URBAN GEOGRAPHY
UNIT-II

URBAN GEOGRAPHY

The basic function of a city

According to the "functional definition" a **city** is not distinguished by size alone, but also by the **role** it plays within a larger political context. **Cities** serve as administrative, commercial, religious, and cultural hubs for their larger surrounding areas.

Non basic sector

Non-**basic** industries consist of primarily small businesses that sell to local customers, including **basic** and **non**-**basic** businesses. Examples of **basic** businesses include big manufacturing and mining companies, while **non**-**basic** businesses include diners, service companies, small consulting companies and convenience stores.

Basic and nonbasic functions in a city

The **basic functions** of **city** also called as **city** forming activities. They involve the manufacturing, processing, or trading of goods or the providing of services for markets located outside the **city's** bound aries. Economic **functions** of a **city** servicing nature are called **nonbasic functions**.

The main functions of a settlement are: Market town – where farmers will buy and sell their goods and materials. Mining town – where **minerals** and fuel might be extracted. Industrial town – where raw materials will be processed into manufactured products.

Functions of urban areas

At the city level, urban functions are related to the **use** and functions of different urban spaces and include residential, productive, social, commuting, recreational, and administrational activities.

Structural **Hierarchy**:

Every urban system is characterised by the presence of a few large **cities** and a large number of small **towns**. The large **cities** account for a larger share of the total urban population, while the small **towns**, despite their numbers, account for a smaller share.

Structural Hierarchy:

An important aspect of urbanisation all over the world is the uneven pattern of development of small towns and big cities within the system. Every urban system is characterised by the presence of a few large cities and a large number of small towns. The large cities account for a larger share of the total urban population, while the small towns, despite their numbers, account for a smaller share. This is true of the Indian urban system.

The million plus cities form the apex of the Indian urban system and account for over one-third of India's urban population (see table 19.4). They are followed closely by the one-lakh cities (class I towns) and the medium towns (classes II and III towns), each of which accounts for over a quarter of the urban population.

Together, these three categories add up to more than 80 per cent of the total urban population. The small towns, which account for 48 per cent of the total number of towns and include classes IV and V towns, constitute only 10.5 per cent of the total urban population. The distribution patterns of the major classes of towns and cities in different states of India show remarkable unevenness.

Functional Hierarchy:

Each major function (as discussed above) has its own hierarchy. For instance, if we take administration, the revenue village is at the lowest level. The level above this is the panchayat union or block and above that tehsil or taluk under a tehaildar. Above this is the district headquarters under a district collector.

Zipfs Rank-Size Rule

It is the concept of explaining the hierarchy of urban settlement at a place. The population of urban settlement(town, cities) will be inversely proportional to the rank in the urban Hierarchy. That means a larger population has a smaller rank in the urban hierarchy. The pattern of the rank-size rule was created by George Zips in 1949, it is also known as Zipf's law.

The "rank-size rule" is related to the relative size of cities. According to the rank-size rule, there should be a larger number of small cities than bigger cities. Also, this rule predicts that the larger a city's population is then the fewer number of cities there should be in the surrounding area with a similar population.

The best known effort to create such a hierarchy is the **rank-size rule** developed by G.K. Zipf in 1949. At its most basic, the Zipf's **formula** is as follows: Pr=P1/P2 n where Pr= the population of the rth city, P1 = the population of the largest city, and r = the **size rank** of the rth city in the set.

The Rank Size Rule According to Zipf

Trade center hierarchies are reflected in the complexity of their functions, and in their size relative to other centers. In order to construct an "urban-size hierarchy," urban centers must be ranked by population size. The best known effort to create such a hierarchy is the rank-size rule developed by G.K. Zipf in 1949. At its most basic, the Zipf's formula is as follows:

Pr=P1/P2 n where Pr= the population of the rth city, P1 = the population of the largest city, and r = the size rank of the rth city in the set. When plotted on double logarithmic graph paper, this creates a straight, but downward sloping line (gradient of 45 degrees). This theoretical rank-size distribution consists of a few large metropolitan areas, a large number of medium-sized cities, and a very large number of smaller communities.
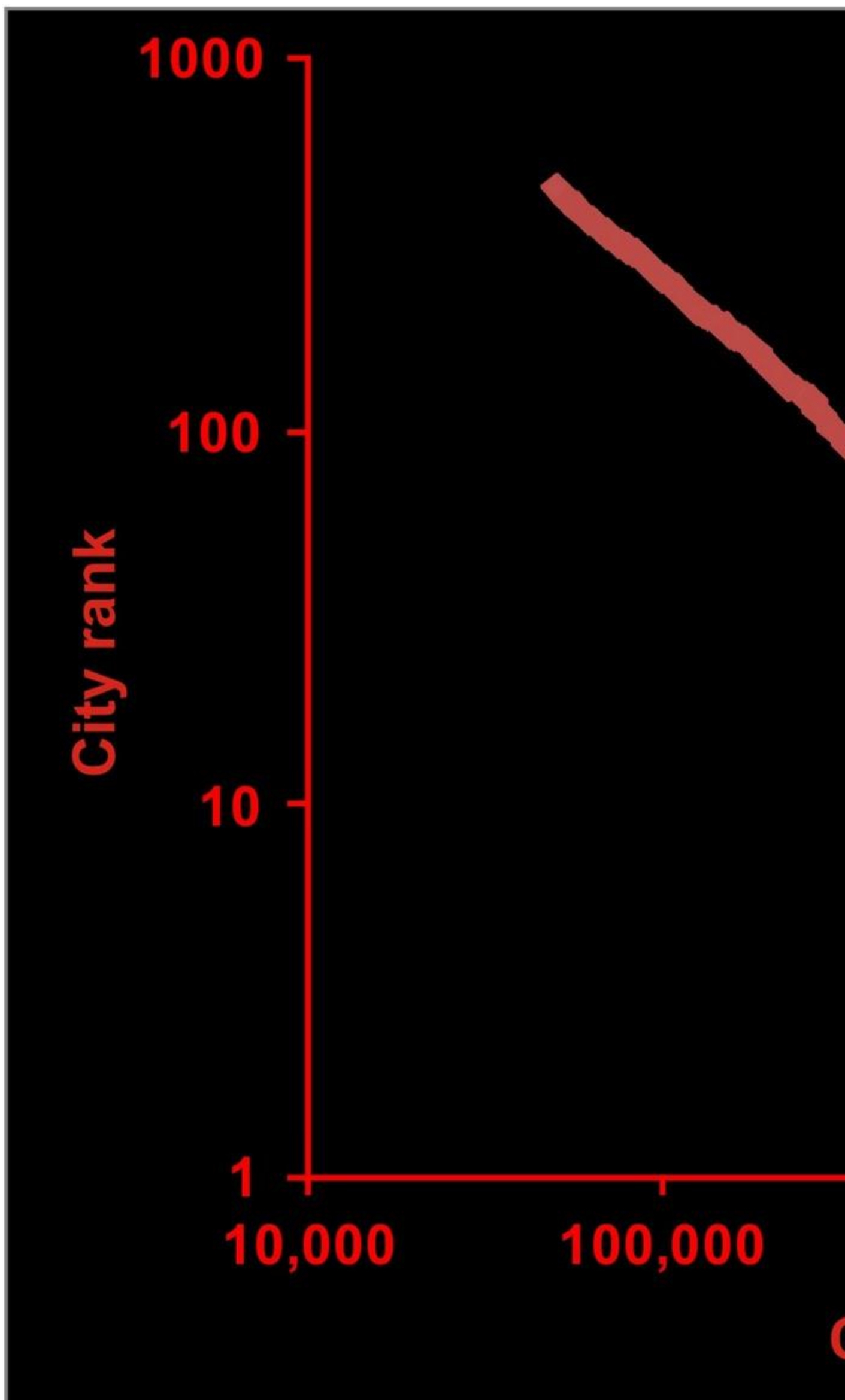
Zipf believed that a rank-size distribution is the result of a balanced system for cities. This however does not always account for the immense populations of metropolitan areas such as London, Paris, New York, Los Angeles, Moscow, and Shanghai. For this reason, **in 1961, Brian Berry** attempted to evaluate city-size variations and distributions by comparing 37 countries. As a result of his research, he found that thirteen nations exhibited rank-size distributions, fifteen nations exhibited primate distributions (one very large city with many smaller centers around it), and nine countries had intermediate distributions (a number of intermediate cities). Berry suggested that simple explanations cannot accurately account for differences in the types of city-size distributions. This is so, he argued, because numerous factors act randomly over a long period of time to produce a rank-size distribution in a given area (e.g., imperialism, capitalism, communism, etc.). Berry believed that as nations develop and become more socially and economically complex, they are more likely to conform to Zipf's rank-size rule. Nevertheless, he noted that some underdeveloped nations have one very large city and, for all practical intents and purposes, no intermediate centers of any kind. On the other hand, other underdeveloped nations have a full complement of centers from the very large metropolitan areas to the smallest hamlets. Often, those nations with a huge primate city that is many times larger than any other urban place in the nation are ruled by authoritarian governments that control settlement patterns.

Functional classification of Towns By C.D Harris and H.J.Nelson

Harris remedied the deficiencies of the former subjective and judgement-based classifications. In his paper 'A Functional Classification of Cities in the United States (1943)', he was able to identify quantitatively dominant function out of multifunctional character of cities. He devised a scale of reference from his study of 984 towns (population more than 10,000) in United States based on the data provided by 1930 Census. He used two sets of information

– i) **employment** and

ii) *occupational* figures

reduced to percentages to indicate cut-off points for urban activities varying in importance.

Harris based his classification on the activity of greatest importance in each city, recognizing that all cities are more or less multifunctional, he attempted to set up quantitative definitions that would enable him to assign each city to one class or category.
He identified nine principal categories of towns –

1. **Manufacturing** (M') Subtype
2. **Manufacturing** (M) Subtype
3. **Retailing (R),**
4. **Diversified (D),**
5. **Wholesaling (W),**
6. **Transportation (T),**
7. **Mining (S),**
8. **Educational (E),**
9. **Resort or Retirement (X)**
   and Others (P).

Here is the table Harris used for classification.

Criteria used by Harris in Functional Classification of Cities of USA

Types	Principal Criterion	Secondary Criterion
Manufacturing Cities (M' subtype)	Employment in mfg. equals at 74% of the total employment in mfg. +retailing+wholesaling.	Mfg. and mechanical contain at least 45% of gainful workers (occupation figs.)
Manufacturing Cities (M subtype)	At least 60% of total employment in mfg. +retailing+wholesaling	Mfg. and mechanical contain between 30% and 45% of gainful workers.
Retail Centres (R)	In retailing at least 50% of the total employment in mfg.+wholesaling+retailing	At least 2.2 times of wholesaling alone.
Diversified Cities (D)	Employment in mfg. +wholesaling+retailing is less than 60%, 20% and 50% respectively of the total employment in these activities.	Mfg. and mechanical contain between 25% and 35% of the gainful workers.
Wholesale Centres (W)	Employment in W at least 20% of the total employment in M+W+R	At least 45% as much as in retailing alone.
Transport Centres (T)	Transport and communication at least 11% of the gainful workers, and workers in transport and communication equal at least one-third the number in mfg. and mechanical.	At least 2/3 the number in trade.
Mining Towns (S)	In extraction of minerals for more than 15% of the gainful workers (for cities of more than 25,000 pop.)	—
University Towns (E)	Enrolment in colleges — (university, technical institution, liberal arts colleges and teachers' colleges) at least 25% of the pop. of the city.	—
Resort and Retirement Towns (X)	No satisfactory statistical criterion was found.	—

Harris's classification suffers with some defects and is not universally viable. He used metropolitan districts as functional units because the industry-group data such as those published now were not available during that time. Consequently, number of cities which were too small to have metropolitan districts were left unclassified.

Carter (1975) labelled Harris's classification as subjective because the decisions to

access or delete with a minimum number or cut-off points seem to be a personal one and were set by simple empirical means. Under the class of 'Transport and Communications', workers engaged in telephone and telegraph services were omitted, which was nothing more than a subjective decision.

Nelson through his classification removed the shortcomings of the earlier classifications by using a stated procedure that could be objectively checked by other workers. His paper '*A Service Classification of American Cities*' was published in the journal Geography in 1955. He decided to base his method of classification entirely upon major industry groups as listed in the 1950 Census of Population for standard metropolitan areas, urbanized areas and urban places of 10,000 or more population. He omitted the little significance groups like agriculture and construction, and finally, arrived at the nine activity groups (manufacturing; retail; professional services; wholesale; personal service; public administration; transport and communication; finance, insurance, real estate and mining).

The problem of city specialization, and also the degree of specialization above the average was solved by giving margins of different degree to different size classes. He did find a definite tendency for the percentages employed in some activities vary with city size. The question – 'When is a city specialized?' was solved by using a statistical technique – the Standard Deviation (SD).

He reasoned that that SD was the simplest and most widely understood of all statistical measures of variation, and that the degree of variation could be compared by use of SD even if, in some cases, we are dealing with large numbers , as in the manufacturing, and in others with small numbers, as in mining as wholesale trade.

Nelson's Nine Activity Groups (1950)

	Manu-facturing	Retail Trade	Professional Service	Trans-portation and Communi-cation	Personal Service	Public Adminis-tration	Wholesale Trade	Finances Insurance and Real Estate	Mining
	Mf	R	Pf	T	Ps	Pb	W	F	Mi
Average	27.07	19.23	11.09	7.12	6.20	4.58	3.85	3.19	1.62
Standard Deviation	16.04	3.63	5.89	4.58	2.07	3.48	2.14	1.25	5.01
Average Plus 1 SD	43.11	22.86	16.98	11.70	8.27	8.06	5.99	4.44	6.63
Average Plus 2 SD	59.15	26.49	22.87	16.28	10.34	11.54	8.13	5.69	11.64
Average Plus 3 SD	75.19	30.12	28.76	20.86	12.41	15.02	10.27	6.94	16.65

A city can be specialized in more than one activity and to varying degrees. Thus he showed for each city all activities that qualified for plus 1, plus 2, or plus 3 SDs above the mean. According to Nelson's Classification, a city can be specialized in more than one activity and to varying degrees.

Suppose, any city which is classified as Pf 2F, it means that it has 22.87 or more but less than 28.76 per cent of its labour-force employed in professional service and 4.44 or more but less than 5.69 per cent employed in finance, insurance and real estate. In short, his table indicates, the number of SDs shows the degree to which the urban centre stands out for the activity in question. A city which does not fall even under 1 SD, average in any activity appears as diversified D, in Nelson's classification.

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Source – H. J. Nelson (1955) 'A Service Classification of American Cities',

Central business district (CBD)

A **central business district (CBD)** is the commercial and business centre of a city, often referred to as the 'financial district'. ... Some of the key **characteristics** of CBDs include: High concentration of offices, banks, financial institutions, and so on. High density and high-rise buildings.

Characteristics of a CBD

There are peculiar characteristics which applies to all business districts and downtown area. These features are common in central city all over the world. Most of these aspects are known and related to those working or owning a place in these business districts. However, its good to know about these characteristics.

1. Exceptionally high land price & property values because this area under prime real estate. The prices are amongst the highest in the city because of their commercial values.
2. CBDs are the areas with large footfall and focal point. This large footfall is due to number of reasons like accessibility & the service being offered by business districts.
3. Many large cities might have multiple business districts and all of them functioning and serving something different.
4. "Central" Business District, might not always be "centrally" located. Their location is highly influenced by multiple factors, major transport routes but not always.
5. There will be lack of open and green spaces. This is attributed to high land prices.
6. Rents are exceptionally high, this makes high density of offices too along with high worker's density. This is primary reason of having skyscrapers & tall buildings in these areas.

7. There will be high end shops and services available since such kind of commercial activities can afford to pay a high rent demanded in a CBD.

Other characteristics include large number of vehicles, international business and head office of various businesses. Though these areas are highly accessible (one of the reason why an area develops into CBD), but still vehicular movement is significant part. Banks & financial institutions are very prominent in these areas. These are the prime financial districts and presence of financial institutions, tallest buildings, lack of open spaces is common.

Christaller's Central Place Theory

Introduction

Central Place Theory (CPT) is an attempt to explain the spatial arrangement, size, and number of settlements. The theory was originally published in 1933 by a German geographer Walter Christaller who studied the settlement patterns in southern Germany. In the flat landscape of southern Germany Christaller noticed that towns of a certain size were roughly equidistant. By examining and defining the functions of the settlement structure and the size of the hinterland he found it possible to model the pattern of settlement locations using geometric shapes.

Assumptions:

Christaller made a number of assumptions such as:

All areas have

- an isotropic (all flat) surface
- an evenly distributed population
- evenly distributed resources
- similar purchasing power of all consumers and consumers will patronize nearest market
- transportation costs equal in all directions and proportional to distance
- no excess profits (Perfect competition)

Explanation of some terms: Central Place, low order, high order, sphere of influence

- A Central Place is a settlement which provides one or more services for the population living around it.
- Simple basic services (e.g. grocery stores) are said to be of low order while specialized services (e.g. universities) are said to be of high order.

- Having a high order service implies there are low order services around it, but not vice versa.
- Settlements which provide low order services are said to be <u>low order settlements</u>. Settlements that provide high order services are said to be <u>high order settlements</u>.
- The <u>sphere of influence</u> is the area under influence of the Central Place.

<u>Details of the theory</u>

The theory consists of **two basic concepts**:

- threshold
  -- the minimum population that is required to bring about the provision of certain good or services

- range of good or services
  -- the average maximum distance people will travel to purchase goods and services
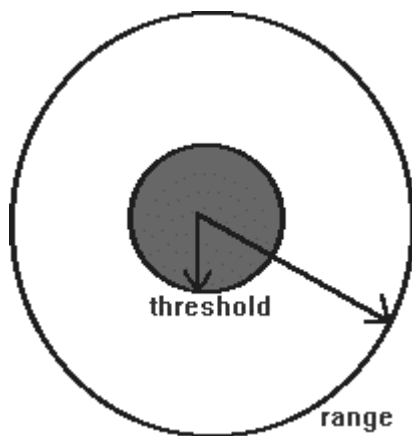
From these two concepts the lower and upper limits of goods or services can be found. With the upper and the lower limits, it is possible to see how the central places are arranged in an imaginary area.

Arrangement of the Central places/ settlements::

As transport is equally easy in all direction, each central place will have a circular market area as shown in C in the following diagram:
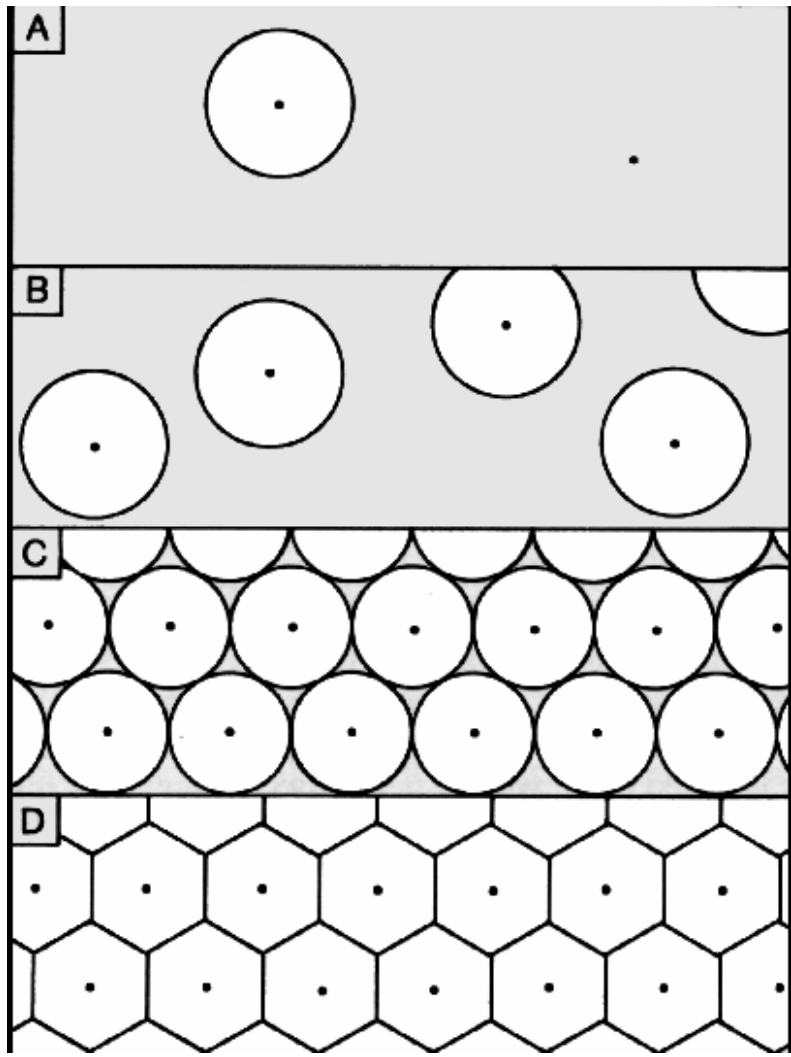
However, circular shape of the market areas results in either un-served areas or over-served areas. To solve this problem, Christaller suggested the hexagonal shape of the markets as shown in D in the above diagram. Within a given area there will be fewer high order cities and towns in relation to the lower order villages and hamlets. For any given order, theoretically the settlements will be equidistance from each other. The higher order settlements will be further apart than the lower order ones.

The three principles in the arrangement of the central places: Christaller noted three different arrangements of central places according to the following principles:

1.   The marketing principle (K=3 system);
2.   The transportation principle (K=4 system);
3.   The administrative principle (K=7 system).

1.   The marketing principle

The following diagram shows the arrangement of the central places according to the marketing principle. There are_____orders of central places. (note: There can be many orders of settlement.) (a) First order service center providing first order services (b) Second order service center providing second order services. (c) Third order service center providing third order services

A-level centers
A-level market areas
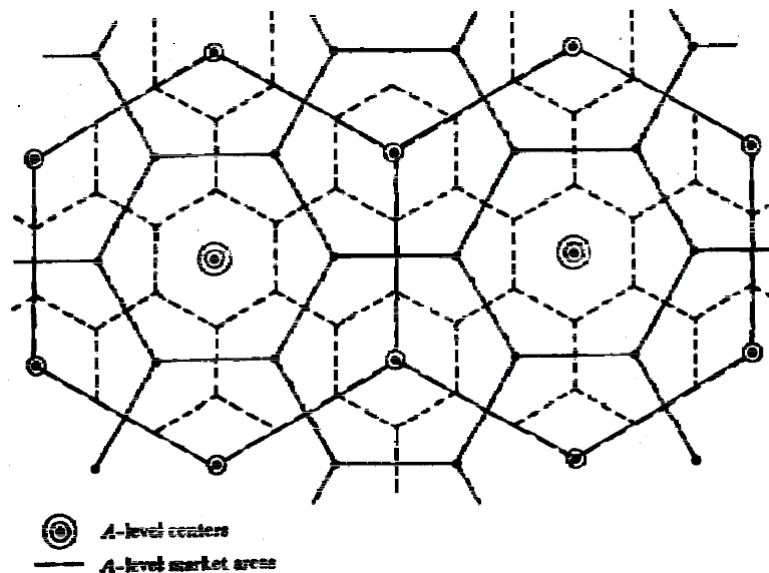
C-level centers

B-level centers
C-level market areas
B-level market areas

The different orders of settlements arrange themselves in a **hierarchy**. Generally speaking lower is the order, larger is the number of settlements and higher the order, greater is the area served.

If the arrangement of the settlements is according to the principle k=3, the theoretical **number of settlements** will progressively divides the previous order by 3 as shown in the following table:

|	Cumulative total	Actual number
7th order	1	1
6th order	3	
5th order	9	
4th order		
3rd order		
2nd order		
1st order		

One high order **central place** is serving three (including itself) of the next lower order central places. The relationship of the **market area** between a lower order center and the centers of the higher level can also be indicated by the value 3.

2. The transportation principle

Christaller pointed out that the marketing principle is an awkward arrangement in terms of connecting different levels of the hierarchy. As an alternate arrangement, Christaller suggested that central places could be organized according to what he called the transport principle

The traffic principles states that the distribution of central places is most favourable when as many important places as possible lie on one traffic route between two important towns, the route being established as straightly and as cheap as possible. The more unimportant places may be left aside. According to the transport principle, the central places would thus be lined up on straight traffic routes which fan out from the central point.

When Central places are arranged according to the traffic principle, the lower order centers are located at the midpoint of each side of the hexagon rather than at the corner. Thus the transport principle produces a hierarchy organized in a k=4 arrangement in which central places are nested according to the rule of four.

■ A center   ● B center
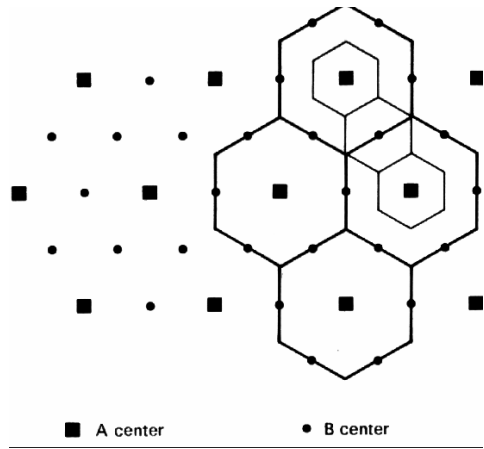
The following table shows how the k=4 principle can be interpreted:

Level of hierarchy	Equivalent number of central places dominated by higher order center	Equivalent number of marker areas dominated by higher order center
1. Metropolis	1	1
2. City	3	4
3. Town	12	16
4. Village	48	64
5. Hamlet	192	256

3. The administrative principle

Christaller's other suggested organizing principle was based upon the realization that from a political or administrative viewpoint centers it was unrealistic for centers to be 'shared'. Any pattern of control which cuts through functional units is potientially problematical. Christaller suggested that an arrangemnt whereby lower order centers were entirely with the hexagon of the higher order center would obviate such problems. Such a pattern is shown in the following diagram. All the six lower order centers are fully subordinate to the higher order center which, therefore, dominates

the equivalent of severn market areas at the next lowest level.

Evaluation of Central-Place Theory

The following passages are some of the evaluation of Christaller's central place theory. Can you summarize the ideas?

 The pattern of cities predicted by central place theory may not hold because

of the failure to meet initial assumptions.

1. Production costs may vary not only because of economies of scale but also by natural resource endowments (i.e. not a homogeneous plain)
2. Transportation costs are not equal in all directions
3. Rural markets (initially households) are not evenly distributed
4. Non economic factors (culture, politics, leadership) may be important but not evenly distributed
5. Competitive practices may lead to freight absorption and phantom freight (other forms of imperfect competition)

URBAN GEOGRAPHY

UNIT-III

UNIT III   **URBAN MORPHOLOGY**

Urban morphology refers to the study of urban form that focuses on the formation and transformation of urban forms of cities, towns, and villages over time; their spatial patterns at different scales; and physical characteristics to inform appropriate urban interventions to promote sustainable urban development. The concepts and approaches to the study of urban form are multidisciplinary. Relevant subject fields are ranging from human geography, urban planning, urban design, architecture, and sociology to cultural studies. Urban morphology usually benefits urban management, design and planning, urban conservation and regeneration, as well as urban policy-making in general to contribute to social economic and environmental sustainability.

Urban morphology is the study of the form of human settlements and the process of their formation and transformation. The study seeks to understand the spatial structure and character of a metropolitan area, city, town or village by examining the patterns of its component parts and the ownership or control and occupation. Typically, analysis of physical form focuses on street pattern, lot (or, in the UK, plot) pattern and building pattern, sometimes referred to collectively as urban grain. Analysis of specific settlements is usually undertaken using cartographic sources and the process of development is deduced from comparison of historic maps. Special attention is given to how the physical form of a city changes over time and to how different cities compare to each other. Another significant part of this subfield deals with the study of the social forms which are expressed in the physical layout of a city, and, conversely, how physical form produces or reproduces various social forms. The essence of the idea of morphology was initially expressed in the writings of the great poet and philosopher Goethe (1790). However, the term as such was first used in bioscience. Recently it is being increasingly used in geography, geology, philology and other subject areas .Urban morphology is considered as the study of urban tissue, or fabric, as a means of discerning the environmental level normally associated with urban design. Tissue comprises coherent neighbourhood morphology (open spaces, building) and functions (human activity). Neighbourhood exhibit recognizable patterns in the ordering of buildings, spaces and functions (themes), within which variation reinforced an organizing set of principles. This approach challenges the common perception of unplanned environments as chaotic or vaguely organic through understanding the structures and processes embedded in urbanisation. Complexity science has provided further explanations showing how urban structures emerge from the uncoordinated action of multiple individuals in highly regular ways. Amongst other things this is associated with permanent energy and material flows to maintain these structures.

URBAN POPULATION STRUCTURE

People of any country are diverse in many respects. Each person is unique in her/his own Way. People can be distinguished by their age, sex and their place of residence. Some of the Other distinguishing attributes of the population are occupation, education and life expectancy.

SEX COMPOSITION

The number of women and men in a country is an important demographic characteristic. The Ratio between the number of women and men in the population is called the Sex Ratio. In some countries it is calculated by using the formula:

$$\frac{\text{Male Population}}{\text{Female Population}} \times 1000 \quad \text{or} \quad \text{the number of males per thousand females}$$

In India, the sex ratio is worked out using the formula

$$\frac{\text{Female Population}}{\text{Male Population}} \times 1000 \quad \text{or the number of females per thousand males}$$

The sex ratio is important information about the status of women in a country. In regions where gender discrimination is rampant, the sex ratio is bound to be unfavourable to women. Such areas are those where the practice of female foeticide, female infanticide and domestic violence against women are prevalent. One of the reasons could be lower socio-economic status of women in these areas. It could be that the men might have migrated to other areas for employment.

Age Structure

Age structure represents the number of people of different age groups. This is an important Indicator of population composition, since a large size of population in the age group of 15-59 indicate a large working population. A greater proportion of population above 60 years Represents an ageing population which requires more expenditure on health care facilities. Similarly high proportion of young population would mean that the region has a high birth Rate and the population are youthful.

Age-Sex Pyramid

The age-sex structure of a population refers to the number of females and males in different age groups. A population pyramid is used to show the age-sex structure of the population. The shape of the population pyramid reflects the characteristics of the population. The left side shows the percentage of males while the right side shows the percentage of women in each age group.

Literacy

Proportion of literate population of a country in an indicator of its socio-economic development as it reveals the standard of living, social status of females, availability of educational facilities and policies of government. Level of economic development is both a cause and consequence of literacy. In India – literacy rate denotes the percentage of population above 7 years of age, who is able to read, write and have the ability to do arithmetic calculations with understanding.

Occupational Structure

The working population (i.e. women and men of the age group – 15 to 59) take part in various occupations ranging from agriculture, forestry fishing, manufacturing construction, commercial transport, services, communication and other unclassified services. Agriculture, forestry, fishing and mining are classified as primary activities manufacturing as secondary, transport, communication and other services as tertiary and the jobs related to research and developing ideas as quaternary activities. The proportion of working population engaged in these four sectors is a good indicator of the levels of economic development of a nation. This is because only a developed economy with industries and infrastructure can accommodate more workers in the secondary, tertiary and quaternary sector. If the economy is still in the primitive stages, then the proportion of people engaged in primary activities world be high as it involves extraction Of natural resources.

THEORIES OF URBAN LANDUSE

I. CONCENTRIC ZONE BY BURGESS.

INTRODUCTION: -

Each city is unique in respect of the detailed pattern of its internal landuse, yet there is a considerable degree of repetition in the broad geographical arrangement of various categories of urban landuse from one city to another. Even a casual inspection of cities reveals that different areas of the city have been given for different landuse. But in most of the city a generalized pattern of landuse can be observed which reflects the role of certain controlling factors like the land values, accessibility and the history of urban growth. On the basis of some generalized pattern of urban landuse a number of theories have been propounded which attempts to generalize about the arrangement of landuse regions within a city. These theories are also known as 'models of internal structure' of towns and also urban growth theories. In this regard important theories are as follows:
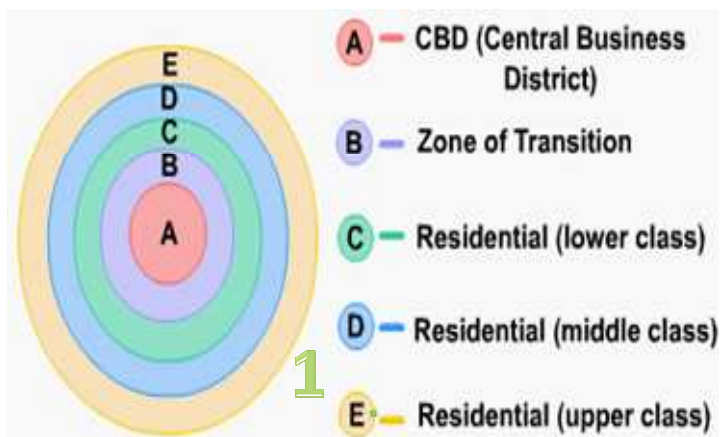
1. Concentric zone theory by Burgess

2. Sector theory by Hoyt

3. Multiple Nuclei theory by Harris and Ullman

CONCENTRIC ZONE THEORY BY BURGESS: -

The concentric zone scheme or model of urban land use was propounded by E.W. Burgess, an American urban sociologist in the year 1925 on the basis of study of American cities in general and particular. Burgess concept was first published as, 'the growth of the city: an introduction to a research project' – a chapter in the book "The city" written with R.E. Park in 1925. It is known as concentric zone model or zonal theory of urban land use pattern. It is one of the earliest theoretical models to explain urban social structures. It is also the earliest descriptive urban landuse model which divided cities in a set of concentric circles expanding from the down town to the suburbs. It is based on the concept that the development of a city takes place outwards from its central area, to form a series of concentric zones. According to Burgess there are five concentric zones showing different types of landuses. They are –

Chicago in   Concentric Theory of Urban

Urban Areas in Chicago

CONCENTRIC ZONE MODEL

A — CBD (Central Business District)

B — Zone of Transition

C — Residential (lower class)

D — Residential (middle class)

E — Residential (upper class)

ZONE I- CENTRAL BUSINESS DISTRICT: – It is the most inner circle forming the core of the city. In Chicago it is known as 'Loop'. Burgess model has also termed the zone as 'Loop'. In New York it is known as Downtown. In this zone where most of the tertiary employment is located and also transport infrastructure is converging making this zone most accessible.CBD is the focus of commercial, social, and civic life. This zone is characterized by large number of sky scrapper buildings mostly engaged in commercial activities like retail trade, business, departmental stores, hotels and restaurants, banks, offices, clubs, theatres, etc. In America it occupies the least space and most part is non-residential.

ZONE II- ZONE OF TRANSITION: – This zone encircles the core or the CBD of zone I. In this transitional zone older private houses are either in the process of being taken over for offices and light industry or in the process of subdivision to form smaller dwelling units. This is the area of the city to which immigrants are attracted. This zone is always changing in character as business and light manufacturing encroach into this zone of residential deterioration. It is inhabited by poor people and labourers who work in business or light manufacturing. It has old structure houses, availability of rooms on rent, low income people and narrow streets; it is characterized by "vice" areas inhabited by unstable social groups rather than by settled families. In American it contains poorest segment of urban population notably first generation immigrants.

ZONE III- ZONE OF WORKING MEN'S HOUSES: - This is the third concentric circle inhabited by the workers in industries who have escaped from area of deterioration but who desire to live within easy access of their work. This zone has the advantage of being located near the major zones of employment. Some older residential buildings in the city are found in this zone, but socio-economic groups are stable and largely consist of working class families. In Chicago, this zone is dominated by two storey buildings in which house owners live in lower storey while the upper storey was given to tenant. The inhabitants of this zone work either in business activities of CBD or in the light manufacturing. Houses of medium income group people are found in this zone.

ZONE IV- ZONE OF BETTER RESIDENCES: - Encircling Zone III is the one of better residences. It is "residential area" of high class apartment buildings or of exclusive "restricted" districts of single family dwellings. The people living here are engaged in certain profession like bank, commercial institution, manager, clerks, etc. The multi room dwellings of this zone have vast open space in front of their houses which is used for gardening.

ZONE V-THE COMMUTER'S ZONE: - According to Burgess it is the Outermost circle beyond the city limits. It is known as commuter's one, suburban areas or satellite cities. People inhabiting this zone daily commute to main city for work. It is characterized by high class residences developed a long lines of rapid travel. The residences are widely spaced and there are open spaces between two houses. Here expensive houses are located in a rural sub-urbanized setting. Here there still be open country and former villages changing in character and functions to become dormitory settlement for commuters who travel to work in the City. Commuting costs are highest. Prior to mass diffusion of the automobile most of these settlements were located next to rail stations.

The main points of Burgess Model can be summed up as follows:–

1. City centre characterized by business activities and light
Manufacturing which is also zone of employment.
2. Encircling city centres are the zones of different class residences.
3. Poor people prefer to live near their place of work where living
Conditions are poor.
4. As we move away from inner city towards periphery gradually
Better class residential dwellings are found.

Burgess work is based on the 'bid rent curve'. This theory states that the concentric circles are based on the amount that people will pay for any use of land. Since the city centre is characterized by converging transportation line it has the highest accessibility, therefore, land use value is highest. Only commercial activities can pay high rent for small size of land on the basis of profits that are obtainable from maintain from maintaining a business on that land. The centre of the town has highest number of customers so it is profitable for retail activities. Manufacturing will pay slightly less for the land as they are interested in the accessibility of workers, transportation of raw material and finished products.

Residential landuse will take the surrounding land. Away from the city centre the land value declines which give rise to the zonation of different class of residences from working men's houses in the inner part to high class residences in the commuter's zone. Besides there is a strong historical element in the Burgess scheme. According to Burgess urban growth is a process of expansion and reconversion of landuse with a tendency of each inner zone to expand in the outer zone. In his model zone is expanding towards working class zone creating a transitional zone with reconversion of landuse.

II . HOYT SECTOR MODEL

Cities are growing much faster than rural areas, and it is important for you to learn about the dynamics of urban geography. There are several classic models used to understand and explain the internal structures of cities and urban areas.

Nature of the City
Cities are at the centre of every advanced society and act as the hub of economic, social and political activities in that area. They have a variety shapes and functions, and their geography impacts the daily lives of those who live in the city and surrounding areas. All cities provide their residents a variety of services and functions: shopping, manufacturing, transportation, education, medical, and protective services. Cities evolved over time, and if a city had favourable factors (agriculture, access to water, trade, defense), its population increased. This led to urbanization (rapid growth, and migration to large cities).

Model of Urban Land Use
The CDB is found at the heart of every older city and is the area of skyscrapers, business headquarters, and banks. Spreading out from this intensive economic land use area is a fringe of wholesale and retail businesses, warehouses, transportation terminals and light industry. The residential area extends outward beyond this ring of activity. Several of these models try to depict the use of this urban area spatially. It makes sense that students at the University of Chicago developed many of these land use models because Chicago was a city that saw rapid growth in the 18th century. One of these Chicagoan scholars was economist Homer Hoyt, who in 1939 developed the Hoyt Sector Model.

Homer Hoyt wanted to provide an alternative to the concentric zone model as a way of explaining urban land use. Ernest Burgess developed the concentric zone model in the 1920s based on his studies of Chicago. Burgess's model suggested that cities have zones arranged in a series of concentric bands that expand outward from the CBD.
Hoyt argued that instead of concentric sets of neighbourhoods, cities are primarily laid out in pie or wedge-shaped zones and corridors developed from the core of the city to the outskirts. In the Hoyt Sector Model, the CBD is still in the centre, but expanding outward away from it along transportation lines are zones used for industry and residential developments. For example, the electric streetcar allowed low-income areas to extend from the CBD to the outer edge of the city.
Land use within each sector would remain the same because like attracts like. The high-class sector would stay high-class because it would be the most sought after area to live, so only the rich could afford to live there. The industrial sector would remain industrial as the area would have a common advantage of a railway line or river.

The Central Business District
As with all classic models of urban land use, the Hoyt Sector Model has at its core the central business district (CBD). Every older city has one such district at its centre; typically,

it is the area with the high-rise buildings, banks, and large business headquarters. It is the commercial and business centre of a city. In bigger cities, the CDB is often referred to as the "financial district."

The Industrial Sector

According to this model, in regions of the city with significant industrial transportation routes (rail, barge, freight), industrial corridors will develop. The noise and pollution of these zones drive all but the poorest residents away from these areas. In these zones, almost everyone rents. In Chicago, several of these industrial corridors stretched outward from the CBD along railroad lines and the Illinois-Michigan industrial canal.

Residential Sectors

Hoyt's model suggests that people will live in the different sectors based on income levels. Since desirable land (near lakes, hills, places away from the smells of the factories) was more expensive, the elite class neighbourhoods were built in zones separated from lower, working-class zones.

Low-Class Residential

Next to the industrial corridors are the lower- or working-class residential zones. People who live here tend to be factory workers and live in low-income housing. Housing is cheap due to its proximity to industry where pollution, traffic, railroads, and environmental hazards make living conditions poor. Those who live in this sector do so to reduce the cost to commute to work. They are sometimes stereotyped as living on the "other side of the tracks," and may experience discrimination.

Middle Class

This residential area is a bit more desirable because it is located further from industry and pollution. People who work in the CBD have access to good transportation lines, making their commute easier. The middle-class sector is the largest residential area.

High Class

Hoyt's model also identified an elite zone, for the handful of upper-class people who live in the city. Michigan Avenue was that elite district in Chicago. High-class residential sectors tend to be quiet, clean, and have less traffic that the other ones. There is also a corridor that extends from the CBD to the edge of the city, where the prime real estate is found. In many cities, you will find the high-class district on the west side, where prevailing winds enter the city and are upwind from industrial zones, which are dirty and smelly. It is unlikely that high-class residential housing would be found near factories or lower-class housing areas. In this way, Hoyt's model suggests a distinct physical separation between the wealthy and the poor

Limitations of the Hoyt Sector Model

Hoyt's model is based on outdated rail transportation and does not consider the existence of personal cars that lets people commute from low-cost land outside the city boundaries. The model also does not take into account the new concepts of edge cities. Edge cities are urban complexes consisting of a large node of office buildings with more workers than residents.

The CBD has lost some of its importance since it was created, as many retail and office buildings have moved into the suburbs. If you look at older cities, they tend to follow the Hoyt Segment Model, whereas newer cities follow Burgess's concentric zone model.

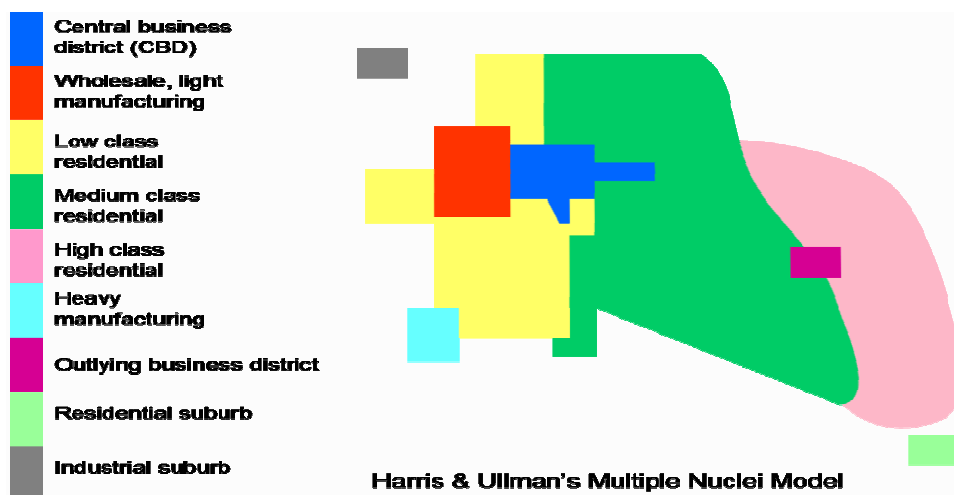# HARRIS AND ULLMAN'S MULTIPLE-NUCLEI MODEL

Introduction:

In 1945, Harris and Ullman developed the multiple-nuclei model. They asserted hat the Central Business District (CBD) was no longer the only centre of an urban area or city. In

earlier models, the CBD was at the core of the urban land use model and was found at the heart of every older city. The CBD is the commercial and business centre of the city and in bigger cities, the CDB is often referred to as the "financial district". They were the first to consider the complexity of the city and its surrounding areas.

Harris and Ullman claimed that, in newer cities, automobile-based intraurban dispersal was creating a multiple-nuclei structure of urban land use. This mobility allows for regional centres to specialize the businesses. In the multiple-nuclei, the "nuclei" are multiple smaller growth centres that developed around the metropolitan area. These nuclei can be ports, universities, airports, parks, neighbourhoods business, and governmental centres. Their goal was to produce a more realistic model, even at the expense of being more complicated. Their aim in this model was to move away from the concentric zones and better show the complex nature of large urban areas.

The model, to no one's surprise, describes the layout of a city based on Chicago. The multiple-nuclei model illustrates that even though an urban centre may have been founded with a CBD, other smaller CBD's evolve on the outskirts of the city near the more high-class housing areas. This allows shorter commutes from the suburbs. This phenomenon creates nodes or nuclei in other parts of the city other than the CBD, thus the name multiple nuclei model.

As multiple nuclei evolve, transportation hubs are built which allow industries to be established with reduced shipping costs. These transportation hubs have negative by-products, such as noise pollution and lower land values, making land around the hub cheaper. You will find hotels near airports because people who travel want to stay near the source of travel. Housing develops in sections and gets more expensive the farther it is from the CBD.

Central business district (CBD)
Wholesale, light manufacturing
Low class residential
Medium class residential
High class residential
Heavy manufacturing
Outlying business district
Residential suburb
Industrial suburb

Harris & Ullman's Multiple Nuclei Model

The Central Business District
The CBD still exists as the primary nucleus, but multiple small business districts developed, distributed around the metropolitan area. Some of these newer areas compete with the CBD for traditional businesses like banks, real estate and insurance companies. These separate nuclei become specialized and differentiated, reducing the pull of the CDB.

Wholesale/Light Manufacturing

These businesses are more consumer-oriented and near residential areas. Manufacturing goods that need small amounts of raw materials and space develop in this area. Businesses that offer wholesale goods like clothes, furniture and consumer electronics are found in this node.

Residential Districts

Residential neighbourhoods of varying status also emerged in nearly random fashion as well, creating "pockets" of housing for both the rich and poor, alongside large zones of lower middle-class housing. There is a sort of randomness to multiple nuclei cities, making the landscape less legible for those not familiar with the city, unlike concentric ring cities that are easy to read by outsiders who have been to other similar cities.

Low-Class

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Residential Suburb

These suburbs are usually single-family homes on a small plot of land on the outskirts of the city. They tend to be laid out on roads with cul-de-sacs instead of following the traditional grid pattern.

Outlying Business District

This district competes with the CBD for residents who lived in nearby middle and high-class neighborhoods offering similar services and products as the CBD. Businesses found in this node are malls, airports, colleges and community businesses.

Heavy Manufacturing

This node is occupied by factories that produce material that is heavy like chemicals, steel, industrial machinery. Mining and oil refining industries also can be found in this node.

Industrial Suburb

This is a community created and zoned for industrial sources on the outskirts of the city. Industrial districts in these new cities, unfettered by the need to access rail or water corridors, rely instead on truck freight to receive supplies and to ship products, allowing them to occur anywhere zoning laws permitted. Because industrial zones create pollution, they are located away from residential.
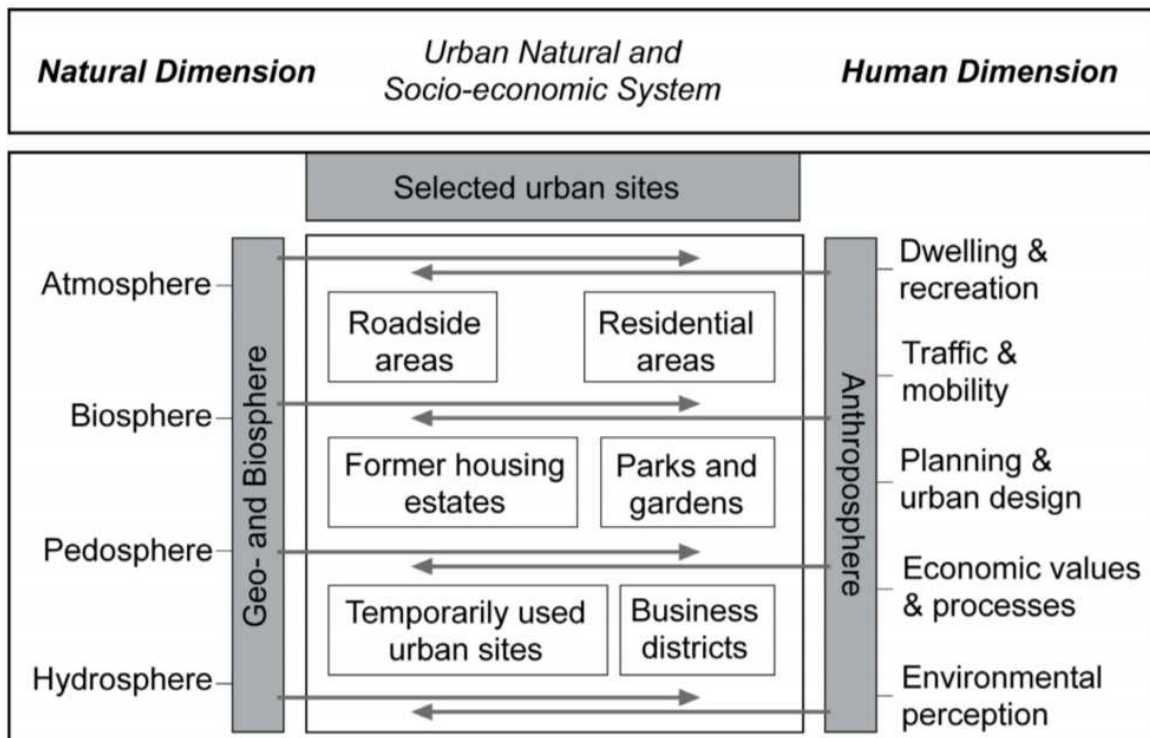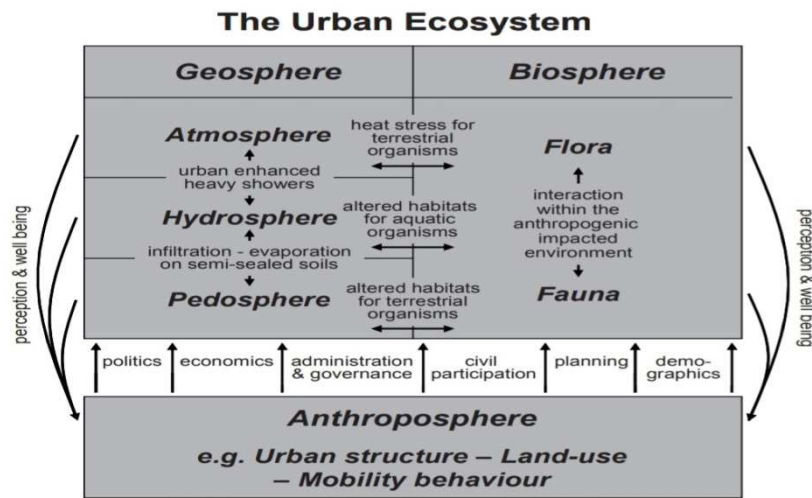
URBAN ECOLOGY

The term "urban ecology" has been used variously to describe the study of humans in cities, of nature in cities, and of the coupled relationships between humans and nature. Urban ecology involves the interrelationships of organisms, including people, with each other and their urban environments. Ecology is an evolving discipline with an increasing focus on landscapes and urban regions. Forman and Godron (1981, 1986) are responsible for defining the field of landscape ecology. "Landscapes as ecological units with structure and function are composed primarily of patches in a matrix. Patches differ fundamentally in origin and dynamics, while size, shape, and spatial configuration are also important. Line corridors, strip corridors, stream corridors, networks, and habitations are major integrative structural characteristics of landscapes" Forman expanded the field to encompass regions.

1.The term 'Urban Ecology' (in German Stadtökologie) can be defined in two ways. Within the natural sciences, urban ecology addresses biological patterns and associated environmental processes in urban areas, as a sub discipline of biology and ecology. In this sense, urban ecology endeavours to analyse the relationships between plant and animal populations and their communities as well as their relationships to environmental factors including human influences.

2 .Urban ecology is an interdisciplinary field that supports societies' attempts to become more sustainable. It has deep roots in many disciplines including geography, sociology, urban planning, landscape architecture, engineering, economics, anthropology, climatology, public health, and ecology. Because of its interdisciplinary nature and unique focus on humans and natural systems within urbanised areas, 'urban ecology' has been used variously to describe the study of humans in cities, nature in cities, and the coupled relationships of humans and nature.

3.Biodiversity patterns as well as characteristics of urban soils and climate and their variation in time and space due to changing urban land uses. Distinguishes a core surrounded by three rings – the densely built-up central core area, a ring with more open space, where some

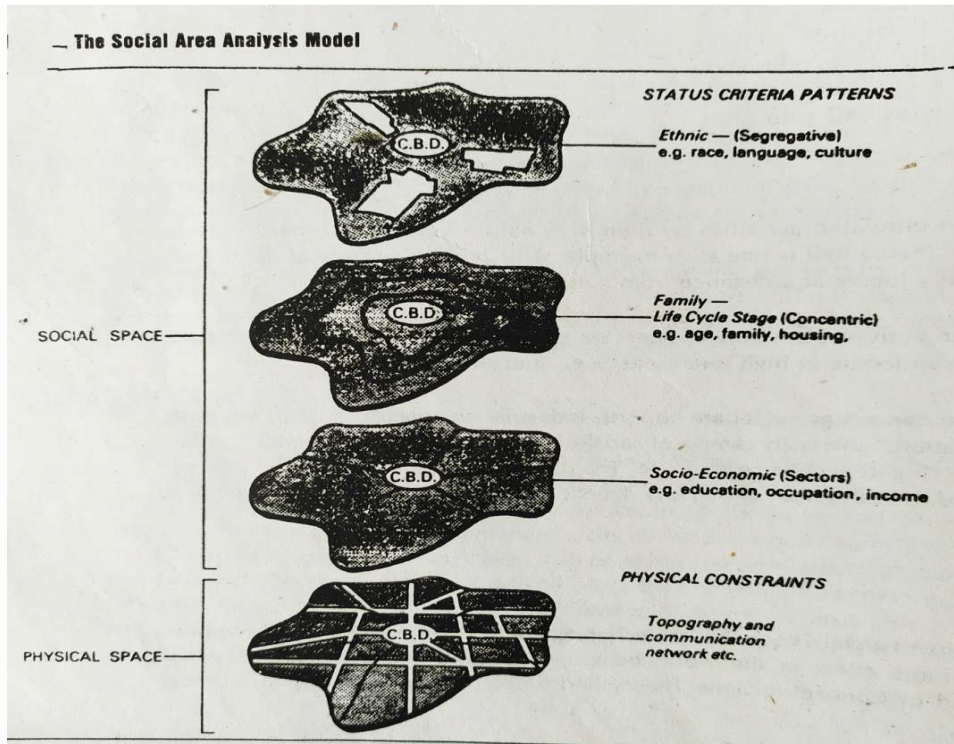smaller cores of densely built-up sub-centres may be found and finally the interior and exterior border zones.

The Urban Ecosystem

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4. Urban ecology can be understood as a spatial science in the same way as eography.Therefore the scale of the studies to be carried out is important. Three different scales should be distinguished, especially in larger cities: the micro-scale of the local neighbourhood with its special built-up characteristics where the study or field experiment is carried out, the meso-scale of the district, which features a combination of different land use

(built-up) types and finally the macro-scale of the total urban area, sometimes composed of different administrative entities or even cities.

SOCIAL AREA ANALYSIS
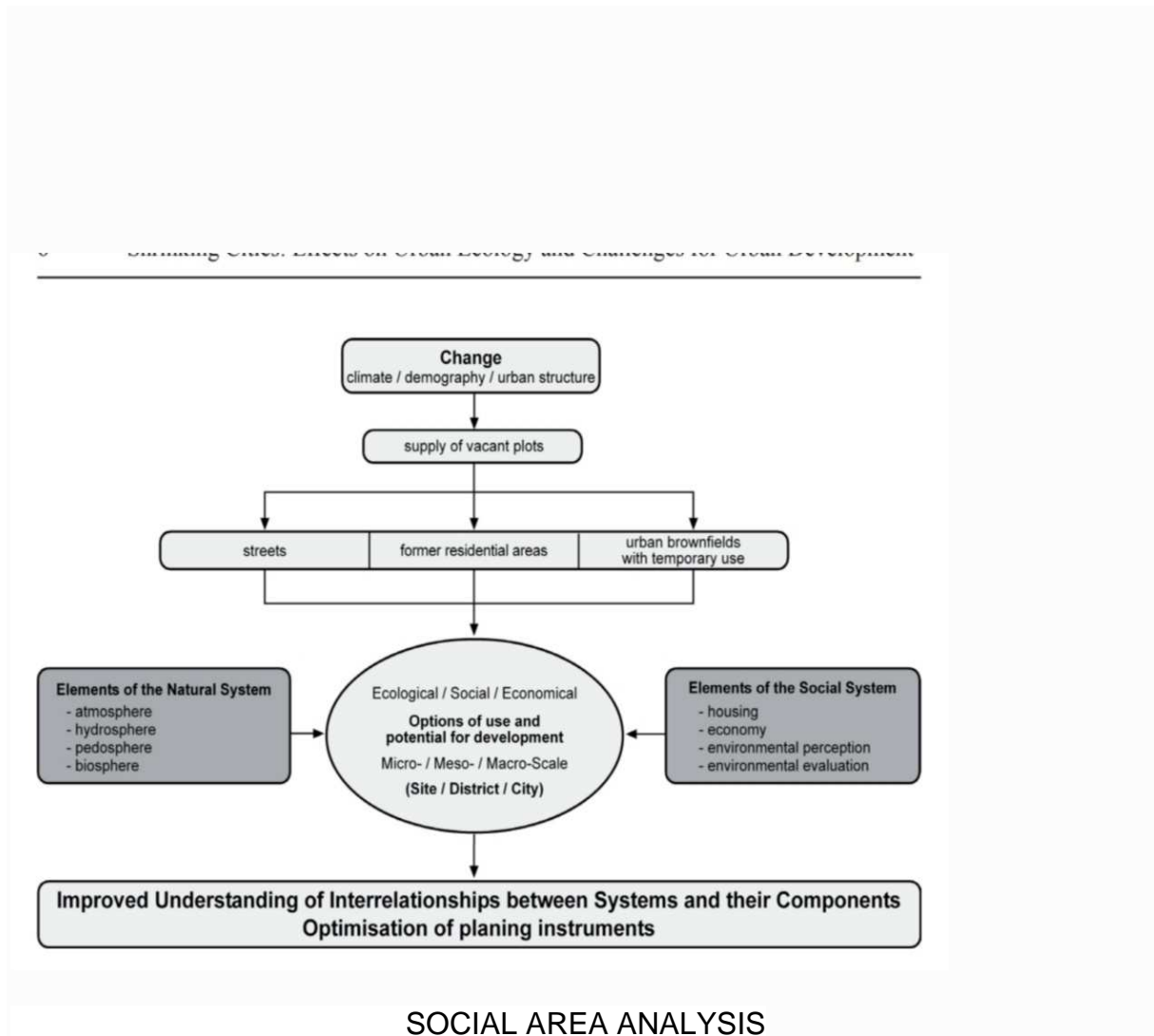
The social area analysis model of urban structure incorporates all three aspect of city structure, namely, concentric zoneas, sectors and multiple nuclei. It is a more comprehensive statement of urban forms. The model developed by R.A Murdie in 1969.According to this model, the physical space of streets, buildings and roads are superimposed by three dimension of social space.

The Social Area Analysis Model

STATUS CRITERIA PATTERNS

Ethnic — (Segregative)
e.g. race, language, culture

Family —
Life Cycle Stage (Concentric)
e.g. age, family, housing,

Socio-Economic (Sectors)
e.g. education, occupation, income

PHYSICAL CONSTRAINTS

Topography and
communication
network etc.

SOCIAL SPACE

PHYSICAL SPACE

1. **Family status**: indicators include population and age variables, house ownership and age characterstics, family size and other life cycle.

2. **Economic status**: Tends to include measure of income, occupation and education.

3. **Ethinic status**:Ethinic groups form clusters and settle in a nuclear form throughout the city thus exhibiting a multiple nuclei tendency.

II-M.Sc

URBAN GEOGRAPHY

CODE – 18KP3G10

UNIT V:Urban problems – Slums, Solid Waste management, Drinking water Supply - Transport – Pollution – Urban renewal and Urban Planning - National urbanization policy.

PREPARED BY

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UNIT-V

URBAN GEOGRAPHY

URBAN PROBLEMS

Urbanization (or **urbanisation**) refers to the population shift from rural to urban areas, the decrease in the proportion of people living in rural areas, and the ways in which societies adapt to this change. It is predominantly the process by which towns and cities are formed and become larger as more people begin living and working in central areas. Urbanization creates enormous social, economic and environmental changes. Urbanization rapidly spread across the Western world and, since the 1950s, it has begun to take hold in the developing world also.

Cities offer a larger variety of services, including specialist services not found in rural areas. These services require workers, resulting in more numerous and varied job opportunities. Elderly people may be forced to move to cities where there are doctors and hospitals that can cater to their health needs. Varied and high-quality educational opportunities are another factor in urban migration. Urbanization also creates opportunities for women that are not available in rural areas. This creates a gender-related transformation where women are engaged in paid employment and have access to education. One problem these migrant workers are involved with is the growth of slums. In many cases, the rural-urban low skilled or unskilled migrant workers, attracted by economic opportunities in urban areas, cannot find a job and afford housing in cities and have to dwell in slums.

The existence of urban heat islands has become a growing concern over the years. An urban heat island is formed when industrial and urban areas produce and retain heat. Much of the solar

energy that reaches rural areas is consumed by evaporation of water from vegetation and soil. In cities, where there is less vegetation and exposed soil, most of the sun's energy is instead absorbed by buildings and asphalt; leading to higher surface temperatures. Vehicles, factories, and industrial and domestic heating and cooling units release even more heat. As a result, cities are often 1 to 3 °C (1.8 to 5.4 °F) warmer than surrounding landscapes.

The promise of jobs and prosperity pulls people to cities. Half of the global population already lives in cities, and by 2050 two-thirds of the world's people are expected to live in urban areas. But in cities two of the most pressing problems facing the world today also come together - poverty and environmental degradation. Poor air and water quality, insufficient water availability, waste-disposal problems, and high energy consumption are increased by the rising population density and demands of urban environments.

Strong city planning will be essential in managing these and other difficulties as the world's urban areas swell.

Impacts of Urbanization

- Intensive urban growth can lead to greater poverty, with local governments unable to provide services for all people.
- Concentrated energy use leads to greater air pollution.
- Automobile exhaust produces elevated lead levels in urban air.
- Large volumes of uncollected waste create multiple health hazards.
- Animal populations are inhibited by toxic substances.
- Traffic congestion and more vehicular movement
- The loss of habitat.

Slums

"A **slum** is usually a highly populated urban residential area consisting mostly of closely packed, housing units in a situation of deteriorated or incomplete infrastructure."

Due to increasing urbanization, slums became common in the 18th to late 20th centuries in the United States and Europe. Slums are still predominantly found in urban regions of developing countries, but are also still found in developed economies. The world's largest slum is found in the State of Mexico.

Slums differ in size, characteristics and most of the slums lack sanitation services, supply of clean water, reliable electricity, law enforcement, and other basic services. Slum residences vary from shanty houses to professionally built dwellings. Slums form and grow in different parts of the world for many different reasons. Causes include -

- Rapid rural-to-urban migration
- Economic stagnation and depression
- High unemployment
- Poverty
- Informal economy
- Poor planning
- Politics
- Natural disasters and
- Social conflicts.

Slum is a British slang word from London meaning "room", which evolved to "back slum" around 1845 meaning 'back alley, street of poor people.

Numerous other non English terms are often used interchangeably with **slum**:

A shanty town or squatter area - This is typically made of materials such as mud and wood. A typical shanty town lacks adequate infrastructure, including proper sanitation, safe water supply, electricity and street drainage.

A *"rookery"* is a colloquial English term given in the 18th and 19th centuries to a city slum occupied by poor people and frequently also by criminals . Such areas were overcrowded, with low-quality housing and little or no sanitation. It is a place of poorly constructed dwellings, densely-populated areas of gloomy, narrow streets.

Causes that create and expand slums

Slums sprout and continue for a combination of demographic, social, economic, and political reasons. Urbanization creates slums because local governments are unable to manage urbanization. The migrant poor enter cities only with hope for leading life without any education and economic support. A migrant has no access to shelter, basic urban services and social amenities. So, slums originate.

Some of the slums in today's world are a product of urbanization brought by *colonialism* in African countries. Major natural disasters in poor nations often lead to migration of families from areas affected by the disaster to unaffected areas resulting in the creation of temporary tent city and slums.

Characteristics of Slums

1. Slums typically begin at the outskirts of a city.
 In cities located near lagoons, marshlands and rivers - slums start at banks or on area above water or the dry river bed;

In flat terrain- slums begin on lands unsuitable for agriculture, near city trash dumps, next to railway tracks.

2. Some slums name themselves after founders of political parties, develops contact with current politicians to have political backing against eviction.

3. The construction quality of the house is inadequate to withstand heavy rains, high winds, or other local climate and location.

4. Paper, plastic, mud-and-wattle walls, wood held together by ropes, straw or torn metal pieces as roofs are some of the materials of construction.

5. Overcrowding is another characteristic of slums. Many dwellings are single room units, with high occupancy rates. Each dwelling may be occupied by multiple families. Five and more persons may share a one-room unit; the room is used for cooking, sleeping and living.

6. Overcrowding is also seen near sources of drinking water, cleaning, and sanitation where one toilet may serve dozens of families.

7. One of the identifying characteristics of slums is the lack of public infrastructure. (From safe drinking water to electricity, basic health care to police services, fire/ambulance services etc.)

8. Fires are often a serious problem.

9. Slums do not generate tax revenues for the government and therefore slow attention from the government.

10. Due to lack of skills and education, many slum dwellers face unemployment.

11. The limit of job opportunities causes many of them to employ themselves in street vending, packaging, making garlands and embroideries, domestic work, shoe polishing or repair, driving manual rickshaws, construction works.

12. Crime rates are higher in slums.

13. Slum dwellers usually experience a high rate of disease like cholera, HIV/AIDS, measles, malaria, dengue, typhoid, tuberculosis, and other epidemics. Throughout slum areas in various parts of the world, infectious diseases are a significant contributor to high mortality rates.

14 High population densities, poor living conditions, low vaccination rates, and inadequate health service are the factors that have been attributed to a higher rate of disease transmission.

15. Child malnutrition is more common in slum areas. In Mumbai and New Delhi, 47% and 51% of slum children under the age of five are stunted and 35% and 36% of them are underweighted.

SLUMS
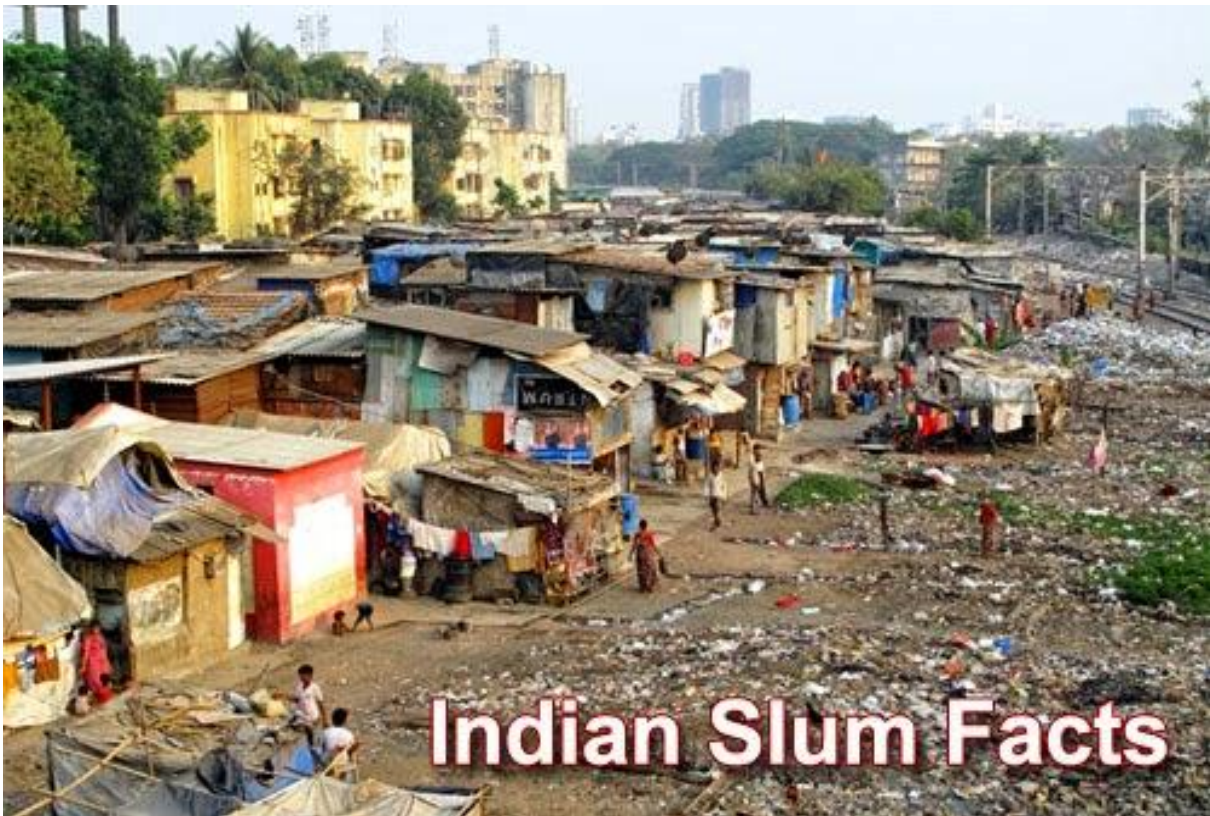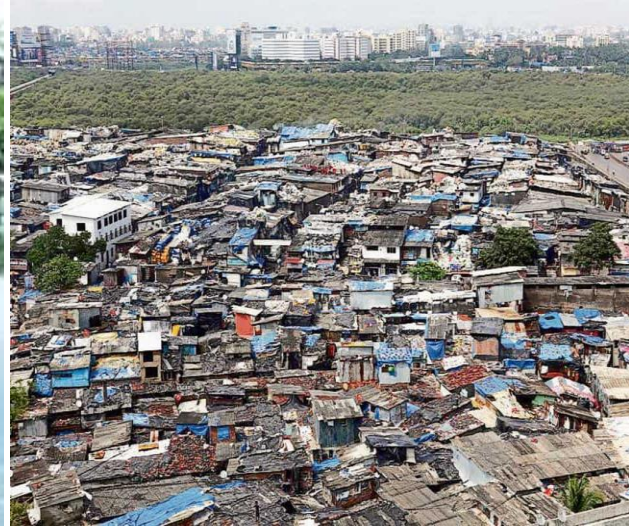
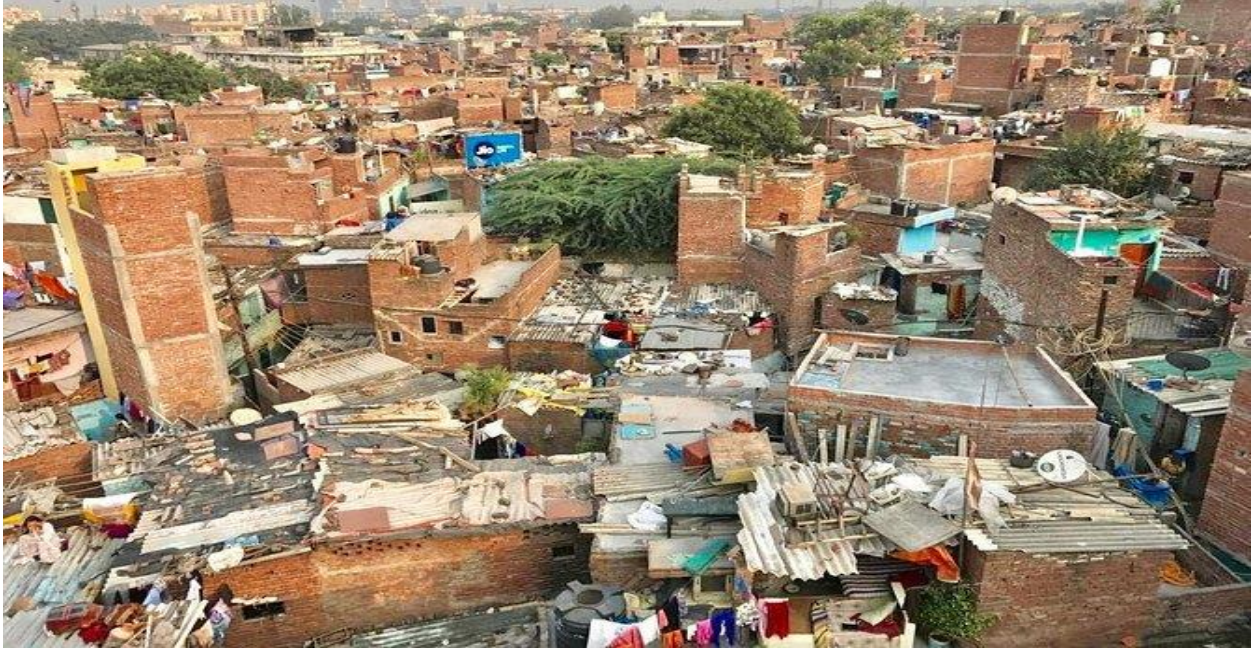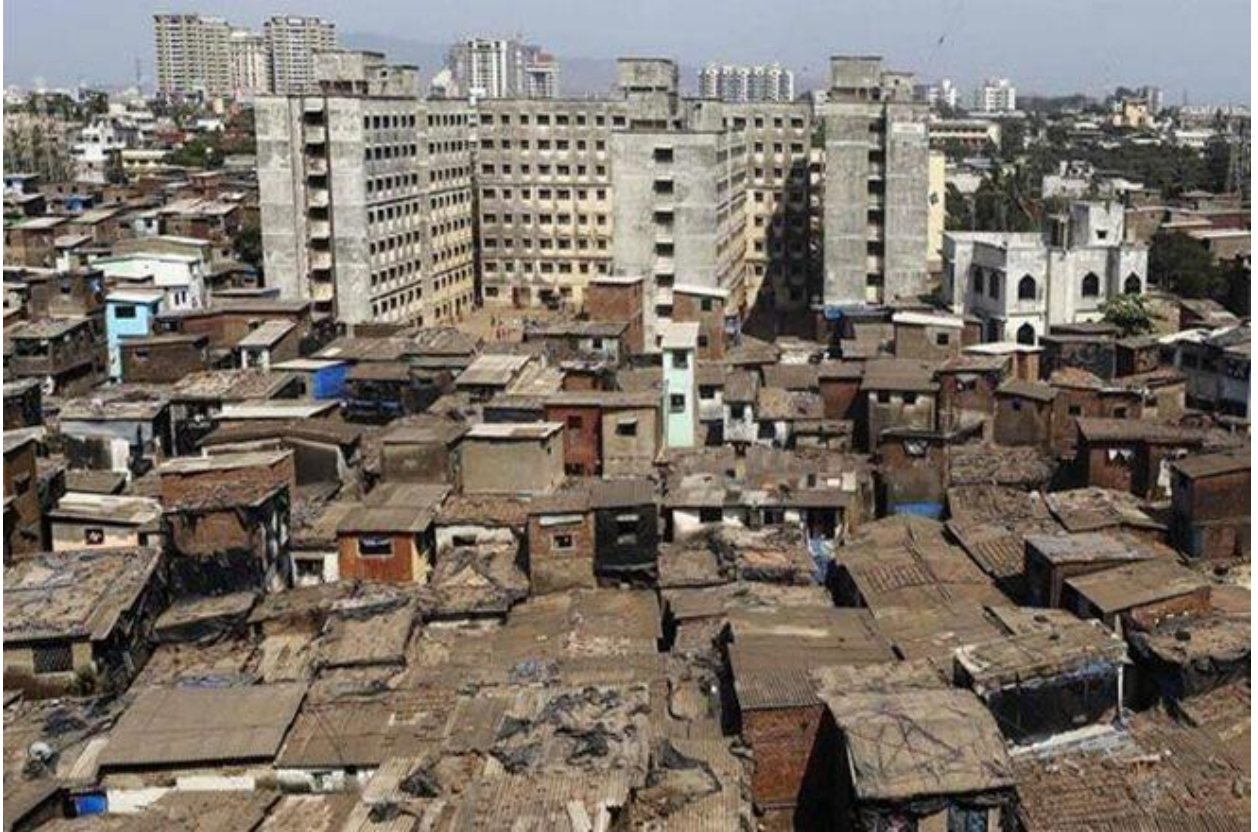

Indian Slum Facts

MUMBAI SLUMS

SLUMS OF KOLKATA

SLUMS OF DELHI

SLUMS OF CHENNAI

SOLID WASTE MANAGEMENT

Waste management is a problem in rapidly growing urban centres in developing countries. The unsustainable production and consumption patterns result in waste that can harm health and the environment. Waste has different origins and different properties. Waste can be solid, liquid, or gas and each type have different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological and household. **Waste management** (or **waste disposal**) includes the activities and actions required to manage waste from its inception to its final disposal. Waste management practices are not uniform among countries (developed and developing nations); regions (urban and rural areas), and residential and industrial sectors can all take different approaches. A large portion of waste management practices deal with municipal solid waste (MSW) which is the bulk of the waste that is created by household, industrial, and commercial activity. Industrialization and economic growth has produced more amounts of waste,

A large portion of the waste is often organic, such as foodstuffs or garden waste. Open uncontrolled dumping is still the most common method of solid waste disposal in developing countries. Typically one to two thirds of the solid waste generated is not collected. As a result, the uncollected waste, which is often also mixed with human and animal excreta, is dumped indiscriminately in the streets and in drains, so contributing to flooding, breeding of insect and rodent vectors and the spread of diseases. Furthermore, even collected waste is often disposed of in uncontrolled dumpsites and/or burnt, polluting water resources and air. Throughout the developing world it is the urban poor, often in the peri-urban areas, that suffer most from the life-threatening

conditions deriving from deficient SWM. This is because; the municipal authorities tend to allocate their limited financial resources to the richer areas of higher tax yields where citizens with more political pressure reside.

Impacts of urban waste

The population growth arise the increase of municipal solid waste production in urban areas causing daily hundreds of tons of waste. Moreover, its composition characteristics comprise toxic and polluting elements that require infrastructure and enormous local resources for its treatment. Local dumping is unhygienic and promotes infestations of insects, worms and rats, and contributes to ill-health. It is also unsightly, as waste is carried and spread by the wind.

Solid waste is often disposed into drainage systems, causing blockages that aggravate unsanitary conditions. The widespread practice of burning waste worsens the often already bad air pollution. The degradation of organic matter in landfills produces methane gas. It burns easily and causes fires that are difficult to extinguish. Serious pollution of groundwater and streams is also caused by water leaking from landfills. Hazardous waste is often not properly handled, pollutes other waste components and causes health hazards.

Solid waste management

Solid waste management is defined as the discipline associated with the control of generation, storage, collection, transfer and transport, processing and disposal of solid waste in a way that harmonizes with the best principles of public health, economics, engineering, conservation, esthetics and other environmental and public considerations .

Due to varied lifestyles and consumption patterns, the quality and composition of waste has been more varied and changing. The developed societies, clinging to the habit of ***"use and throw away"***, are characterized by their huge consumption of resources and consequently by their big generation of waste. In Europe, each person generates 500 kg of waste per year. In past and even today many Mexican cities have disposed of their municipal waste in an inappropriate manner, using uncontrolled landfills to bury their garbage, causing a chain of environmental degradation.

Urban waste management is a public service that local entities (municipalities or consortiums) provide to citizens and consists of the household collection of the waste that we generate and transport to centralized treatment plants. It is expected that close to 70 per cent of the global population will be living in urban areas by 2050. Currently, solid waste landfills in and around cities are contributing to high levels of air pollution, which has a negative effect on the health of millions of people around the world. This creates an urgent need for us to rethink the way we dispose of waste in the cities. Urban waste represents a largely untapped source of recyclable materials for production, reusable goods as well as a source of both heat and electricity when properly utilized in efficient waste-to-energy plants.

There is a growing realization of the negative impacts that wastes have had on the local environment (air, water, land, human health etc.).Complexity, costs and coordination of waste management has necessitated multi-stakeholder involvement in every stage of the waste stream. This calls for an integrated approach to waste management. Local Governments are now looking at waste as a business opportunity, (a) to extract valuable resources contained within it that can still be used

and (b) to safely process and dispose wastes with a minimum impact on the environment.

The collection and re-use of waste provides a livelihood for many urban poor and is basically positive, but working conditions are unhealthy. . Many families depend on waste for their livelihood. Waste management offers opportunities to create income for unskilled poor people through waste collection, sorting and recycling.

Disposal method

A *landfill* is a site for the disposal of waste materials by burial. Landfill is the oldest form of waste treatment, although the burial of the waste is modern; historically, landfills have been the most common method of organized waste disposal and remain so in many places around the world.

Incineration

Incineration is a disposal method in which solid organic wastes are subjected to combustion so as to convert them into residue and gaseous products. This method is useful for disposal of both municipal solid waste and solid residue from waste water treatment. This process reduces the volumes of solid waste by 80 to 95 percent. Incineration and other high temperature waste treatment systems are sometimes described as *"thermal treatment".* Incinerators convert waste materials into heat, gas, steam, and ash.

Incineration is carried out both on a small scale by individuals and on a large scale by industry. It is used to dispose of solid, liquid and gaseous waste. It is recognized as a practical method of disposing of certain hazardous waste materials (such as biological medical waste). Incineration is a controversial method of waste disposal, due to issues such as emission of gaseous pollutants.

Incineration is common in countries such as Japan where land is scarcer, as the facilities generally do not require as much area as landfills. *Waste-to-energy (WtE) or energy-from-waste (EfW)* is broad terms for facilities that burn waste in a furnace or boiler to generate heat, steam or electricity.

Waste hierarchy

The waste hierarchy refers to the "3 Rs" Reduce, Reuse and Recycle, which classifies waste management strategies according to their desirability in terms of waste minimization. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of end waste. The waste hierarchy represents the progression of a product or material through the sequential stages of the pyramid of waste management.

Recycling

The type of material accepted for recycling varies by city and country. Each city and country has different recycling programs in place that can handle the various types of recyclable materials. The Chinese government announced an import ban of 24 categories of recyclables and solid waste, including plastic, textiles and mixed paper.

Re-use

Recoverable materials that are organic in nature, such as plant material, food scraps, and paper products, can be recovered through composting and digestion processes to decompose the organic matter. The resulting organic material is then recycled as mulch or compost for agricultural or landscaping purposes. In addition, waste gas from the process (such as methane) can be captured and used for generating electricity and heat.
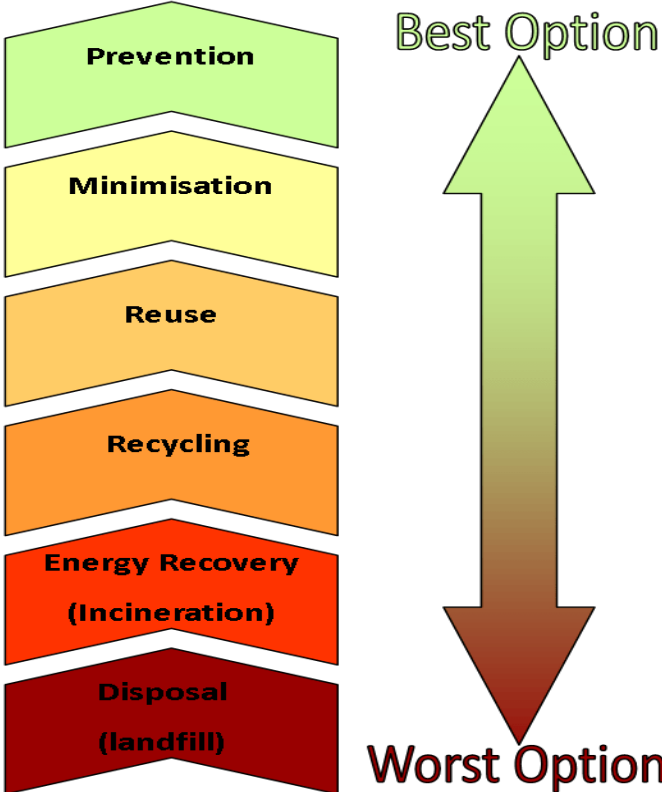
Reduction

An important method of waste management is the prevention of waste material being created, also known as waste reduction. Methods of avoidance include reuse of second-hand products, repairing broken items instead of buying new ones, designing products to be refillable or reusable (such as cotton instead of plastic shopping bags), encouraging consumers to avoid using disposable products, and designing products that use less material (for example, light weighting of beverage cans)

Solid Waste Management in India

Solid Waste Management (SWM) is one among the basic essential services provided by municipal authorities in the country to keep urban centres clean. However, almost all municipal authorities deposit solid waste at a dump yard within or outside the city. Compost pits should be constructed in every locality to process organic waste. Community participation has a direct bearing on efficient waste management.

Delhi and Mumbai together generate about 10 million tons of garbage every day. The Swachh Bharat Abhiyan is the most significant cleanliness campaign by the Government of India. Swachh Bharat Mission (SBM) or Swachh Bharat Abhiyan (SBA) or Clean India Mission was a country-wide campaign, to eliminate open defecation and improve solid waste management (SWM) in urban and rural areas in India. The objectives of the mission also included eradication of manual scavenging, generating awareness and bringing about a change regarding sanitation practices.

Waste Management Hierarchy

Prevention

Minimisation

Reuse

Recycling

Energy Recovery
(Incineration)

Disposal
(landfill)

Best Option

Worst Option

DRINKING WATER SUPPLY

Water will be one of the key resources for sustainable urban development. It is needed for every human activity – for household use, agriculture, industry, leisure – and water also has an important ecosystem function. Safe and readily available water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes.

The main challenges related to water in urban settlements: the Climate change, increasing water scarcity, population growth, demographic changes and urbanization; lack of access to safe water and sanitation, and increasing water-related disasters such as floods and droughts. These problems have enormous consequences on human health and well-being, safety, the environment, economic growth and development. The lack of adequate water and sanitation facilities leads to health issues such as diarrhoea, malaria and cholera outbreaks. In many population centers and megacities, water availability has severely limited environmental, social, and economic development.

Civilizations developed around water. But human activities have altered the quantity, quality, and distribution of water on earth. Urbanization creates water stress. Urbanization increases per capita water consumption. Wealthier people use more water, energy,

and water-intensive goods. The urban poor in the developing world face problems in getting drinking water and basic sanitation.

Regions in the Middle East and North Africa, Central Asia, and parts of Latin America and North America are exploring new approaches for a water-smart future. The World Bank's Water Scarce Cities (WSC) Initiative is an undertaking that offers approaches to urban water security in scarcity conditions. For example, **Morocco** is rising above the challenge of urban water scarcity by engaging in participatory groundwater management, and reducing its water demand by preventing leakages in its water networks. In **Orange County, California (USA),** authorities have successfully reduced reliance on external water supplies by reusing wastewater, and using its aquifer. In **Malta,** a water-scarce island located in the Mediterranean, efforts have been made to diversify water resources, including desalination of seawater and brackish groundwater and harvesting rainwater. **Namibia** is increasing water security through multiple approaches, including storing water for future use through careful aquifer management, and using direct reclamation of drinking water from domestic sewage effluent.

Water pollution has become one of the most crucial problems in cities around the world. Urban water problems are different in the developed and developing parts of the world, but all cities share the same goal of managing our precious water resources in a sustainable

way. Reducing water pollution in urban areas is a key component of urban water management.

Cities in developing countries report shortages of sources for raw water. The demographic and land expansion of urban areas and the conglomerations of cities have had a negative impact on surface water and groundwater resources. Severe environmental pollution in urban areas is caused mainly because of lack of sanitation and inappropriate solid waste management.

In many cities, the management of urban water systems is inefficient. In some cities, urban water systems are poorly maintained, and leakage in water distribution networks occurs. Water shortages, groundwater contamination are the reasons to shut down major industries in urban areas.

The urban poor are suffering the most from drinking water scarcity problems. The poor often pay far more for a litre of water than their richer neighbors, because they often lack access to the water supply system and rely on water provision from private vendors.

Quantity, quality, pressure and time are four important parameters that need to be maintained by water supply providers. Water is a political issue in an increasing urbanizing context. Growing water scarcities is due to increasing complications over its ownership, poor management and depleting quality. UNESCO's International

Hydrological Program is at the forefront of promoting science, knowledge and capacity-building for the sustainable management of freshwater resources.

Water challenges in urban India

According to a study by the Centre for Science and Environment, 48% of urban water supply in India comes from ground water. In a city like Mumbai for example, 3,750 Million Litres per Day (MLD) of water, including water for commercial and industrial use, is available, whereas 4,500 MLD is needed. Several large cities of India have experienced water shortages in recent years, with Chennai being the most prominent in 2019.

With very limited allocation coming from the government, the capacity of city level administration to improve the infrastructure facilities for water supply is highly limited. There are three major sources of water for a city's water needs: rivers, lakes/tanks and ground water. Most of the cities are primarily dependant on water from rivers and large lakes/tanks either natural or manmade. To meet the growing demand, the city level authorities are increasingly depending upon the ground water source. Slowly, ground water has become the major source of drinking water for the people.

People in the urban areas get access to drinking water from either public or private sources. The major components of

public water supply systems are; (a) Piped water supply (b) Public stand posts (PSPs)/community taps (c) Community water tanks (d) Public tanker supply (e) Public tube wells/bore wells, and (f) Public dug wells. During summer and times of water scarcity, municipal water tankers are brought into service to supply water. The private source consists of: (a) Private tanker supply (b) Private tube wells/bore wells (c) Private Wells (d) Bottled water/packaged water, and (e) Water vendors. The private water tankers and vendors supply untreated water and they do not take responsibility for its quality.

In certain cities in India, the level of infrastructure coverage extends to 100% (Chandigarh, Mysore, Allahabad and Dehradun), but some cities have 60% to 80% average coverage. In terms of drinking water supply duration, some cities provide more than 10 hours, others supply between 1 to 2 hours. In certain cases, people get daily water supply, at times twice a day for a few hours to once in alternate days in others. People in slums and low income localities, receive water for few minutes a day through the Public Stand Posts (PSP) where water is available for short duration at a low pressure.

The central government in India as well as the various state governments since independence has implemented different programmes and schemes and allocation for improving urban water supply. There is water theft and unauthorized water connections which amounts to a high level of unaccounted for water. Due to rapid

urbanization, industrialization and increased usage of fertilizers, quality of water has decreased considerably. There is also the problem of fluorosis and salinity in water making it inconsumable for the people.

Improving urban water supply in urban India requires innovative governance and institutional arrangements that blend the strengths of public, private and community partnerships; penalize industries that pollute water bodies; ensure strict vigilance and regulations to bring illegal pumping from underground reservoirs under control.

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URBAN PROBLEM - TRANSPORT

Urban productivity is highly dependent on the efficiency of its transport system to move labor, consumers, and freight between multiple origins and destinations. Transport terminals such as ports, airports, and rail yards are located within urban areas.

Urban Transport Problems:

a. Traffic congestion and parking difficulties.

b. Longer commuting.

c. Public transport inadequacy.

d. Difficulties for non-motorized transport.

e. Loss of public space.

f. High infrastructure maintenance costs.

g. Environmental impacts and energy consumption.

h. Accidents and safety.

Congestion is a major challenge in large cities. According to the INRIX Traffic Scorecard, cities like Moscow, London, Rome, Paris, Madrid, Toronto and Chicago are all among the 25 most congested cities in the world. Overloading is the primary cause of congestion. Congestion contributes to air pollution, inefficient use of fuel, and slower commutes. Growing populations, roadwork, and the distance between homes and workplaces all contribute to increased

congestion and longer commute times. As cities expand outward, and distances increase between residences and places of work, congestion becomes a bigger problem.

Figure 5.2

The Seven Facets of the Urban Transport Problem
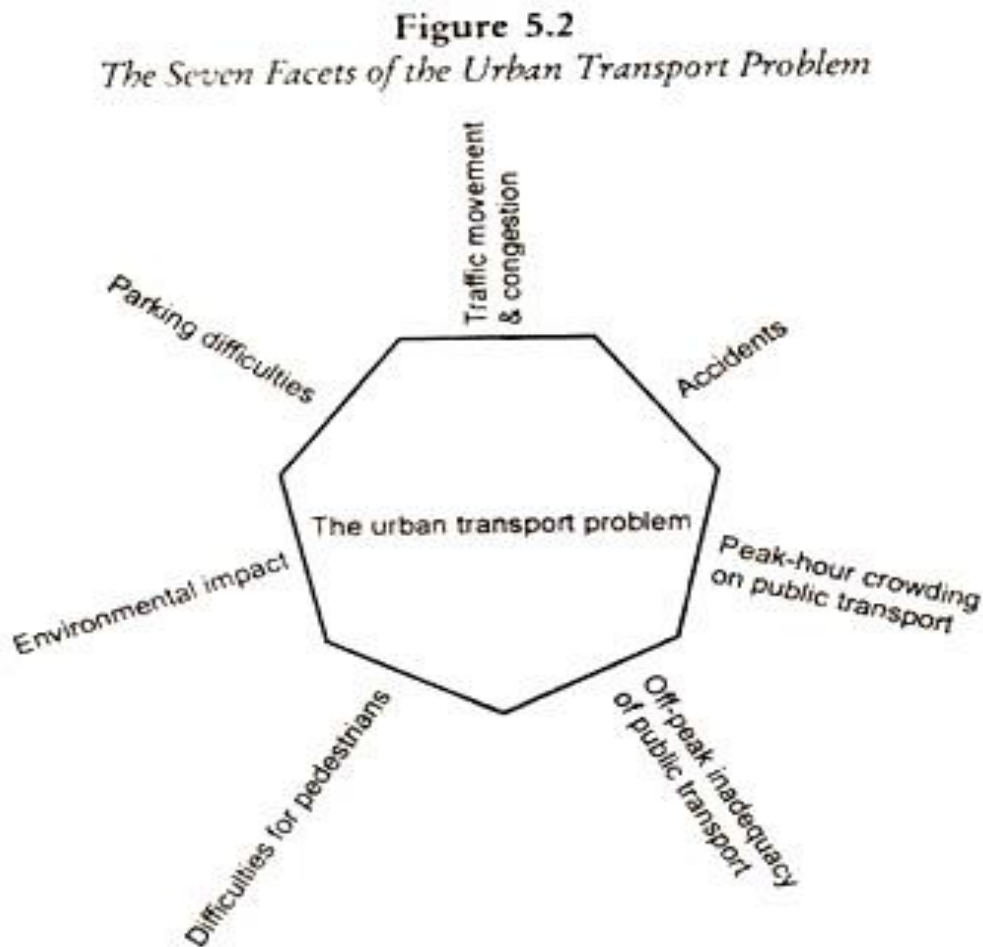
Urban sprawl makes public transportation systems more expensive to build and operate and restricts pedestrian movement. Cities struggle to provide sufficient parking space to serve central business districts (CBDs). In developing countries the problem is particularly acute. Indian and South-East Asian cities often have narrow streets. Costly and multi-storey car-parks can only provide a partial solution for parking in cities.

Automobile dependency affects the quality of life of residents, including public health. Traffic generates noise and fumes that make walking in urban areas unpleasant. Traffic noise is the major environment problem caused by traffic in urban areas. Working is therefore more difficult since noise disturbs concentration and conversation. High noise levels can also disturb domestic life as sleeping and relaxation become affected. Fumes emitted from cars contain carbon monoxide, aldehydes, unburnt hydrocarbons and other gases and deposits like tetra-ethyl lead, nitrogen oxides, and carbon particles. In large cities such as Mexico City, Los Angeles, New York and Tokyo, fumes are responsible for the creation of very unpleasant smog.

Recent trend in many cities in India and the rest of the World is heavy investments into railways. Several metro, light rail transit (LRT) and monorail projects have been initiated, which is a new approach to urban transportation management.

Managing traffic is becoming an increasingly complex. The Intelligent Transport Systems (ITS) offer opportunities to manage travel demand and can help reduce the need for new infrastructure. ITS is the integration of information and communications technology with transport infrastructure, vehicles and users. The ITS applications can play an important role for transport, particularly in big cities. In particular:

Improving traffic flow:

■ Signalised junction controls can improve traffic flow and reduce air pollution

■ Urban traffic management and control will enable police and local authorities and public transport operators to share information and help a more efficient transport system

Improving road safety:

■ Enforcement cameras deter speeding

■ Intelligent traffic signals can increase the time available for people crossing the road, where and when this is needed.

Urban transport problem in India

Indian roads are also popular for heterogeneity of vehicles sharing the same road space. There are around 32 different vehicle types in India such as bicycles, cycle-rickshaws, auto-rickshaws ('tuk-tuk'), motorcycles, cars, buses and trucks. The rapid motorization has led to severe congestion, longer journeys and higher per capita trips. Weather characteristics such as rain, humidity, heat, and more windy conditions are associated with higher travel speeds. Travel speed starts declining early in the morning and recovers late in the evening. Distance also makes a difference in travelling. Longer trips are faster. Trips further away from the city centre are also faster.

- 4 of Indian cities rank amongst the 10 most congested cities globally.
- Bengaluru (71%), Mumbai (65%), Pune (59%) and New Delhi (56%) ranking 1st, 4th, 5th and 8th respectively.

Registered vehicles per million populations have increased. The road space for vehicles has decreased. Most urban centers have a daily floating population that comes into the urban centre, from the suburbs for business, job, etc. This means, there is a significant amount of suburban travel and therefore, suburban connectivity is important for the economic activity in a city. In the larger cities like Mumbai, Kolkata, Chennai and Delhi, the Indian railways have been running suburban rail

services. In most others, suburban connectivity is provided by infrequent bus services. Suburban railways constitute a major part of the urban mass transit systems in selected cities in India like Mumbai, Kolkata, Chennai, and Hyderabad. Informal public transport systems like auto-rickshaws, cycle-rickshaws, informal car-pooling systems, etc., also called as Intermediate Public Transit Systems (IPT) forms an important share of the public transit systems.

As urbanization continues, motorization is taking place at an even faster pace. In particular, the smaller cities are witnessing the fastest growth. Motorized two-wheelers occupy the dominant share in a city's vehicular movement.

The federal government of India has launched two programmes – 100 Smart Cities and Atal Mission for Rejuvenation, and Urban Transformation (AMRUT) for 500 cities that have a population of 100,000. An urban transport system is subject to planning, execution and development by the states and union territories;

Smart ticketing has been slow to gain popularity in India. All metro systems have implemented smart ticketing solutions.

India plans to build National Highways, Expressways, Mass Rapid Transport (MRT), Bus Rapid Transport (BRT), pedestrian skywalks, walkways, and cycle tracks, in cities. Government has plans

to develop 200 low-cost airports in tier-II and tier-III towns across the country.

100% battery-driven electrical vehicles (EVs) are the ultimate goal of the vehicle alternative power train development over the next 15-20 years.

Intelligent Transportation System (ITS) involves a number of Information and Communication Technology (ICT) interventions used for efficiently managing transportation. Major areas in ITS are: Passenger information systems -These systems provide real time information to passengers using a public transport system. Usually the Expected Time of Arrival (ETA) is displayed on electronic sign boards at the bus stands, MRT platforms or the Airports and Railway stations. Such systems also sometimes provide information on personal mobile devices for example in the aviation industry and Indian Railways. This reduces the uncertainty about ETA and eases the congestion at waiting.

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POLLUTION

Pollution is the introduction of contaminants into the natural environment that causes adverse change. Pollution can take the form of chemical substances or energy, such as noise, heat, or light. A pollutant is a waste material that pollutes air, water, or soil.. Pollutants can be either foreign substances/energies or naturally occurring contaminants.

"*Particulate matter*" (**PM**) is the general term used to describe solid particles and liquid droplets found in the air. The composition and size of these airborne particles and droplets vary. Two size ranges, known as PM10 and PM2.5, are widely monitored. "Coarse particles" are those found near roadways and dusty industries (range in diameter from 2.5 to 10 micrometers or microns). The existing "coarse" particle standard (known as PM_{10}) includes all particles less than 10 microns in size."Fine particles" (or $PM_{2.5}$) are those found in smoke and haze that have diameters less than 2.5 microns. In the US, exposure to very fine particulate matter known as PM2.5 is considered **safe** by the US Environmental Protection Agency.

The concept of urban pollution refers to the presence of poisonous or harmful pollutants in cities and urban areas. Urban pollution may come from natural sources, but the most dangerous are those emissions related to human activities. The two main causes of

pollutants in urban areas are – 1.Transportation technologies such as the automobiles and 2. Power production technologies such as industrial heating and cooling and coal-burning power plants. Pollution affects air, water, land, oceans, and even climate. Cities are major contributors to pollution problems because there is a direct relationship between population densities and levels of pollution.

AIR POLLUTION IN URBAN AREAS

Air pollution has become a public concerned problem in modern metropolises. In May 2016, the World Health Organization (WHO) reported that more than 80% of urban areas now have levels of air pollution higher than the limits it recommends. For low and middle income countries that figure increases to 98%.

Urban air pollution is clearly a growing problem. The pollutants are - dust, dirt, soot and smoke. The urban air is constantly being polluted by natural sources such as volcanoes, wildfires, dust storms, and sea salt spray or from sources related to human activities such as power plants, industry, households, transport, agriculture, and

waste treatment. Air pollution is intensified in cities because of housing, population density, industry accumulation, and traffic.

There are two large groups of pollutants - *Primary pollutants* are those that are directly emitted into the atmosphere (carbon monoxide or sulfur dioxide), and *Secondary pollutants*, such as ozone, are formed because of chemical reactions between other pollutants and atmospheric gases.

Example for Urban Air Pollution

India accounts for seven of the world's 10 cities with the worst air pollution. Gurugram, a suburb of the Indian capital New Delhi, is the world's most polluted city.

Impacts of Urban Air Pollution

Exposure to high levels of air pollution can cause a variety of adverse health outcomes. It increases the risk of respiratory infections, heart disease and lung cancer. Breathing ozone and particle pollution can lead to increased asthma attacks.

Many air pollutants contribute to climate change by affecting the amount of incoming sunlight that is reflected or absorbed by the atmosphere, with some pollutants warming and others cooling the Earth. Global warming is primarily caused by emissions of too much

carbon dioxide (CO2) and other heat-trapping gases into the atmosphere when we burn fossil fuels

Preventive Measures of Air Pollution in Urban aeas

1. Drive your car less.
2. Turn off your engine.
3. Don't burn your garbage.
4. Plant and care for trees.
5. Switch to efficient designing of vehicle engines.
6. New designs of vehicles working in battery, electricity can be used.
7. Use less energy.

NOISE POLLUTION

The sounds we hear become noise when they are unwanted. Noise not only makes hearing, concentrating, and working more difficult. Noise pollution can be defined as any disturbing or unwanted noise that interferes or harms humans or wildlife. Noise pollution is also known as environmental noise or sound pollution. Noise pollution is generally defined as regular exposure to elevated sound levels that may lead to adverse effects in humans or other living organisms. The decibel is a widely used unit of sound measurement. According to the World Health Organization, sound levels less than 70 dB are not damaging to living organisms.

Noise disturbs sleep. Insufficient or poor quality sleeps results in stress, fatigue, and changes in body's chemical balances. Urban noise affects more than quality of life issue; the level of noise in many cities can cause serious and long-term harm to health, The two main causes of pollutants in urban areas are transportation technologies such as the automobiles and power production technologies such as industrial heating and cooling and coal-burning power plants. Automobiles produce a large amount of carbon monoxides to the air we breathe in. With active populations, road traffic, industry, and construction, cities are expectedly noisy places. Still, noise is a leading source of dissatisfaction for city residents. Long term exposure to noise

from road, rail, and air traffic results in physiological and psychological stress, which indirectly may contribute to heart disease, and high blood pressure.

Many cities and states have laws that limit noise in residential areas. Health protective laws, attention to design and planning, and improvements to machines can minimize noise from transportation, construction, mechanical equipment, entertainment, and human behavior. Construction sounds like drilling or other heavy machinery in operation. Airports, with constant elevated sounds from air traffic, i.e. planes taking off or landing. Workplace sounds, often common in open-space offices. Constant loud music in or near commercial venues also creates noise. Chronic or repeated exposure to sounds at or above 85 decibels can cause hearing loss.

Sources of Urban Noise

Cities have many sources of noise; many of the more significant and preventable sources arise from traffic and industry. Motor vehicle traffic is usually the single greatest contributor of noise in most cities.

Motor vehicle noise, including noise from automobiles, motorcycles, buses, and trains, Traffic noise disproportionately affects residents living near highways and freight and transit routes. Emergency

response vehicles are problematic sources of noise for residents living near hospitals or police and fire stations. Traffic noise is not inevitable; cities can minimize traffic noise by maintaining roads, constructing sound barriers, reducing vehicle speeds, enforcing illegal vehicle modifications, carefully routing freight trucks, choosing electric buses, and increasing the use of public transit, bicycles, and walking.

Many noise complaints result from proximity of housing to businesses, industries, and institutional uses. Thoughtful planning and building rules and their strict enforcement can mitigate many noise conflicts.

Health Effects of Noise

Loud sounds can damage sensitive structures of the inner ear and cause hearing loss. This makes conversation and other daily activities more difficult, and also causes many other health problems. Health impacts of noise depend on the intensity of noise, on the duration of exposure, and the context of exposure. The long-term consequences of these effects on children's development are particularly significant..

Noise interferes with sleep. Noise can make it difficult to fall asleep, and abrupt noises can cause awakenings. People affected by noise may get up "tired" or "not rested" in the morning. Recent scientific studies

have shown a strong correlation between environmental noise and an elevated risk for high blood pressure. Not only that, but in areas with excessive noise pollution, such as areas near airports, residents run a higher risk of heart attack and stroke. Noise affects the efficiency of workers in industries-reduction in hearing ability and noise also affects the workers' cardiovascular system and leads to hypertension, headache, fatigue, nervousness, and anger.

Preventive measures of Noise Pollution

We can Reduce Noise pollution by turning off appliances when not in use, use of earplugs, lowering the volume, planting more trees, regular maintenance of vehicles and machines etc. Cities can monitor and enforce noise standards in residential areas. An effective method of safeguarding buildings from the threat of external noise is to make use of stone wool products. After all, stone wool structure can be engineered to withstand and reduce the detrimental impact of noise on people and buildings.

Guangzhou, China, ranked as having the worst levels of noise pollution in the world, followed by Cairo, Paris, Beijing and Delhi. Of the 50 cities, Zurich was found to have the least noise pollution. According to a report called 'Noise and Health', Spain has the highest rate of population exposed to excessively loud noise: it currently affects more than 9 million people, or 20% of the population.

Higher levels of noise are hazardous and it is also difficult to make them escape in a closed environment. The increased levels of noise pollution in the environment have made it an urgent need to create awareness about the causes, effects, and prevention of noise pollution.

WATER POLLUTION

Water pollution can be defined as the contamination of water bodies. Water pollution is caused when water bodies such as rivers, lakes, oceans, groundwater and aquifers get contaminated with industrial and agricultural effluents.

Urbanization has been linked to the degradation of urban waterways. The major pollutants found in runoff from urban areas include sediment, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, and viruses. Suspended sediments constitute the largest mass of pollutants to waters from urban areas.

Urban areas have the potential to pollute water in many ways. Groundwater and surface water can be contaminated from many sources such as garbage dumps, toxic waste and chemical storage and leaking fuel storage tanks, and dumping of hazardous substances. Construction is a major source of sediment erosion. Nutrient and bacterial sources of contamination include fertilizer usage, pet wastes, leaves, grass and faulty septic tanks. Petroleum hydrocarbons result mostly from automobile sources. When water comes in contact with urban surfaces such as roofs, roads and footpaths, it becomes contaminated with oil, metals and other pollutants.

Pollution of water resources has become a major environmental challenge for many urban areas in both developed and developing countries. Urban water pollution is a big growing problem in developing countries of the world. Indian cities rank among some of the most polluted urban centers around the globe.

Major water pollutants in urban areas

1. Sewage: Due to the lack of municipal sewage treatment, the human waste has become one of the largest contributors to the pollution of water bodies in urban areas.

2. Plastic Wastes: Another major contaminator of water sources in metro cities especially in India is plastic waste which ends up in streams and local rivers, e.g. Yamuna in Delhi.

3. Wasted Tap Water: When you leave the tap running, it converts clean water into polluted water, which is another major cause of water pollution in India.

4. Other Activities: A lot of water is wasted at car wash stations, gas stations, and in general by people living in urban areas, adding to the total water pollution by a city centre.

5. Addition of Microbes: **Pathogens** addition into water can be bacteria, protozoa or viruses.

6. Addition of organic and inorganic material: Materials like petroleum, insecticides and herbicides, detergents, disinfecting cleaners, and drugs etc.

Impacts of water pollution in urban areas

Some of the water-borne diseases are Typhoid, Cholera, Paratyphoid Fever, Dysentery, Jaundice, Amoebiasis and Malaria. Chemicals in the water also have negative effects on our health. Pesticides addition can damage the nervous system and cause cancer because of the carbonates.

Preventive measures of water pollution

- Conserve water by turning off the tap when running water is not necessary.
- To minimize and prevent water contamination proper treating of industrial sewage and wastewater before releasing it into the environment is essential.
- Wastewater treatment is removing pollutants from wastewater through a physical, chemical or biological process. The more efficient these processes are, the cleaner the water becomes.
- In urban areas of developed countries, municipal wastewater is typically treated by centralized sewage treatment plants but these steps are more expensive.
- Repair and replacement of leaking and malfunctioning equipment is necessary.
- Usage of plastics and dumping of plastics into land and water should be strictly prohibited.
- Industries dumping effluents into water bodies should be penalized.
- Preventing pollution in urban areas is often largely a public relations task. People need to be educated about proper ways to dispose of waste.
- Rules and regulations are often necessary to reduce the amount of pollutants contaminating our water bodies.

URBAN RENEWAL

Urban Renewal is an economic development tool used by local governments across the country. The term 'urban renewal' implies redevelopment of urban areas to ensure growth of infrastructure, promotion of tourism and better quality of life. Urban renewals are currently taking place all over the world to create jobs for people in order to give them and their families a better quality of life. With all the benefits that urban renewal brings, these countries will grow up culturally, economically and politically so that they can have a rank in the world.

The rehabilitation of city areas by renovating or replacing old damaged buildings with new housing, public buildings, parks, roadways, industrial areas, etc., often in accordance with comprehensive plans. Urban Renewal Projects changed the landscape of American cities in the 1950s and '60s. Urban renewal (also called urban regeneration in the United Kingdom and urban redevelopment in the United States) is a program of land redevelopment often used to address urban decay in cities. Urban renewal is the clearing out of blighted areas in inner cities to clear out slums and create opportunities for higher class housing, businesses, and more.

Urban Renewal process has had a major impact on many urban landscapes. It has played an important role in the history and demographics of cities around the world. Unemployment, poverty, shortages of affordable housing, health epidemics, and transportation problems often accompany physical decay in modern cities. Attempts to relieve these social problems through the maintenance, rehabilitation, and rebuilding of the physical environment are known as urban redevelopment.

Disadvantages of the urban renewal –

- Seizing of property
- No proper planning
- Expensive

URBAN RENEWAL IN INDIA

Jawaharlal Nehru Urban Renewal Mission (JNNURM), Atal Mission for Renewal and Urban Transformation (AMRUT) and Heritage City Development and Augmentation Yojana (HRIDAY) are some of the major central initiatives taken by the government. At the state- and city-levels, urban renewal includes initiatives in Delhi, Mumbai, Kolkata, Indore, Ahmedabad, Mysore, Pune and Hyderabad.

Jawaharlal Nehru National Urban Renewal Mission (JNNRUM)

Launched in 2005, Jawaharlal Nehru National Urban Renewal Mission was a city-modernization scheme with an investment of over $20 billion over seven years. It covers two components viz. provision of basic services for urban poor (BSUP) and an Integrated Housing and Slum Development Programme (IHSDP).

The scheme was designed -

- to raise investment in urban infrastructure
- to build better civic amenities
- to ensure universal access to basic utilities
- to create affordable homes for the urban poor, slum dwellers and people of economically weaker sections.

The Government of India has launched the Atal Mission for Rejuvenation and Urban Transformation (**AMRUT**) with the aim of providing basic civic amenities like

- water supply,
- sewerage,
- urban transport,
- parks

All these were planned to improve the quality of life for all especially the poor and the disadvantaged.

URBAN PLANNING

Urban planning is a technical and political process that is focused on the development and design of land use and the built environment, including air, water, and the infrastructure such as transportation, communications, and distribution networks   Urban planning is an interdisciplinary field that includes social science, architecture, human geography, politics, engineering and design sciences. The primary concern was the public welfare, which included considerations of efficiency, sanitation, protection and use of the environment, as well as effects of the master plans on the social and economic activities

The goal of planning is to guide the development of a city or town so that it improves the welfare of its present and future residents by creating convenient, equitable, healthful, efficient and attractive environments. The rapid growth of population and the process of urbanization have resulted in an increasing demand for land in urban settlements.

The improper use of urban land poses serious problems in all countries. Therefore, proper planning of urban land use is the most

essential for an orderly and efficient growth of urban areas. Planning has to be done in such a way that the utmost available land is utilized.

The aims of urban planning should be as follows-

i. Removal of slums.

ii. Providing people with proper housing facilities or accommodation along with the basic infrastructure like electricity and water supply.

iii. Organization and improvement in the means of transport and communication.

iv. Setting apart space for industries, parks and public places including burial sites.

v. Making arrangements for recreation both for children and for older people.

vi. Arranging for sanitation and cleanliness of the town and its adjoining areas.

vii. Allocating space for marketing centres, shops, and so on.

viii. Arranging for education, health and medical services.

The principal phases of an urban planning process are:

1. Preparatory / exploration phase.

2. Feasibility / planning phase.

3. Formal planning / zoning phase.

4. Design and implementation phase.

5. Operational phase.

Urban planning includes techniques such as: predicting population growth, zoning, geographic mapping and analysis, analyzing park space, surveying the water supply, identifying transportation patterns, recognizing food supply demands, allocating healthcare and social services, and analyzing the impact of land use.

An important challenge for urban planning is of capacity both at the local government level to envision and prepare a city development plan, a master plan and a financial plan, and at the level of the state government to provide legislative and administrative support and an enabling environment for facilitating the process of planning at local and regional level. This requires setting up and strengthening municipal cadres in the states which provide the basis for training and building human resource capability.

Information Technology is playing an important role in urban planning through the use of GIS, remote sensing, GPS, geo-informatics, etc. Opportunities for urban planning with integrated transport and land use on a much larger scale are emerging in the planned highway expansion in the country with the Golden Quadrilateral, freight corridors, and other networks. This offers very large scope for planning new cities at the nodes of the major transport systems, ensuring inter-city connectivity.

Jawaharlal Nehru National Urban Renewal Mission (JNNURM) made it mandatory for cities to prepare a City Development Plan (CDP) and make their demands for specific projects against the backdrop of the CDP. For urban planning to work, District and Metropolitan Development Plans as well as CDPs will have to become legal and CDPs will have to be integrated with master plans and/or development plans as well as financial plans.

The Government of India launched a new flagship programme called Rajiv Awas Yojana (RAY) in 2011, with the aim of incentivizing states to assign property rights by way of land or built-up space to slum-dwellers.

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NATIONAL URBAN POLICY

Urbanization in most developing countries is bringing about enormous changes in the spatial distribution of people, resource, as well as the use and consumption of land. In order to harness urbanization, mitigate its negative externalities and promote an "urban paradigm shift", there is need for a coordinated approach and clear policy directions. Brazil, China and South Africa are examples where clear national urban policies have been vital in orientating action to tackle inequality and to energize the development process.

UN-Habitat has supported several urban policy development processes including those of Burundi, Malawi, Mongolia and Sri Lanka (National Urban Sector Policy Framework). UN-Habitat's contribution to a national urban policy includes country assessment; advice on setting up of national processes and stakeholder participation; documentation of good practices to support national processes; analysis of urban planning policies and instruments.

The development of a national urban policy is the key step for reasserting urban space and territoriality. It is also vital in providing the needed direction and course of action to support urban development. The Policy provides a coordinating framework to deal with the most pressing issues related to rapid urban development, including slum prevention and regularization, access to land, basic services and

infrastructure, urban legislation, delegation of authority to sub-national and local governments, financial flows, urban planning regulations, urban mobility and urban energy requirements as well as job creation.

The Ministry of Housing and Urban Affairs has recently formed a committee to draft India's National Urban Policy. The move is in accordance with the requirements of the New Urban Agenda of UN Habitat, signed by 193 countries in Quito in October 2016.

NATIONAL URBAN POLICY IN INDIA

Indian cities face challenges in terms of deficits in infrastructure, governance and sustainability. With rapid urbanization, these problems are going to aggravate, and can cumulatively pose a challenge to India's growth. Keeping in mind the above challenges, the government launched the Atal Mission for Rejuvenation and Urban Transformation (Amrut)) as a step towards harnessing the agglomeration economies of the urban centres and making cities engines of growth.

The mission lays emphasis on creating infrastructure, improving service delivery, making cities smarter for improved livelihood and providing for faster and integrated mobility. It envisages convergence across various initiatives such as Amrut, Smart Cities,

Hriday (National Heritage City Development and Augmentation Yojana), Pradhan Mantri Awas Yojana and Swachh Bharat.

The centre has also formulated separate policies for urban sanitation, transport, transit-oriented development and also a national mission on sustainable habitat, each with a specific mandate and vision. To address this, India needs to develop its own national urban policy (NUP) as an instrument for applying a coherent set of interventions in relation to the future growth of cities, in partnership with all stakeholders.

National Urban Policy Framework (NUPF) outlines an integrated and coherent approach towards the future of urban planning in India. The NUPF is structured along two lines. Firstly, at the NUPF's core lie ten sutras or philosophical principles. Secondly, the ten sutras are applied to ten functional areas of urban space and management. The NUPF stands on ten sutras or guiding principles:

1. Cities are clusters of human capital
2. Cities require a 'sense of place'
3. Not static Master Plans but evolving ecosystems
4. Build for density
5. Public spaces that encourage social interactions
6. Multi-modal public transport backbone
7. Environmental sustainability

8. Financially self-reliant

9. Cities require clear unified leadership and

10.   Cities as engines of regional growth.

The NUPF recognizes the fact that urban development is a State subject. Hence, the States need to develop their respective State Urban Policies including Implementation Plans based on this framework. The Center will support the development and implementation of State Urban Policies based on the framework directly and shifts away from top down central schemes. It presents a new way of thinking about Indian cities and job creation emerges as a key issue in planning for India's urbanization.

The vision aimed by NUPF is to see cities as complex and changing agglomerations of people who are constantly interacting with each other, with socio-economic institutions and with the built environment. A beginning has already been made through the HRIDAY and Smart City missions where individual cities have been asked to create a bottom-up vision for themselves.

The national urban policy proposes to address problems relating to urban infrastructure deficiencies by giving special emphasis to the housing sector, water supply and sanitation, municipal solid waste management and urban transport. It also proposes to reduce urban poverty by increasing investment in poverty alleviation programmes,

development of employment generation strategy and by trying to integrate poor communities into city planning by improving access to services and land rights.

Need for NUP -

- To spell out the country's plan for urbanization.
- To outline and highlight the importance and objectives of cities.
- UN Habitat mandates that all member-nations should have such a policy.
- For leveraging urbanization to the fullest extent and with the greatest efficiency.
- For addressing India's current urban distress.
- To build capacities at the state/urban local bodies level to prepare cities for future challenges.
- To focus on areas such as inclusive growth, infrastructure finance system and robust urban information system.
- To streamline development and ensure that all urban missions are brought under a common platform.
- To deal with issues like slum prevention and regularization, access to land, basic services and infrastructure, urban mobility, urban energy requirements and job creation.
- To address this, India needs to develop its own national urban policy (NUP) for future growth of cities.

Significance / Results Expected

- A NUP will provide a framework for states, which would be encouraged to adopt a state version of this policy.
- It would encourage programmes and policies to be integrated and aim at operationalizing the spirit of the 74th Amendment.
- NUP would involve participation of all stakeholders.
- The policy will look at urban legislation, urban economy, and urban planning.
- Increases private and public investments in urban development and consequent improvement of cities' productivity, inclusiveness and environmental conditions.
- Better coordination by national actors, as well as lower levels of government in all sectors.
- Environmentally friendly urban and national development.

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