Chapter -II

Analysis of Internal Structures of Cities

Approaches and Theories in the Indian Context

Any city, however small, is in fact divided into two, one the city of the poor, the other of the rich; they are at war with one another.

Plato in The Republic
Residential segregation within Indian cities has been analysed by the researchers using different theories and models based on different approaches. To be able to judge the appropriateness of these theories and models in Indian context, it is necessary to understand these in some details. It must be noted that these theories and models have responded to the need of the respective period in which each of these have been developed and applied. Thus, there is, all the more necessity to discuss the same in some details. This discussion has been undertaken below in this chapter to be followed by review of studies on residential segregation in cities of India, inclusive of debate on the subject. As is known that most of the cities and especially the metropolitan cities in India, have long histories which too have influenced their respective internal structures. This historical perspective to residential segregation has also been discussed briefly. Finally, the relevant approach to such a study for large cities in an economy which is in between pre-industrial and industrial stage of development (also termed as semi-feudal/semi-capitalist by some) is also discussed.

Accepted Models and Theories

The proposition to study the process of segmentation or residential segregation in the metropolitan cities involves, essentially two tasks. The first one is to study the spatial distribution of population within the cities and the second is to record the process through which this residential differentiation (Badcock : 1984) takes place in the cities. This process termed by Badcock as the residential assignment process, explains the factors which guide the individual family's choice of housing location. Both these exercises have been undertaken by urban geographers using both descriptive as well as statistical
analysis of urban areas. The various theories to such an analysis, vary greatly in their philosophy, methodology and subject matter (Bourne : 1981, 10). Nevertheless, all researchers have used some system for the classification of these theories and models. Badcock (1984) classified these theories and models based on the paradigm adopted for the study. According to Badcock paradigm of morphology, of logical positivism, of behaviouralism and of structuralism are four paradigms in urban geography, in which these theories and models can be classified. The paradigm of morphology, according to Badcock is outdated in urban geography, whereas that of logical positivism, also termed as spatial analysis approach, is related to two aspects quantitative methodologies and spatial model building. "For a positivist, science is the means by which observers attempt to gain predictive and explanatory knowledge of the world around them". Hence a "positivist proceeds by constructing theories, or highly generalized statements (laws) which express the regular relationship between separate, discrete events arising in the natural world" (Badcock : 1984, 3). Herbert (1982) has also adopted the same classification system. However, Lowder (1986) has classified these theories and models into two groups, descriptive school and dynamic/explanatory school. All the researchers have, nevertheless discussed about five theories and models which deal with the internal structures of the cities. These theories and models are, a) morphological models, b) urban ecology models, c) trade-off models, d) behaviouralist theories and e) structuralist theories. Whereas the first three are concerned with depicting the existing situation, the last two and
partially, trade-off models are concerned with the explanatory part of the analysis.

It must be noted that excepting the morphological models, all the other models and theories discuss about the individual household's choice of location in space. But these differ in their assumptions about the basis of choice, that is, the factors which determine the choice. Also, all these theories and models note that the aggregate outcome of the locational decisions of individual households is homogenization of sub-regions. However, attempt to model the internal structures using empirical data and applying rigorous statistical techniques is undertaken by urban ecologists only. The various theories and models which have tried to explain or depict the internal structures of the cities have been discussed below in details.

**Morphological Models**

The morphological models are concerned with the analysis of the locational pattern of different component parts of the cities. These were the earliest models developed for the spatial analysis of the cities. The data used for developing these models are city plans, land uses, housing typologies and so on. Frequently, these studies are undertaken with an historical perspective. The intervention of colonialists in the planning of third world countries, for example British in India, could be very well explained with the help of these models. These models were used for urban areas which were not so complex as the present day ones and especially these could very well describe the small towns. The earlier studies were more concerned with the description of the townscape - the elements of which were the central square, the market place, the residential quarters and so on. But later
on, the studies took a systematic form of analysing the land use patterns within the cities. Large cities are based on this approach.

Urban Ecology Models

These models are based on Darwin's concept of evolution which describe the species to be in continuous struggle for existence and thereby leading to their competition for space (niche) in the urban ecosystem. For the first time, this concept was introduced in social sciences by R.E. Park who named this school as that of Social Darwinism. He was the first one to notice social homogeneity of localities within the cities and was also the first to be influenced by the dynamics of plant communities. In his work on urban residential differentiation, Park (1926) observed that "the processes of social selection and segregation accompanying the growth of the urban community lie behind the creation of natural social groups as well as natural social areas within cities." (Badcock : 1984). He recognised language, culture, religion and race as factors responsible for residential segregation. Taking the work ahead from where Park had left it, that is recognising residential segregation in the cities, Burgess, not only modeled it but also tried to provide an explanation for the same.

Under the influence Social Darwinism, Burgess (1925) proposed a spatial configuration of industrial cities developing at that time. He stated that the processes which shaped the city were analogous to those in the nature. Burgess saw in Chicago that spaces allocated to different uses in the city were on (economic) competitive basis. Explaining the growth and residential differentiation in the city, he explained that this
"competition for space forced the invasion of the most convenient parts of the city and, eventually (led to) their succession by a more dominant activity or group". (Badcock : 1984, 7). In a situation where "the property market was free of restrictions, areas of the city would be 'naturally selected' for occupation by the function that could maximise the use of the site" (Badcock : 1984 ; 7) or the region. Thus activities and people with similar strength come together to form natural areas, each being distinguishable from the other because of its social or ethnic homogeneity. "Every area of segregation is the result of the operation of a combination of the forces of selection." (Herbert : 1982; 18), followed by invasion and succession. The residential areas were segregated from the commercial zones (the Central Business District) and high income groups from lower ones through differences in land and rental values. This kind of process in Chicago was a result of waves of immigrants from Europe settling in the cheapest housing, close to the heart of the city where low-skill job market was located. They shared the high rents in the central areas by crowding into the tenements and avoiding transport fares for the journey to work. The pressure on the innermost housing led to the better established households leaving the area once their real incomes improved and the transport fares were affordable to settle in better neighbourhoods and larger land areas available near the periphery. The model reveals a definite zonation corresponding to the occupational mobility, ability to save and stage in the immigrant household's life. More significant here is relationship between the socio-economic status of the family and the distance at which it is located from the city centre. The relationship is
stereotyped as a gradient, where the socio-economic status rises with the increase in distance from the centre.

The model holds true only on certain assumed conditions; a single centred city, universal accessibility to the centre, uniform availability of urban amenities within the city and a free competition of space. These very assumptions would exclude all the present day cities of the industrializing societies where none of the above conditions, excepting the first one, in many instances, are satisfied. As shall be seen later, neither is land market perfectly competitive due to land policies and speculative tendencies, nor is the infrastructure including transportation, uniformly distributed over the entire city. Secondly, even in US conditions when this model was tested by Schnore (1963, 1966) in 184 cities, proved to be valid, at best, in 40 per cent of the cities and that too in the older and larger cities.

The concentric zone theory as proposed by Burgess, was first questioned by a land economist, Homer Hoyt, who, in the process of collecting some information related to housing market in American cities found that the residential growth in these cities was more axial than concentric. His hypotheses was: "rent areas in American cities tend to conform to a pattern of sectors rather than of concentric circles. The highest rent areas of a city tend to be located in one or more sectors of the city. There is a gradation of rentals downward from these high rental areas in all directions." (Hoyt: 1939, 76). His data was obtained from individual blocks in 142 American cities. After mapping them, he found that a series of sectors emanated from the Central Business District (CBD). The high grade residential areas occupied the most desirable space and were responsible for the pattern of
urban growth in the city. The other grades of residential areas were aligned around the high grade areas, with the lowest-grade areas occupying the least desirable land, that is those adjacent to manufacturing areas. In yet other study of six US cities, tracing the shifts in the location of high rent areas between 1900 and 1936, he found that the fashionable areas (high grade areas) expanded outwards from the city centre along the main commuter lines, towards areas occupied by the most elite, placing as much physical distance as possible from the industrial zones. Hoyt sought the explanation of this phenomena in the dynamics of the property market in which, the obsolete (old) houses vacated by the higher income groups to occupy the high grade areas were transferred to the middle income groups and the vacancies thus created were occupied by lower income groups and so on. A filter down process was observed when new housing was added to the edge of the expanding city. Hoyt also recognised the existence of residential segregation within American cities.

Hoyt's sector model seeks the explanation of spatial structure through the supply side mechanisms (production of new housing) as catalyst for change whereas Burgess, sought the explanation for the change through demand side model with competition offered by new migrants to the city. Also Hoyt does not recognise the importance of density and resulting environment conditions created which are important determinants for the rich in their choice of housing by neglecting existing housing stock. However, the economists still consider Burgess's model to be that of supply side since the location of a household in the city is explained by the availability of housing. The sector model was tested by Richardson and others (1974) in Edinburgh over a period
of 66 years (1905 - 71) and found it to be valid. According to Richardson (1977) Hoyt's contribution is in breaking away from the (restrictive) overemphasis on accessibility, that is, competition for the most central place and bring in the importance of other urban activities as determinants of urban physical structure. Also, it is not necessary that the high income areas would expand on the fringe in a concentric zone but could develop in sectors depending on the location of other urban activities. Thus, according to Hoyt, the location of high income areas is a function of location of other urban activities and not the distance from the central place.

The third model along the same lines, was that by Harris and Ullman (1945), which they termed as multiple nuclei model. It differed from other two by its abandonment of the central business district as a sole focal point (from which the city grows) to existence of number of discrete nuclei around which individual land uses were geared. The conditions for the location of these nuclei was observed to be varying from city to city and hence no generalized spatial form was suggested by them.

For a long time, there remained an impression in urban geography that the zonal and sectoral models, were contradictory. But, later on, through the work of Anderson and Egeland (1961), it was realised that both these models represented different aspects of urban structure and there was a possibility of complementarity in them. The debate was resolved as a result of social area analysis developed by Shevky and Bell (1955). Simultaneously, there was a shift towards use of statistical methods in model building (Gregory : 1976) and incorporation of other aspects of city life in analysing physical structures of the cities. Social area
analysis is a method that can model the spatial structure of the socio-economic pattern of cities, using the census data. Three indices; social rank composed of three variables, occupation (proportion of manual & non-manual workers), education (level of formal education) and rental levels; urbanization also composed of three variables fertility, women in labour force and single family dwellings and segregation were used for the analysis. Sub-areas of the town were allotted a position within a two-dimension social space diagram, whose axes were social rank and urbanization. Further differentiation in the third dimension, according to the segregation scores was also attempted. Using the census data for Los Angeles, Shevky and Williams (1949) showed "that each 'social area' (a census tract) within Los Angeles could be characterized in terms of social rank, urbanization and segregation scores." (Badcock : 1984, 10). This method has been extensively used by urban geographers in mapping the social mosaic of the cities in Europe, America and even in Asia and identify the 'natural areas' formed by homogenous populations within them. However, this method has remained more as a technique of analysis than a method to explain the emerging social mosaic.

Social area analysis was undertaken in late forties, with a few hand-picked variables available, but, with the advent of computers it became possible to process large amount of data. The method, known as factorial ecology, built upon social area analysis was evolved by geographers to describe the social patterning of the cities. The method employs principal component analysis to develop maps of the factor scores. For this technique as well, census data is used. The data includes population...
census - population, age, sex, race, marital status, education, residential mobility, income and occupation - and housing census - tenure, type of structure, age, density of population, presence or absence of facilities such as television or refrigerator, type of fuel used and rental value.

The patterns of the North American cities emerging through the use of factorial ecology, when generalized, showed that there was an overwhelming tendency of social class/status scores to be distributed in sectors whereas the family or household status, that is, urbanization construct to be distributed in zones (Berry: 1971). North American factorial ecologists, thus, could give descriptive model of their cities: "If the concentric and axial schemes are overlaid on any city, the resulting cells will contain neighbourhoods remarkably uniform in the social and economic characteristics. Around any concentric band communities will vary in their income and other characteristics, but will have much the same density, ownership, and family patterns. Along each axis communities will have relatively uniform economic characteristics, and each axis will vary outwards in the same way according to family structure." (Berry: 1965, 116).

Although, the geographers were well elated with this discovery, there were some who were sceptical about the generalization of the city patterns emerging through this method. Herbert (1967) and Robson (1971) had realised the complicating effects of 'remnant' housing stock of the nineteenth century development (in the inner-city areas) within English cities. The same holds true for almost all the European and even Asian cities where pre-industrial and industrial developments co-exist in the city.

Secondly, large scale public housing in England, in developing
countries which have adopted socialist model and socialist countries adds to the complication. Modelling them has not been very simple as in American cities where capitalist laws operate in residential allocation.

Urban ecology models have heavily depended on economic logic to explain the processes which determine the city structure. The pattern of location of households with different incomes is explained by the pattern of growth of the city in the past which is said to affect the quality of housing available to the household. These theories are thus discussed by economists as well and are termed by them as historical theories of residential location (Evans : 1973, 5). Attempts have been made by some urban economists to integrate the economics of housing supply with the demand of housing space (in relation to other activities in the city) to arrive at the locational choice of a household within city. (For details see Evans : 1973).

The major criticism against the models derived from urban ecology, that is, zonal and sectoral models has been, that they assumed an upward gradient of socio-economic status from the city centre. That has not been found to be true for Australian cities where, typically, the wealthy were more interested in consolidating their residential dominance of the well-developed suburbs closer to the centre or midway between the centre and the fringe. (Johnston ; 1966 ; 1969). Large scale sub-division of fringe areas were left for the middle socio-economic groups. The pre-industrial city, argued Kirby (1983) also represented a pattern which was reverse of Burgess model. Sjoberg (1960) developed a model of pre-industrial cities where he found the pre-eminence of central areas—where the powerful lived—over
the periphery. Thus, patterns observed in metro cities in India and other developing countries have also shown this trend where the distant suburbs are largely middle level socio-economic classes whereas the centre by the richest. All the facilities are also found to be concentrated at the centre (See Lowder : 1986). The discrepancy in the models, argue the structuralists, (as shall be seen later) cannot be plainly explained by the laws of economics and to understand different patterns it is necessary to understand the existing political economy of the country analysed. Needless to mention that the urban ecology models depicted the physical structure of only certain cities grown at a specific point in history. Under certain socio-economic conditions (Castells : 1977) described by Quinn (1940) in details : "a certain degree of ethnic and social heterogeneity; an industrial-commercial economic base; private property; commerce; economic organizations functionally specialized and spatially differentiated; an effective system of transport, without too much irregularity; a central urban nucleus with high property values" (Castells : 1977, 116), the models of urban ecologists are found to be valid. The growing capitalism, in Europe and America desired that the fringe areas or the areas along the major communications routes developed as high income areas. For example, as argued by Tabbs and Sawers (1978), the tram companies had bought the land along the tramways and were giving them for high income residential neighbourhoods at high profit margins which lead to sectoral growth. Emergence of particular type of city patterns can be attributed to the specific dynamics in each country. However, the common aspect of all the cities during that era was that the growth of capitalism desired private sector to
command the urban growth. The role of State was limited to facilitating the growth of private enterprises. It was much later, after the segregation of the cities on socio-economic basis the Welfare State came into existence (De Swaan: 1988).

The techniques used to model the cities using social area analysis or factorial ecology, do not account for spatial distribution of services and welfare measures unless special efforts to collect data has been undertaken by the local authority. The high income residential areas are richly endowed with services and infrastructure as compared to the other areas. It has been observed that the neighbourhoods, which can pay for these services, indeed get larger share of these. Distribution of facilities and services can be used as one of the indicators of residential differentiation. Why and how this differentiation in distribution of facilities had come about has been analysed by Abram de Swain and has been discussed later along with structuralist theories. What has not been modelled and would be difficult to bring into the gambit of the model is the social networks, group affiliations, social movements, class consciousness, distribution of power and authority and so on. Lastly, these models do not explain the processes which give rise to these patterns. For this, one has to look for other models outside the framework of geography.

**Trade-off Models**

The urban economists, especially the neo-classical economists have tried to explain the residential structure of the cities with the help of trade-off models. It is important to note here that these models although are part of general theories of urban land use, they have shown exclusive concern for residential
activities. They "seek to deepen our understanding of how residential phenomena (densities, rent and land-values, the distribution of incomes and social class) are arranged within cities." (Badcock: 1984, 18). Thus, there are two kinds of models in urban economics; ones which treat urban activities in a general way and those which have residential activities as their primary concern. The latter ones are of importance for the present study.

The trade-off models can be traced back to the work of Von Thunen. Then followed the work of Hurd (1903), Haig (1926) and Ratcliff (1949) who were the first to appreciate the complementarity between urban rents and transport costs (accessibility). Hurd worked with urban land values, rents and costs (especially transport) within the cities. Haig considered rent as a charge for accessibility (low transport costs) and argued that the use gets allocated to a piece of land through the process of bidding. Ratcliff further developed this argument and gave a concept of bid-rent curves, using which he developed a model explaining their influence on land-use patterns in the city. According to him, various urban activities compete for locations by 'bidding' at various rent levels - their bids determined by their need for centrality and their ability to pay to give an efficient land-use pattern. His model is again a concentric one where the retailing functions, which have the greatest need for accessibility in order to maximise profits, pay the highest rents for the most central locations. Here, the land is intensively used and vertical development takes place. The next ring is of those industrial and commercial functions which do need centrality but cannot pay higher rents and hence have to
be content with lower accessibility. These activities may be warehouses, offices etc. which require less public accessibility. Largest space occupied is by the residential activities and number of trade-offs between the land costs, transport costs and density are involved here. Closer to the centre would be high valued land, occupied at very high densities by groups who incur low transport costs. Towards the periphery, live those with private transport who can incur higher costs on transport but give priority to low density residential areas. The question that urban economists have sought to answer is what determined the land prices and now each income group would respond to the same. Wingo (1961) and Alonso (1962) also gave the similar representation of urban land use pattern. Reminiscent of the classical model of Burgess, they also stated that, "In equilibrium, land uses are allocated according to their ability to outbid competitors for the most convenient sites, resulting in a series of homogeneous, concentric zones oriented around the CBD." (Badcock : 1984, 18).

The relationship of land values to the land use and intensity of activities discussed above by the urban economists has also been analysed using Density Gradient Models. Based on the theory of urban economists as to "how a city's population resolves the conflicting costs of space and transport", this model relates the intensity of land use, particularly the residential density to the economic class of the population. Density gradients are easy to calculate and are "based on the gross population density of census tracts and the straight line distances which separate them from a pre-established central point. The simplest equation takes the negative exponential form" (Lowder : 1986, 246). As discussed
above, the higher is the density, lower is the utility and hence the upper income groups who are able to afford higher cost of transportation would seek low density localities. Thus, as one moves out towards the periphery of the city, it is observed that the density decreases—termed as distant decay function—whereas the income of the inhabitant population increases. This model has been developed in the context of western capitalist countries and assumes all the conditions imposed by the urban economists in their analysis of intra urban structures.

It has been found that over a period of time, commercial land use displaces the residential activities in the central parts of the city. That is, the commercial land use outbids the residential use in city cores, thereby forming a crater at the centre in the density gradient. The peak density, instead of being at the centre, is found in areas adjacent to the centre, forming a ring around the same. Using these models in the context of developing countries, researchers have arrived at contradictory conclusions. They have also tried to relate density with land values, again arriving at contradictory conclusions (Lowder: 1986). This is so because of the assumptions involved in forming this model.

At this point, it must be noted that all these models are based on many, too simplified assumptions. The first one is, all these models are preoccupied with monocentricity, that is a single point of origin (where employment opportunities are concentrated) for rent and density gradients. Secondly, the land prices or rent is only a function of distance from the centre and not any other factors such as level of infra structure, (government investment if it is the case) etc. Thirdly, it is assumed that the city will be circular, making accommodation for topographical constraints.
Fourthly, there exists transportation network in all directions of the city and the transport costs are not subsidised. Fifthly, there is uniform availability of services in the city or that since citizens pay for the services the crucial decision is that of location. Sixthly, it is assumed that each household has at least one member in the workforce, implying that every household has assured income and that demand for residential space is income elastic. That, given the budget constraint, each household maximises its utility by trading off space consumption against commuting costs (if at all they are significant). That is, a household finds "its optimal location relative to the centre of the city by trading off travel costs, which increase with the distance from the centre, against housing costs, which decrease with distance from the centre, and locating at the point at which total costs are minimized." (Evans: 1973: 7-8). All these criticisms have come from within the profession of urban economists. But there are more fundamental criticisms on these models which come from outside the profession and thus are not related to the methods and biases of the modellers but are on the neoclassical economics itself on which these models are based.

**Behaviouralist Theories**

The behaviouralist theories in urban geography, which falls into the realm of human geography, developed as a critique to the positivist science (urban ecology and land economics models) and is a reaction to the overzealous advocacy of a scientific and objective methodology. However, amidst wide gamut of research attributed to this approach, it has not yet developed as a science. There exists as many subjectivist positions as there are subjectivists. However, one thing is common to all the studies is
their reaction against the mechanistic, aggregative and dehumanizing qualities of models discussed earlier. Subjectivists have argued that the urban ecologists and the economists "in their zest to construct models fail to separate fact from value and reduce place and space to abstract geometries in which man is a 'pallid entrepreneurial figure.' Because of its continual thrust to generalize and to abstract from reality, spatial analysis forms only a superficial view of human behaviour with no real attempt to understand internal motives and the real nature of processes which are at work". (Herbert: 1982, 34, reproducing Ley's (1977) argument).

The subjectivists, by reasserting the role of human values in the way in which space is regarded, focused their research on why and how a decision is made. "Subjectivism has led to a number of important strands of study in urban geography concerned with decision-making, with perception and with spatial cognition." (Herbert: 1982, 35). Their contribution has been a behavioural interpretation of the city's social topography, that is how decisions about the location choice and moving to new dwelling are made. These are mostly non-economic reasons. In most of the urban areas of developed economies, unlike in the developing ones, the residential mobility is remarkably high. The decision to move are specific to the concerned family - improve or maintain family's social position, change in family composition, stage in life cycle, changes in neighbourhood etc. The relocating household's decision about where to locate depends upon its reason to move and which is related to the criteria used for new choice. The criteria for new choice could be any one or more among the following: cost, dwelling characteristics,
location, quality of physical environment and social status of the neighbourhood. The relative importance of each of these factors depend upon the socio-economic status of the household. The search procedures and the actual choice made are also investigated by the behaviouralists.

The major criticism of this approach is that there is almost total absence of empirical investigation to test the philosophical concepts in the field of urban geography. Their dismissive attitude towards scientific procedures have led the approach to remain, at best, critique of positivist science. Secondly, in context of developing countries, where for half the population in urban areas the main struggle is for subsistence, issues related to residential choice are far fetched.

**Structuralist Approach**

The quantitative models and the subjective - humanist theories could not explain the inequalities existing among the individuals, neighbourhoods and regions. Even in the advanced capitalist societies, poverty and inequality were reinstated as nagging features of the societies (cities). Not to mention the situation in the developing countries, where the dominating urban image is large-scale poverty and squalor and proliferating slums on one hand and small pockets of posh areas on the other giving rise to concepts of dualism, under development and so on. Large number of studies on the poor and poverty were taken up in Europe and America. Evidences found also suggested that the economic progress need not naturally lead to social progress without the intervention of the State, in the capacity of 'provider of distributive justice.'(Titmuss : 1976, 141). Neither the conditions of fair competition between buyers and sellers existed
nor was freedom of choice unlimited in all spheres of economy including in urban areas. There existed large number of constraints imposed by the supply side variables on individual's demand which resulted in unequal distribution of urban resources. Within social sciences, the new approach, termed as 'structuralism', or political economy, have found strong methodological roots. The political economists analyse the ways in which individuals relate to each other in a social context and the role of State in the existing society, both, they contend, have an impact on structure of the society, and by that, also affect the structure of urban areas. They sometimes even give their visions of an ideal society on which their criticisms about the existing society are based (Gordon: 1971). Within this group of analysts, two distinct philosophical trends are observed; the first one is characterised as Liberal Formulations which are based on the perspective of a Welfare State and other one is the different versions of Marxist analysis termed here as Marxist View Point.

Perspective of Welfare State

The liberal's understanding of the society assumes "that individual units act rationally and are free...to (rationally) maximize their welfare" (Gordon: 1971, 10) implying that the society is truly egalitarian. However, the liberal's do accept that there are institutional constraints which predetermine the range of goods from which individuals can choose. They also assume the society to be in equilibrium which primarily means political stability arising due to the fact that all individuals have freedom to behave rationally and thus only few of them are discontented. Further, they believe that the imbalances, if exist,
are temporary phenomenon to be corrected by the Welfare State. According to liberals, "there are three principal kinds of government action which society both prefers and requires. First, the government should redistribute income. Second, the government should act when private market mechanisms cannot satisfy consumer preferences effectively. Third, the government should act to provide certain goods that the market mechanism is incapable of providing, like national defense." (Gordon: 1971, 11). The liberal's, thus, agree that location of an household in space is, by and large, due to the principle of demand and supply discussed under urban ecology and trade-off models but with the constraint imposed by the role of State or of Urban Managers in the urban context. Their explanation starts from the role of urban managers in distribution of urban resources and thus in determining the location of different income groups in the city. They do have the faith in the goodness of the Welfare State and thus the Urban Managers. The process of residential segregation in the period of transition from feudalism to capitalism in Europe and America and the need of a Welfare State in such a situation has also been discussed as part of formulations of the liberals.

Urban Managerialism

The framework of 'Urban managerialism' gives insights into who gets the scarce resources and who decides their distribution. Raymond Pahl, the proponent of the theory said that the socio-spatial system of a city was controlled by the members of the local governmental bureaucracy called 'urban managers'. The housing managers were seen to be in a position to control urban resources and thereby regulate life chances of a household. Hence, he concluded that they were the 'independent variables' in
the socio-spatial system. Proponents of this approach contend that 'Urban managers', in their gatekeeper role control the entry into various housing sub-markets through the existing institutional structure (Kirby: 1983). They have, thus, concentrated their efforts on the functioning of estate agents, land lords, developers, financial institutions and the government. However, they have been unable to bring them into one framework of analysis and hence various studies have "tended to be empirical examinations of the individual institutions." (Kirby: 1983, 25).

Pahl, further argued that the housing allocation process or one's location in the spatial structure of the city would further control one's access to other scarce resources in urban areas. This was so because not all the urban population was equally mobile. Evidences available from Britain indicated that physical mobility of the population was grossly overstated and only one third or less of the total adult population had an option to use a car (Hillman et al: 1973). He also argued that the distribution of power within the society could have the same effect which would determine who got these resources.

From the above discussions, two important points emerge out; one the role of institutional constraints in urban development and housing assignment process and two, existence of wide differences in the availability of resources, procedure of their allocation and quality of services available to different groups in the city.

The explanation given about the spatial inequalities or unequal distribution of resources has not been acceptable completely by researchers on many counts. The first set of criticisms came
about from a set of researchers who were preoccupied with managerialists' role of local bureaucracies and found evidence of their malpractices and incompetence (Badcock: 1984, 47). However, more serious criticism came from Lambert and his co-workers (Lambert et al.: 1978) who, from their study of inner Birmingham found that the housing programme designed to rehouse the city's most vulnerable classes had failed and that the housing queues were growing longer. The existing management structure - inclusive of its malpractice and incompetence - and the policies had only a partial explanation for this situation. They were convinced that "many of the developments taking place in the local built environment were quite literally 'beyond the control' of local authorities and their managers." (Badcock: 1984, 47). They had put down the responsibility on the central government. It must be at least added that Pahl had later on realised the limits imposed by the central government on the power of local authorities through their monetary and fiscal measures. However, in situations where, despite having central policies on housing and fiscal allocations, the access to housing depended on which segment of labour market - indirectly the income group - one belonged to (Badcock: 1982). The role of central government or even the State as welfare distributing mechanism was being questioned by certain researchers. They argued that the welfare policies and programmes failed because the role of State was to essentially support the propertied classes in urban areas. It is important to realise that all political economists differentiate between 'State' and government. The State comprises of government, the entire executive and judicial machinery whereas the government is only
concerned with the governing activities.

Process of Segregation in the Era of Rising Capitalism

None of the above criticism touch the question of what is behind or what motivates the urban managers or the State (if equated with the former), to take particular decisions. This question has been answered by Marxists, as briefly discussed earlier. Secondly, all the studies are of the industrial cities which have no history extending before the industrial era, the cities of America and Australia and even Britain with an exception of London, falling into this category. The urban managers can be thus, important for particular locational decisions. But that does not give an understanding of how the resources have come to be distributed unevenly, specially in the cities which have long histories. Many cities of Europe and of the developing countries, that is, all those countries which have passed through a long period of feudal era, belong to this category. Finally, the discussion assumes the existence of a Welfare State. But the question is how did the Welfare State, the highest form of collective actions, came to exist and what role it had to play vis-a-vis the processes of segregation. Abram de Swaan (1988) has tried to answer all these questions using the concepts of 'externalities' and historical sociology. This is also an explanatory theory, however, only restricted to certain specific period and situation in history. More specifically, the process of segregation as was observed in the era of emerging capitalism has been explained by this theory.

De Swaan has used two separate concepts simultaneously to explain the rise of Welfare State. The first concept used, that of 'external effects' or externalities, has been taken from welfare
economics, and is defined by him as "the indirect consequences of one person's deficiency or adversity for others not immediately afflicted themselves." (De Swaan : 1988, 2). For example, outbreak of cholera epidemic in the poor households can affect the health of non-poor, if they are staying in the same neighbourhood and even if the poor and non-poor neighbourhoods are separate, there is always a possibility of the spread of epidemic from the former to the latter.

The concept of 'human figurations', taken from the stream of historical sociology, has been used by him to explain the "changing pattern of interdependent human beings." (De Swaan : 1988, 3). Figuration, thus defined, is a concept used to convey both, "interdependence and process, (and) referring to individual human beings and to the social entities they make up together." (De Swaan : 1988, 2 referred from Elias : 1978, 6; 128-33 and Goudsblom : 1977).

The emergence of capitalism changed the pattern of mutual dependence between the rich and the poor. In the feudal times, the poor were needed for work and warfare and the threat of violent attacks on the person and property emanating from the poor had to be dealt through force or coercion. But, these relations changed with the capitalist system where the poor were potential labourers as well as consumers, were military recruits and political supporters. On the other hand, if coerced, they could be threat to labour and public harmony and public order. The existence of poor localities were also a threat to public health. The established had, thus, realised that individually, neither would they be able to ward off the threats emanating from the poor nor reap benefits that the presence of poor afforded
them. This increased the interdependence among the rich, which, in its advanced stage, gave rise to the necessity of having a national collectivity. This was the State which had "an abstract sense of responsibility" (De Swaam : 1988, 10) for the needy - the task to be fulfilled out of public tax funds. Through this, "the dilemma familiar ... (to) ... welfare economics any joint effort on the part of the rich to control the 'externalities' or to exploit the opportunities the poor offered, might also benefit those among the established ranks who had not contributed to it". (De Swaam : 1988, 3); was solved.

The collectivization process, in the areas of relief for the poor, education and health care have been discussed at length, taking the examples of Britain, France, Germany, United States and Netherlands. Out of the former three, health care has been chosen here to elucidate this process in which residential segregation is the first stage. Outbreaks of cholera epidemics had become frequent in the nineteenth century cities as the consequence of the living conditions among the poor. The better-off citizens individually decided to move out of these areas, which were till then heterogenous (all classes of families living together) to the newer and healthier neighbourhoods. Although, this seemed like individual efforts, each family responded to the situation, depending on their economic status and the aggregate result was partitioning of the urban space into socially more homogenous neighbourhoods. In a city, there were stylishly laid out rich neighbourhoods and there were slum areas also. Thus, residential segregation was the first step to ward-off the externalities of mixed living. Nevertheless, how much the rich wished to prevent the epidemics from spreading beyond the
"poverty (slum) areas" they were powerless. The collective efforts of sanitation, as preventive measures, were more essential than opting for individual curative efforts.

In the middle of nineteenth century, a consensus was emerging that fresh water supply and sewerage systems were the remedy to the problem. However, this required straining the existing financial position to the extreme or considerable increase in the rates. Who would pay was the major point of conflict. The residential segregation helped in settling this problem. The water supply and sewerage networks were established for the paying subscribers, that is in the newly settled richer neighbourhoods. Finally, these networks were expanded to slum areas - once the rest of the city was saturated with these networks - at public expense. Again, the motive behind this was to prevent the outbreak of cholera, even in the poor neighbourhoods, for the health of the entire city population. Thus, came into existence the Welfare State.

The Marxist View Point

The marxist view point tries to explain the urban structure in light of the existing class relations. However, it is that "there are many Marxisms, and the issues that separate them are both complex and controversial" (Duncon and Ley : 1982, 54) and hence have not been discussed here. The main contribution of Marxism to urban theories is largely in relation to the rent and property relations - the work being quite consistent with Marx's work in these areas; theory of suburbanization and the role of State in urban change that is role of State in facilitating the urban real estate interests and thereby perpetuating inequalities in allocation of urban resources, through its vast network of
These theories of urban space came into prominence during sixties. The exodus of middle class from the cities, civil rights movements, viz. struggles for the rights on their homes against highways and urban renewal, and moves of relocating urban poor for the sole purpose of reclaiming valuable land occupied by poor for constructing luxury housing, office buildings, convention centres, commuter expressways and so on, all made many urbanologists to question the very motives of the urban planning attempts and also the role of government in all these in the capitalist countries. There was no answer to the question of as to why the urban managers operated against the interests of the disadvantaged groups. It was also realised that the capitalist mode of production, besides causing unemployment, giving low wages, creating unsafe working conditions and having arbitrary management also created spatial inequalities within the urban areas. After all, a capitalist mode of production "requires a spatial organization which facilitates the circulation of capital, commodities, information etc." (Lamarche: 1976, 86).

Marxists begin with the analysis of the mode of production of the country under study and then they identify the class contradictions within the urban society. They also analyse the nature of State and its role in perpetuating the hegemony of propertied class over the propertyless. This, they argue would be reflected in the type of institutional structure created and the functioning of the same. In urban areas, these institutional structure helps towards the consolidation of propertied class and furthering their aim of amassing property. In a conservative State set-up, as argued earlier, through the competition for
space, poor would be pushed to most undesirous locations. In a liberal set-up, the state would only intervene on behalf of the poor to stem the externalities emanating from poverty areas. Marxist urbanologists, through empirical research of cities in Europe and America have tried to show how the state apparatus, at different points of time, has been subservient to property market. Since, the location of each income groups in the city is subservient to property, it is the propertied class and their economic interests which dictate the location of property less class or the poor in the cities.

The marxist analysis is based on the understanding that the "class distinction that originate in the production process, determine political power in urban context and lead to predictable social patterns" (Tabb and Sawers : 1978, 11) that are reflected in the spatial pattern of the city. Whether the income segregation is concentric-zonal or sectoral or any other form, it is of less consequence than the fact that the segregation exists and that too at the behest of propertied classes. Engels, in his classic study, The Conditions of the Working Class in England in 1844 had tried to explain the cause and effect relationships behind the particular configuration (concentric as in case of Manchester, the city studied by him). He had seen that the retail merchants, forced by competition, had opened their shops along the thoroughfares. This also enabled the rich to move swiftly through the wide avenues cutting the working class neighbourhood, without having any glimpse of misery hidden behind the shop facades. Further, Engels observed that all the decisions related to location of activities were taken by the capital-industrial and commercial - in the city. The city also
mirrored the differential occupational status in the segregated living arrangements.

Marxists, in America, taking examples of the dominant profit seeking ventures of particular cities, have tried to explain the urban geography of those cities. They have also sought the explanation of the spatial structure in the forms of local government (Ashton: 1978) and their fiscal policies. (Markusen: 1978). But all of them have the same answer to the urban ills, including the existence of poverty areas, that is the alteration of the political economic system. On the other hand, the conservatives believe that "in as much as the urban crisis results from individual maximizing behaviour in a market context and therefore is either optimally efficient or so close to it that a corrupt and bungling government could only make matters worse if it tried to improve upon the market" (Tabb and Sawers: 1978, 6), whereas the liberals acknowledge the undesirable consequences of the market and think that the government intervention in reducing the inequalities through welfare measures would solve the problem. Thus, the marxists, radically differ from the other two by recognising the need for systemic changes rather than fragmented approach (of liberals) or any market solution (of conservatives).

The marxists set out with a premise - notwithstanding the debate on spatial structure affecting the redistribution of income - that, "inequality has its basis in the structure of the labour market and the institutions that perpetuate such an arrangement within advanced capitalist societies" and this, they argue, is "the crucial framework of relations that sets the level of dependency of households upon the state, dictates how they will
fare in the finance and property markets and predisposes their assignment to various sectors of the urban and housing markets." (Badcock: 1984, 169). Thus, at best, the spatial attributes would compound the structurally produced inequalities, which are more persistent and damaging. Besides the demand side determinant, that of the position of household in the labour market, marxists like managerialists, argue that there are supply side variables: fiscal policy, the production of land for housing, availability of housing finance, selection and allocation procedures of private and public sector institutions which would determine whether the needs of all households are met or not. Hence, both, the household's direct income, which determines its ability to pay and the institutional framework behind the housing provision and the political and economic forces that enmesh it are important to analyse the residential assignment process. Nevertheless, it is the former variable. (the result of households position in the labour market) which is deterministic amongst the two due to the fact, that the State through its institutional set up intervenes on behalf of the propertied classes, that is the rich. Thus, the supply side variables are also biased against the poor.

The role of State, in context of developing countries too, is that of promoting the interests of the urban real estate. In fact, real estate production in developing countries is "an important means of accumulating wealth" (Durand - Lasserve: 1986). Thus, the role of State is more repressive and it uses all the instruments at its disposal to "eject the poor from desirable locations, deny them access to resources and force them to the unserviced periphery or unsavory sites of the cities. The legal
code and municipal by-laws establish the rights of private property, define acceptable forms and the uses to which it can be put according to location. Planning is the medium, which arranges the city to suit particular ‘interests’. The nature and pattern of public investment is a means of benefiting groups in a position to gain overspill values through ownership of adjoining property. The State also employs repression directly to protect private property, to hinder if not hound the less well endowed and to silence opposition.

The repressive tactics are felt mostly by the weaker groups and increasing class segregation reflects on the spatial plane of the city. The inner city provides a major scenario for such action: the poor are systematically weeded out of sites with lucrative development potential by planning mechanisms which both define and condemn substandard property or objectionable land uses. State investments in water mains, roads and services enhance the land values of private proprietors at the expense of tax payers not so favoured. At the periphery the poor's hard earned services often render them more vulnerable to ‘gentrification’ owing to the increased burden imposed via the State's taxation of property and lumpy charges for regularisation. Thus the structures of production (land and housing) and financial markets (credit) effectively prevent the poor from participating in formal property production systems, while informal ones are constrained whenever they seem likely to provide a viable alternative” (Lowder: 1986, 242). Consequently, the poor are always confounded to seek housing in the informal sector. They are either permitted to squat or purchase illegally sub-divided land resulting in their living under perpetual threat of eviction. This, in fact,
promotes a typical patron-client relationship, wherein either the politicians or local landlords are their patrons who would eventually use them for political gains. Because of this peculiar situation, housing colonies or settlements inhabited by urban poor are found mushrooming all over the city. In fact they come up and consolidate where and when their patrons wish.

Classification into Inductive and Deductive Approaches

Clearly, the studies on residential segregation are concerned with two tasks. That of depicting the existing situation, that is constructing the model of physical structure of a city using empirical data and that of explaining the internal structure of the city through the processes of segregation. The former task is based on inductive approach of analysis whereas the latter on deductive approach. The theories and models discussed earlier, can thus, be classified on the basis of primacy of either of the two approaches discussed above.

Morphological models, Urban Ecology models and Trade-off models are based on inductive approach, though some level of deductive reasoning has been adopted by the advocates of these models. However, the deductive reasoning is based on the assumptions valid for the capitalist economies of the last century. Hence the explanatory power of these models is extremely limited. These models, thus, can be termed as those based on inductive approach.

It is necessary to mention that urban economists, too, sometimes begin with the explanatory portion, that is, discussion of residential allocation process. In that case, the models are based on both, inductive as well as deductive approaches. The theories dealing with the explanation of internal structure of the city are based on deductive approach. The adherents of
this approach, do not consider it important to construct the
model of a city but content themselves with detailed
investigation of the processes that determine the city structure.
Their model is dynamic or process oriented. To distinguish
between the two approaches, the works concerning portrayal of
existing structure are termed here as models and those concerning
the explanation are termed here as theories. The theories of
behaviouralists and structuralists are based on deductive
approach. It can also be seen that few efforts have been made to
link up the two approaches. The researchers have based their
analysis on either of the two approaches and have opted to
develop new methodologies within each approach. Whereas for the
analysis of a real situation both the approaches are essential.
Whether, this has been attempted for Indian cities or not will be
analysed below.

Debate on Internal Structure of Indian Cities -

Review of Studies

Segregation in Colonial India

The residential segregation within the large cities in India, in
most of the instances, is a colonial legacy. All four large
cities, Calcutta, Bombay, Madras have received their impetus to
growth as a result of British economic interests. The coastal
areas served as the first bases of British, where the colonial
authorities required some centres from where they could control
the inland and at the same time carry on with the trade. Forts
were established at these centres, for example in Bombay, Madras
and Calcutta, and lines of communications, connecting them with
the points of production. When regular sea borne trade came to be
profitable proposition, new settlements arose in the inland,
which acted as collection centres for the indigenous products. Later on these centres became the distribution points for the products imported from the imperial country.

Two categories of cities came into being; one, where the indigenous population existed in small minority and was outnumbered by the Europeans and the second one where the local population existed in large numbers or pre-dated the Europeans. Often, the former type were the coastal centres, which were converted into regional capitals, precisely because of the reason that local population was in minority leaving entire control of the administration to the Europeans. These cities were well laid out for the colonial population. The migrant population, which was attracted to these cities was strictly restricted to limited number of neighbourhoods. For example, in Madras, the migrants were encouraged to create their own communities, according to their tradition. Segmented village type communities, associated with a particular occupation came up in Madras. Care was taken to contain the city’s growth on segregated lines.

Segregation came as an easy tool, in case of the second type, to be able to have peaceful co-existence. Like the former feudal rulers, British also found it easier to attach their neighbourhoods to the existing settlements, than to transform the latter for their habitation. Most of these cities either had civil lines or a cantonment, or both, the former housing the administrators and the latter the military -which became important after the transfer of East India Company’s rights to the British Crown. Seven cities of Delhi is a classic example of this behaviour of the rulers of this country. The British, unlike the Muslim rulers never considered themselves as a part of
this country and refrained from interfering with the internal organization of the indigenous cities, which were already segregated on caste lines. The native's city was separated from the areas of the rulers through buffer zones comprising of either any natural physical features or railway line, or an open space or an industrial premises. The European neighbourhoods were styled along the pattern of British Garden City movement, thus having lavish houses with spacious grounds and served by roads, water and later on with drains.

Before British came, the community facilities in the cities were provided through the local charitable institutions. However, with the curb on the powers of the local rulers and the erosion of the economic base (mainly agricultural revenue) of the local elites who funded these institutions, the native areas of the cities became more and more deficient in community facilities. The colonial rulers and the officials of the local administrative authorities were not at all interested in stopping this deterioration and solving the problems. Not only that, the division between the rulers (which include military and administrative officials) and the natives was maintained in the administrative structures. For example, separate municipalities were formed for European zones in Hyderabad, Poona and Bangalore whereas in other cities, through the Sanitary Reform Act of 1859, European zones were put under military supervision and Sanitary Commissioners were made responsible for native zones. Massive funds were provided for the development of hill resorts and summer migration to cooler climates for the Europeans instead of improving the conditions in Bombay, Calcutta and Madras. (Lowder: 1986, 62). Massive migration to the cities, especially to
Bombay, Calcutta, etc. where cotton and jute textile mills were established, haphazard growth, traditional city structures (winding lanes and dense built-up areas), resistance by the local population to British interference in their areas, large scale poverty and the resultant inability to pay for the services and the indifference of the provincial governments, compounded the problems in the native areas of these cities. Although, through Bombay Municipal Act of 1888, certain changes were sought in the administrative set-up of the municipalities to involve the native elite in government, the former were not given any decision making status in the city. The local bodies had very little revenue collection, and thus had to largely depend on loans from the central funds. These procedures were time-consuming, which further affected the development programmes.

Further division, on class lines, existed within the British parts of the city. Proximity to the Governor's palace reflected the status of the official. Thus, the houses of the high ranking officials owning carriages were close to the place of work whereas the lower division employees, for example the clerks, the menial workers and so on, who were largely indigenous people, were housed in the native city, away from the place of work and location of the amenities. However, within the native areas, the division along class lines was not existing. Instead, the segregation was along the caste lines. Poor and rich belonging to the same caste could be found living in adjacent areas, where the poor serviced the rich. The only visible segregation was between the native rulers, who were powerless by then, and the rest of the population. Within each neighbourhood, which are dominantly occupied by a single caste, the rich families clustered around
symbols like temples, tombs, main bazaars and so on to show their status. Only the recent migrants were relegated to the distant areas, which were not yet integrated within the main city.

The present day metropolitan and other large cities were left by the colonialists with segregated structure. The original settlement (before coming of British), known as old areas of the city, were marked by mixed landuse and heterogenous population. These areas had concentration of commerce and retailing outlet. Adjacent to major commercial area, lived the indigenous and traditional elites, wanting to remain closely associated with the activities of the core and considering this closeness as the status symbol. The need of the better educated amongst them to shift to greener areas, constructing a house (popularly known as bungalow) on a plot of land in the style of British housing, led them to move to a new neighbourhood outside the old city area but at the same time, as close as possible to the latter to avail benefits of existing facilities. The need of these elites to shift out of old city areas was felt as a result of degradation and neglect of these areas, as already discussed. The British occupied areas, after the independence, were taken over by those comprising the State machinery that is the bureaucracy and the politicians.

**Thesis of Heterogeneity**

The structuralist theory discussed in the context of developing countries has led some researchers to conclude that there does not exist any residential segregation in the cities of these countries. The most obvious manifestation of the processes discussed above is, mushrooming of slums and squatter settlements
all over the city. De Bruijne and Schenk, after reviewing the studies on segregation in India concluded: "the poor are needed 'everywhere', near the rich and the middle classes whom they 'serve' in a cheap way, and have to be near to the workspots which offer employment" (1990: 11). These authors have used housing characteristics as a yardstick of measuring poverty. Indeed, number of studies have shown that slums and squatter settlements have very high proportion of population below the poverty line (see Chapter - 3).

De Bruijne and Schenk have based their conclusion on number of studies analysing the distribution of slums in various cities. These studies have been compiled below. Bose (1968), using the results of the survey organized by the Anthropological Survey of India in Calcutta during 1962-63, observed that bustees were found in 58 wards out of total 65 wards in the city. In Madras too, slum pockets were evenly spread over the entire urban area (Arangannal : 1975). Only in nine out of total 120 divisions, no slums were found and in another eight divisions more than 25 slums were located. In the rest 103 divisions, between one and twenty five slums were found (Arangannal : 1975). "Thus slums tend to be distributed throughout the city" (Singh and De Souza : 1980, 40). As shall be seen in the two cities taken for case study, the slums are found almost all over Madras and Greater Bombay. In Bombay, instead of slums, chawls are found in certain wards.

'It is true that poor tend to live near their place of employment. They are found living in the servant's quarters of rich households, they are found living on pavements, they live in industrial areas. Nevertheless, it is also true that poor pockets
in the middle and upper class areas are small and not noticed. Large, noticeable slum is either improved or classified as objectionable and notified for clearance. It is observed that although the rich require the services of the poor and the poor require patrons, it is the desire of the better-off not to be too much confronted with the presence of these 'servents'. "Hence, the fine grained pattern of urban residences consists often of invisible nearness, hidden slum pockets in interior parts of residential blocks, in the rearguards of urban estates. Living within calling distance may sometimes even allow visual screening off of the ugly hutment areas from the eyes of others" (De Bruijne and Schenk: 1990, 14). On the other hand, in industrial areas, where rich donot live due to all round pollution, there is no necessity to hide these slums. The urban blight, squalor, pollution, stench, fumes, etc. are all pervasive in these areas. To that extent, segregation do exist in Indian cities as well.

**Attempts to Construct Homogenous Sub-Regions**

The researchers attempting to study residential segregation within individual cities in India have, by and large, used morphological models and urban ecology models among all the theories and models discussed earlier. Also, most of these studies are based on inductive approach. It is also found that some researchers have not stuck to one particular model but mixed both these models. The distinguishing line between morphological model and urban ecology models is quite blurred in many instances.

Most of the earlier studies, that is during sixties and seventies were based on morphological models. (See Meher: 1978, Bidwai: 1983, Kulkarni: 1981, Das: 1981, Pingel: 1976 etc.). Most of
These studies were based on empirical evidences at one point of time and without any attempts at putting them into a theoretical perspective. The only exception is the study by John Brush who, in his study on The Morphology of Indian Cities (1962), analysed a large number of land use studies to arrive at some generalizations about the configuration of functional areas. He identified two major types of urban land use patterns, namely the indigenous and the colonial, in Indian cities. The characteristic segregation within both the areas was very succinctly summed up by him.

"Brahmins and other high castes are usually in the best-built residential areas in or near the centre of the old cities. Muslims are clearly separate from Hindus and are themselves subdivided into quasi castes and economic classes. The labouring castes and menial outcastes of lowest socio-economic status occupy the poorest houses and tend to be located in the outskirts rather than the centre" (Brush : 1962, 60 as quoted by De Bruijne and Schenk : 1990, 1).

About the colonial pattern Brush writes: "Each grade and wage level was assigned to a specific section of town, creating an economic and originally a racial or national hierarchy of status differing from the traditional caste and socio-economic segregation of the indigenous cities. The system was unlike Indian tradition, especially at the intermediate and low grades, in that families of different religions, castes and mother tongues found themselves living side-by-side. The system also differed from tradition on that the highest ranks would be found farthest out from the centre of the town" (Brush : 1962, 63 as quoted by De Bruijne and Schenk : 1990, 1-2).
By and large, most of the researchers in India adopted a normative approach and analysed the existing structure as deviation from the standard. This limited methodology, non-availability of secondary data, non-comparable classification and even definitions of landuses and one time point data gave no understanding of the structural changes within the cities, thus limiting the significance of these studies. There were also studies which tried to identify the determinants of landuse (see Das : 1981, Pingel : 1976, Nayani : 1987, etc.), more through qualitative reasoning than rigorous statistical analysis. These studies, besides suffering from the above mentioned deficiencies lacked any theoretical framework which could explain the landuses and their relationships in context of structure of the society. They did not attempt to transcend the narrow boundaries of morphology. Secondly, these were too deterministic and failed to capture the dynamism of urban areas.

Importantly, all these models had certain common elements such as a) central concentration of commerce and retailing outlets and b) series of residential districts differentiated by "their degree of attachment to that core and their residents' use of space to display 'status" (Lowder : 1986, 207). Further it was also observed by most of the researchers working on developing countries that indigenous elites - being closely related to the activities of the core - tended to remain within the core or closer to the core, more so if means of transport were inadequate or expensive and if the public utilities were provided at far slower pace than the growth of city's population and expansion of city's territory. However, those who were educated and by that belonged to professional classes were more aware of possible
externalities of living in old (congested) areas, and at the same time more status conscious, wanting to display their status through use of more space shifted out of the traditional centre. They were, at the same time, aware of the concentration of utilities in the centre and thus tended to settle down in neighbourhoods adjacent to the core. In contrast the poor, mainly the new migrants and those having low social status, could not get access to the established city (primarily due to prohibitive land values) tended to settle down on unserviced and mostly illegally subdivided periphery or in areas classified as objectionable land uses. They could be found living near the airports, railway tracks, river banks, military installations, large industries and on city's garbage dump. The actual form that the city took varied due to dissimilar histories, different scales and their level of economic development (Lowder : 1986, 209-10).

"The central area of most cities in India, certainly, the non-British cities retains a locational advantage and some traditional prestige as a place of residence for people of high social status with above average literacy levels and lower status population" (Brush : 1962,65). Also there are examples of peripheral sectors with new housing colonies, where the high economic classes are grouped in a fashion similar to those which exist in western cities. Such urban areas with population of the new elite are examples of the beginnings of spatial restructuring and expansion, which will continue as urban income levels increase and general economic development occurs (Brush : 1962,65).

Indian Town Planners adopted the practice of residential
segregation in the new towns planned by them after 1947. Number of industrial towns and state Capitals, Chandigarh and Gandhinagar are examples of this. The first level of segregation is between industrial zone and residential, commercial and public and semi-public land use zones. The second level of segregation planned through the master plans is between different income groups through the control of density where low density areas are meant for upper income groups and so on. Similar exercises were undertaken for the existing cities as well, however, without success because none of the master plans formulated for these could be implemented. Also, in reality, high density levels represented higher income groups unlike the assumptions made in the master plan.

Examples of studies undertaken of Indian cities using urban ecology models are numerous. Most of the researchers started by assuming that a particular model "depicting broad homogenous residential zones would or could typify residential patterns in Indian cities" and subsequently accepted or rejected this hypothesis, nevertheless concluding that some broad homogenous zones could be discernible within the city (De Bruijne and Schenk : 1990, 2). Some of the conclusions arrived at by these researchers and compiled by De Bruijne and Schenk (1990, 2-3) are stated below:

"Poono does not strictly lend itself to this concentric zone theory but the sequence of activities to be discovered as one moves away from the core is practically the same as suggested by the theory" (Sawant : 1978, 39).

"After careful examination of the growth pattern of the town, it may be said that in case of Shahdara concentric theory is
applicable" (Gupta : 1985, quoted by De Bruijne and Schenk : 1990, 2).

"Bilaspur, a river based city, represents a fixed pattern of concentric, sectoral and nuclear developments " (Khan n.d., quoted by De Bruijne and Schenk : 1990, 3).

"Taking into account the evolution of functional location in Durgapur and the distribution of residences by types and income groups, it can be concluded that the ecological processes of city growth are universally operative and Durgapur is no exception. In its ecological patterning Durgapur seems to follow more the sectoral pattern of Homer Hoyt rather than the concentric zones of Burgess" (Sahai : 1980, 60). However, the researcher immediately nullifies the above argument by making a contradictory concluding statements. "Western Sociologists have tried to subsume the growth pattern of industrial cities in the West under a general law. This law has a very limited application to the city in India. In other words the growth pattern of Indian cities is quite different from general pattern of Western cities" (Sahai : 1980, 67).

Berry and Spodek (1971) explored the comparative ecology of Ahmedabad, Bombay, Kanpur, Madras, Poona and Sholapur and concluded that in the first three cities, the groups with higher socio-economic status tended to be located towards the centre of the city whereas those with the lower status further out. In yet more study, that of Madras (Weinstein : 1974), it was observed that the households with the highest socio-economic status tended to locate in concentric zone closest to the bazaar and those with second highest farthest away. In between were located the groups with low economic status, those with the lowest status living
closest to the ring of highest income population.

In the above studies, the researchers have attempted to differentiate the population on the basis of income. However, there are some who have recorded differentiation in the city on the basis of ethnicity or even caste. One such study is by Bose (1965), who had concluded that the "map of Calcutta (showed) a highly differentiated texture. Ethnic groups (tended) to cluster together in their own quarters". These groups were "distinguished from one another not only by language and culture but also by broad differences in the way they (made) their living. That is, each ethnic group identified very closely with a particular occupation. Another study had recorded residential differentiation on the basis of caste. In Howrah, a town adjacent to Calcutta, Chatterjee (1960) found that the "influence of the caste system is reflected in the usual concentration of the higher castes in the central areas of good residential localities, while the lower caste groups usually occupy the fringe. The people still attach more importance to these centrally situated residential areas. Thus, inspite of the modern development of road transport, the residential decentralization or movement towards the fringe outside the old residential areas is not very marked" (As quoted by Berry and Rees : 1965, 445).

Above, only few studies have been quoted. But it can still be seen that confusion exists in the choice of methodology for such studies, although the approach used is the same. Mechanistic application of available models and theories have restricted the possibility of fruitful conclusions.

The scenario is, however, not so bleak. Some researchers have either developed their own methodology (by simultaneously
applying different approaches) or selected their own set of indicators for measuring the segregation. The data for most of the studies have been collected through primary surveys. However, some have also relied on census data, no matter how inadequate that may be.

One such study is by C.S. Yadav (1979) on Delhi. He has attempted to investigate as to whether the population in the city was differentiated zonally or sectorally using indices for selected localities in Delhi. The indices were a) typology of the residential localities, status and character of localities, b) social organization - socio-economic characteristics of population, c) housing structure - morphological aspects, quality and size of accommodation, amenities, ownership and rental values, d) intensity of residences - density and e) behavioural aspects - knowledge, experience, evaluation and residential desirabilities of various localities. Two centres Connaught Place and Chandni Chowk were selected for the construction of zones and sectors (Yadav : 1979, 20-21). Limitation of data availability for cantonment and New Delhi Municipal Committee areas, did not deter him from statistically testing the zonal and sectoral models. However, no clear picture emerged except in case of one indicator namely typology of residential localities and that too with Chandni Chowk as centre. Five zones were identified by him and which were a) central pedestrian zone followed by b) a mixed zone of planned and unplanned localities, c) then a zone of regularized (originally unauthorized) unplanned localities, d) a zone primarily of planned localities and finally e) a suburban zone of sporadic development of localities (208). Except this, all the indices displayed partial zonal and partial sectoral
differentiation. He concluded that beyond the historical core classified by him as pedestrian zone, the State, through its policy measures—degree of security granted to residents—influenced the type of neighbourhoods that came up.

Prakasa Rao and Tewari (1979) tried to model the spatial structure of Bangalore using data collected through household survey. They have calculated density gradient, and also attempted to model the ecological structure using four indices namely a) social, which included religion and caste, b) economic—income, occupational structure and status and rent, c) family characteristics—household size, sex ratio, working women and fertility ratio and d) migrant status tenure and density.

Through the analysis of density gradient, Prakasa Rao and Tewari found that density peaks—in an overall distance decay pattern—were associated with high concentration of trade, transport, commerce and household and non-household industries and slums. These areas had mix of commercial and residential land uses, but in different mixes. The low density areas were associated with a larger proportion of predominantly residential areas, institutional areas and open spaces (326). "It became evident that population density is mainly a function of the mix of the type of land use, occupational structure and socio-economic status" (Prakasa Rao and Tewari: 1979, 326). While analysing the ecological structure of the city they found that social-religious and caste—showed maximum tendency of spatial segregation. Specifically, the Muslims, the Christians and the Scheduled Castes among all, were the most segregated social groups. In contrast, the variable indicating family characteristics displayed the least tendency towards spatial segregation.
Further, they did not find concentric zonation in a regular geometric form but the dominance of city core and increasing socio-economic status as one moved out towards periphery indicated some amount of zonation. Sectoral pattern with mixed activities, however, with industries dominating, emerged along the transport corridors. It can be seen that no significant pattern is observed.

Interesting results have been arrived at by researchers who have used social area analysis or factorial ecology for analysing internal structure of the cities. One such study is by Sita and Phadke (1987) undertaken for Bombay. The important feature of this study is that they have attempted to bring in the aspect of temporal change. It is necessary to mention that their main effort was towards identifying low income areas in Bombay by using fifteen variables, seven variables, namely, percentage of houseless and institutional population, female literacy, percentage of scheduled caste and tribe population, sex ratio, literacy rate, persons per household and population density depicting the social status and eight variables, namely, percentage of workers to total population, percentage of female workers to total workers, percentage of workers engaged in each of the occupation, household industries, non-household (factory) industries, construction, trade and commerce, transport, storage and communication and other services depicting the economic status. Census data collected in 1971 and 1981 were used for the exercise. When they used only variables depicting social status they found that most areas in the island city, more so around industrial zone and those in the northern extremity of the city had population with low social status in 1971. In 1981, the
pattern for island city remained the same whereas eastern Bombay clearly emerged as an area housing population with low social status. When variables depicting economic status were used, they found that the entire eastern Bombay including eastern parts of island city had low economic status in 1971, the lowest being around the industrial zone in island city. In 1981, the population with low economic status seemed to have shifted northwards, though, the highest concentration remained to be in the island city around the industrial zone. "The 1971 pattern brings out the commercial and the textile cores as areas occupied by the poor", that is those with low socio-economic status. The differentiation between the western and the eastern suburbs was striking, the latter having more concentration of poor.

In 1981, slight reduction in contrasts was observed which the authors surmise as the result of some middle class population settling down in eastern suburbs, especially in wards N and T in north-east. This could also be due to use of only three variables in 1981 (Sita and Phadke 1987, 80). This study stands out in contrast to that by Berry and Spodek (1971) in which, the researchers, using factor analysis, found that areas near the city core were inhabited by population with higher socio-economic status. Also important to note in the study by Sita and Phadke is that the differentiation was more sectoral (eastern and western sectors of the city) than zonal.

Factor analysis undertaken for Calcutta by Berry and Rees (1969) covering 80 wards and using 37 variables data matrix (based on 1961 census), variables being related to family structure, literacy, type of employment, housing characteristics and land uses, showed that "alongside the rich ethnic variability
described by Bose (1965). Calcutta is also characterized by a broadly concentric pattern of familism, an axial arrangement of areas according to degree of literacy and both substantial and increasing geographic specialization of areas in business and residential land uses, gradually replacing the former mixture of businesses and residences that were separated, rather, into occupational quarters" (469).

Social Area Analysis undertaken for Hyderabad using only two constructs: social rank, comprising of three variables namely, literacy among the general population, literacy among females and relative proportion of scheduled castes in the population and urbanization, comprising again of three variables namely, proportion of workers in manufacturing industries, workers in commercial activities and workers in other services depicted an interesting pattern. It was found that the "areas of lowest social rank formed a peripheral ring and also occupied the city's industrial zones, whereas the areas of highest social rank were found in the economic core of the city". It was also found that "the residential quarters of workers in the three occupational groups used to define urbanization were highly segregated, almost mutually exclusive, so that the three constituent variables bore little relationship to each other" (Berry and Rees : 1969, 489).

**Assessment of the Debate**

/From the above review of studies related to residential segregation in India it can be concluded that almost all the researchers asserted the existence of residential segregation within the cities. However, there is no consensus on the basis of segregation. Some have found Indian cities to be segregated on the basis of caste, some on basis of ethnicity, some on basis of
religion whereas some on basis of class. Some have also found differentiation of land uses within the cities in contrast to mixed land use pattern of earlier periods. Also the studies have all concentrated on indentifying the areas occupied by groups on two extremities of social or income ladder leaving vague impressions of areas occupied by middle income and social status groups. Thus, a clear pattern of sub-regions, like the ones modelled by Burgess or Hoyt and so on, have not necessarily followed the analysis of differentiation. Many researchers attempted to establish residential segregation within the cities without the help of existing models. Again, they could not develop any clear distinct model. On the other hand, some have attempted to explain the present structure in terms of deliberate attempts by the rulers in past towards residential segregation of different communities. This arguments assume importance especially during British rule in India and which has been discussed in details earlier.

Interestingly, most of the researchers excepting Sita and Phadke (1987) for Bombay and Prakasa Rao and Tewari (1979), for Bangalore found that the social groups having high economic and social status tended to concentrate in and around the central localities in these cities. However, the conclusions arrived at by the researchers have largely depended on the indicators selected for the analysis and assumptions and postulates behind the selection of these indicators. If not so, it is difficult to explain the contradictory conclusions arrived by Berry and Spodek (1971) and Sita and Phadke (1987) in their respective studies on Bombay.

Mixed and contradictory conclusions and unclear patterns observed.
above led some to form the thesis of heterogenity (De Bruijne and Schenk: 1990) discussed earlier. However, it must be understood that metropolitan cities of India display both the characteristics, of pre-industrial city discussed by Sjoberg (1960) and industrial city discussed by Burgess, Hoyt, and so on. Thus, mixed living and unclear patterns are bound to be found in Indian cities.

Sjoberg concludes about the pre-industrial cities to which belong those in India, that: "The feudal city's land use configuration is in many ways the reverse of that in the highly industrialized communities. The latter's advanced technology fosters and is in turn furthered by a high degree of social and spatial mobility that is inimical to any rigid social structure assigning persons, socially and ecologically, to special niches."

There are "three patterns of land use wherein the pre-industrial city contrasts sharply with the industrial type: 1) the pre-eminence of the "central" area over the periphery, especially as portrayed in the distribution of social classes, 2) certain finer spatial differences according to ethnic, occupational and family ties and 3) the low incidence of functional differentiation in other land use patterns" (Sjoberg: 1960, 95-103) as quoted by Berry and Rees: 1969, 446).

The literature review shows that not necessarily the Indian cities display this pattern accurately. Especially the metro cities where industrialization has rapidly advanced and so has the service sector, the differentiation on the basis discussed by Sjoberg donot seem to be observed. Instead the cities seem to be passing through some 'transitional' stage in which "caste is being replaced by an increasingly distinct class system" (Bose: 70)
Thus, an admixture of ecological patterns of pre-industrial city and industrial city seem to be observed (Berry and Rees 1969, 455). Not only that, the poor and rich are found to be living side by side, and also functionally dependent on each other. This, the present researcher believes, is due to the peculiar development of all 'Third World' countries which are dependent on world capitalism. Saфа terms the level of economic development of these countries as dependent or peripheral capitalism (1983, 3).

The penetration of capitalism is decided by the needs of world capitalism which are restricted to certain large industries. There are many sectors together termed as informal sector which grow outside the gambit of the former and caters to the needs of vast majority of the population. It is in this informal sector that poor live. However, it is not that the world capitalism donot need the informal sector. On the contrary there are numerous linkages between the two sectors. For example, the soap product of a multinational company, such as Johnson & Johnson, is processed, shaped and wrapped in the informal sector to which the work is sub-contracted so that the cost of production of that soap is reduced. The workers employed in this factory are found living in an adjoining slum colony (Seabrook 1987). It is beneficial for the world capitalism that the informal sector grows in Third World countries. Not only in production sector, even in service sector the low priced services of the poor are required by the non-poor and that too at the door-steps of the latter.

The poor are required by the non-poor and as a result slums are tolerated in upper income residential areas by the non-poor. On
the other hand, poor too benefit because in a typical patron-client type relationship, the poor are offered protection against evictions, gentrification, etc. by the politicians, employers, etc. Till the time informal sector remains in these countries the heterogenous residential areas will remain. Thus, it is not correct to judge residential differentiation in Indian cities using models applicable in capitalist system, where the entire urban land is under capitalist market. Affiliations of caste, religion, and region also tolerate the mixed living of different income groups. A relevant exercise, therefore, in such contexts would be to analyse sub-regions for thier relative concentration of poor.

From the above review of studies on segregation, it can be seen that most of the studies are based on inductive approach. Attempt to understand the processes of residential segregation is lacking. In a situation where both the processes, that of homogenizing and of heterogenizing, are at work, as discussed above, inductive approach might not give the clear picture of the cities.

The methodology adopted by the structuralists of analysing the residential allocation process at macro level and assess the access of lower fractiles to the housing is an important starting point for such a study. The processes of residential segregation, hence, would be analysed in the following two chapters confirming to the deductive approach of analysis. However, that is not sufficient to prove the hypothesis of segregation for Bombay and Madras. The manifestations of residential assignment process on the physical structure of the city need to be investigated. This would be undertaken using different indicators - those denoting
quality of life and income status of population. The indicators selected would be based on set of assumptions and postulates derived from the understanding of processes of residential assignment. The approach, therefore, might appear to be deductive. However, in absence of intra-city data of income and other variables such as rent, housing conditions of entire population, and so on indicating economic status, which can be plotted spatially, there is no choice but to deduct the spatial pattern of cities using a set of indicators. Nevertheless, the approach can be termed as inductive because the attempt would be to discern the existing pattern in Bombay and Madras using empirical evidences. The second part of the study, which is a micro level analysis will be based on inductive approach. The attempt would be to analyse relative concentration of urban poor and lower income groups within certain sub-regions of these two cities. It can thus be seen that the attempt in the present study would be to establish the connection between the two approaches in specific situation - that of Bombay and Madras. It is likely that the attempt might fail and the study appear to be compartmentalised into two parts.

Notes
1 These models are by Alonso (1964), Wingo (1961), Mills (1967, 1969) and Hoch (1969). Alonso and Wingo tried to explain the relationship between land values or rent and accessibility through theoretical analysis rather than assuming that land values declined with distance from the city centre. Alonso gave a general theory of land rent in which the location of urban firms and households is fixed in a market equilibrium. The effects of the changes in the urban transportation system on the urban land uses, especially residential uses, has been studied by Wingo.

2 The trade-off models, which tried to give explanation of the residential patterns within cities using simple as well as complicated methodologies are criticised for being too mechanistic. The models based on urban ecology also suffer from the same criticism, the main attack coming from the
behaviouralists and the humanists. Although positivists have adopted sophisticated and quantifiable techniques, their entire work is based on the assumption that the human beings are perfectly rational or economic decision makers who act with complete knowledge of the situation. This, the behaviouralists argue, strips the people of their essential humanness and individuality and that humans do not always act in accordance with crude economic rationale since there are certain values and cultural practices for survival which are above competition.

The second attack is on the ideological basis of these models. The critics contend that the positivist framework (neo-classical economics) is used as a powerful ideological instrument to legitimise and even nurture capitalism. (Badcock: 1984). This is seen as a deliberate attempt to maintain the status quo, that is a situation of class exploitation through an ideology of perfect competition, as also reflected in housing and land markets.

Avoidance of ethical questions is the final criticism of positivist framework of analysis. The critics argue that the assumptions made in these models do not reflect any awareness of social conditions and issues by refuting to move out of their disciplinary establishment. Either unreal assumptions are made, like for example, a situation of full employment in the city or economy or the negative aspects of the existing society, for example the existence of inequality and poverty are grossly overlooked.

The problems of "riots, crime, poverty, congestion, slums, pollution" which have become the bane of large cities in developing countries much before their liberation from colonial yoke, also were discovered in American cities during 1960's. Thus, as in developing countries where the role of State or public sector intervention in a big way was thought of as a way out of the urban crises, even in latter case large scale policy measures were envisaged.

The most important events which brought the discussion about the existence of unequal groups in the cities to the forefront were social upheavals that took place during 1960's, notably the civil rights movements in America, France and so on. Developing countries too had witnessed large scale unrest in this decade. There was profound effect of these movements on "the direction of social sciences and the nature of social policy." (Badcock: 1984, 30). Firstly, "they helped to arrest the self-indulgent tendencies within disciplines like sociology, economics, psychology, and geography," (Badcock: 1984, 30) all of which had lost their social conscience. Secondly, they questioned the very principles and goals of the capitalist societies.

Gordon (1971) has listed three main "analytical and normative perspectives (which) are typically applied to understand the political economy of ... (urban) problems in the United States - radical, liberal and, conservative views of society." (Gordon: 1971, XIII). The conservative view
subscribes to market operation in allocation of urban resources and does not see any role of State for the purpose. The urban structure that emerges as a result of their analysis is the same as that explained through the trade-off models already discussed.

5 Pahl’s work is grounded on Weber’s Theory of Social and Economic Organization wherein, the individual’s class situation is ascribed to his/her position in the market as a consumer. Weber gave the concept of ‘life chances’ which are "the kind of control or lack of it which the individual has over goods or services and existing possibilities of their exploitation for the attainment of receipts within a given economic order." (Badcock : 1984, 46 as quoted from Parsons : 1968, 424). This is quite contrary to what Marx had theorised; the class structure emerging out of the relations of production and thus one’s class position is ascribed to one’s position in the labour market. Thus, as per weberian position, the consumption, especially the access to collectively provided services (arising due to spatial inequalities) is as important a source of inequality as the position in the sphere of production.

6 If local authorities or the urban managers are considered to be separate than the central government, that is, if both are not a part of the same State then, there are four types of alternatives in relation to resource control and allocation within the cities. (Pahl : 1975). The first type is the pure managerialist mode where the control of access lies solely with the local officers and professionals. The second type is where the overall direction of the resource allocation is given by the central government - keeping in view how it’s interest or ideology is best served - and the local authorities have very little scope for decision-making. This is the statist model. The third type, control-by-capitalists model, is that where the local authorities or the central government, in short, the State, ensures that the resources are primarily allocated to facilitate the accumulation of capital, for example, by providing costly but non-productive infrastructure for the reproduction of labour. The profit is the chief criterion for the 'best' use of the resources. Finally, the pluralist model is the fourth type where there is a permanent tension between the central government or the national bureaucracies and the local private capital as well as with political party of the dominant class. Whereas the former might want a larger share of resources and also might prefer to distribute them according to their own logic, the latter might require the resource distribution in their favour. There can be a constant conflict between the private and the public sector, each bidding for greater share of central (federal) funds (Badcock : 1984).

From country to country, the typology of model may change, depending on, what is the analysis of 'the nature of State' for any particular country. There are big debates, international as well as national within each countries, specifically within the developing countries on this issue.
Large part of this debate stems from the Marxist understanding of State: "State is a machine for the oppression of one class by another." (Lenin: 1984, 15). The debate is focused around, who comprises the ruling class and what are the relations of this ruling class with the State the government, the ruling party (parties) and the opposition party (parties) and so on. And if the State - the central government, the local governments and the entire bureaucratic machinery - intervenes on behalf of the ruling class(es), the crude manifestations of which are the dictatorial regimes, what would be the nature of relations among the three components of the State and through what mechanisms does State intervene are major areas of debate.

7 The patron-client relationship and governing of political support from those in the illegal housing market is a mechanism requiring skilful manipulation by both, the community and State's representatives. Firstly, the community's leaders are co-opted as cadres of the political parties and are absorbed into the lowest rung of the politico-administrative ladder. Each individual neighbourhoods are associated with sponsors who have helped the community with certain material well-being. The potential class threat is thus, transformed into dependency (Lowder: 1986).

8 See Lowder (1986) for the historical background of colonial cities.

9 Most cities collected roads taxes, tolls, ferry charges, rates for the provision of piped water supply, sewers, electricity and fire protection and collected fees for education, medication, markets and slaughter houses. Besides these, in Punjab, Uttar Pradesh and Central Provinces, octroi which was the principal source of revenue and tax on all products consumed within the town barring those items on which imperial taxes were collected (like on salt, opium and mineral oils), were other sources of revenue. Madras and Uttar Pradesh also maintained pre-colonial tradition of taxing occupations, offices and appointments. In Assam, Bengal and Madras, the principal tax was levies on houses and land (that is property) as per their gross-rental value assessed by the council (Lowder: 1986, 64).