CHAPTER-II

THEORETICAL APPROACHES AND REVIEW OF LITERATURES

2.1 Introduction

The thesis is about analyses of residential pattern and quality of life (QOL) in Aizawl city. These two topics are usually taken out differently, albeit largely interrelated (Smith and Gray, 1973; Bederman, 1974). Generally, analysis of urban residential pattern tries to examine processes and patterns of differentiation of urban population. On the other hand, analysis of QOL from a geographical perspective includes selection of either objective or subjective parameters or both of them to study spatial inequalities in QOL at individual, household or areal unit scale. In spite of the presence of overlapping areas, the two concepts are distinct and unique fields of studies. Hence, the present chapter is sub-divided into two parts - the first part deals with previous literatures on residential pattern and the second part deals with literatures on quality of urban life. Conceptual and theoretical approaches are also discussed whenever necessary.

2.2 Literatures on Residential Pattern

Urban residential pattern has been a subject of interest among scholars for a long period of time. One of the earliest writings on residential pattern could be traced back to Hippodamus of Miletus, called by Aristotle as the founder of city planning, who argued that cities should naturally be divided into three parts - one for artisans, one for farmers, and one for soldiers and that the land should further be divided into sacred, public and private lands (Marcuse, 2002). Spatial division of population on the basis of class was considered essential for the functional organization of society
during the ancient Greek period (Plato c. 460 BC/1937: 422). Segregation of urban spaces may also take vertical form in the ancient cities as depicted by Lewis Mumford (1961:104-105) as-

“Occupational and caste stratification produced in the ancient city an urban pyramid, which rose to a peak in the absolute ruler: king, priest, warrior, scribe formed the apex of the pyramid; but the king alone, at the highest point, caught the full rays of the sun. Below him the layers widened out into merchants, craftsmen, peasants, sailors, house servants, freed men, slaves, the lowest layer deep in perpetual shadow”.

In his discussion on residential pattern in feudal cities in European nations, Sjoberg (1960) maintained that city society was made up of three groups - an upper class, a lower class and a group outside mainstream society which are mainly minority ethnic group like Jews. The upper class would live at the centre, close to the religious, ceremonial and political core. The lower class would live at more peripheral locations with the outcaste groups at the very edge or living in segregated communities. Although Jews were spatially segregated and confined to Jewish ghettos, the segregation “obviously did not apply to business” (Kostof, 1992: 107) and were admitted to the city each day and have played an important in the city’s economic life.

During the colonial period, colonial cities were usually segregated into imperial space and colonized space. According to a well-known urban historian Anthony King (1990), class and racial polarization, spatially expressed, existed in colonial cities at international scale as a result of colonial policy, which also ensured strict segregation between colonial and colonized populations. Mabogunje (1992) has argued that the colonial town planning in Nigeria was segregationist in practice in
order to ensure better health conditions for the European colonial officials. In colonial British India, the White population was concentrated within the walled cantonments while the Indian population was largely banished outside the walls (Home, 2013). Moreover, the colonial power often imposed segregation among different races in multi-ethnic cities. Different ethnic groups in Singapore were allotted separate geographical areas by its founder Starnford Raffles (Home, 2013). Nairobi city in Kenya was segregated into Asian Sector, African Sector, a small Asian enclave and European area (Washington, 2001). However, it is needed to mention here that even without any intervention by the hegemonic states through planning laws and zoning regulations, there is a natural tendency among various ethnic groups to maintain segregation from other groups.

After the 19th century, it was realized that the processes of industrialization and modernization have profound impacts on the spatial structure of western cities. A number of approaches were developed and presented to analyze residential patterns. The first well-known approach was developed under the influence of Social Darwinism. This approach, known as ‘human ecological approach’ seeks to find out spatial arrangement of social groups within cities as a result of competition, invasion, domination, segregation and other ecological processes for a particular location. The ecological approach was extended to formulate empirico-positivistic approaches like social area analysis and factorial ecology. During the 1960s and 1970s, dissatisfaction with the above approaches resulted into the introduction of neoclassical, behavioral and radical approaches to explain urban social differentiation. Thus, urban residential pattern has been studied from various approaches, each of which has significance in certain ways.
2.2.1 Human Ecological Approach

Human ecology is an approach to analyse patterns of social life with reference to (a) natural or biological forces operating beyond the consciousness of human agents, and (b) social organization as the product of unconscious evolution (Saunders, 2001). The concept of human ecology in urban social geography was developed during the 1920s and 1940s by Park, Burgess, McKenzie and their associates known as the Chicago School of Sociology. They conceived the city as a kind of social organism which grows from simple to the complex, from the general to the specialized; first to increasing centralization and later to decentralization (Park, Burgess and McKenzie, 1925).

Human ecology is an application of plant and animal ecology to analyse patterns of environment-societal relationship within a city. The Chicago school believed that the sitting of major urban settlements and the distribution of different types of neighbourhood within them can be understood in terms of ecological principles (Giddens, 2006). They focused on a particular geographical area identified as ‘natural areas’ in which the struggle for existence occurred among various groups of population through ecological processes like competition, invasion, segregation and economic differentiation, succession and dominance. In this way, they tried to find out processes of social differentiation in urban areas through these ecological processes. The process of competition for space resulted in the domination of space by certain social group and in certain cases, cohabitation of more than one groups while repelling other groups.

Burgess (1925) nicely brought out the concept of human ecology in his model of residential differentiation and urban structure based on Chicago. In his classical descriptive study on the spatial structure of Chicago, Burgess viewed the annular
outward expansion of the city as a result of decay of inner cities and their invasion by lower status group. He identified five concentric zones, each of which were occupied by different classes. The first zone called the central business district was exclusively dominated by commercial activities. The second zone - the zone in transition - was undergoing transition from high class residential to mixed land-use due to invasion by the immigrant lower class. The third zone - the zone of working men’s home - was occupied by more affluent immigrants who have escaped the second zone but still required easy access to their work place. The fourth zone - zone of better residence - was the home of middle class where men were outnumbered by women and subsidiary shopping centres have developed. The fifth zone - an affluent and exclusive suburban zone was dominated by single family dwellings.

Beyond the five urban zones, Burgess (1930) also recognized the sixth and seventh zones which were agricultural districts and metropolitan hinterland respectively. Burgess’ model of urban spatial structure, however, has been criticized because of its nature as an ideal or constructed type rather than as a substantive generalization (Timms, 1971). Burgess himself accepted the model as an ideal construct and maintained that exogenous factors like climatic condition, geographical barriers like hills, lakes, mountains and types of street plan may have an effect upon the city structure (Burgess, 1953).

While formulating his well-known concentric zone model of urban land-use, Burgess (1929) also remarked that in cities with substantial degree of relief, terrain, rather than distance from the city centre will be the dominant factor in residential differentiation. Instead of concentric zone, an altitudinal zonation will be obtained, with “the poor in the valleys, the well-to-do on the hillsides, and the rich on the hilltops” (Burgess, 1929:119). This pattern of residential differentiation reflects the
importance of environment as an important determining factor in residential locational choice. Blumenfeld (1959) considers this pattern to be of recent origin: a product of particular modern conditions like new means of transportation that had not obtained throughout urban history. Meyer (2005) revisited the ‘altitudinal zonation’ theory by studying the American city of Worcester. On the basis of 1891 data, he found out that most high-status residents of Worcester lived at moderate elevations up to 30 m above the city center. However, the five most elevated neighbourhoods were exclusively or overwhelmingly of working-class population.

Concentric model of urban spatial segregation was followed by ‘Sector theory’. In his analysis of spatial distribution of rental class in 142 American cities, Hoyt (1939) concluded that the tendency of high class people to occupy the most desirable lands, particularly along major transport routes from the central business district (CBD) and elevated areas commanding a fine view, safe from flooding and accessible to cooling breezes led to the formation of ‘sectors’ of residential areas rather than ‘zones’ as in the case of Burgess model. According to Hoytian sector model, if one sector of a city developed as a low rent residential area or a high class residential area, it will tend to retain the character for long distances as the sector is extended through process of the city’s growth. Thus, Hoyt’s sector theory assumed the existence of social stratification which translates into spatial differentiation. However, being an economist, he placed undue emphasis on the economic characteristics of areas, ignoring other important factors, such as race and ethnicity, which may also underlie urban spatial structure. Hoyt sector theory has been applied in many cities. Amato (1974) demonstrated that Bogota city in Columbia was continuing to develop along the same sector pattern identified by Hoyt. While there are enough differences and contradictions between Burgess’ Zonal model and Hoyt’s
sector theory, they may also be considered “independent, additive contributors to the total socio-economic structuring of city neighbourhoods” (Berry, 1965:115).

Harris and Ullman (1945) provided another urban land-use theory called ‘Multiple Nuclei theory’ which, unlike the earlier theories, built around a number of separate nuclei. Putting economic activities as the basis of explanation of urban structure, the multiple nuclei theory tries to explain the multi-nodal nature of urban growth. The theory maintained that while certain economic activities tend to conglomerate to gain maximum profit from external economies of scale, certain activities like factory development and high-class residential development are ‘detrimental to each other’ and secondly, while some economic activities gained from locating at central locations, other activities could not afford high rents and, therefore, located elsewhere. Although the theory may be simple and less specific, the value of multiple nuclei theory lies in its recognition of the development of new nodes around outlying business districts corresponding to decline in traditional CBD. The theory concerned more on the impact of economic diversification rather than social differentiation on the spatial structure of cities. Moreover, they suggested that land-use patterns vary depending on local context and hence the “multiple-nuclei model may be closer to reality” (Pacione, 2009:143).

Better known as morphological or urban land-use models, these ecological models of urban spatial differentiation, however, has been criticized heavily as they did not pay enough attention to the role of choice, preference and social action (Hollingshead, 1947). They relied too much on a biological model (Firey, 1947; Jones, 1960), and their models were essentially descriptive. Moreover, they neglected the possible influence of institutional and political factors and developed their ideas on the basis of a free market economy. This made their approach inadequate for
countries where the role of the state has been prominent (Bassett and Short, 1989). The significance of the classical land-use models was that they were “the first to appreciate that, while language, culture, religion and race provide the motivation for residential segregation in cities, geographical barriers and physical distances along with improved mobility provide the means to practice it. They ‘discovered’ that the physical features and two-dimensional spaces of the city are used by different cultural groups to accomplish social distancing and residential segregation” (Badcock, 2002:5).

A number of studies have been taken to test the validity of classical land-use models and if possible, to develop alternative models in both developed and less developed cities. More important studies include Mann’s model of urban land-use in medium-size British cities. Mann (1965) incorporated the climatic factor particular the prevailing west wind in his model such that the best residential area is located in the western fringe of the city, upwind of and on the opposite side of industrial area, the working class nearby the industrial zone and the lower middle-class housing on each side of the best residential area.

Apart from morphological models, another important study on Chicago was taken out during the 1930s. The concept of ‘urbanism as a way of life’ was proposed by Louis Wirth in 1938 to analyse the products of increasing urbanization at individual and community levels. From his study of Chicago, Wirth (1938) argued that individuals living in cities get fragmented due to increasing division of labour, socio-economic and cultural diversification which he measured using the criteria of size, density and heterogeneity.
2.2.2 Social Area Analysis and Factorial Ecology

Social area analysis is an approach developed to analyse urban residential pattern that arises with increasing scale of society and concomitant functional differentiation. On the basis of Wirthian theory of urbanism, social area analysis was developed by Shevky, Williams and Bell (Shevky and Williams, 1949; Shevky and Bell, 1955) in an attempt to identify the ‘community or social areas’ of Los Angeles and San Francisco. Thus, “Social area analysis, sensu strictu, provides a means of portraying the social geography of a city as part of a deductive model of social change based largely on Wirthian theory” (Knox, 1982:74). The social area analysis was based on the concept of social change and its impact on cities, especially large cities or metropolis.

The ‘natural areas’ in ecological approach were thus replaced by ‘social areas’ in social area analysis. Generally, social areas are considered to contain “persons having the same level of living, the same way of life, and the same ethnic background” and “persons living in a particular type of social area would systematically differ with respect to characteristic attitudes and behaviours from persons living in another type of social area” (Shevky and Bell, 1955: 20). Proponents of social area analysis argued that urban ‘social’ or ‘community areas’ were the product of three major trends deriving from the ‘increasing scale of society’ which, in Sheky-Bell model is synonymous with the emergence of urban-industrial society (Timms, 1971). In the simplest sense, increasing scale of society may be seen as change from traditional to modern lifestyle. It is largely associated with increasing functional differentiation of urban society and its concomitant socio-spatial differentiation with increasing size, mobility and heterogeneity of urban population.
To measure these changes, they proposed three constructs. The first of the constructs identified by Shevky and Bell (1955) is ‘social rank’ or ‘socio-economic status’. It is related to a variety of socio-economic measures pertaining to employment and occupational status, years of schooling, cost of housing and possession of various household facilities. The second construct is labeled ‘urbanization’ by Shevky while Bell called ‘familism’ or ‘family status’. This construct is usually indexed by indicators pertaining to measures like age and sex characteristics, type of tenancy, house structure etc. The indicators normally used in the computation of the index are fertility, women in the workforce, single family dwellings etc. The family status construct is believed to be a reflection of three interrelated aspects of societal change including the relationship between population and economy, the structure and function of kinship units, and the range of social relations which are centred on the city (Timms, 1971). In western cities, technological development and industrialization has led to striking changes in household size; kinship structure, relations and functions; as well as changes in the role of women from ‘motherhood’ to ‘working woman’. The third construct is related to ‘ethnic status’ and concomitantly, migration status. The increasing heterogeneity or diversity of population through migration resulted into redistribution of population through isolation and segregation of ethnic groups. Since migration is usually age and sex selective, this construct is related to change in demographic characteristics.

Another approach, popularly known as ‘Factorial ecology’ emerged during the 1960s as “geography’s adoption of human ecology” as well as a “formalization of many aspects of social area analysis thinking” (Fyfe and Kenny, 2005). It emerged as a reaction to theory-based social area analysis and its uni-dimensional nature of the indices to measure the urban social structure. An attempt was made to study
residential pattern through empirical research, based on more set of variables which may help to formulate more generally acceptable theory. Factorial ecology, therefore, is a term given to the introduction of multivariate statistical techniques to extend the social area analysis/approach in order to reveal the bases of residential differentiation within the city using a larger set of diagnostic variables than the seven employed in social-area analysis (Timms, 1971; Davies, 1984; Pacione, 2009). Thus, factorial ecology is a purely technical procedure, and unlike social area analysis, there is no theoretical framework, and so no direct inferences can be drawn as to the nature of the processes which give rise to the social and spatial patterns which are revealed (Clark, 1982). Therefore, while the term ‘social area analysis, sensu stricto’ applies only to that mode of analysis originally outlined by Shevky, Williams and Bell (Berry and Rees, 1969) and deductive in nature; factorial ecology is an outgrowth of social area analysis and inductive in nature.

Thus, the difference between factorial ecology and social area analysis is that, in factorial ecology, a multivariate technique called factor analysis is used primarily as an inductive device with which to analyse the relationships between a wide range of social, economic, demographic and housing characteristics (Knox, 1978) where as in social area analysis, factor analysis is employed to validate the hypothesis of Shevky, Williams and Bell. It may, however, be noted that factorial ecology is not altogether different from social area analysis and input variables mainly relate to three factors of social area analysis.

A number of studies have been produced to test the validity of social area analysis as well as to explore the ecological structure through factor analysis. Some studies confined to extract the factors of differentiation only while some other studies tried to produce social areas.
One of the earliest studies on social area analysis is Shevky and Williams (1949). To classify more than 570 census tracts of Los Angeles, they took seven variables—three variables including occupational status, educational status, and income for social rank, three other variables like fertility, women in the labour force and the physical characteristics of neighbourhoods for index of urbanization, and the number of people in highly isolated population groups for index of segregation. In order to obtain composite index for the social rank and urbanization constructs, values for each variable were converted to percentile scores and the mean percentile score of the variables represents the index for each construct.

Another early work on social area analysis was Bell’s (1953) study of San Francisco. Using centroid technique of factor analysis, he tried to ascertain whether social rank, familism and ethnicity did represent necessary, sufficient and separate axes of differentiation. They hypothesized that measures of occupational status, educational achievement and rent comprise an unidimensional index of social rank and measures of fertility, women in the workforce and single family dwellings comprise an unidimensional index of family status. His findings partially validated the theory as the ‘data are clearly in agreement with the hypotheses’ such that ‘the indicants correlate with the underlying three factors in the predicted fashion’ and there were high inter-correlations among indicators of social rank and family status respectively (Timms, 1971).

In their case study of San Francisco, Shevky and Bell (1955) found out that the city was differentiated along social status, family status and ethnic status. They observed that high-economic-status tracts were found in hill and view locations away from industrial and port facilities; areas of nuclear-family status were displaced away
from the urban cores; while areas of ethnic status emerged adjacent to the business zones and near industrial waterfront districts.

Van Arsdol, Camilleri and Schmid (1958) studied ten different cities in the United States. They took variables relating to occupation, education, fertility, women in workforce, single family dwellings and percentage of Negro population. With the help of factor analysis, they identified that the first three indicators formed social rank, the next two formed urbanization or familism and the last indicator formed ethnic status. However, as against the model, fertility which is an indicator of urbanization factor correlates highly with both indicators of social rank factor viz. education and occupation. Regarding individual cities, four cities deviated from the overall result and/or the idealized model. In these deviant cities, fertility correlates more highly with the social rank factor rather than urbanization or family status factor.

Timms (1971) studied Brisbane by taking data from 554 residential collectors’ district. He selected 11 variables pertaining to social rank, family status and ethnic status. These indicators were analysed with factor analysis. The three factors captured 89 per cent of the communality. Correlation coefficients were derived with the help of product moment correlation. Analysis of data reveals the predicted model is clearly followed by the observed data. Within social rank construct, fertility shows high positive correlation with the proportion of single-family dwellings and a high negative correlation with the proportion of women in the workforce. Interestingly, the study found out that social rank and family status are independent bases of social differentiation, ethnicity is closely dependent on the other two axes. Thus, it was concluded that “social rank and familism emerge as by far the most salient of the social area constructs in the modern city” (Timms, 1971: 168).
Sweetser (1965) compared the residential structure of Boston and Helsinki which were largely similar in their status, functions and size. Twenty two variables were taken to represent the three constructs of Shevky and Bell. Then, they were analysed using principal components method. The analysis extracted three factors namely socio-economic, young familism or progeniture and urbanism factor in both Boston and Helsinki. To test the similarities and differences between the ecological structures of the two cities, a coefficient of congruence was computed. The values of coefficient of congruence were very high for the first two factors while the third factor urbanism was much less congruent. He interpreted that socio-economic status and progeniture were fundamental dimensions of ecological structure in both Helsinki and Boston.

In his factorial ecological analysis of Montreal, Canada for the years 1951 and 1961 using only 27 variables, Greer-Wootten (1972) identified all the three classic factors. Interestingly he also found out ethnic factor and socio-economic factor are not independent but related to each other due to pronounced English-French division. The English-speaking people are found to obtain higher social rank while the French speakers are found at the bottom of the social ladder.

Foggin and Polese (1977) analysed 368 census tracts of Montreal using 63 variables drawn from 1971 census. Using principal component analysis, they obtain six factors. Out of the six factors obtained, factors one and three comprised of variables dealing with socio-economic status, factors two and five are made up of demographic variables and factors four and six are exclusively of ethnic variables. The reason that each of the dimensions is represented by two factors is explained as an effect of large number of variables taken in the analysis. From their analysis, they observed that the city’s richest neighbourhoods are located close to the city’s centre.
They also found out that a few relatively poorer neighbourhoods developed within the high-income areas which according to them indicate the decline of the absorptive capacity of the inner city so that new immigrants have to settle nearby workplace.

Smith and Gray (1972) while studying the inter-census tract variations in social well-being in Tampa Bay, Florida maintained that the common finding of various studies in factorial ecology viz. socio-economic status, stage in life cycle and ethnicity were usually confined to variables derived from census reports. They claimed that such studies overlook social pathology factors like crime, diseases, overcrowding etc. The factor analysis on Tampa Bay, however, revealed that the maximum variance was explained by social problems which loaded high on health, crime and other social pathologies. Socio-economic dimension that reflects income, occupation, housing quality and education was second in explained variance. A racial segregation factor came third followed by social deprivation reflecting unemployment, poverty and infant mortality.

In their study on factorial ecology of Dublin City with the help of principal axis factoring, Brady and Parker (1975) has taken 56 variables and they extracted five factors which collectively explain 71.24 per cent of the variance of the data matrix. They have termed the extracted factors as housing conditions-twilightism, socio-economic status, family status, residual communities and professionalism.

Social area analysis and factorial ecology have been adopted to study cities in developing countries too although they frequently resulted in fewer dimensions or different patterns (Abu Lughod, 1969; Berry and Rees, 1969). In his study on Accra, Ghana, McElrath (1968) has taken four constructs of social rank, family status, migration status and ethnic status. For each construct, two indicators were taken. The
inter-correlations among indicators clearly followed the predicted pattern except one-
the correlation between fertility ratio and women in workforce was positive unlike the
predicted negative correlation. He explained that the Ghanian women were usually
involved in small-scale economic activity which can be taken up while having large
family. He maintained that “family status does not operate as an independent form of
sub-population differentiation in the urban area of a society where only limited
changes of the structure of production have occurred” (McElrath, 1969:49). In the
absence of independent family status factor, three independent dimensions of social
differentiation were recognized: social rank, migration status and ethnic status with
migration status being the most important axis.

One of the most cited works on factorial ecology in developing country was
conducted by Abu-Lughod (1969). She analyzed the residential pattern of Cairo,
Egypt. She conducted a factor analysis of thirteen indicators reflecting variations in
socio-economic status, family status, demographic structure and ethnic composition
over 216 census tracts. Three independent factors were extracted from the analysis-
style of life factor relating to socio-economic status and family; male dominance
factor and social disorganization factor. The importance of the study lies in the fact
that the study failed to obtain independent social rank and family status factors in
contrast to the pattern observed in American cities. This may be due to Egypt’s
lagging position in the modernization process as indicated by high correlation
between social rank and family status which was accounted for by family size since
polygamy was a privilege of wealthy men (Maloutus, 2012)

Similar observation was also made on the study of Calcutta by Berry and Rees
(1969). In fact, it was the first ever attempt to study residential structure of an Indian
city using factorial ecology approach. In this study, 37 variables relating to family
structure, literacy, type of employment, housing characteristics and land-use for 80 census wards of Calcutta were taken for analysis. Among the factors observed was a combination of social class and family status variables rather than showing distinct dimensions. In descending order of importance, the factors they have uncovered are as follows: Land-use and familism, Bengali commercial area, non-Bengali commercial caste, substantial residential areas, literacy, Muslim concentration and special land-use factors.

Berry and Spodek (1971) studied the factorial ecology of six large Indian cities. From these cities, they extracted 4 to 9 factors in which the socio-economic status factor was usually presented as the most important factor. They also extracted familism factor and communal or caste factor wherever data were available. They considered that the three factors were the general properties of India’s urban ecology. From their analysis of maps of factor scores, they also found out that the dominant spatial pattern in India’s large cities is the presence of high status neighbourhoods in central area and the low status neighbourhoods in the periphery.

Brush (1971) studied the factor-ecologic structure of Bombay (present Mumbai). He extracted five factors. The study also revealed that the spatial structure of Bombay proper is predominantly zonal but unlike the Burgess Model, the residential around the city centre attracts upper-class population.

Prakasa Rao and Tewari (1986) studied the factorial ecology of Bangalore using principal component analysis. They took twenty variables and they extracted four components viz. socio-economic status, religion-based segregation, congestion and household character. They grouped the component scores into high, high-medium, low medium and low groups and mapped accordingly to examine the spatial
patterns of the dimension of ecological structure. They found out that the middle-class occupied the city centre while the high status and low status groups occupied the periphery.

In his study of social areas in Beijing, Sit (1999) employed principal component analysis to reduce 89 variables belonging to housing, socio-economic and family status to generate seven components or factors. The principal components are labeled as Inner-city slum, Post-1949 suburban and cultural environment, immigration communities, suburban farming, professionals, modern housing and high rent and elitist environment. Then, he identified eight social areas of Beijing with the help of Ward’s clustering method.

In his study of the factorial ecology of Tokyo special district, Takano (1979) extracted six significant factors out of seven variables from 124 census blocks. In those six factors, the two highest rank factors are the ‘social rank factor’ and the ‘urbanization factor’. Those two factors have strong influence on the social area differentiation of Tokyo special district. In addition, four lower rank factors suggestive of permanent or non-permanent residents, commuters' traffic facilities, employed or non-employed inhabitants and the slum-like inhabitants complicate the social area differentiation.

Li and Shanmugathan (2007) studied social areas of a small Beppu city in Japan by taking 90 variables for 163 census units with the help of geographical information system (GIS) technique. The research showed that in Japan, age or life stage is the most important factor that determines the socio-spatial division in Beppu city. It was also found out that socio-economic factor was also important while the study did not found any significant influence of ethnic factor.
Dickason and Kalamazoo (1989) studied social areas of Delhi by taking forty variables which were derived from 1971 census of India. With the help of principal component analysis, they have extracted eight principal components that describe nearly 80 per cent of the total variance explained. The first component was termed informal/formal sector while the other components were named modernized white collar, manufactural employment, familism, informal commercialism, personal service worker, Informal entrepreneurship and westernization. Since variables related to ethnicity or religion was not available, the study could not highlight segregation factor.

Kalal (2002) studied the residential pattern of Pune cantonment following the social area analysis via factor analysis. He took 79 variables to study social areas of 125 wards of Pune cantonment. He extracted four factors which explained 72.5 per cent of the total variances. His factors were socio-economic status, ethnic factor, slum factor and Age-structure factor. Then he employed cluster analysis to group wards showing similar socio-economic and demographic characteristics. In total, seven clusters were identified.

In Northeast India, Sarma (1982) analyzed the factorial ecology of Guwahati city, Assam. He took 55 variables from 221 census blocks. With the help of factor analysis, he extracted as many as nineteen components to explain 72 per cent of the total variance. His first factor was socio-economic which explained 11 per cent of the total variance and the spatial pattern of which was essentially sectoral or zonal as found in the city structure of the developed countries. The second and third factors he extracted were social status and index of youthfulness which explained 10.6 per cent and 6.9 per cent of the total variance respectively. On the basis of the first three components, he grouped the city blocks into 6 socio-economic areas viz. 1) high
middle status 2) low middle status 3) lower middle economic, high middle social and younger mixed family status 4) areas of lower economic, socially and younger mixed family status 5) areas of high middle economic, low social and older mixed family status and 6) High middle economic and social and older mixed family status areas.

After the early 1970s, urbanists started to realize that the internal spatial organization of cities could not be explained adequately with the relationships among social class, family status and ethnicity. The introduction of multivariate analysis to reveal the underlying structure of western cities has also been criticized to lead to a “crude Americanocentric generalizations” of the internal socio-spatial structure while undermining the nature of cities in other economies (Maloutus, 2012:8). Moreover, urban ecologists were accused of arbitrarily selecting the cities and variables achieve desired results.

2.2.3 Neoclassical-locational Approach

During the 1960s, neoclassical economics offered another explanation of residential differentiation based on assumption of rational economic behaviour of rental class. Much of this urban land-use theory is based on the work of Alonso (1964) and Muth (1969). As an application of Von Thunen’s agricultural land-use theory, the theory began with a set of simplifying assumptions like monocentric city, featureless plain and linear transportation cost to distance. Individuals are also assumed to be identical in terms of income and preferences and will seek to maximize their unique utility functions with respect to land rents, prices and wages. Under these premises, neo-classical models theorized urban structure as a series of concentric circles, or Von Thünen’s rings, emanating outward from the CBD which is the centre of economic gravity and most accessible area. Then, patterns of land-use are
determined by land value that, in turn, is related to distance from the city centre. Naturally, land value declines outward from the CBD as envisaged by distance-decay theory if not disturbed by factor like quality of land (Alonso, 1960).

From neoclassical economic perspective, residential differentiation occurs since each social class has different bid-curve for different locations. The bid-rent curve is characteristically steep for the poor since they have little money to spend on transportation. Therefore, their ability to bid for the use of the land declines rapidly with distance from the place of employment. The rich group, on the other hand, characteristically has a shallow bid rent curve. When put in competition with each other, the poor group is forced to live in the centre of the city, and the rich group living outside. This means that the poor are forced to live on high rent land (Harvey, 1999). This is because commuting was costly and only the rich could afford to bear transport cost, they preferred to live in the healthier peripheral suburbs (Leontidou, 1990). Therefore, due to ‘flatter’ bid-rent curve of the wealthier ones, there is “a paradox in American cities: the poor live near the center, on expensive land, and the rich on the periphery, on cheap land” (Alonso, 1960:107). Households determine their residential locations based on the trade-off between the costs of commuting and land costs, and residents choose their residential locations in order to maximize utilities. This theory, therefore, is also known as ‘trade off’ theory of residential location since it represents each household as choosing its location by ‘trading off’ housing costs, which tend to fall with distance from the city centre, against transport costs, which tend to increase with distance from the centre (Evans, 1992). However, a number of studies have contrasted the Alonso model. In his study on Kent, Barbolet (1969) has pointed to the groups of lower middle-class home-owners who lived at some 60-80 minutes travelling time from London. Long journeys to work have also been
documented in relation to Negroes in the American city (Berry and Horton, 1970; Harvey, 1972). Data from Reading show that professional, white-collar and blue-collar workers all travel significant distances to their work (Cripps and Cater, 1971).

Monkkonen (2010) in his study of Merida city in Mexico found that high-income groups concentrated in a central zone while low-income groups tend to disperse throughout the peripheral areas. Low-income residential areas exhibit lower density because they are on hillsides, or other areas where high-density development is not possible, or because they are recently settled areas that as yet have not urbanized completely. The paper also shows that levels of segregation of low-income households and ethnic minorities are not high in Mexico compared with those of the United States or Europe.

Neoclassical explanation of urban residential pattern is criticized on the ground that the model is static and is based on an ‘economic man’ assumption and other unrealistic assumptions such as the one that only transport between the residence and the city centre counts. It has also been shown that if some wealthy groups value the time used for transport more than high land consumption, they will prefer central to peripheral belts (Illeris, 2004). Another major shortcoming of the ‘trade-off’ model is the assumption of a monocentric city. Lastly, the model assumes the absence of government interventions which is, however, fairly common and can have profound impact on the distribution of Land-use and land value (Cadwallader, 1985).

2.2.4 Behavioural Approach

The behavioural approach to residential choice was described first by Wolpert in 1965. Unlike neoclassical economic perspective, behavioural approach was rooted
in psychology. The theory claims that individual or household choices do not depend on rationality of human action and maximizing utility function. Instead, it acknowledges that residential segregation should be seen as at least partly a result of individual preferences, perceptions and decisions. Residential choice and decision making may be more influenced by the satisfying behaviour of individuals. Therefore, choice of residential location may be determined by household’s characteristics including individual’s position and events in the family life cycle rather than the trade-off between housing cost and location. Moreover, an individual’s perception, memories and experiences of places may be a guiding factor in residential choice.

According to Wolpert (1965), the behavioural approach analyzed a person’s residential preference and housing location with the help of place utility and threshold. It may be noted that place utility is simply a level of satisfaction with the place where one lives and is derived from the perceived levels of salient residential attributes in a particular neighbourhood or residential area. Behaviouralists seek to understand residential choice and pattern of residential location through the windows of individuals - their thoughts, knowledge, and decisions. They argued that individual behavior - their choice and preferences, has not been conditioned by economic factors alone, but may vary depending upon the family life cycle (Harman, 1975), satisfaction levels on present location, natural events. Residential stress, which describes the perceived disparity between present and desired residential conditions, may also form an important factor (Clark and Cadwallader, 1973; Brummel, 1981) although this may happen only when a certain threshold is reached (Van Kempen and Murie, 2009).

Van Kempen (2002) has given a special form of behavioural approach - ethnic cultural approach. Unlike the general behavioural approach which focuses on housing market, the ethnic cultural approach argues that housing conditions and residential
patterns differ between groups, and these differences can be attributed to cultural or racial differences between these groups (van Kempen, 2002; Logan et al., 2002). In some cases, immigrants may possess the socio-economic and cultural means to integrate residentially with the host society, but may instead prefer to live amongst their own countrymen in immigrant enclaves.

The significance of ethnic-cultural approach is that processes of residential differentiation in the form of ethnic segregation have been driven by non-economic or non-market forces. As such, the residential pattern predicted by neoclassical model would not be applicable as residential choice is not influenced by income through location and distance. Contrarily, the main reasons of ethnic concentration are purely socio-cultural or political as the spatial segregation of different ‘communities’ helps to minimize conflict between social groups while facilitating a greater degree of social control and endowing specific social groups with a more cohesive political voice. Another important reason for the residential clustering of social groups is the desire of its members to preserve their own group identity or lifestyle (Knox and Pinch, 2010).

Johnston, Poulsen and Forrest (2006) analyzed ethnic residential pattern in Auckland, New Zealand using threshold method. Data were taken from 7100 census blocks in the city enabling them to have a detail study. They have identified 24 separate ethnic identities with other. They have found out that the Polynesian ethnic group was the most concentrated group while the European descendents lived in areas dominated by other groups. On the other hand, the New Zealand Europeans were concentrated as majority of them were found in areas they dominated and do not intermixed with either Polynesians or Asians.
Pacione (1996) studied Vienna where ethnic segregation was a relatively minor factor of social differentiation in the West European city. Data on the numbers and ethnic origins of residents in each of the 245 city wards were extracted from the 1991 census. He found out that districts with high levels of foreign residents tend to be in the inner suburbs around the urban core. He explained that such residential differentiation arises due to a combination of choice like a desire or mutual support and cultural contacts as well as constraint factors including lack of capital resources and eligibility for council housing which result in some areas being favoured by immigrant group.

Massey et al. (1987) however found out that black in American cities attempted to improve their social rank through entry into more improved neighbourhoods of predominantly white population. They also find that very few blacks are successful in their attempt to ‘spatially assimilated’ into relatively poorer white neighbourhoods due to racial prejudice. This may be related to the observation that once blacks enter neighborhoods in significant numbers, the areas cease to be attractive to potential white settlers (Duncan and Duncan, 1957; Taeuber and Taeuber, 1965; Aldrich 1975).

In a study of Miami, it was found that low, middle, and upper-class blacks tend to live among other blacks, regardless of their socioeconomic standing (Boswell and Cruz-Báez, 1997:481). In Buffalo, New York, Trudeau (2006) found that low-income African Americans have lived in persistent segregation due to the spatial rootedness brought about by living in areas with existing social networks. This study implied that ethnic residential segregation can function as a survival strategy that utilizes social support to overcome shallow economic resources. In his study on Atlanta, Zhang (1998) identified that the most established Asian group, the Chinese,
are the most integrated residentially while the more recent arriving Vietnamese are the most segregated. In a significant study on Irish residential pattern in Luton, Britain, Walter (1986) found out that residential clustering of Irish-born people in Luton arose as a by-product of distinctive cultural background.

The positivist approaches like behavioural and neoclassical approaches, however, have been criticized for paying too little attention to the constraints people faced in a housing system that embraced different tenures with different means of access to the market (Murie, Niner and Watson, 1976). It may also be noted that in comparison to classical models like urban morphology and social area analysis, neoclassical models and behavioural approaches are less followed with respect to analysis of urban residential pattern.

2.2.5 Marxist Approach

By the early 1970s, works on residential structure of cities through factorial and social area analyses of different cities in an attempt to link and test the traditional concentric and the sectoral models of urban structure declined considerably. It was realized that the ‘game of hunt of the Chicago model’ (Robson, 1969) had run into an explanatory cul-de-sac, with rapidly decreasing returns to effort and a general theoretical approach to the study of urban residential structure linked to changes in class structure and other factors was needed (Hamnett, 2009). Moreover, they, along with the neoclassical bid-rent theory and behavioural approach failed to take into account the role of institutions and underlying factors responsible for class formation which is one of the most important factors of residential differentiation. Due to lack of philosophical underpinnings, Harvey, a well-known Marxist geographer has called for a new theoretical position which centres on “specifying the necessary relationships
between social structure in general and residential differentiation in particular” (Harvey, 1975:5). Thus, a new Structural-marxist perspective on urban socio-spatial differentiation has been developed to explain the process of urban differentiation and inequality in western capitalist cities (Harvey, 1973; Harvey and Chatterjee, 1974).

Therefore, the arrival of Marxist geography with the publication of David Harvey’s Social Justice and the City (1973) resulted into the shifting away from the study of residential patterns per se, and a concern with household choice and preference as the explanatory variables, towards a concern with the underlying economic and social processes which structured the nature of the urban housing market and, in combination with the existing class and ethnic structure, produced residential patterns (Hamnett, 2009). According to Harvey (2001:384) “Divisions such as those between cities and suburbs…are actively produced through the differentiating power of capital accumulation and market structures”. Thus, the production and reproduction of residential differentiation in urban space may be understood from the unequal distribution of resources in capitalist society. Such a model naturally stands on the concept of a free housing market and does not take into consideration the intervention of the state and the existence of a social system (Sibley, 1981). From Marxist perspective, capitalists seek profits by investing in property in the city, where it provides the maximum returns (Harvey, 1973; Gottdiener, 1985). There are two common ways to attain maximum profits - opening up of unused land at low cost and redevelopment of valuable land (Fong and Shibuya, 2000).

Criticizing the earlier explanations of residential differentiation like the deterministic classical ecological models and positivistic approaches like neoclassical and behavioral approaches, Harvey (1985) considered residential differentiation as a product of resource constraints in housing arising out from the wider structural forces
within the economy and society and he argued that the preferences, choices and value systems of individuals are produced by forces external to the individual's will. From his studies on Baltimore, he concluded that financial and governmental institutions play an active role in shaping residential differentiation through housing market rather than social ecological processes, consumer preferences and utility-maximizing behaviours. Housing market has been controlled by land-owning investors seeking to obtain positive profits from selling of land. He attributed the active role of the landowners as an outcome of the support of financial and governmental institutions. Thus, the ‘flight to the suburbs’ of the housing seeking middle class takes place when they were subjected to ‘blow-out’ from the inner city which has been characterized by inflow of low-income population and a rapid decline in basic services and amenities.

It may however, be worthwhile to mention that while Marxists reject the ecologists’ treatment of “geometric properties of spatial patterns as fundamental”, they acknowledge the opposite danger of seeing “spatial organization as a mere reflection of the processes of accumulation and class reproduction” (Harvey, 1982: 374).

2.2.6 Vertical Differentiation

Vertical social differentiation, also called ‘vertical segregation’ by White (1984) is an axial analogy of horizontal differentiation of residential pattern. The term refers mainly to the process of social differentiation along vertical space through differential occupation of building floors by different socio-economic classes. Vertical differentiation has received much less attention than horizontal social differentiation in urban geography mainly due to the development of urban geography in the Anglo-American context where it has been rather unimportant (Maloutas and Karadimitriou,
The early models of urban structure like human ecology, social area analysis and factorial ecologies concentrated on horizontal structure only and neglected the vertical dimension. The only textbooks of urban geography that deal with vertical social differentiation are White (1984) and Leontidou (1990). Other literatures on vertical social differentiation can be found in Laquerbe (1967), Dopp (1968) and Maloutas and Karadimitriou (2001). All these papers deal with the Mediterranean cities.

Leontidou (1990) reported that vertical differentiation of urban functions (as well as social classes) is common throughout Mediterranean cities while single land-use zoning is rare meaning that a significant proportion of urban land serves multiple purposes. Many buildings have commercial, administrative or industrial uses at ground level and residences in their upper storeys. She explained that the intermixture of social classes, of residence with economic activity well as the inverse-Burgess spatial pattern in Mediterranean cities, is both a cause and an effect of the proximity of workplace and residence along with the proliferation of multi-storey apartment buildings which in turn may be attributed to “rising prices of land and construction, which rendered the single-family house inaccessible even to the middle classes” (Lichtenberger, 1976:90).

In his study on Naples in Italy, Allum (1973) has reported that the ground floors of the residential buildings were the famous bassi in which the poorer families live. The upper floors of the same buildings were inhabited by the upper classes. This cohabitation, according to him, ‘accounts for the ideological unity of all social groups’.
Laquerbe (1967) took 20 per cent sample of buildings in central Montpellier, France. He found out that in buildings that were entirely in residential use, almost all ground-floor flats were occupied by the lower class or the proletarian class. The proletarian class, however, occupied only 85 per cent of the 3rd floor and above. He also found out that vertical differentiation was the strongest in the old city-centre where there was the highest representation of the richer bourgeois population.

2.3 Literatures on Quality of Life

Analysis of quality of life (QOL) is an outcome of the ‘Social Indicators Movement’ which originated from the United States of America. The social indicator movement has had its origins in the then American president Edgar Hoover’s Presidency’s Committee on Social Trends in the USA and its report Recent Trends in the United States in 1933 (Land, 1975). Coincidentally, much of the work was done by another Chicago school of sociologists under the chairmanship of William Ogburn. But, as pointed out by Smith (1973), the movement really took off between 1959 and 1966 with the publications HEW Indicators and HEW Trends by the US Department of Health, Education and Welfare (HEW). These reports were followed by a study on the impact and side effects of American space program on the society under the directorship of Raymond Bauer (Bauer, 1966). The study revealed that there was almost a complete lack not only of adequate data but also of concepts and appropriate methodologies for this purpose (Noll, 2002). In 1969, there was also the publication of the landmark report Toward a Social Report by the HEW (USDHEW, 1969), which was an attempt to produce a social equivalent of the annual Economic Reports. Another important work which deserves mentioning was Drewnoski (1970). A number of studies have followed these early works from different disciplines. Since it would be impractical to review all the previous studies, it is attempted here to review
those QOL studies carried out by geographers and scholars from other disciplines who have carried out studies relevant to the present work.

### 2.3.1 Quality of Life in Developed Cities

In his well-known book *Human Geography: A Welfare Approach*, Smith (1973) studied the geography of social well-being in the United States and proposed seven ‘general criteria’ of social well-being relevant to the United States which are decomposed into 47 variables. His general criteria include income, wealth and employment, living environment, health, education, social order, social belonging, recreation and leisure. He extracted three principal components. The first of these explained 38.56 per cent of the variance; the second, 13.74 per cent; the third, 11.98 per cent. Smith has called the first two components as general socio-economic well-being and social pathology. He found difficulty in labeling the third component. The analysis produced clear inter-state variations in general social well-being. The southern eastern region forming the old cotton belt performed lower while the manufacturing belt of northeast region was performing relatively better. On the other hand, the social pathology pattern did not conform to the general social well-being.

In another study, Smith and Gray (1972) studied Tampa Bay, Florida, to make an attempt to develop indicators of social well-being. The study was very similar to the inter-state analysis done by Smith (1973), although there were some changes in indicators. Following the same methodology, the result of the study shows that the inner city adjacent to the central business district (CBD) shows relatively low level of social well-being.

Bederman (1974) developed an index to measure quality of life in Atlanta, Georgia. The indicators choosen were roughly similar to the above study of Smith and Gray (1972). Five criteria including health factor, public order factor, housing quality
factor, socio-economic factor and density factor were identified and eleven variables were chosen to measure them. The analysis identified distinct, relatively homogenous zones bearing resemblance to the sector model of urban land-use. Similar results emerged from quality of life studies in Gainesville, Florida (Dickinson, Gray and Smith, 1972) which reveal sharp zonal and sectoral polarized city.

Johnston (1975) discussed the spatial pattern of inequality in quality of life and social well-being in New Zealand. He correlated the spatial inequality found in the country with the settlement pattern. He concluded that the residents of the largest cities are the most advantaged and that those in the smaller towns and the remote rural areas suffer the greatest relative deprivation. He also considered two components of spatial variable viz. division of an area into territories and accessibility were important determinants of levels of social well-being within New Zealand.

Knox and Scarth (1977) selected 41 objective variables to express the quality of life in 95 départements or regions of French. An index was derived from the calculated Z-Score. They also employed cluster analysis and multiple discriminant analysis to classify the whole regions into 9 groups. They found out that the quality of life in France varied markedly from region to region. Then the variables are grouped into clusters at the level of the départements a more sensitive pattern emerges which does not fit very clearly into any previously acknowledged regional distribution like physical regions of French or French planning regions.

Knox and MacLaran (1978) studied geography of social well-being in Dundee by taking 50 variables relating to health, housing, employment opportunities, education, personal security, income and consumption, leisure, social and political participation, access to amenities, environmental quality and social stability.
Liu (1976) employed 132 variables related to economic, political, environmental, health, education and social conditions to rank 243 United States metropolitan cities. In his study, he found out that the majority of large Standard Metropolitan Statistical Areas (SMSAs) with high quality of life were in the West, with substandard metropolitan areas concentrated in the south and north-east.

In their study of spatial patterns of QOL in the highlands of Scotland, Knox and Cottam (1981) have taken a number of data to measure both objective and subjective QOL. They have used an eleven-point equal-interval scale from ‘not at all satisfied’ (0) and ‘very satisfied’ (10) to gauge people's satisfaction with seven key domains of life including job, home, health services, district, primary education, secondary education, public transport, with various 'sub-domains' and with their subject’s lives as a whole. They have found out that people's levels of satisfaction were relatively high: about 8.5 out of 10 for most domains of life. People were particularly dissatisfied with those aspects of life for which public institutions and authorities are responsible, in contrast to more personal and self-determined aspects of well-being.

Pacione (1987) studied the socio-spatial inequality in southern Italian city of Naples by selecting a range of objective indicators to measure a variety of housing, economic, social and demographic aspects of life in the city by using principal component analysis and found out that there was a marked distinction between the inner- and outer-city.

In another study, Pacione (1998) has taken 54 variables to measure the social, economic and demographic characteristics of each of 122 neighbourhood districts that constitute the commune of Rome to provide insight into the basic socio-spatial
structure of the city region. By using principal component analysis, he analyzed the social geography of Rome and identified 7 clusters of social areas.

MacLaren (1981) studied QOL of Dundee by taking both objective and subjective social indicators. He took 50 objective indicators from various quality of life domains like health, housing, employment, education, personal security, consumption, family and neighbourhood stability, leisure, quality of neighbourhood environment, access to urban amenities and participation in the democratic system. For subjective well-being, the respondents were asked to measure their levels of satisfaction on their living conditions within 0 - 10 point likert-scale. He found out that inner-city areas are relatively poor in housing, environmental quality and finance-consumption. On the other hand, suburbs and public housing estates in the periphery were showing more adequate levels. Significantly, a comparison between mean objective and subjective indicator scores revealed positive correlations for all domains apart from education.

In his analysis on supra-national variations in well-being in Europe, Illbery (1984) has taken 27 objective variables to represent of seven major constituents of social well-being: demographic structure, housing, health, education, economic growth, material well-being, and leisure and recreation. Firstly, he employed correlation analysis to examine the degree of relationship between the variables. Then, principal component analysis was done to calculate a composite index of social well-being for each country. Lastly, cluster analysis was employed to produce a classification of countries on the basis of the major dimensions of social well-being derived from the principal components analysis. The study demonstrated clear core-periphery contrasts in social well-being. Interestingly, the results of the study imply
that macro-variations in social well-being are reflective of inequalities in economic development.

Hemmasi (1995) selected 21 objective variables for his studies on QOL in North Dakota to assess spatial and temporal variations in quality of life in the 53 North Dakota counties from 1980 to 1990; and second, to explore relationships between quality of life indicators and migration rates for these counties. Using principal component analysis, he produced three basic quality of life dimensions for North Dakota counties including affluence, suffering, and demography.

Guhathakurta and Cao (2011) have selected six dimensions to study variation by place or community in the QOL of Greater Phoenix’s residents. The dimensions include education, economy, income, and jobs, public safety, housing, transportation and mobility, and public health. Then, 28 towns within the study area were ranked on the basis of their score in indicators belonging to each dimension. Variable weights were assigned to each dimension. Their result shows that the exclusive, small, and mostly residential communities as well as the outer suburbs were the top ranked while the older and larger cities were in the lower half of the list. The study also found that the wealthy, exclusive, and small communities provide the highest QOL for its residents. But larger and more diverse cities also provide a relatively high QOL. Thus, size or age of communities does not significantly determine the level of residents’ well-being.

Kweon and Marans (2011) investigated subjective QOL in Detroit Metropolitan area at multiple geographical scales. They classified the metropolitan area into various types of settlements like urban core, larger cities, mid-size cities, older suburbs, new suburbs, small towns and rural settlements. From the mean
satisfaction scores on a 7-point and 5-point Likert scales for each type of place in Detroit, they found that people tended to be satisfied with their lives. However, people living in the larger places were less satisfied, while those living in the suburbs (older and newer), small towns, and rural areas were more satisfied. The satisfaction level in urban core was significantly lower than satisfaction levels in the old and new suburbs, small towns, and rural areas.

2.3.2 Quality of Life in Developing Cities

In his study on quality of life in Kwara state in Nigeria, Oyebanji (1982) first tried to develop territorial social indicators by selecting 31 objective variables under different dimensions including prosperity, environment, education, health and social disorder. Following Smith (1973), he employed standard score or Z-score method to compute the composite index of each dimension. Then, he transformed again the composite scores to compute the overall index or general social well-being for each region within the Kwara state. Finally, with the help of choropleth map, the author has shown high and low QOL regions.

Omuta (1988) investigated spatial variation in quality of life in Benin city, Nigeria. He adopted stratified random aligned traverse sampling method to select a sample of 1410 households from twenty one neighbourhoods in Benin. To assess the overall objective quality of life, five broad dimensions of quality of life including employment dimension, housing dimension, amenity dimension, educational dimension, nuisance dimension and socio-economic dimension are used. Each dimension comprises two or three variables. He also studied percieved or subjective quality of life for each dimension. On the basis of differences in quality of life, he was able to divide the whole city into three zones for planning purpose.
Rossouw and Naude (2008) undertook a study on temporal change in objective indicators of non-economic QOL for 354 sub-national magisterial districts in South Africa using principal components method to derive three indices. They found out that though income does matter for the overall QOL, non-income components of the QOL can make an important difference. They also found out that some of the relative income poor areas have improved their non-economic ranking during the study period. They also found out that the environmental QOL in South Africa is better in non-urban areas.

Tesfazghi, Martinez and Verplanke (2010) studied QOL at Kirkos sub-city of Addis Ababa, Ethiopia based on primary household survey and secondary data. They took data from a sample of 607 households from 11 Kebeles or neighbourhood administrative units through a stratified and systematic sampling method. Geographical information system (GIS) was used to derive proximity variables which were nearest distance to school and health facilities. Subjective quality of life was measured using a six point Likert scale that ranges from one for completely dissatisfied to six for completely satisfied. Coefficient of variation (CV) is applied to study the variability of the subjective QOL at Kebele level while factor analysis was applied to identify the dimensions of objective QOL in the sub-city. The QOL dimensions identified are crowdedness, socio-economic status, safety and proximity, housing and demographic dimensions. They found out that there is large variation between the QOL of the respondents in the sub-city.

Mridha and Moore (2011) examined the life experiences and satisfaction of residents on housing and neighbourhood environment in Dhaka, Bangladesh. They selected six different areas in Dhaka. After analyzing a sample of 204, principal component analysis was employed to extract six components of residential
satisfaction. They are management and maintenance, architectural features, neighbourhood, neighbours, recreation facilities and ambient environment. The authors concluded that the factors clearly indicate the importance of the socio-physical neighborhood environment as a major contributor to residential satisfaction in Dhaka. They also found out that the overall socio-physical features of the neighborhood and community influence life satisfaction more than the physical features of the individual dwellings.

Malekhosseini and Joodaki (2011) collected both objective and subjective primary data to study QOL in various localities of Noorabad city, Iran. Number of samples by using Kokran formula and with regard to time and finance restrictions of research was determined. With regard to gathering information from about 25 households in each locality, number of understudying households is 307 out of total households of more than twelve thousand. Residents were asked about their subjective QOL in various dimensions which they termed ‘Life Territories’ like housing, urban environment, quality of public services, public service convenience, economic situation and individual QOL. A six-point Likert scale was used for evaluation of rate of satisfaction with life territories. For objective QOL, factor analysis was employed to reduce 23 variables to obtain six dimensions like urban facilities and infrastructures, social activities, housing situation, social relation, social economic situation and health, treatment activities.

Fakhruddin (1991) has taken in-depth analysis of spatial variation in QOL in Lucknow, Uttar Pradesh. The study, claimed to be ‘the first of its kind’ in India analyzed 31 variables for determining quality of urban life. These variables were grouped to indicate material well-being, health and nutritional status, cultural level, housing standards, building standards, territorial stresses and spatial congestion.
Stratified random sampling was adopted to select 5 per cent sample from each *mohalla* or neighbourhood from a total of 1184 *mohallas*. The selected variables were analyzed with the help of factor analysis and three distinct areas from the entire city were derived from the factor scores.

Chandramouli (2003) has taken Census of India 2001 data on housing to assess differences in quality of life among 155 divisions of Chennai city. A composite index was calculated with the help of Z-Score. The composite index does not show any pattern except that the central and western parts of the city have low negative index. The whole city was divided into two categories - high QOL areas and medium QOL areas. The census divisions categorized as medium and high were clustered in the northern, eastern and to an extent in the southern part of the city. Many of the census divisions in the high as well as medium category have a higher proportion of people in the lower and middle-income brackets.

Das (2008) studied QOL in Guwahati. By using purposive sampling for collection of data, she selects 10 per cent of municipal wards out of the total 60 wards. From each ward, 3 per cent of the total households were picked for interview to represent different income groups. In all, samples of 379 households were taken. To measure subjective QOL, 27 variables were taken for analysis apart from 7 objective variables. Principal component analysis was employed to analyse the data and she found out that satisfaction from condition of traffic, satisfaction from level of environmental pollution and satisfaction from availability of parks and greens scored very low where as satisfaction from own economic condition and satisfaction from cost of living are the two highest.
Bardhan, Kurisu and Keisuke (2011) studied the linkages between urban form and QOL in Kolkata. They found that the urban form of Kolkata was highly monocentric. They also argued that the economically weaker populations are pushed away from the city centre that the city centre is losing population showing a trend of gentrification.

Kapuria (2014) estimated the QOL in Delhi, India with the help of Fuzzy sets theory. With the help of factor analysis, she extracted seven factors which were labeled as categories of QOL. She found that the differences in satisfaction on overall QOL and access were primarily influenced by location.

A review of various approaches to study patterns of urban differentiation and concepts and literatures on QOL has indicated the centrality of socio-spatial analysis in urban social geography. Within urban space, society and space interacts in such a manner that urban spaces have been continuously modified through accretion, addition and demotion of spaces and new forms of urban spaces have emerged through the modifications of urban landscapes that, in turn, influence the formation of new urban cultures and vice versa. According to Soja (1980), a two-way process of socio-spatial dialectic continuously operates in cities in such a way that people create and modify urban spaces while at the same time being conditioned in various ways by the spaces in which they live and work. Through the socio-spatial process, “Neighbourhoods and communities are created, maintained and modified; the values, attitudes and behavior of their inhabitants, meanwhile, cannot help but be influenced by their surroundings and by the values, attitudes and behaviour of the people around them” (Knox and Pinch, 2010:5). The present study is also about the outcome of socio-spatial interaction in Aizawl city.