling. Also, manufacturing and mechanical industries usually contain between 30-45% of gainful workers; (iii) Retail cities (R)- Employment in retailing is at least 50% of the total employment in manufacturing, wholesaling and retailing and at least 2.2 times that in wholesaling alone; (iv) Diversified cities (D) - Employment in manufacturing, wholesaling and retailing is less than 60%, 20% and 50% respectively,

of the total employment in these activities; (v) Wholesale centres (W) – employment in wholesaling is at least 20% of the total employment in manufacturing, retail and wholesale and at least 45% as much as in retailing alone; (vi) Transportation centres (T) – transportation and communication contain at least 11% of the gainful workers and they equal at least one third the number in manufacturing and mechanical industries and two-thirds the number in trade; (vii) Mining towns (M) – extraction of minerals account for more than 15% of the gainful workers; (viii) University towns (E) – enrolment in schools of collegiate rank (universities, technical schools, Liberal Arts College and teachers colleges) equalled at least 25% of the population of the city; (ix) Resort and retirement towns (X) – no satisfactory statistical criterion was found.

4. It is primarily characterised by retailing of goods and services, office activities and major service providences. Although the same activities are also found in other parts of the city, the intensity is usually highest at the centre. The CBD is also characterised by centrality as the key to its locational context, and “often form the historical core of a city”. Accessibility is the most important feature of the CBD, being most easily accessible from any part of the urban sphere of influence. Most specialised products and services tend to be located here so as to provide access to particular sections of consumers. Head offices of important firms, chains, retailers, service providers tend to locate here because of the access it can provide. The region also provides the opportunity to all these offices to interact and serve as a cluster that constitute the financial hub of a city. The severe competition for land here leads to very high land values, which in turn leads to high intensity of land use. Also residential use is at its lowest here and may even be absent in some cases.
5. According to Ramachandran, the fringe villages undergo a process of change that ultimately results in their complete absorption within the physical city and this process leads them through the following important stages: (i) these villages first experience agricultural land use change and diversity; (ii) the next stage is that of occupational change, whereby, the village population responds to employment opportunities in the city; (iii) this stage is followed by growth in urban land use as real estate development, industrial sites begin to develop and land values increase substantially; (iv) the ultimate stage in the transformation of the fringe village is the “urban village”.

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Acknowledgements:**Figure 15.3: The Multiple Nuclei Model**

https://upload.wikimedia.org/wikipedia/commons/8/8f/Multiple_nuclear_model.svg

URBANISATION |

Structure

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16.1 INTRODUCTION

In the previous unit, we discussed about various aspects related to the nature, evolution, classification and morphology of urban settlements. In this unit we will highlight various issues related to urbanisation. The word urbanisation implies a process, which mostly defines the transition, growth and expansion of a settlement from being rural in nature and characteristics, to urban. Urbanization is a process which is associated with the process of migration of populations from rural to urban areas accompanied by a change in the occupational structure. It is also related with development of a planned township which is initiated as an “urban” complex and may not have been originally a rural settlement. Urbanisation essentially involves the expansion of a concentrated built-up area with high densities of population. Therefore, it also contributes to alteration of the ecosystem around it. Around the urban region gradual transitions occur whereby, the rural economy is affected by the synergies of an urban economy – and a process of

suburbanisation takes place, leading to the development of the fringe or a peri-urban region. This serves as a transitional zone and is ever-changing as the urban sprawl takes place and the peri-urban is engulfed by the urban, while the adjoining rural then transforms into peri-urban, so on and so forth.

In the initial section of this unit, we will discuss urbanisation as a process and explain the process through its history. In the subsequent section we will describe the process of suburbanisation, fringe development and its problems. We will also analyse trends of urbanisation in developed and developing countries. The concluding section deals with problems of urbanisation and urban growth.

Expected Learning Outcomes

After completing the study of this unit, you should be able to:

- ❖ describe the process of urbanisation in the world in its different phases;
- ❖ explain the urban sphere of influence;
- ❖ describe the development, causes and consequences of the urban fringe;
- ❖ analyse trends of urbanisation in developed countries and developing countries specifically in India; and
- ❖ identify the major problems of urban growth and give an overview of physical, social and environmental problems

16.2 THE PROCESS OF URBANISATION

Before discussing in detail about the process of urbanisation through its history, we should know what does process of urbanisation mean? The process of urbanisation is the process whereby more and more people live in urban places. Urbanisation is often explained as a process of being urban – which denotes an aggregate measure comprising occupations, lifestyles, a diversified economy dominated by the service sector, intensively built-up areas and progressively dwindling natural environments. Over the years, the factors that have led to increase in urbanisation have essentially been the same factors that attract people from rural areas to the urban places.

But have you ever thought how this process was initiated? We have a brief discussion about this in Unit 15 under section 15.3 titled 'Evolution of Cities'. In this section we will have a detailed discussion about the processes of urbanisation during different periods.

16.2.1 Early Urbanisation

As discussed in the earlier units, the earliest examples of urban development originated on the banks of the Tigris and the Euphrates between 5000 to 3000 B.C. Various technological inventions such as

wheeled cart, ox-drawn plough, sailing boat, system of canal irrigation, development of pottery and metallurgy brought changes in the economic and social organization. Agricultural production increased, improved transport allowed food surpluses to be assembled in towns and new institutions were founded to deal with storage, exchange and redistribution of food and other goods. Increased specialization of occupations took place and long distance trade increased. Thus the beginning of urban life must have been a purely economic and pre-eminently a social process. Social change at this stage involved bringing together large complex communities that's become collection of specialist of various kinds rather than self sufficient family groups. The earliest archaeological evidence seen taking place were in Mesopotamian villages is given by rise of temples rather than an indication of social economic change. Early settlements were restricted in size. Though one estimate limits 200,000 people, actual populations were smaller. At its peak, an urban area may have had a population of 50,000 and Babylon might have reached 80,000, others might have been smaller. These estimates have been complicated by agriculturalists that are believed to have lived in the city. Social classes gradually evolved as a result of division of labour. Increased production led to trade over greater distances. .

Specialized crafts such as the art of writing, maintaining records and accounts, improvement of skills in mensuration and calculation, beginnings of science and development of urban life took place gradually over time.

Although evidence is scanty, urban way of life had spread to ancient Egypt, the eastern Mediterranean, the Indus valley, China and South-east Asia. Between 3000 and 2000 B.C. urban centres diffused to Europe. This spread was important in that many developments took place in Europe that transformed the geography of cities.

During the third millennium B.C. urban life came to the established in early Mediterranean. Knossos in create, Tory in Asia Minor, and Mycenae in Greece etc. flourished. Like the cities of Middle East, these cities were small and had a high proportion of agriculturalists living in them. Trade in these towns was important and of high value, in which the Mediterranean provided a highway particularly to the island studded Aegan sea. In addition, the skills of craftsmen developed, thus raising the demand in the international market.

By the 8th and 7th centuries B.C., the Greek city states, evolved from early Mycenaean cities. As each city had limited patches of agricultural land and limited means of transporting bulky supplies, these small settlements encouraged migration and colonization. Thus Syracuse and Massilia (Marseilles) was founded in 600 B.C. to 500 B.C. Around this time technological advances in tools and weapons, alphabetical writing, improved ships and introduction of coinage facilitated trading, took place. These developments influenced the rise of Greek Empire which acted as a stimulus for urban development. By 300 B.C., Alexander of Macedonia opened up Asia to Greek trade and colonized the Persian Empire and

cities were founded, e.g. Alexandria. Athens had reached a size of 100,000 to 150,000 people. Other centres were smaller.

Improved communication and weapons were indirectly responsible for the rise of Roman Empire which provided a stimulus for urban development. By second century A.D., Rome had an estimated population of 200,000. They emerged after the Roman defeat of Greeks in Italy and Sicily. During this period urban life developed north of Alps. New cities were established in the Rhine valley and in England. Defence during this period was more important than urban functions. Improved route ways established new towns and linked old ones, during the Roman rule. In course of time, some decayed completely, others lapsed into relative obscurity, but many including Bordeaux, Cologne, London, Paris etc., have survived to become major modern cities of Europe.

The fall of Roman Empire in the 5th century A.D., led to a recession of urban life and at that time trade virtually disappeared. The Dark Ages have been described as a period of “an economy without markets”. Hence many towns were abandoned, while in others, urban life merely survived. Many towns reverted to the status of the small city. In eastern Mediterranean, urban life continued its former pattern. While in the relict of the Roman Empire larger cities like Alexandria and Byzantium continued to survive, even though they did not flourish.

The most basic problems of cities are those posed by the process of urbanization itself, a process by which the world is progressively becoming a more urban society with the shift from rural and agricultural forms of living. Estimates of the extent to which the world is more urban vary, because of problems of definitions. The first occurrence of the demographic revolution coincides with the emergence of the industrial city in Western Europe and the beginnings of modern urbanization.

16.2.2 Impact of Industrial Revolution

During Western Urbanization, there was large-scale migration from rural areas accompanied by an increase in population growth and the proportion of urban population increased sharply. The technical and economic changes which accompanied the Industrial Revolution had proved to be the most potent force affecting the development of the whole history of urbanization. The invention of the steam powered engine and the development of railways was followed by large scale exploitations of coal-fields and the creation of industrial towns on an unprecedented scale. At the same time improvements taking place in agriculture created an increased food surplus to support the growing urban population and, later in the 19th century, mechanization also made many agricultural workers redundant and encouraged them to seek work in new industrial centres. The process of industrialisation consistently demanded greater numbers of people as the economies of scale proved to be highly profitable. The rural poor migrated in large numbers as wage employment brought in attractive assurances. Besides, urban society provided many other opportunities like

better education and health facilities. As industrialisation set in, markets expanded, creating earlier non-existent choices for the consumer. Urbanisation gradually became a process that consistently provided better standards of living and greater choices.

Improvements in transport, better roads, new canals and the development of railways encouraged this mobility of population and also facilitated the movement of foodstuffs and industrial raw materials into cities and allowed their products to be distributed to larger and more distant markets.

Industrialization and urbanization went hand in hand throughout the 19th century. In Britain, industry was grafted to long established towns, but on coalfields new industrial towns grew up with factories and workshop adjacent to endless streets of identical working class houses (also known as *row houses*) build to the minimum standards of the late nineteenth century by laws. In the city of rapid technical progress, the city as a social unit lay outside the circle of invention. Except for utilities such as gas mains, water pipes and sanitary equipments, though belatedly introduced, often slipshod and inadequate, the industrial town could claim no improvement over the seventeenth century town. Until 1838 neither Manchester nor Birmingham functioned politically as incorporated boroughs.

By 1860 just over 50% of the population of England and Wales was classified as urban, a figure which has risen to 77% by end of the century. Several changes took place in France, Germany and U.S.A., but several decades later than in U.K. In Scandinavia and to the lesser extent in Mediterranean Europe the large scale urban consequences of industrialization were not felt well into the present century, while in many countries of eastern Europe the proportion of town dwellers remained only about 30% of the total population.

16.2.3 Post-Industrial Urbanisation

While most advanced countries became urbanized, non-western countries remain predominantly rural. The urbanization which began in the early 19th century subsequently began to affect the developing countries of the world in recent decades of the 20th century. Since 1920, however, rates of increase in proportion of urbanization in the developing world have been universally faster than in developed countries. In Western Europe and Northern America the rapid growth of cities coincides closely with the Industrial economic development. Non-Western countries, however have witnessed the growth of major cities without this accompanying economic development and this has led to the assessment by most observers of a state of over-urbanization or pseudo-urbanization.

The levels of urbanization reached in 1976 in different regions of the world, varied considerably from a low of 23% in Africa to the high of 74% in North America, as compared with 38% for the entire world. The rates of urbanization tend to be greater in less developed regions of the world, whereas the levels of urbanization are highest in the developed regions. In general the developed nations of the world can be considered as being in

the terminal stage of urbanization, since much of their development has involved the concentration of economic activity, accompanied by a concomitant localization of population. The developing nations, on the other hand, tend to be in the acceleration stage of urbanization and other nations having a largely agrarian society are in the initial stage of urbanization.

If per capita income can be taken as measure of economic development, it is observed that there is a roughly linear correlation between per capita income and level of urbanization, with the level of urbanization being greatest in nations with highest per capita income levels. Conversely, in nations where the per capita income is lowest, the level of urbanization tends to be lowest.

The broad pattern of world urbanization has attracted a number of economic interpretations, some concerned with statistical evidence, other with the impacts of this process of change upon society and economy. One largely unresolved problem which has attracted the geographer concerns the ordering of cities by population size within a country. Another is concerned with the implication for societal changes in which the growth of cities involved.

The world's population, as a whole, has been experiencing rapid urbanization, in that; rates of increase of urban population have exceeded overall rates of population increase for at least two centuries. The world's population is experiencing urban growth as well as urbanization, the levels of urbanization are quite varied among the world regions, with some having reached higher levels of urbanization than others.

Rates of urban growth have exceeded rates of general population growth, and it is appropriate to say that there has been an urbanization of world population for the last two centuries. Furthermore, urbanization has increased at an increasing rate, which is to say that the rate of urban growth in the world outstrips the rates of overall population growth by a greater margin as time passes.

Considering both level of urbanization and rate of urbanization, a nation can be placed in the context of urbanization. There are nations with levels of urbanizations in excess of about 75%, have relatively low rates of urbanization.

For example, in the United States, the relatively highly populated early settlements have tended to exhibit characteristics that are unfavourable for further population growth of their cities. These cities have become more crowded and the traditional industries, on which their early growth was based, have become outmoded and unable to keep abreast of recent technological change. Therefore, these places experience low rates of urbanization even though they may have high levels of urbanization. By contrast, cities that have had relatively low urban populations (lower levels of urbanization) have been the recipients of regional shifts in industrial activity that has served as a catalyst for accelerated population growth. States with highest rates of urbanization tends to be those that have more

amenities such as space and a favourable climate (e.g. Florida and Arizona).

16.2.4 Contemporary Urbanisation

The important factors that have brought about a more rapid growth in the twentieth century are:

- 1) A change of industries from heavy to lighter industries to reach the consumer, which attracts favourable location and provides access to national and international markets. External economies of scale, access to skilled labour, availability of ancillary services have attracted large industrialists to cities.
- 2) The tertiary sectors of the economy with a wide diversity of jobs, which involve provision of services tend to be found in urban settlements. This resulted in higher standards of living, increasing participation in national life, increasing opportunities for modern service industry for service workers, which has not only encouraged migration but also the growth of smaller urban settlements.
- 3) Social factors such as education, fine arts and other cultural centres have attracted a wider cross-section of people. Today, more people have easy access to education and the arts.
- 4) Natural increase of population plays an important role in the growth of population. Improvement in medical techniques, sanitation and general standard of living has added to the natural increase. Besides, mobility of population has increased and migration has led to increase in population densities in urban regions.
- 5) The impact of transport especially motor transport has extended the journey to work by longer distances resulting in the growth of a loosely structured urban area e.g. North Eastern seaboard of U.S.A.

In recent decades, growth of urban settlements has continued at a high rate in many parts of the world. New towns were created and large cities are becoming gigantic. In 1900 only 9.2 per cent of the world's population lived in towns with a population of over 20,000. This proportion has risen to 20.9% by 1950, 30% by 1970 and 42% in 1985. The proportion of urban population in the world was 53% of the total population in 2012. Urban growth is, in fact, now taking place at a faster rate in the regions along the Tropics (previously known as the less developed world) than either Western Europe or North America. This is due to the substantial rural to urban migration in the less developed realm. An interesting measure of recent urbanization is the increase in the number of million cities or cities with population exceeding one million. In 1800 there was no city in the world with a population exceeding a million, although London with 959,310 inhabitants came close. By 1850 there were two million cities, London and Paris, and by 1900 there were eleven cities with more than one million inhabitants. They were London, Paris, Berlin, Vienna, Moscow, St. Petersburg, New York, Chicago, Philadelphia, Tokyo and Calcutta. Of these

only the last two lay outside Europe and North America. In the present century the number of million population cities rose to 20 in 1920, 51 in 1940, 80 in 1960 and 129 in 1970. Though most of these cities are found in Europe and North America, they are increasing rapidly in the tropical world. In 1940 only 4 tropical cities had a population of more than one million (Bombay, Kolkata, Mexico City and Sao Paulo), and by 1970 it was 26.

Another effect of accelerated urban growth had been to cause cities to coalesce with neighbouring towns to form a vast, amorphous urban sprawl known as Conurbation or Metropolitan city in U.K. and U.S.A. respectively.

Of all type of urban centres, based on population size, the one that has grown the fastest and likely warrants the greatest attention with its large size is the metropolitan area, roughly analogous to the urbanized area. The term is used to refer a single functional unit with a population of at least 100000 people. Some metropolitan areas are gaining population very rapidly, others are growing at only modest rates and a small number are losing population. Considerable variation exists in recent rates of growth of metropolitan areas in different parts, particularly in developed regions as compared with the developing regions.

The million plus city is small in comparison with gigantic urban forms, some of which exceed 10 million inhabitants. Such agglomeration exists around capital cities of London, New York and Tokyo and also around industrial areas such as Greater Manchester, West Yorkshire, and West Midlands in U.K. and Ruhr districts of West Germany.

16.2.5 Urban Sprawl and Agglomeration

In simple terms, urban sprawl refers to the areal expansion of urban concentrations beyond what they have been. Urban sprawl involves the conversion of land peripheral to urban centres that has previously been used for non-urban uses to one or more urban uses. In the process, the land absorbed by the urban centres becomes a functional part of the urban agglomeration and is occupied by people who in attitude, behaviour and activity are integrated into the Urban Society. This process of areal expansion has been in effect for centuries, yet the term urban sprawl is used mainly with reference to fairly recent times. Perhaps, urban sprawl has a meaning beyond the mere occupancy of land on the periphery of cities or the areal expansion of cities. In other words, urban sprawl refers to the pace of land conversion to urban use and magnitude of areal expansion of the city. However, the areal expansion of cities have increased greatly, when the greatest surge of migration of cities have taken place.

Among the problems associated with urban sprawl, the most significant problem is the inefficiency of land use. Another problem arising from urban sprawl is progressive loss of farm lands, especially those of highest quality.

Cities in general tend to grow outwards. In the developed world, housing areas are extended at lower densities as the distance from the centre

increases. Suburban Villas are predominant in the U.S.A. and Australia. In the U.K. with its stringent planning controls, this urban sprawl accelerated by the growing use of the motorcar leads to the diminishing extent of agricultural land. In Europe as a whole, population in the urban fringes increased about two and a half times as fast as in more central housing areas between 1940 -1950 and five times as fast between 1956 -1960.

In Japan the areas covered by towns and cities by 1990's was one-fifth of the cultivable area for settlements, like farm-land, prefer flat or gently sloping ground. In the United Kingdom, the proportion of urban land doubled between 1900 and 1960 by 11% of the total area; by 2000 it was 16%, a comparatively modest increase made possible by the acceptance of higher building densities than those of the 1930's.

The cities in developed economies tried to limit urban sprawl by introducing the format of increasing densities through building high-rises, while, green belts were prescribed around large cities wherever possible. The planning of New Towns was designated in such a way that the increasing population may be accumulated.

According to Thomas, proposals to limit the spread of London were made during the reign of Elizabeth I. Ebenezer Howard popularized the "*garden city*", and thereafter, his followers advocated green belts all around the Britain's major cities in order to preserve agricultural land, provide recreational spaces. This led to the demand by people to control the unabated growth of population. In 1935 a fully prepared scheme was launched, so that nearly 30,000 acres were acquired to maintain a 10 miles (16km) wide green belt around London. Other urban areas have taken up this idea. Sometimes some buildings have permitted in open areas. A new idea is to have a series of green wedges, so that this will allow more people to have the chance for easy access to the countryside for mental and physical relaxation.

The process of sprawl also leads to a continued process of coalescence of vast built up areas to form entirely urbanised regions. Jean Gottman had suggested that the whole of the north-eastern seaboard of U.S.A. from New Hampshire to Maryland could be regarded as a single urban complex of staggering dimensions, which he termed as *Megalopolis*. The growth of the size of cities creates many social and economic problems, including expensive and often inadequate housing, over-crowded roads, over burdened public transport system and pollution by smoke fumes and noise. The condition in turn, cause stress and tension among city-dwellers and indicate a strong relation to vandalism, crime and delinquency.

SAQ 1

- a) Name the two changes that accompanied the industrial revolution had proved to be the most potent force affecting the development of the whole history of urbanization.
 - b) What is Urban Sprawl?
 - c) State the two problems associated with Urban Sprawl.
-

16.3 THE URBAN SPHERE OF INFLUENCE

In the previous section, you have studied about urban sprawl. You might have now realised that over the time, the city grows beyond limit. However, these areas away from the city centre also remain connected with the city through their various socio-economic activities. In other words, these socio-economic activities of the core areas of the city have served these peripheral areas. This is known as sphere of influence. But, now the question is how to measure or indentify these sphere of influence. In this section, we will discuss about the concept of city region and delimitation of city region which is based on the concept of urban sphere of influence.

16.3.1 The City Region

The concept of the city region is a “mental construct” (Dickinson, 1964). It is that region which has functional links with the city, the major functions being work, dwelling, recreation and transport. The term “umland” (meaning ‘the land around’) was first used in 1914 to describe the city region, subsequently, terms like urban hinterland, sphere of influence, urban field and city regions have been used to denote more or less the same concept.

As Aurousseau (1934) mentions that the city has to be interpreted as “an organic part of a social group”, it is evident that the definition of the city region is related to the associations with the city. The major associations which help define city regions are commonly determined by transport and movement of population. There are also a large number of minor criteria or associations that may be considered to identify the city region. The common approach to delimiting city regions is the superimposition of the boundaries created by all such associated factors and then considering the outer limit of these boundaries.

According to Dickinson (1964), the associations that define a city region fall into four categories:

1. Trade relations – the area of trade
2. Social relations – area of use and access of educational, cultural and recreational facilities
3. Area of movement of population – zone of daily commuting
4. Impact of central city upon land uses – agricultural and urban functions serving the city

16.3.2 Delimitation of the City Region

The process of delimiting the city region is a complex one, as the factors and criteria will vary from city to city. While, in general, the four associations discussed by Dickinson (1967) in his book “City and Region –

A Geographical Interpretation” (as stated in section 16.2.1. above) are used to measure the limits. Other criteria that are used are number of telephone connections, extent of newspaper circulation and the limit of local bus or train routes. The process however has become gradually complex as rapid expansion of the continuous built-up area has occurred, making delimitation more and more difficult. The process of rapid urbanisation in the industrial period led to continuous built-up areas extending into one another whereby the city and its surroundings were becoming increasingly difficult to distinguish at the peripheral zone (Ghosh, 1998). This continuous and coalescing built-up area was termed conurbation by Patrick Geddes.

SAQ 2

- a) Define City Region.
 - b) Why has delimitation of the city region been more and more difficult?
-

16.4 THE URBAN FRINGE

You might have realised till now that the influence of the urban centre decline as we move from centre of the city to the periphery. Therefore, there would be a transition zone where both rural and urban characteristics are observed. This transition zone is known as fringe or urban fringe. In this section, we will define the fringe and describe the characteristics of the fringe.

16.4.1 Defining the “Fringe”

The rural-urban fringe is the transitional zone in which the influence of the urban centre decreases categorically, while the rural characteristics take over. It is difficult to fix the boundaries or the limit of urban centres very precisely. This is because of the fact that administrative boundaries like that of the municipality or corporation does not clearly demarcate the city. Nor does it clearly identify the rural limits. This is why it is important to understand the nature of the transitional zone. There are residential areas beyond the administrative boundary which are served by commercial centres, which may also be highly accessible. Often these enclaves may be interspersed by cultivated land growing vegetables, flowers etc. for the urban market. These areas gradually extend into regions where the occupational character changes from non-agricultural to agricultural, thereby becoming characterised as rural.

16.4.2 The Characteristics of Fringe

The rural urban fringe necessarily contains features of both urban and rural places, the transition being unidirectional – i.e., growth of the urban centre and retraction of the rural activities. Following features may be noted in general:

- These regions are progressively less densely built-up than the city itself
- There is also a reduction in population density as one moves from the urban to the rural places
- The fringe tends to have more open space, be it farmland or grassland or a bit of both.
- The fringe is often characterised by location of factories and manufacturing units that have been pushed outside the city limits because of increasing environmental concerns.
- In the rural-urban fringe, the occupational structure of the population shows a gradual transformation from non-agricultural to agricultural/or other primary activities.
- The intensive accessibility found in the city centres diminish gradually in this regions
- The nature of transportation facilities undergo a transition.
- Certain modes of transport like the underground metro rail networks diminish and gradually give way to surface railways only (i.e., local trains, apart from bus services)
- Markets and supermarkets tend to locate themselves at greater distances from one another, while within the city, they may be very closely spaced.
- Diversity of the market is also largely limited in this zone.
- A related factor is that the consumer behaviour tends to change from urban to rural.
- Number and types of institutions both experience a gradual reduction

16.4.3 The Problems of the Region

Most often than not, the rural-urban fringe experiences a clear lack of planning vision. Being located outside the limits of the municipality or corporation on the one hand and also the rural administrative boundary in some cases, these regions do not receive the attention of planners. The regions tend to experience land-related conflicts where residential and commercial land competes with agricultural land. The powerful urban land developers tend to force conversion of agricultural land as well as natural areas like ponds and forest / grassland patches for getting higher returns from land. Often the law and its enforcement both suffer from lack of implementation, resulting in poor land management.

Economically, most fringe areas, especially in developing economies, are characterised by a choice conflict – whether or not to convert land from rural uses to urban uses. Resultant changes are also not managed well in most circumstances.

SAQ 3

- a) Define rural-urban fringe.
 - b) State any two problems associated with the rural-urban fringe.
-

16.5 TRENDS IN URBANISATION

In the initial section we have already discussed some of the trends in urbanisation in general while discussing about urbanisation in an evolutionary perspective. Till now it might be clearer to you that there are different patterns observed in developed and developing countries as far as trends in urbanisation are concerned. Let us discuss them very briefly.

16.5.1 Patterns in Developed Countries

Urbanisation in the developed economies could be attributed to the industrial revolution. According to the previous discussion, it may be found that industrial revolution led to an expansion of the market – a result of rising GDP and per capita incomes commensurate with the rise in production and thereby the demand for labour and capital. Urbanisation in developed economies saw a gradual stagnation in the 1980's, after which we have also found instances of counter-urbanisation, whereby, changes occur in the peri-urban regions and less impact of population migration and growth are found in the city proper.

16.5.2 Patterns in Developing Countries

The process of urbanisation has taken an unprecedented turn in what was termed as the Third World primarily consisting of the less developed countries of Africa, South America and large parts of Asia.

16.5.3 Urbanisation in India: An Overview

The process of urbanisation in India can be adequately explained by the steady rise of urban population as a percentage of total population across the census years. The following table sums up the statistics:

Table 16.1: No. of Towns and Percentage of Urban Population in India 1901-2011

Year	No. of Towns	% of Urban Population
1901	1827	10.84
1911	1815	10.29
1921	1949	11.18
1931	2072	11.99
1941	2250	13.86
1951	2843	17.29
1961	2365	17.97
1971	2590	19.91
1981	3378	23.34
1991	3768	25.72
2001	5161	27.81
2011	7935	31.16

Source: Census of India 1981, 1991, 2001, 2011

For the first time since Independence, Census 2011 reveals, that the absolute increase in urban population has been more than its rural counterpart. The growth rate of the urban population in 2001 was 31.5% while in 2011 it was 32.7 which shows a 1.2 times increase. The level of urbanisation increased from 27.81% to 31.16%. The urban population in India stands at 37.7 crore as against 28.6 crore in 2001.

However, the total urban population in India does not reflect the dynamic variations across states. There are many states which have become highly urbanised like Maharashtra and Tamil Nadu and others reveal slow pace of urbanisation, e.g., Assam, Nagaland, Tripura etc. Smaller states like Goa and Pondicherry and Union Territories of Chandigarh and Delhi are predominantly urban.

In the post Independence period, higher urban growth was found in the states which had higher per capita income (Maharashtra, Tamil Nadu and West Bengal) – primarily because of the concentration of economic activities in Mumbai, Chennai, Kolkata etc. The economic history of these cities also reveals that they were also *primate* cities. Over five decades, these cities continue to dominate the urban scenario. In spite of medium urban growth, the developed states like Maharashtra, Gujarat, Tamil Nadu and Haryana continue to have higher levels of urbanisation. According to Sivaramakrishnan *et al.* (2005), the urban scenario in the post-independence period was characterised by dualism. The developed states attracted population to urban areas due to industrialisation and infrastructural investment. Even in smaller towns, investment and decentralisation resulted in higher growth coupled with the push factor of the rural-urban migration due to lack of improvement in the agricultural sector. In the backward states, urban growth has been either below or equal to the national average.

SAQ 4

- What are the trends of urbanisation in developed countries especially after 1980's?
- What was the unique trend of urbanisation observed in 2011 Census of India?

16.6 PROBLEMS OF URBAN GROWTH

Urbanisation has brought some positive changes in socio-economic conditions of human life. Simultaneously, urbanisation and urban growth create some problems. Each urban centre has its own problems. But for our convenience, we group those under three categories i.e. physical and economic, social and environmental. Let us discuss these issues in detail.

16.6.1 Physical and Economic Problems

As evident from the previous discussions in different sections of this unit, till now you might have understood that the gradual increase in urban

population is a reality. Urban places are characterised by diversity in terms of the economy. While rural places are largely based on primary activities of one or two kinds (e.g. agriculture and fishing or forestry), urban places support numerous activities ranging from primary (as in mining), secondary (as in manufacturing industries) and a large number of services. Larger the urban centre, more varied is the nature of economic activities. However, the urban centres face constant pressures to thrive in a highly competitive environment. These centres constantly face several kinds of dilemma.

Some the dilemmas are given below:

- a) There are more people than it can accommodate and therefore there is always a shortfall of infrastructural facilities like housing, drinking water, sewage etc.
- b) There are numerous activities competing for limited resources – e.g., a plot of land having a pond will give higher returns in monetary terms if it is converted to residential property, further returns if converted to commercial property.
- c) There is always a shortfall of capital investment that is made and can be made – at any given point of time; there are several other cities that have secured a better position in the global network in terms of trade, commerce, communication or even tourism etc.
- d) Development and expansion of the market (mostly the consumer market) depends upon the purchasing power of population (per capita spending may be very different for two cities of the same stature e.g., Kolkata and Bangalore, both being megacities)

The economic base of the urban place determines the physical layout and the nature of the built-up region. The economic status of a city is directly related to land use and infrastructure planning. An example may be cited from the Indian cities to explain this point. Mumbai, which is the commercial capital of the country and has to spend much more on infrastructure provisioning than Nanded, or, Goa, which is an important tourist destinations has to spend more on provisioning for tourism than infrastructure.

16.6.2 Social and Socio-Psychological Problems

An urbanised society is also more cosmopolitan in nature compared to its rural counterpart. While this has numerous advantages in terms of acculturation, it has its disadvantages as well. The lack of knowledge about one another's roots and culture creates a sense of alienation from the community. It often leads to loneliness and psychological deprivation among both young and old members of the urban society. A contributive factor for loneliness is low level of social interaction because of pressures of work for both school children and adult workers alike. Individuals in an urban society are also subject to more competitive behaviour because of limited employment opportunities vis a vis number of unemployed, lack of equity in quality of education and training of human resource, low wages, economic slowdown and job-cuts. All such factors lead to insecurity among

individuals leading to depression, low self esteem, varied degrees of criminality and other types of abnormal socio-psychological behaviour. There is also evidence of crowding and noise pollution being causes of socio-psychological problems.

16.6.3 Environmental Problems

Cities represent a completely artificial environment (Middleton, 1999); they absorb vast quantities of resources and create a large volume of wastes which are disposed off into the ecosystem. Kreimer *et al.*, (1995) gives the example of Rio de Janeiro's Guanabarra Bay where commercial fishing reduced by 90%, mangroves reduced by 90%, silting of the Bay increased at the rate of 81 cms per 100 years, because of the two ports, 6000 industries, twelve shipyards, sixteen oil terminals, urban sewage and garbage. The important types of environmental degradation are air and water pollution, solid waste in addition of an overall alteration of the natural ecosystems. You will read about these environmental issues in details in your Course on Environmental Geography. Let us discuss some of the environmental issues associated with urbanisation.

- i) **Air Pollution:** The impact upon the urban atmosphere is diverse. The principal sources of air pollution in urban areas are from combustion of fuels for domestic heating, power generation, motor vehicles, incineration of wastes and industrial processes. The major pollutants emitted by these processes are sulphur dioxide (SO₂), carbon monoxide (CO), oxides of nitrogen (NO and NO₂), lead (Pb) and suspended particulate matter (SPM). Ozone (O₃), which is not a result of combustion, but is formed from NO_x and volatile organic compounds in the presence of sunlight, is the most important constituent of photochemical smog. These atmospheric pollutants affect human health directly through inhalation and indirectly through food and water contamination. Directly inhaled, it affects the respiratory tract, cardiovascular functions, pulmonary functions, causing morbidity and reducing mortality. In recent times, these traditional pollutants have been substantiated by other toxic and carcinogenic chemicals due to the increasing use of complex material for manufacturing processes – like cadmium, mercury, beryllium, benzene, radon, asbestos etc.
- ii) **Water Pollution:** Urban environments tend to alter and modify the natural hydrological cycle by affecting its quality. Runoffs from urban areas are high in pollutant content and are choked with sediment. While the urban regions are built, the construction activities choke water bodies, increasing the volume of suspended material. The process of urbanisation removes vegetation cover and water bodies from its surface so as to accommodate buildings, roads and railways. Removal of vegetation cover affects water retention. Finally, when construction of the built-up area is completed, the natural surfaces have been removed and made impermeable. No infiltration leads to water logging in surrounding areas. Most urban streams and rivers have gradually become biologically dead due to the volume of

pollutants. Most rivers in developing countries have been long identified (Hardoy, 1992) as large open sewers. The coliform count of rivers at the entry points of cities are found to be much lower than when it leaves the city – often in millions per 100 ml. Water related diseases like typhoid, cholera, diarrhoea, jaundice are common causes of morbidity in and around cities, especially among the poor city dwellers who do not have access to safe drinking water and access domestic water from untreated sources. Water pollution should be viewed from two aspects – surface water and ground water. The pollutants affect both, but the long term impacts upon groundwater are more complex. Aquifers do not have the self-cleansing capacity that rivers do and are almost impossible to reverse. Another aspect of groundwater that is critical is its overuse due to urban activities and water demand. The overuse of groundwater can also lead to subsidence of ground due to lowering of water tables. Mexico City experienced subsidence of 9 metres in some areas, after 100 years of groundwater overuse (Schteingart, 1989).

- iii) **Solid Waste:** One of the reasons for irreversible damage of the soil and water quality of urban areas is the volume of waste that it generates. While the volume of waste is extremely high, another more crucial aspect is its treatment, without which the waste is left to degrade the environment, cause health hazards and make irreversible changes to the surroundings. Hardoy (1992) reveals alarming statistics that show the proportions of uncollected garbage in percentages, where Accra (Ghana) and Kampala (Uganda) is high as 90%, followed by Dar es Salaam (Tanzania) and Karachi (Pakistan) at 65%. The situation has improved only marginally over the decade. Serious health hazard is created due to garbage being either not treated at all or inadequately disposed of. Either way, it becomes home to disease vectors and may also lead to fires.
- iv) **Loss of Natural Ecosystems:** The quest to build cities does not stop at any given point as urban life is more physically, economically and socially more attractive than rural life. As cities are built and as they expand, land is the only commodity that falls short. The built up spaces encroach on whatever that comes in its way- be it agricultural land, forests, wetlands, swamps and marshes. The cause is more economic and commercial than ecological. Cities are economically more viable, profitable and attractive – having more direct monetary benefits and gains in comparison with gains from ecosystem conservation (where the benefits are long-term and non-monetary). The utility of a parcel of land viewed in the short term tends to allow built-up spaces to win over its conservation. In the bargain, vast stretches of natural ecosystem have been sacrificed for urban growth. Some of the states of the United States of America have been documented to have lost as much as 95 - 99% of their (Bradley and Buisson, 1992). Losses of forests and agricultural land for urban growth are also phenomenal across the world. The benefits of

retaining environmental systems have been long studied and popularised – leading advanced nations to take drastic steps in curbing growth which consumes natural ecosystems. However, in less developed countries, legislation and its execution are both weak. Lack of political will and the inability to take environmental matters seriously is another major cause of such losses being ignored by nations.

SAQ 5

- a) Why are the long term impacts upon groundwater more complex? Give any two reasons.
 - b) Name any two major causes responsible for loss of natural ecosystem in urban areas particularly in developing countries.
-

16.7 SUMMARY

The earliest examples of urban development originated on the banks of the Tigris and the Euphrates between 5000 to 3000 B.C. Various technological inventions brought changes in the economic and social organization. But, the technical and economic changes which accompanied the Industrial Revolution had proved to be the most potent force affecting the development of the whole history of urbanization. During the post-industrialisation period, while most advanced countries became urbanized, non-western countries remain predominantly rural. The urbanization which began in the early 19th century subsequently began to affect the developing countries of the world in recent decades of the 20th century. Since 1920, however, rates of increase in proportion of urbanization in the developing world have been universally faster than in developed countries. If we look at contemporary urbanisation, the important factors that have brought about a more rapid growth in the twentieth century are: A change of industries from heavy to lighter industries to reach the consumer; the tertiary sectors of the economy with a wide diversity of jobs; Social factors such as education, fine arts and other cultural centres have attracted a wider cross-section of people; natural increase of population plays an important role in the growth of population; and the impact of transport especially motor transport has extended the journey to work by longer distances resulting in the growth of a loosely structured urban area. There are different patterns observed in developed and developing countries as far as trends in urbanisation are concerned. Urbanisation in developed economies saw a gradual stagnation in the 1980's. After 1980's developed countries has been experiencing instances of counter-urbanisation, whereby, changes occur in the peri-urban regions and less impact of population migration and growth are found in the city proper. The process of urbanisation has taken an unprecedented turn in what was termed as the Third World primarily consisting of the less developed countries of Africa, South America and large parts of Asia including India. Urbanisation and urban growth create some problems. These problems can broadly be grouped under three categories i.e. physical and economic, social and environmental.

16.8 TERMINAL QUESTIONS

1. Explain the important factors that have brought rapid urban growth in the twentieth century.
2. Describe the four categories of associations proposed by Dickinson that define a city region.
3. Explain various features of rural-urban fringe.
4. Analyse the physical and economic dilemmas faced by the present day urban centres.
5. Explain the trends of urbanisation in India.

16.9 ANSWERS

Self-Assessment Questions

1.
 - a) Technical and economic changes
 - b) The areal expansion of urban concentrations beyond what they have been.
 - c) (i) Inefficiency of land use, and (ii) progressive loss of farm lands, especially those of highest quality.
2.
 - a) It is that region which has functional links with the city, the major functions being work, dwelling, recreation and transport.
 - b) Rapid expansion of the continuous built-up area periods led to continuous built-up areas extending into one another whereby the city and its surroundings were becoming increasingly difficult to distinguish at the peripheral zone.
3.
 - a) The transitional zone in which the influence of the urban centre decreases categorically, while the rural characteristics take over.
 - b) Clear lack of planning vision, (ii) land-related conflicts (iii) the law and its enforcement both suffer from lack of implementation, resulting in poor land management. (Any two)
4.
 - a) After 1980's developed countries has been experiencing instances of counter-urbanisation, whereby, changes occur in the peri-urban regions and less impact of population, migration and growth are found in the city proper.
 - b) For the first time since Independence, Census 2011 reveals, that the absolute increase in urban population has been more than its rural counterpart.
5.
 - a) (i) Aquifers do not have the self-cleansing capacity that rivers do and are almost impossible to reverse and (ii) its overuse due to

urban activities and water demand lead to subsidence of ground due to lowering of water tables.

- b) (i) legislation and its execution are weak, (ii) lack of political will and (iii) the inability to take environmental matters seriously. (Any two)

Terminal Questions

1. (i) A change of industries from heavy to lighter industries to reach the consumer; (ii) The tertiary sectors of the economy with a wide diversity of jobs; (iii) Social factors such as education, fine arts and other cultural centres have attracted a wider cross-section of people; (iv) Natural increase of population plays an important role in the growth of population; and the impact of transport especially motor transport has extended the journey to work by longer distances resulting in the growth of a loosely structured urban area
2. (i) Trade relations – the area of trade; (ii) Social relations – area of use and access of educational, cultural and recreational facilities; (iii) Area of movement of population – zone of daily commuting; and (iv) Impact of central city upon land uses – agricultural and urban functions serving the city.
3. (i) These regions are progressively less densely built-up than the city itself; (ii) There is also a reduction in population density as one moves from the urban to the rural places; (iii) The fringe tends to have more open space, be it farmland or grassland or a bit of both; (iv) The fringe is often characterised by location of factories and manufacturing units that have been pushed outside the city limits because of increasing environmental concerns; (v) In the rural-urban fringe, the occupational structure of the population shows a gradual transformation from non-agricultural to agricultural / or other primary activities; (vi) The intensive accessibility found in the city centres diminish gradually in this regions; (vii) The nature of transportation facilities undergo a transition; (viii) Certain modes of transport like the underground metro rail networks diminish and gradually give way to surface railways only; (ix) Markets and supermarkets tend to locate themselves at greater distances from one another, while within the city, they may be very closely spaced; (x) Diversity of the market is also largely limited in this zone; (xi) A related factor is that the consumer behaviour tends to change from urban to rural; and (xii) Number and types of institutions both experience a gradual reduction
4. (i) there are more people than it can accommodate and therefore there is always a shortfall of infrastructural facilities like housing, drinking water, sewage etc.(ii) There are numerous activities competing for limited resources – e.g., a plot of land having a pond will give higher returns in monetary terms if it is converted to residential property, further returns if converted to commercial property. (iii) There is always a shortfall of capital investment that is made and can be

made – at any given point of time; there are several other cities that have secured a better position in the global network in terms of trade, commerce, communication or even tourism etc. (iv) Development and expansion of the market (mostly the consumer market) depends upon the purchasing power of population (per capita spending may be very different for two cities of the same stature e.g., Kolkata and Bangalore, both being megacities).

5. Refer to Section 16.5.3.

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GLOSSARY

Behavioural Theories of Settlements	: It explain the existing patterns of settlements in a region.
Central Business District	: It is the central area of the city. In common parlance, it is known as the “downtown”. It is primarily characterised by retailing of goods and services, office activities and major service providences.
City Region	: It is that region which has functional links with the city, the major functions being work, dwelling, recreation and transport.
Compact Settlement	: The houses are close to each other and inter-building spaces are small.
Conurbation	: The term invented by Patrick Geddes to describe constellations of cities sprawling together.
Dispersed Settlement	: Buildings are spread over a large area, and inter-building spaces are large.
Dry-point Settlements	: These are the sites that avoided the risk of flooding. For example, in marshy areas, higher ground that is little away from water body can prove to be a favourable site.
Ekistics	: The scientific study of human settlements, drawing from several disciplines, including architecture, city planning and social sciences.
Megalopolis	: It is defined by its poly-nuclear characteristic, where, large cities are joined by a continuous chain or complex of cities.
Morphology of Settlements	: The layout or the internal structure of the settlement.
Neolithic Period	: The stage or cultural evolution or technological development characterised by the use of stone tools and the existence of settled villages dependent on domesticated plants and animals.
Normative Theories of Settlements	: Theories of settlements which are not concerned about the existing patterns rather attempt to define an ideal system of settlements.

- Patterns of Settlements** : It means the geometrical shape that the houses in a settlement acquire. Pattern can be- linear, rectangular, square, circular, amorphous, etc.
- Rural-Urban Fringe** : It is the transitional zone in which the influence of the urban centre decreases categorically, while the rural characteristics take over.
- Site** : It refers to the actual location of the village. It is related to the physical surrounding.
- Situation** : It refers to the culture, economy and political set-up of the settlement. Therefore, situation covers the socio-economic aspects of the settlement.
- Slum** : UN-HABITAT defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following: (i) Durable housing of a permanent nature; (ii) Sufficient living space; (iii) Easy access to safe water in sufficient amounts at an affordable price; (iv) Access to adequate sanitation; (v) Security of tenure.
- Spur-line Settlements** : Settlements those are located in valleys in mountainous and hilly areas.
- Types of Settlements** : It refers to the nearness of the houses in an area. There are four types of settlements-compact, semi-compact, dispersed and farmstead.
- Urban Sphere of Influence** : Over the time, city grows beyond limit. However, these areas away from the city centre also remain connected with the city through their various socio-economic activities is known as urban sphere of influence.
- Urban Sprawl** : It refers to the pace of land conversion to urban use and magnitude of areal expansion of the city.
- Wet-point Settlements** : These are the sites close to a supply of water. For example, in desert areas, oasis or any other source of water acts as a favourable site for settlement.

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