CHAPTER ONE

THEORETICAL AND CONCEPTUAL FRAMEWORK OF RURAL URBAN FRINGE
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INTRODUCTION

Certain attributes of population of the human habitat provide key guideline for a region to be declared as ‘urban’ or ‘rural’. These regions give way to the emergence of mainly two sets of constructs (way of life) that are much talked in settlement geography and economic geography. Urban regions exhibit modern and industrial constructs while rural regions manifest traditional and agricultural constructs. These two sets of constructs are not exclusive features that are only observed in mentioned regions for the civilization travelled the path of industrialization (urban attribute) only after passing through agricultural revolution (rural attribute). Thus emergence of urban areas has brought about the transformation of rural areas. Sociologists treat urbanization as a process of diffusion of certain modernizing traits or characteristics in a population.¹

Thus urbanization, being dynamic in values, transforms the land use pattern of the areas and population attributes in its vicinity and its influence leading the evolution of a transition belt around the city. This transition belt with certain urban as well rural attributes is popularly called urban fringe. Urban fringe has landscape alike legal city and develops at its outskirt. Cities do not grow of themselves; countryside set them up to do the task that must be performed in central places.² Consequently urban fringes are outward growth of cities with dominant functions of production of perishable agricultural products, accommodating daily commuters of city and location of many industrial units.

Urban fringes, therefore, are space into which towns outgrow as a result of ongoing process of dispersion creating an area with
distinctive characteristics of partly assimilating the extending urban complex but still are partly rural and accommodating such population that are economically not belonging to the country side. Two aspects\(^3\) physical and social of urban fringe can be considered:

1. The notion of the fringe as a distinctive physical area or region of the city, primarily designated by characteristics of land-use associations.

2. The notion of the fringe as that area where urbanization impinges on rurality and, therefore, where the processes envisaged by Wirth\(^4\) can best be observed and, indeed, should be in operation. The *rural-urban continuum* should most effectively be studied within the confines of this geographical area.

The brisk pace of urbanization, all over world in general in post-industrialization scenario and in India specifically after independence has attracted the scholars of numerous fields as of urban geography, land economics, city administration, management and planning etc. to study the urban fringe regarding its nature, development, landscape, problems and planning. The extension of urban land-use are most visible along roads in the form of residential areas, industries, retail centres, educational centres, or other urban units that find themselves difficult to grow within cities due to shortage of lands or expansive. These urban units manifest themselves in the form of units of sewage, water works, parks, gardens, golf courses, cantonment areas or graveyard etc.\(^5\)

In the contemporary worlds (modern age), it becomes difficult to distinguish urban or rural life style. The land-use patterns and certain social attributes of a region therefore, play vital role to provide the bases to recognize them. Few decades earlier it was easy to distinguish urban and rural areas as separate entity but now the
diffusion of innovations have been so phenomenal that these are natural similarity among urban rural areas in terms of facilities and occupational structure as a family constitutes both type of people performing urban as well as rural functions. In the Western Europe and North America, the regions surrounding urban areas are so much well versed with urban culture that it is almost difficult to recognize urban or rural set up.6

Urbanization is a dynamic process. All the cities therefore has tendency to grow. E.W. Burgess7 also maintained that as the city grows outwards from the centre so new houses are built on the periphery. New styles in housing manifest at urban fringe and such houses are result of deliberate migration of richer element of city population and they, in consequence, move progressively outward. Structurally they are based on accessibility, the cost of commuting and the costs of land.

Population, settling down at urban fringe with rapid pace and agglomeration of industries, situation of residence of commuters and shops of other urban amenities and better facilities give way for development of urban fringe. Land use pattern, in consequence, is the most transformed landscape in the fringe. Thus making change in the land use a suitable feature to demarcate urban fringe. Although the availability of semi-public institutions like universities, parks, cantonments and parks etc. make the demarcation of urban fringe difficult on the basis of land use change. But these are the characteristics of public institutions that lead to the development of urban fringe making land-use change primary elements of urban fringe demarcation.

ORIGIN AND EVOLUTION OF RURAL URBAN FRINGE

Rural urban fringe is a modern process of rapid urbanization which comes to existence as a consequence of expansion of urban
areas. Evolution of fringe is associated with the process and development of urbanization. In the process of urbanization while the centripetal forces and attractional tendencies keep on interacting in the structure of city, and the centrifugal forces give rise to the evolution of fringe areas. The influence of these forces comes to fore firstly along roadside afterward it spread to nearby rural areas and agricultural lands which later makes a distinct identity of transition area. Increasing population of urban areas play important role to the development of rural-urban fringe.

The process of origin and evolution of fringe areas necessarily gets theoretical base in the ‘Ecological Theory of Sub-urbanization’ of Vinsworrow. The factors of ecological evolution of fringe can be mentioned as follows:

(i) Rural-urban migration,
(ii) Urban invasion,
(iii) Urban precedence,
(iv) Sub-urbanization process,
(v) Urban-oriented tendencies,
(vi) Emergence of rural-urban continuum,
(vii) Intrinsic urban action.

**RURAL URBAN FRINGE : CONCEPTUAL BACKGROUND**

A zone of frontier of discontinuity between city and country in which rural and urban land uses are intermixed and the absence of a clear break between rural and urban condition is a feature of the modern city. The fringe is defined in relation to the city and it exists in the agricultural hinterland where the land use is changing. It lies between the continuously built up area and the urban shadow and ecologically can be viewed as an area of invasion in which population density is increasing rapidly and land uses are rising.

A large number of literatures surfaced during the period from
mid 1940s to the beginning of the 1960s to study the outward growth of the city. This period was basically concerned with the defining features and delimitation of rural-urban fringe.\(^9\) Wissink\(^{10}\) has called fringe on area of ‘great differentiation’ in terms of land-use pattern. The term ‘a geographical no-man’s land’ was used by Golledge\(^{11}\) here two expressions are based on wise variety of uses found in an area which is partly included in urban complex. The outward growth of city is not well defined, advancing circles of rapidly completed development. It outgrows haphazardly, making fast strides at one point and hardly moving at all at another. It is this process which occasions the incoherent land-use pattern which represents fringe. Conzen\(^{12}\) and Whitehand\(^{13}\) have recognized fringe belts as significant determinants of morphology of urban settlement.

The views of fringe, however, for the first time was put forward by Von Thünen in 1928. He presented that a city is surrounded by annular rings of land use. His agricultural belts around city were based on demand. The most important belt is located immediate after city. Jonasson expressed his view regarding European cities in 1925. In his land use theory, he held that the belt immediate after city meets its needs. A number of sociologist- Douglas, Park, Mackenzie and Burgess etc. have presented their views of fringe belt. MacKay in 1928, for the first time in ‘The New Explanation’ expressed that cities are invading on their outer areas and exploiting agricultural lands by building up bungalow, godown, bill boards, filling stations and restaurants etc. He termed it ‘metropolitan invasion’. During the period of 1940s Christaller, Homer Hoyt, Mackenzie and Colby carried significant study about surrounding areas of city. Colby, a sociologist, presented an article in ‘American Geographical Magazine’ and expressed that centripetal and centrifugal forces in urban geography have significant roles to play in fringe areas.
The word ‘Urban Fringe’ was used by T.H. Smith\textsuperscript{14} in 1937 for the first time in geographical literature. He used the world urban fringe for the built-up area of city in the study of population of Louisiana. He noticed specific land-use outside the administrative boundary of city and termed this built-up area ‘urban fringe belt’ with right-tourist camps, filling stations, residential buildings etc. extending along roadsides. Although Gaplin\textsuperscript{15} had used word ‘fringe’ in 1915 as synonyms of city when there is a process of transformation of rural areas into urban areas, in operation.

Salter\textsuperscript{16} in 1940, for the first time classified the fringe belt and defined urban fringe as ‘a mixture of land uses, rural and urban’ and classified it into a series of belts surrounding the city by the analysis of land use characteristics. Such area is full of series of and complex problems and needs proper planning for solution.

After 1940s a number of American geographers concentrated on fringe studies. In studies it was established that Buffalo and New York grew by one percent as city but their suburbs grew up to 33 percent. The urban population of Willington and Charleston, and Carolina decreased while the population of their suburbs increased by 45 and 50 percent consecutively.\textsuperscript{17}

Wehrwein\textsuperscript{18} described the fringe in USA as an ‘institutional deserts’ because of the uncontrolled location there of unpleasant and noxious establishments such as slaughter houses, junkyards and wholesale oil storage, and of utilities such as sewage plants and cemeteries. G.S. Weherwein expressed of three belts in urban fringe-

(i) Less productive belt between agricultural land and pastures,
(ii) Cut-overs belt between forests and farms,
(iii) Suburb belt between forms and city.

As the third belt vividly invades agricultural land, Dr. R.L. Singh termed it as ‘urban erosion’. G.S. Wehrwein said ‘On the outer border
of the city, between the areas of rural and urban land use, there is an intermediate zone which shares the characteristics of each. This fringe is invaded by urban uses…….’

**R.B. Andrews (1942)**\(^{19}\) established difference between urban fringe and rural-urban fringe. He pointed out that urban fringe is completely built-up area and active extensive area while rural-urban fringe emerges after circumference of urban fringe. Rural-urban fringe is expanded at the outer boundary of economic city. It is mixed area with urban and rural land use. R.C. Klow (1942) also studied problems of suburb areas.

**Chauncy D. Harris (1943)**\(^{20}\) termed fringe areas as ‘climax area’ in his article ‘Suburbs’. On the basis of population related to a metropolitan, he prepared a map and found that 60 percent of the population resides is suburbs He opined that there are small urban or semi-urban areas within transition belt of urban fringe and they are suburbs. He divided suburbs into six categories:

(i) Industrial fringe suburbs,
(ii) Industrial suburbs,
(iii) Industrial suburbs more important mixed areas,
(iv) Residential suburbs more important mixed areas,
(v) Might residence suburbs,
(vi) Mining and industrial suburbs.

**H.H. Balk (1945)**\(^{21}\) used urbanization for the development of fringe areas.

**W.I. Fiery (1946)**\(^{22}\) recognized that the accessibility of the areas at the outskirt of city induce the phenomenon of fringe areas. He mentioned that the land at the boundary of the city are used as fringe not because of their geographical location, soil or any other factor but the accessibility and the development of road network makes it suitable to be used as fringe. Fiery has also brought out
simplicity between the rural-urban fringe and the edge of the central business district of the city (Fig. 1.1). Both are marginal areas between two types of land use, agriculture and residences in the rural-urban fringe, and business and residences at the edge of the central business district. This marginality, he says, is based on accessibility to some central transportation point. So, there is tendency for slum condition to occur in there areas.

![Diagram](image)

**Fig. 1.1 : Amount of Social Utility Yielded by Specified Land Uses at Varying Degrees of Accessibility to a Population Centre:**

- AA'=Agriculturally used land
- RR'=Residentially used land
- CC'=Commercially used land

(After Walter Firey, "Ecological Consideration in Planning for Rurban Fringes," American Sociological Review vol. 11, 1946, p. 411, Fig. 1.)

**Rodehaver** in 1946 in a study of Madison and Wisconsin, identified the strong pull on urban migrants to a central city for work, shopping, church-going and social activities. Urban fringe, he says, is a transition zone between urban land use and agricultural land use. He, in his study *The Fringe as a two directional movement*, said that there is movement of population form two directions in the fringe area. Rural population moves towards city for education and employment while urban population moves towards rural areas to meet their need of residence. Making a landscape of
mixed land uses (urban and rural) to develop.

**Roterus and Hughes (1948)** presented the sequence of development of rural urban fringe bared on the observation area around Flint and Michigan.

**Richard Dewey (1948)** stated fringe area as mix landscape of agricultural and urban life style related land uses. Urban population fed up to pollution and busy atmosphere escapes city longing for wider residential areas, land, clean environment and better social cemeteries prefers to migrate to peripheral regions.

**Myers and Beagle** studied fringe of Detroit and termed it ‘true and partial fringe’. They worked out a method based on only one factor, the concentration of non-village-rural nonfarm (NV=RNF) population. They used 36-square mile township.

**Blizzard and Anderson (1952)** have attempted a more specified definition, and according to them, ‘rural urban fringe is that area of mixed urban and rural land uses between the points where full city services cease to be available and the point where agricultural land uses, predominate’. On the basis of these characteristics, they determined the inner (city ward) and outer (rural) boundaries of the rural-urban fringe.

**Martin (1952)** found in his studies conducted in Eugene and Oregon, that people of the fringe considered themselves urbanites. He based his study on the urban land uses and intensive agricultural practices and residential areas.

**Mc Kain and Burnight (1953)** have classified fringe into limited fringe and wide fringe. Immediate after city lies the limited fringe and afterward lies the wide fringe.

**Mayer and Kohn** studied the suburbs of Chicago and classified them into two types of suburbs with differential growth
rates which included old municipalities with 35 percent growth rate and industrial municipalities with higher growth rate being used as night staying buildings.

**Duncan and Reiss (1956)**[^31] studied fringe belt of Chicago and established differences among urban fringe, rural non-farm and rural form. He used 'urban fringe' for the population suburb outside of city. He included urban fringe into city region.

**Kurtz and Eicher (1958)**[^32] used the word ‘rural urban fringe’ for fringe areas and declared it a transition zone with mixed land use with rural and urban characteristics.

**Golledge, R.G. (1960)**[^33] studied Sydney Metropolitan and observed the wide variety of uses is on area which has been only partly brought into the urban complex and termed it ‘a geographical no man’s land’. He, discussing the reasons for development of urban fringe, said ‘The nature and structure of urban fringe are determined by influence of rural and urban interaction on land uses’.

**Conzen (1960)**[^34] has accepted the fringe belt as an important determinant of urban morphology. It is associated not only with metropolitan growth but also reflects the temporal impact of earlier fringe advancing with urban front.

**Russwurm (1960)** has called the discontinuous marginal land between city and village as fringe. He says, the transitional land use area after corporate limit of city, that is not yet claimed by city but outer built up area with less density than city but more than that of rural area and engaged in non-agricultural works in higher proportion, is fringe belt. He surveyed Ontario in London and studied the non-farm activities of landlords’ farmers per 200 acre of land.

**Wissink (1962)**[^35] has called fringe an area of ‘great differentiation’ in land use terms which reflects the variety of land

[^31]: Duncan and Reiss (1956)
[^32]: Kurtz and Eicher (1958)
[^33]: Golledge, R.G. (1960)
[^34]: Conzen (1960)
[^35]: Russwurm (1960)
uses found in fringe areas.

Lewis Keeble (1964)\textsuperscript{36} has defined the urban fringe as ‘the land surrounding the town which is not considered as a part of it but whose use is influenced directly by the town’.

Gibbs observed variety of functions performed in the fringe to be more than that of urban or rural areas individually because rural and urban, both the functions are practiced collectively.

Pastaland (1966)\textsuperscript{37} concluded that fringe area is such a belt where the rural land uses direct the urban land uses.

Whitehand (1967)\textsuperscript{38} has described the fringe a ‘heterogeneous region’ due to the differences in the definition of fringe. The fringe does not constitute any definite set of elements but is dictated by the reality of the landscape. Their integrity is ensured by their constituents that are emerged of morphological elements which were located near built up area of the fringe. He proposed three belts of urban fringe:

1. Lower Fringe Belt,
2. Middle Fringe Belt,
3. Outer Fringe Belt.

K.V. Sundaram (1968)\textsuperscript{39} established difference between satellite towns and urban fringe. He kept the fringe area as the third part of city and according to him, its boundary is determined on the basis of agricultural land and unused urban and rural land.

Pryor (1968)\textsuperscript{40} studied the fringe area of Melbourne and divided it into rural fringe and urban fringe.

Carter (1972)\textsuperscript{41} has asserted the process of dispersion to be responsible for the emergence of fringe area in which the extension of urban land leads to the development of urban fringe.

R.L. Singh has expressed the urban fringe to be urban
erosion. Om Prakash said it to be Peri Urban area and accepted it such a circumferential belt compared to an island with its bordering beach which gradually vanishes into sea.

**K.N. Gopi (1978)** says, the trend of fringe-development has been characterized by different secondary causes or impulses. The main cause or impulse, however, has been the same, viz. rapid growth of the core city.

**R. Ramachandran (1989)** says, the rural-urban fringe is an area of mixed rural and urban populations and land uses, which begins at the point where agricultural land uses appear near the city and extends upto the point where villages have distinct urban land uses or where some persons, at least, from the village community commute to the city daily for work or other purposes.

**Manju Pandey (2005)** in her thesis has assumed the urban fringe as the probable development area in present and future.

Thus it can be conducted that the urban fringe are landscape with mixed land uses and semi urban and rural social life.

**CHARACTERISTICS OF RURAL URBAN FRINGE**

The peripheral areas around cities showing remarkable changes in physical and morphological as well as in economic and cultural terms giving emergence to a transition belt with mixed land uses of rural and urban features, are termed as rural-urban fringe. The rural-urban fringe exhibit a set of characteristics owing to the physical and morphological nature and structure of city they are contiguous with. Definitions of rural-urban fringe as envisaged by a number of authors also incorporate a number of important features. The rural-urban fringe neither exhibits a complete set of urban characteristic nor any of rural but incorporates rural as well as urban features in its landscape.
Wehrwein (1942)\textsuperscript{45} described the fringe in USA and listed its features as slaughter houses, junkyards and whole sale oil storage and of utilities such as sewage plants and cemeteries.

Walter Firey (1946)\textsuperscript{46} has listed the characteristics of urban fringe as follows:

(1) It invades the productive land.

(2) There are unequal distributions of plots of lands and factories or residences scattered randomly.

(3) It needs heavy taxes to be paid for the settlement to meet the amenities but the factories and shops do not have the adequate capabilities.

(4) The new buildings occupy the most of the landscape hiking the price of lands and discouraging the agricultural practices.

(5) There is change in demography. Landlords reside in the area. Youths and children dominate the population. Population heavily depends on the city. People devote their spare time in gardening and agriculture.

Golledge\textsuperscript{47}, in a study of Sydney presented seven characteristics-

(1) There is constantly changing pattern of land occupancy.

(2) Farms are small.

(3) Crop production is intensive.

(4) The population is mobile and of low or moderate density.

(5) Residential expansion is rapid.

(6) The provision of services and public utilities is incomplete.

(7) Speculative building is common.

These conditions reflect the nature of the fringe as already outlined and represent the push into rural surrounds of young, mobile middle class populations and attempts by speculative
builders to provide for them at a rate which, in some cases, outreaches the input of services and utilities. The additional features those Golledge includes are farm size and crop production, presumably related to urban demand.\textsuperscript{48}

\textbf{R.E. Pahl (1956)}\textsuperscript{49} has also attempted to summarize the characteristics of the fringe and his four headings take in many of the characteristics proposed by Golledge.

\textbf{(i) Segregation}: The ability to pay for the new housing of the fringe results in a pattern of segregation appearing. A characteristic variety of settlement form is accompanied by segregation of population by ‘class’. To such an extent it developed that many parts of the fringe become status symbols in a residential context, they are the places in which to live.

\textbf{(ii) Selective Immigration}: Pahl says, the rural-urban fringes will attract in particulars ‘mobile middle class commuters who ten to live and work in distinct and separate social and economic worlds from the established population’. Those who come to live in the fringe constitute a small section of the whole urban community and they tend to retain their orientation towards the city. Many studies have demonstrated a pattern of linkages that is unrelated to the fringe itself. \textit{Kurtz} and \textit{Smith}\textsuperscript{50} in a study of Lansing Michigan, concluded that the urban migrants of the fringe returned to the city, even to the areas of previous residence for social activities.

\textbf{(iii) Commuting}: People go to city for work and get back for night staying.

\textbf{(iv) The Collapse of Geographical and Social Hierarchies}: This is one of the most interesting of Pahl’s conclusions and advances it the concept of a distinctive fringe. With the populations partly directed towards other parts of the city for certain services, then

(26)
the service content of fringe settlements becomes modified. They do not need to carry an array of goods and services commensurate with the population they serve, but can become specialized in particular directions. Instead of rounded bundles of functions at particular hierarchical levels collected at appropriate nodes, the various functions are being dispersed in several nodes in specialized or segregated bundles, the whole process being precipitated by the mobility of the population. The segregation of incoming groups, with their links back to the city, reflects on the traditional social hierarchies of the rural areas.

Pahl summarizes the above points by maintaining that ‘a new population is invading local communities, bringing in national values are class consciousness at the same time that a new type of community, associated with dispersed living is emerging’.

Thus there are different views regarding features of rural-urban fringe. One view expresses the rural-urban fringe to be of static features, a mix of land-uses brought about by the incomplete extension of the city as well as the demands which it makes on its marginal areas. The other view manifests the fringe as exhibiting distinction in the nature of the communities which occupy it, brought about by the migration of mobile, middle class families orientated to the city and dominated by life styles.

**Pryor (1968)** suggested different set of characteristics of rural-urban fringe, the zone of transition in land use, social and demographic characteristics.

(i) The continuously built up urban and sub-urban areas of the central city,

(ii) The rural hinterland.
The characteristics of these two distinct belts can be summarized as follows:

(i) Almost complete absence of non farm dwellings,
(ii) Uncoordinated zoning or planning regulations,
(iii) Areal extension beyond although contiguous with political boundary of the central city,
(iv) An actual and potential increase in population density, with current density above those surrounding rural areas but lower than that of the central city.
(v) An incomplete range and penetration of urban utility services.

Giggs (1979) in a study of Nottingham showed that there are basic differences between north and west which was built up and industrialized in the nineteenth century; and South and East which is still underdeveloped and can be considered part of the fringe. A cluster analysis of 78 parishes using 15 variables was carried out, the variables representing population growth, age structure, housing characteristics, socio-economic status, employment, work-place and mode of mobility and dependency. Significant differences between the parishes were revealed and four sets were identified.

1. Modern Mining Settlement,
2. Large residential suburbs,
3. Small residential suburbs,

He concludes, ‘the major residential tracts of the suburbs-old private housing council estates and miners’ estates-are all clearly segregated, with the private estates generally located closest to the old village cores. Large planned tracts are given to commercial, educational and institutional uses.
**Carter (1975)**\(^{55}\) says in the urban fringe, a wide mix of land uses are characteristics ranging from the old, untouched rural villages to modern residential estates: from a variety of commercial developments, including out-of-town shopping centres to the city services and industries which are conveniently located at margins.

**Dr. Sudesh Nangia (1976)**\(^{56}\) studied Delhi Metropolitan fringe belt and suggested following characteristics:

1. This belt characterizes the huts, slum and illegal occupations. The most of the settlements are unplanned.
2. These is mixed land use.
3. It is difficult to maintain agricultural land use.
4. These lack of urban amenities.
5. It is difficult to provide amenities to the scattered settlements and it needs heavy budget.
6. Rural as well urban, both lifestyles are characteristics of this belt.

**M.M.P. Sinha (1980)**\(^{57}\) studied Patna Metropolitan and stated that the rural-urban fringe acts as a bridge linking to urban and rural areas.

Many of the Scholars those have attempted the phenomenon of fringe belt mentioned its characteristics with its soul being mix land use of rural and urban lifestyle. It may, whatsoever, be the differences in the evolution and development of cities in the western countries and India but the basic process of urbanization and land conversion process remain the same. Post-independence urbanization in India has followed, more or less same trend as in western countries with additional feature of informal sector of economy playing significant role in urban areas. In pre-independent India, rural-urban fringe
areas were mostly occupied by cantonments and air stripes but after independence, it started accommodating other features as brick kiln, godowns, big factories and graveyard, sewage plants, garbage store and periodic markets etc. A peculiar feature of emergence of rural-urban fringe is opening of units of informal sectors such as ‘gimti’ ‘chat corners’, grocery and retail shops. So far as residential buildings are concerned these are firstly occupied by rural population who couldn’t afford urban life style but fond of the same. Urban population started heading towards fringe belt after urban land ceased to accommodate them and then commuting started.

According to western views, the agricultural land uses is considered as a distinct rural feature but in India the presence of agricultural land-use is used to define the inner (city ward) boundary of the rural-urban fringe. Thus, if agricultural land-use occurs within the municipal limits, the fringe begins inside the city limits. This phenomenon is common in many Indian cities (e.g. Greater Mumbai) whose limits have deliberately been defined to include some agricultural land. Revenue village, in India, contiguous with municipal limit with urban land-use entirely would be deemed as part of city. A revenue village with mixed land use urban as well as rural is considered as part of the fringe zone. This peculiarity gives rise to different sets of characteristics of rural-urban fringe in India and can be summaries as follows:

(i) Presence of factories, small or large at the village or within village boundaries,

(ii) Presence of brick kiln, timber yard, warehouse, air ports, bus and truck repair services,

(iii) Growth of shops at either side of roads from villages leading to city,

(iv) Development of residential areas by people who came from
outside the village and more frequently from the city itself,

(v) Establishments of colleges, hospitals or dispensaries etc.,

(vi) Presence of water works, sewage plants, cremation or burial rounds and slaughter houses,

(vii) Development of stadium and playgrounds etc.,

(viii) Development of apartments or flats by registered builders and big business houses etc.

Thus fringe areas have cultural juxtaposition of rural and urban land uses.

DELIMITATION OF THE RURAL-URBAN FRINGE

Urbanization is a dynamic process, so is the rural-urban fringe. With the physical growth of the city, the urban front keeps advancing, pushing the rural urban fringe in forward direction towards rural areas. Geographical barriers (rivers) now hardly, are capable of restricting the expansion of rural-urban fringe as science and technology is at such an advanced level that accessibility can not be denied to any area, particularly contiguous to cities.

The land conversion process, neighbourhood evolution, residential sequential development and tipping effect have varied nature following the realities of landscape and keeping the rural-urban fringe diverse in nature and growth. A great variation which characterizes the rural-urban fringe and frayed nature of its edges complicates any attempt the area at all objectively.

During the period, starting in 1940s continuing up to 1969 immensely, the phenomenon of rural-urban fringe fascinated many scholars from diverse fields e.g. sociology, economics and geography. This was literary period of fringe. Scholars attempted different methods to delimit rural-urban fringe with the realities of landscape
existing at the time. But no generalized method could be evolved that is universally acceptable. Some of the prominent views and methods applied by scholars are, hence, worth mention.

George S. Wehrwein,58 land economist by profession, wrote one of the earliest and the best known paper in 1942 on the rural-urban fringe and referred to it as ‘the area of transition between well recognized urban land uses and the area devoted to agriculture’. He delimited the fringe area around ‘Indianapolis’ on the basis of 150 persons per mile density of population. But how one could arrive at inner and outer boundary was not mentioned. He made no suggestions as to field techniques. It, so, can not be applied to the study area ‘Allahabad Fringe’.

Myers and Beegle59 in a study of the rural-urban fringe of Detroit applied a method based on the concentration of non-village-rural-non form (NV-RNF) population. They used 36 square-mile townships obtained by subtracting the sum of farm population and the population of incorporate places from the total population. The rural-urban fringe for Detroit was taken to include those townships having 50 percent or more NV-RNF population occurring in contiguous area outside the city, whereas townships with values of 25 to 50 percent, normally further from the city, were called ‘partial fringe’ areas. All incorporated territory was excluded. In this study the township has been used as unit which is destined to result a very coarse-textured delimitation. It can amount to little more than a rough approximation of the extent of the fringe.

Rodehaver (1946)60 in a study of Madison Wisconsin, identified the strong pull on the urban migrants to the central city for work, shopping, church going and Social activities. He covered 640 acres of land contiguous to administrative limit of the city and
adopted three elements as the basis of study:

(i) Number of non-farming family,

(ii) Density of non-farming family,

(iii) Value of land and buildings per acre.

This method has difficulty to demarcate urban fringe clearly as it is based on high density and the stretch of development along transportation route can hardly be studied.

Blizzard and Anderson (1952)\(^6\) worked with the rural-urban fringe of Williamsport, Pennsylvania. Their work is of particular interest in connection with the inner or city word boundary of the rural urban fringe. They visualize it as a series of points reached in leaving the city beyond which city services are incomplete. Normally this is corporate boundary of the cities. They speak of ‘the predominance of commercial farming waste land or wooded areas as marking the outer boundary’. They delimited the urban fringe on the basis of survey of motor transportation. This underscores the importance of subjective judgments in fixing the boundary in applying their method to any other case study.

N.P. Gist (1952)\(^6\) studied fringe area of Columbia and included the families with at least one member working in the city and he delimited a ring of one or one half mile contiguous to the city. Families not working in city were kept out of study. This definitely, generates difficulty in collecting the data and can, hardly be applied to other cities.

**Delimitation Problem : Conceptual and Theoretical Framework**

Martin (1953)\(^6\) studied Eugene-urban fringe (Spring field) and included residential areas, and natural barriers like, rivers, mountains etc. in delimitation of urban fringe immediate after the corporate limit of the city. The patterns of settlement in reference of
natural barriers were demarcated with the transformed scattered mixed land use. The residential land use thus has been given primacy and density of residential areas is not mentioned to be used as index of fringe characteristics.

Queen and Carpenter (1953)\textsuperscript{64} studied urban fringe of Melbourne to find out its problems. They delimited fringe area of Melbourne Metropolitan on the basis of census of 1966. This methodology can hardly be fruitful to apply to delimit fringe of other cities because of dominance of only urban features in the study.

Dr. R.L. Singh (1953)\textsuperscript{65} studied transition belt of Varanasi and listed characteristic of its suburbs. He selected Sundarpur as a sample for his study in the transition belt. He noticed the characteristics of fringe areas from Rajghat (inner section of city) to University.

Congen (1960)\textsuperscript{66} visualized fringe area as the probable determinant of morphology of urban settlement. According to him, the urban morphology is outcome of succeeding fringe. He studied Northumberland and divided the fringe into two sections. Thus he based his study on the urban growth and development but he didn’t apply any certain technique to guide others, keen in carrying forward the study in other cities.

Russwurm (1963)\textsuperscript{67} studied the urban fringe of London (Ontario) by exhaustive survey. He carried his study in 200 acres of land contiguous to city and classified the population engaged in non-agricultural activities with less than 50 percent 50 to 75 percents or more than 75 percent land lords or tenants. He accepted the above categories under fringe area.

Hind Smith (1961)\textsuperscript{68} considered areas lying in urban-shadow the unproductive land because of urban invasion as the fringe area. They delimited urban fringe on the basis of four factors as follows:
(i) Undeveloped subdivided land,
(ii) Land for sale for the urban functions,
(iii) Land under non-agricultural ownership,
(iv) Agricultural land with more than general tax levied.

Hind Smith, thus gave more importance to the land only and this can't be applied to other areas.

**Devnath Mukherjee (1963)**[^69] studied the urban fringe of Orlando (Florida) and assumed the undeveloped sub-divided land contiguous to city as an important feature of the fringe. This, according to him, determines future development of the city. He adopted the corporate limit of city as the inner boundary of the fringe. He used following land use characteristic as index to analyze land use of fringe:

(i) Urban Land,
(ii) Orchard Land,
(iii) Agricultural Land,
(iv) Ranch Land,
(v) Pastoral Land,
(vi) Unproductive Land,
(vii) Forest Land,
(viii) Marshy Land.

He assumed 25 percent of built up area under the rural urban fringe. Thus, he extended more importance to the urban land use.

**Leon (1966)**[^70] considered population with non-agricultural activities to be significant factor while **Herbert and Thomas**[^71] named suburbs to be rural urban fringe and accepted structure of shopping centers for the development of suburbs and **R.S. Johnston**[^72] focused on pattern of residential development but all these, can rarely, be applied to present study area.

**Robin Pryor (1968)**[^73] reviewed the literature dealing with the
rural urban fringe and its problems. He added little techniques of delimiting the area, but his research in the value for the detailed summary of rural-urban fringe characteristics. As a landscape phenomenon, Pryor said, the rural urban fringe various from city to city and from one time to another. This has resulted in considerable confusion and lack of clear delineation in case studies. The problem is magnified by the range in time of studies and by the range in sizes of the urban centers involved by the variations in type and degree of zoning control beyond local corporate limits and by the different aims and interests of the research workers.

According to Pryor, the rural-urban fringe may be divided into two sub-zones:

(i) **An Urban Fringe**: It is in contact with and contiguous to the central city. Its density of occupied dwellings is higher than the median density of occupied dwellings for the rural urban fringe as a whole. It has a higher ratio of residential commercial, industrial and vacant land as distinct from farm land. It also, has high proportion of increase in population density, of commuting and of land use conversion from farm to non-farm than does the rural urban fringe has as a whole.

(ii) **A Rural Fringe**: It is contiguous with the urban fringe but exhibit the aforesaid characteristic below the median for the entire rural urban fringe.

From a review of sixty case studies of rural urban fringe areas, Pryor arrived at a number of hypotheses regarding socio-economic characteristics of rural-urban fringe and these can be summarized into three sections:

(i) The residents of the fringe,
(ii) The factor of accessibility of the fringe,
(iii) Land and dwellings in the fringe.
But his fringes ‘need to relate specific characteristics of the rural-urban fringe to the size, morphology, economic base and rate of growth of the associated central place’.\textsuperscript{74}

\textbf{Ujagir Singh}\textsuperscript{75} studied fringe areas of KAVAL (Kanpur, Allahabad, Varanasi, Agra, and Lucknow) towns and based his study on different socio-economic factors such as density of dwellings, population density and structure, changes in land use and built-up area, pattern of transportation, localization of different institutes and kiln factory etc. He suggested delimiting outer-boundary on the basis of composite map showing above characteristics. Criterion adopted by Ujagir Singh matches with that of Rodehovar and Martin to delimit rural-urban fringes.

\textbf{R.C. Gupta (1972)}\textsuperscript{76} based his thesis on the rural urban fringe of Shahadara (Delhi), and adopted different factors for delimitation of inner belt and outer belt. He selected metalled roads and streets, supply of electricity, supply of water, public sewage system and vacant land etc. and for outer belt. He adopted continuous belt with semi urban facilities and associated open land or agricultural land outside of it. Sudesh Nagia completed his research work on the topic of ‘\textit{Pattern of Rural Settlement in Delhi : A Geographical Analysis}’ and delimited the rural urban fringe of Delhi. On the basis of structural and functional characteristics, he delimited the fringe belt extended from 11 to 28 Km. including 178 villages. In his book\textsuperscript{77}, he expressed the fringe areas to be in polygonal shape which have more extension along roadsides. He adopted mainly three determinants-

(i) Static determinants,
(ii) Occupational and functional determinants,
(iii) Demographic determinants.

\textbf{R.P. Singh (1973)}\textsuperscript{78} was awarded Ph.D. degree on the research work ‘\textit{Jaunpur and its Rural Urban Fringe : A Study in Settlement}'}
Geography’. He adopted distinct determinants to delimit outer and inner fringes. Inner fringe, he says, starts with corporate limit of the city and is contiguous with built-up area of the city and non used agricultural land in the vicinity of rural settlements. The urban social and economic amenities trickle down gradually to the inner fringe. He delimited inner fringe on the basis of density of built up area, diversity in types of dwelling, types and pattern of streets, occupational structure of residents, basic amenities and density of population etc. The outer fringe was delimited with a diameter of 3 to 5 km. supplying milk, vegetables and raw materials (e.g. oil and perfumes) for local industries.

R. Romachandran and B. Srivastava (1974)\textsuperscript{79} presented different parameters to delimit the rural-urban fringe of Delhi Metropolitan region. Ramachandran presented five variables for delimitation of rural urban fringe of Bangalore and Delhi in his book.\textsuperscript{80}

(a) Density of population: 400 persons/sq. km. or more,

(b) Population growth in the preceding decade: 40 percent or more,

(c) Females per thousand males: 800 or less,

(d) Proportion of workers in non-agricultural activities: 50 percent or more,

(e) The outer limit of city bus services or local train services.

The above approach has its own limitations as the parameters vary with regional variations.

K.N. Gopi (1978)\textsuperscript{81}, in his work, has examined the entire phenomena of the transformation of the fringe of metropolitan settlement of Hyderabad in the light of structural changes in the metropolitan economy and society. Dr. Gopi has suggested a typology
of fringe settlements which is evolutionary in character for each type is characterised by a specific set of economic activities, social system and morphological features. He has considered the characteristics of fringe are dynamic in nature and are susceptible to change under the compelling influence of the expanding metropolis. He has identified twenty suburban centres around central city of Hyderabad based on the following two principles:

1. Daily commutation,
2. Dependence of suburban settlements on the central city for the supply of essential services, such as water, electricity, telephone, transports etc.

He has selected ‘Uppal’ for his study and have considered it as urban fringe, showing the duality of co-existence of rural and urban morphological features, rural and urban ways of life and social and cultural values.

Hiralal (1980)\(^{82}\) studied the rural urban fringe of Bareilly. He selected mainly three determinants for the delimitation of the rural urban fringe:

1. Occupational determinants- Ratio of non agricultural workers,
2. Static determinants- future extension of the area,
3. Demographic determinants- density of population, rate of change of density, population growth, sex-ratio and literacy etc.

He constructed distance maps for each determinant and superimposed all them to determine the rural urban fringe of the Bareilly. He sub-divided the fringe into primary fringe belt and secondary fringe belt. The fringe area of Bareilly includes 77 villages. His method of delimitation of the rural urban fringe has some
resemblance with Mayor of Bengal.

**B.P. Mishra (1980)** brought out the logical confusion of term-rural-urban fringe in his article ‘The Concept of Rural-Urban Fringe’ and ‘The Rural Urban Fringe its Concept and Importance in Planning’. The rural-urban fringe, he says, is a controversial administrative term which is illegal and unauthorized. He discussed many of the fundamental determinants to be taken into account while dealing with delimitation of the rural-urban fringe.

**Pramila Kumar (1980)** studied the rural urban fringe and focused the study on urban outward growth, urban agglomeration and standard urban area. These areas have been determined by the census. Dr. Kumar has selected seven determinants, including tendency of urbanization in village, supply of electricity and migration of rural population towards cities to delimit the rural-urban fringe.

Dr. Kumar has included 14 village under urban agglomeration and 36 villages under standard urban area around Bhopal. Fourteen villages exhibiting outward urban growth has been named as primary fringe while other Thirty Six (Standard urban agglomeration) have been declared as secondary urban fringe.

**M.M.P. Sinha (1980)** in his thesis ‘The Impact of Urbanization on Land use in the Rural-Urban Fringe: A Case Study of Patna’, has selected a number of determinants to delimit the rural urban fringe of Patna. Thirteen main determinants selected by him are journey time, urban influence, public utility service, value of land, non-agricultural activities, number of families according to houses, sex-ratio, commuting population, population density, literacy, primary activities, agricultural activities and built-up area etc.

Relative importance of determinants has been considered and statistical methods (correlation coefficient) has been given due
importance in the delimitation of rural urban fringe.

Triyugi Nath\textsuperscript{86} in his study delimited Allahabad fringe on the basis of population engaged in non-agricultural work around Allahabad city with a diameter of 15 km.

In the Ph.D. thesis submitted by Z.T. Khan\textsuperscript{87} titled ‘Bilaspur : A Study in Urban Geography’, the percentage of population engaged in agricultural activities has been selected to determine primary (60% population) and secondary (60% to 80%) fringe.

Binda Thakur\textsuperscript{88} studied the fringe area of Darbhanga city (Bihar) and adopted sixteen determinants to delimit the fringe. All the determinants were kept under primary and category of secondary determinants. Dr. Thakur has sub-divided the fringe of Darbhanga into two categories at urban fringe and (b) Rural fringe. The village (63) contiguous to the city were named as urban fringe and other village were kept under category of rural fringe.

Many of the other scholars, in India, like Maya Ganguly\textsuperscript{89} (Fringe of Kolkata), Kamala Gupta\textsuperscript{90} Agra city), Irshad M. Hussain and N.A. Siddiqui\textsuperscript{91} (Saharanpur), R.S. Jadhav and G.S. Kulkarni\textsuperscript{92} (Poona Fringe), V.A. Janaki and H.M Ajwani\textsuperscript{93} (Gujarat village and Urban influence), V.L.S. Prakash Rao and V.K. Tiwari\textsuperscript{94} (Banglore) and V.K. Tyagi\textsuperscript{95} etc. have studied the phenomenon of the rural urban fringe and suggested a number of parameters to be applied in delimitation of the rural urban fringe and the problems associated with them. They have put forward the realities of socio-economic landscape to deal with problem of delimitation and the same time, to over come of the problems.

Literary review of the approaches synthesized by a number of scholars reveal the fact of lack of any suitable statistical method to have gained any universal consensus or that is universally acceptable. It is because of dominant role of cultural factors to delimit the rural-urban fringe. Geomorphological factors play least role as the urban
space is scarcely affected by the natural barriers

**Delimitation of Allahabad Fringe Area**

The rural urban fringe of Allahabad district has been delimited on the basis of percentage of non-agricultural working population and physical verification of the study area. Accessibility (by metalled roads), density of houses and availability of different industrial units, warehouses and brick kiln are taken as the other criteria for the delimitation of rural urban fringe of Allahabad district.

Around the city of Allahabad block ranging in circumference of 10 to 15 kms. are selected. This range varies with the extension of mixed land use pattern that has been physically verified. This circumference includes 6 Development Block around the city. The average of the non agricultural working population of these 5 development blocks is calculated by ‘mean and standard deviation’ method. The standard deviation’ is 29.78 (Table 1.1).

**Occupational Structure in Blocks Related to the Fringe**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Development Blocks</th>
<th>Total Workers</th>
<th>Non-Agricultural Workers (X)</th>
<th>Percentage of Non-Agricultural Workers</th>
<th>Percentage of Non-Agricultural Workers to the Total Main Workers</th>
<th>X-X</th>
<th>(X-X)^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kaurihar</td>
<td>113629</td>
<td>24359</td>
<td>21.44</td>
<td>32.16</td>
<td>-2.10</td>
<td>4.41</td>
</tr>
<tr>
<td>2</td>
<td>Soraon</td>
<td>63870</td>
<td>16050</td>
<td>25.13</td>
<td>39.52</td>
<td>1.59</td>
<td>2.53</td>
</tr>
<tr>
<td>3</td>
<td>Bahadurpur</td>
<td>82870</td>
<td>20506</td>
<td>24.74</td>
<td>41.56</td>
<td>1.20</td>
<td>1.44</td>
</tr>
<tr>
<td>4</td>
<td>Jasara</td>
<td>48360</td>
<td>8433</td>
<td>17.44</td>
<td>25.16</td>
<td>-6.10</td>
<td>37.21</td>
</tr>
<tr>
<td>5</td>
<td>Chaka</td>
<td>51038</td>
<td>18192</td>
<td>35.64</td>
<td>55.95</td>
<td>12.10</td>
<td>146.41</td>
</tr>
</tbody>
</table>


\[
\bar{x} = \frac{\sum x}{N} = \frac{141.25}{6} = 23.54
\]

\[
Sd = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{236.62}{6}} = \sqrt{39.44} = 6.28
\]

Standard Deviation = Sd + \bar{x}

\[
= 23.54 + 6.24 = 29.78
\]
The rural-urban fringe of Allahabad city has been decided theoretically by this method. The villages lying at the outer limit of the fringe have the value of non agricultural population more than 29.78. Some of the villages have been excluded from the study area on the basis of physical survey. Transportation facility, housing status, agricultural land use pattern and other urban functions have been included in the parameters of exclusion. The outer limit of Nagar Mahapalika has been taken as inner limit of Allahabad fringe area (Fig. 1.2).

The mean and standard deviation technique is used to analyses the regional characteristics. Thus, this technique has been used in the study region.

Thus, the rural urban fringe area includes 201 villages with area of 30329.81 hectares. The population of the rural urban fringe of Allahabad is 394942. The population of scheduled castes is 53128 and that of scheduled tribes is 202 in the study area according to Census 2001. It has 68.05 percent literacy and sex ratio was 879 in 2001.

A set of parameters were selected for delimitation of fringe areas around Allahabad city. These are as follows:

(i) Changes in land use pattern,
(ii) Conversion of agricultural land to non-agricultural purposes,
(iii) Presence of factories,
(iv) Presence of secondary activities of economy,
(v) Occupational structure,
(vi) Level of urbanization and literacy,
(vii) Development of residential areas,
(viii) Presence of urban infrastructure,
Fig. 1.2 Location Map of Allahabad Fringe Area
(ix) Accessibility.

Different zones have been developed from all these attributes around Allahabad city and the zones having four or more than four attributes are recognised as fringe areas. Census data, statistical data published by statistical magazine of district and information canvassed by physical verification of the study area have been used to develop different zones.

Occupation structure of the countryside areas around the city beyond its corporate limit for the years 1981, 1991, and 2002 has been basically used to demarcate the fringe landscape with dominant urban activities.

3 Harlod, Carter (1975): The Study of Urban Geography.
58 Wrehrin, George S. (1942): op. cit.
60 Rodehaver, M. (ND) : op. cit.

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