

# Delineation of rural-urban fringe: a case study of Aligarh city

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## Abstract

Cities are dependent on their surroundings for their existence and growth. Having a rapidly increasing population, a city needs a huge amount of agricultural products for its sustenance. To a considerable extent, it depends on countryside for the supply of vegetables, milk, food-grains, fruits and labour. These commodities are not only brought from immediate surroundings but also from hundreds of miles away. Thus, the city covers a huge area of surroundings for getting their agricultural products. The frequency and intensity of services depends on linkages in terms of distance of a city with its countryside and the available nature of transport and communication. The characteristics and socio-economic development of a fringe differ from that of another. People do their recurring commuting to perform their daily activities and jobs from the margins of a city to its central part, where their offices and institutions are generally located. The villagers also travel daily to cater their socio-economic needs to neighboring towns and cities. Thus, cities work as centres of gravity for socio-economic, cultural and administrative activities which are truly representative of the countryside.

Aligarh city performs a variety of functions. It provides a number of services to its countryside i.e., health services, educational services, banking services and bus services and in return of which it receives some services from its surrounding areas i.e., supply of agricultural products and daily labour. The information on the basis of which the fringe zones has been delimited, have been collected through surveys and records maintained by the colleges and schools, telephone offices, commuters' assembling points, banks, mandis and milk collection points. The five sets of determinants for delineating the rural urban fringe of the Aligarh city are spatial, economic services, occupational structure and demographic and housing character. Our main conclusion is that the expansion of the city mainly has a north and north-east direction, especially along bypass and national highways.

**Keywords:** *fringe, delineation, commuters, literacy, occupational structure, demography*

## Rezumat. Delimitarea franjei rurbane: orașul Aligarh ca studiu de caz

Orașele depind de împrejurimile lor pentru existența și creșterea lor. Având populație în creștere rapidă, orașele au nevoie de o cantitate imensă de produse agricole pentru susținere. Depind, în mare măsură, de mediul rural pentru aprovizionarea cu legume, lapte, cereale, fructe și forță de muncă. Aceste mărfuri nu sunt aduse numai din imediata vecinătate, dar și de la sute de mile depărtare. Astfel, orașul acoperă o zonă vastă de împrejurimi pentru a-și obține produsele agricole. Frecvența și intensitatea serviciilor depind de legăturile în ceea ce privește distanța dintre un oraș și mediul său rural și natura transportului și comunicării disponibile. Caracteristicile și dezvoltarea socio-economică a unei franje diferă de cele ale alteia. Populația realizează deplasări zilnice pentru a-și desfășura activitățile profesionale traversând orașele de la periferie spre centru, acolo unde se află, în general, birourile și instituțiile în care lucrează. De asemenea, locuitorii satelor călătoresc zilnic către centrele urbane învecinate pentru a-și satisface nevoile socio-economice. Astfel, orașele funcționează ca adevărate centre de gravitație pentru activitățile socio-economice, culturale și administrative care reprezintă cu adevărat împrejurimile rurale.

Orașul Aligarh îndeplinește o varietate de funcții. Acesta oferă o serie de servicii ruralului înconjurător, mai precis: servicii de sănătate, educaționale, bancare și de transport cu autobuzul și primește, în schimb, anumite servicii din zonele învecinate, în principal furnizarea de produse agricole și munca zilnică. Informațiile pe baza cărora a fost delimitată franja rururbană au fost colectate prin anchete și înregistrări întreprinse de colegii și școli, birouri de telefonie, puncte de asamblare a navetei, bănci, piețe rurale și puncte de colectare a laptelui. Cele cinci seturi de factori determinanți pentru delimitarea franjei rururbane din orașul Aligarh includ: caracteristici spațiale, servicii economice, structura ocupațională a populației, determinanți demografici și locativi. Se constată că extinderea orașului se desfășoară în principal spre nord și spre nord-est, mai ales în lungul șoselelor de centură și autostrăzilor naționale.

**Cuvinte-cheie:** *franjă, delimitare, navetiști, alfabetizare, structura economică a populației, demografie.*

## Introduction

In the modern age of urban expansion, the term "fringe" has assumed an important significance. Many scholars in different disciplines have discussed the "rural-urban fringe" but no precise definition has emerged yet. Subjective definitions based on individual areas of study are not adequate since the definition should be capable of being universally applicable and not only to a particular region. The term rural-urban fringe is comprised of two groups

of words – "rural fringe" and "urban fringe". The term urban fringe was first used by Smith (1937) to describe the built-up area just outside the corporation limits of the city. The variation in the form of fringe area has been distinguished by several authors who have suggested different names for this phenomenon. Thus, Kurtz&Eicher (1985) differentiate between "fringe" and "suburbs", "pseudo-suburbs", satellites and "pseudo-satellites". Schnore (1957) distinguished between "satellites" and "suburbs" and Martin (1953) discussed satellite rural areas. Mckain&Burnight (1953) have also

discussed the "extended fringe" and the limit of fringe respectively. Reinemann (1960) distinguishes between "outlying adjacent zone" and "sub-urban zone" and Wissink (1962) between "inner fringe" and "outer fringe", Meyers&Beegle (1947) have discussed, "true fringe", "partial fringe" and adjacent rural township. Duncan&Reiss (1956) distinguish between urban fringe, rural non-farm and rural farm within Chicago's fringe. Whiteland (1967) has given the terms Internal Fringe Boundary (IFB), Middle Fringe Boundary (MFB) and Outer Fringe Boundary (OFB). Wehrwein (1942) explains that the rural-urban fringe "consists of rural territory pierced by fringe-like projections of urbanized land uses because of the stellar growth of the city and is the area of transition between well recognized urban land uses and the area devoted to agriculture carried out in more or less modified form".

The census of India has defined a town in different ways in different census years. In 1951, towns included all municipal areas irrespective of their size and also all cantonments; in addition, some other places which had urban characteristics were also treated as towns. The definition was necessarily vague and subjective, as it did not lay down any clear-cut directives for treating small centers as towns. The result was that a very large number of overgrown villages were declared towns in 1951, which were classified after a decade. This classification was changed in 1961, which lay down that the list of towns would include all municipal or notified areas, while civil lines and cantonments were not included within municipal limits. It would also include all places and all centers, which (a) have a population of 5000 inhabitants, (b) have a density of 1000 people per square mile, and (c) at least seventy-five percent adult male population should be engaged in non-agricultural pursuits. Although this is an improvement over the 1951 definition, the 1971 census slightly changed the definition to include all centers in which the population was 5000 or more, with a density of over 400 persons per square kilometer and at least three-fourth of male working population was engaged in non-agricultural livelihood. Largely these criteria were followed except in a very few cases which had tourist interest or administrative importance, or some other urban characteristic. The concept of urban agglomeration was introduced for the first time in the 1971 census. An urban agglomeration was defined as "a continuous urban spread constituted of a town and its adjoining urban outgrowths or two or more physically contiguous towns together with continuous well organized urban outgrowth of any such town" (Das, 1985). The term "fringe" suggests a borderline case between the rural and the urban, and actually lies on the periphery of urban areas, surrounding it and

distinguishing it from the truly rural countryside. In India, some geographers have also attempted to delimit the urban fringe. Singh (1966) has delimited the urban fringes of Kaval towns by superimposition of a series of maps covering several geographical factors. Alam&Khan's (1972) "Metropolitan Hyderabad and its region" is one of the most outstanding work which deals with the relevant points of urban influences; and their "metropolitan core". Nangia (1976), Srivastava&Ramachandran (1974) demarcated the rural-urban fringe of Delhi. The work of Phadke&Sita (1981), Gowda (1981), Kumar (1980), Sinha (1980) and Hyma (1971) may also be cited in this regard.

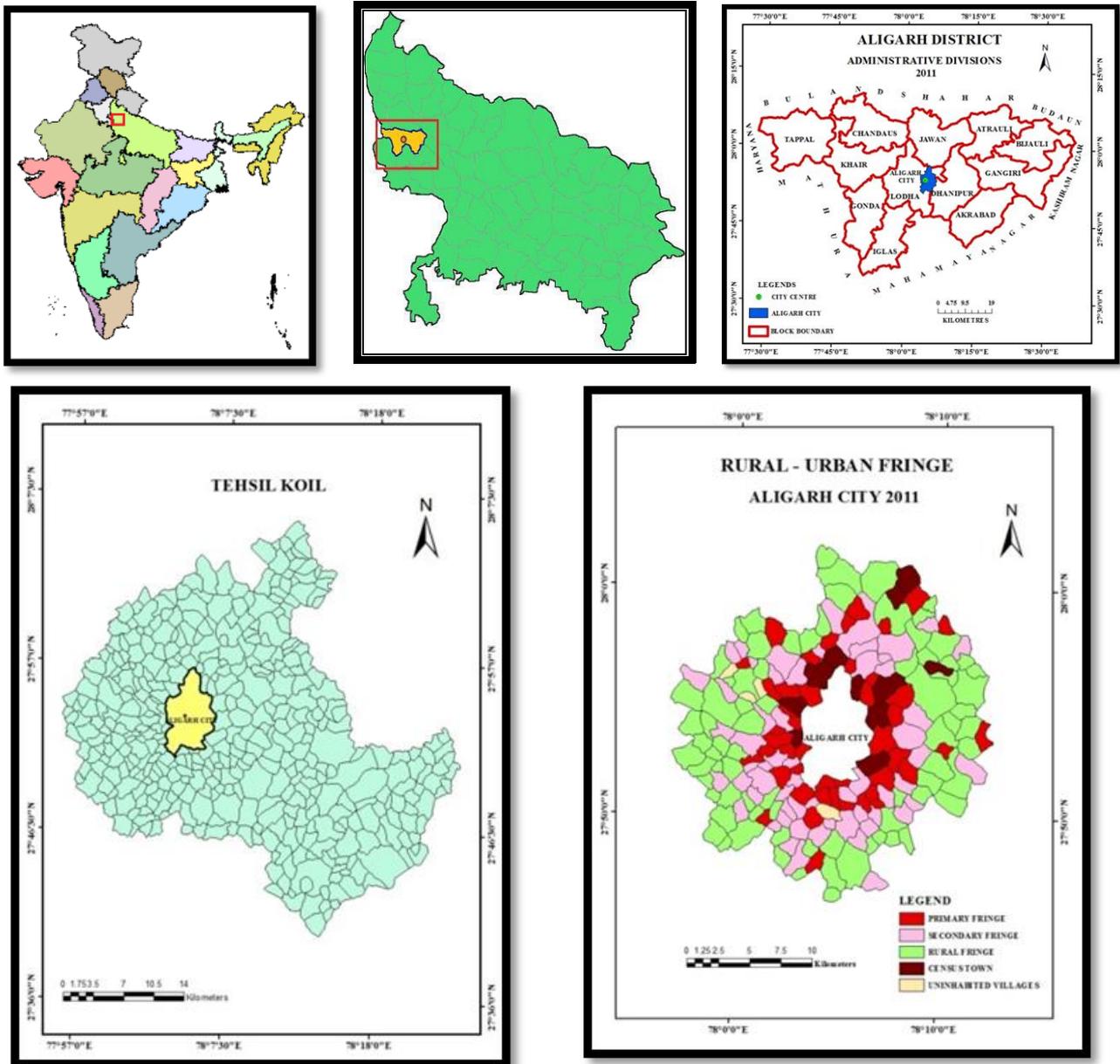
As the fringe is a bridge between the rural area on the one side and urban center on the other, all the characteristics of urbanity and ruralism are medium in the fringe area. These characteristics are travel time, urban habits, land value, public utility services, commuting population, non-agricultural activities, population density, primary activities, built-up area and sex ratio, literacy rate and agricultural activities, etc. and the characteristics may vary from town to town. But if all factors are considered together with suitable weightings according to their relative importance, the resulting index values are likely to be a reasonable guideline for fringe demarcation. An important problem in the rural-urban fringe area is the problem of land use. The pattern of land use in the area is dynamic and it changes from rural land use to urban land use over short periods of time and distance. A shift from non-residential land to residential use and food cropland to cash crop land is some of the important changes. The resultant pattern is complex and its real value is difficult to assess. Scattered settlements, vacant land, small proportion of farm workers and the return from the land are some of the important associated considerations; all these factors are guided by location. An important development in the urban settlement during the past few decades has been the rapid expansion of population and built-up area into unincorporated suburb and in areas surrounding or large towns and cities. This recent fingerlike trend of development at the margins has been made possible by the mechanized transportation and the extension of public utility services such as electricity, water and sewage etc. beyond the city's limit. The process of accretion, which takes place outside the city, has generated a zone of transition between the rural and urban landscape, properly known as the rural-urban fringe.

### **Study area**

Geographically, the city of Aligarh is located in the fertile tract of the rivers Ganga and Yamuna between 27°29' to 28°11'N latitudes and 77°29' to

78°38'E longitudes, at the intersection of the 27°51' parallel and the 77°58' meridian. The elevation at the center of the city is 187.38 meters above mean sea level. The city is situated about 140 km southeast of New Delhi, the National Capital of

India. Aligarh district lies in the alluvial tract formed by the rivers Ganga and Yamuna. The region experiences a tropical monsoon type of climate characterized by distinct seasonal rhythm (Fig. 1).



**Fig. 1: Location of the study area**

## Results and Discussion

### *Fringe Delineation of Aligarh City*

It is evident from the various studies carried out at global and national levels from time to time that there are some common factors, which may be taken as the indicators of the urban influence on the surrounding countryside. It would be a rather wise step to decide first those indices or determinants. At the same time it

is not advisable to delimit the urban fringes of Indian cities on the basis of criteria suggested for fast growing urban centers of the west, as the land use structure of the Indian cities is highly a mixed one as compared to western urban centers. The basic factors to delimit the fringe region are concerned with land use influx, mixed rural urban functions, interaction with the main city, socio-economic development and demographic traits. However, besides analyzing each and every structural and functional characteristic in delineating the urban

fringe, at least preparation of three maps of the same size, showing the present land use, transportation and occupational pattern of the population are deemed necessary to do. In addition, personal observations in the field would go a long way in fixing the "territorial extent" of the tentative fringe upon which the said factors could be analyzed.

The studies carried out by several researchers to delimit the fringe have helped in selecting certain determinants to delineate the rural-urban fringe of Aligarh. A few determinants have been selected in the present study, which are partly spatial and partly occupational and demographic. Rural-urban fringe is a unique landscape comprising of a particular mix of land uses and socio-economic activities made by a collection of processes that have impacted on the fringe in a specific way. The degree of relationship between the city and its surrounding area varies from city to city depending upon the functions which the city performs based on the physical and socio-cultural factors. The results prove some urban centers are strongly interrelated with their surrounding areas, while some have poor relations, depending upon the degree of interaction. Urban geographers have given different names to surrounding area of a city; for example, Umland (Sing, 1955), Urban Hinterland (Green, 1950), Metropolitan region (Alam&Khan, 1972), Urban field (Singh, 1964) etc.

Different researchers have worked on different themes of interrelation and influence of city with its surrounding areas as identification of rural-urban fringe, linkage, socio-economic and demographic profile, change in land use pattern; Jefferson (1931), Smailes (1947), Dickinson (1947), Pahl (1965), Sinclair (1967), Whiteland (1967), Pastalan (1967), Oosthizen (1969), Prayor (1969), Khan (1983), Sharma (1983), Flore&Irwin (2004), Mahon (2005), Khan et al. (2011). At present times, rural-urban fringe has become very complex due to the high rate of urbanization process. The high growth of population in the urban centers leads to spread out of population in the surrounding areas of city, but does not lead to spatial extension of city limits; also, it causes the changes in the limits of fringe area. The criteria used for the delineation of the rural-urban fringe vary from region to region. The criteria for the selection of variables for demarcation of rural urban fringe mostly depends upon the functional linkage of the city with its surrounding area and secondly, on the availability of data of selected variables. The indicators used for delineation of rural-urban fringe not only vary from developed to developing nations, but also from one city to another within the same country.

It is clear from earlier studies such as those of Fiery (1946), Meyers&Beegle (1947), Green (1950), Singh (1955), Balk (1945), Pryor (1968), Gollodge (1960), Ellefson (1962), Dikshit&Swant (1968), Alam&Khan

(1972), Hudson (1973), Phadke&Sita (1985), that there are certain common factors which have been emphasized as meaningful indicators of the urban influence on the surrounding area of the city.

On the basis of aforesaid studies, some common factors revealing fringe characteristics may be taken as the indicators of the urban influence on the periphery and outskirts of the urban centers. It is good to consider those indicators or determinants for fringe delimitation. In case of Indian cities, however, it is not proper to delimit the urban fringe on the basis of criteria suggested for fast growing urban centers of developed countries. Although some Indian scholars have tried to analyze different demographic aspects, land-use and characteristics of rural-urban fringe, yet, a comprehensive methodology for delimitation of the rural-urban fringe of a city is still lacking. For the delimitation of rural-urban fringe of Aligarh city, the aspects like land-use, mixed rural-urban functions, socio-economic development, interaction within the main city, availability of urban amenities, proportion of NV-RNF (non-village, rural non-farm) population demographic characteristics, transport facilities and occupational structure have been considered as basic factors. The land value speculation is another important determinant. To reveal the structural and functional characteristics of the Aligarh fringe, the standard deviation method has been applied, which appears to be quite useful in working out and revealing the impact of transportation, occupational and demographic characteristics etc., the analysis of these factors having been supported through personal observations and primary data collected.

With a view to delimit the extent of rural-urban fringe of Aligarh city, an attempt has been made on the basis of five major determinants i.e. spatial, economic, occupational, demographic and housing characteristics.

#### **a. Spatial determinants**

Based upon the present land-use map, personal investigation and the assumptions of possible future growth of the city in different directions beyond the present municipal limit, a tentative limit of rural-urban has been determined.

Field surveys have revealed that an important problem of the rural-urban fringe is related to land-use. The land use is not uniform on all sides in the periphery of the city. In some areas, the intensity of non-agricultural land-use is very intense. Thus high intensity could be seen along Ramghat road, GT road (Kanpur), GT road (Delhi), Anupshahar road, Khair road and along the Ramghat road to GT road (Kanpur) bypass, Khair road to GT road (Delhi) bypass, GT road (Delhi) to Anupshahar road bypass and along Anupshahar road to Ramghat road

bypass, while along the Agra road, Mathura road and Mathura road to Khair road bypass the intensity of land-use is marginal, which is located to the south of the city.

### ***Economic determinants***

#### ***Milk supply***

In Aligarh city, milk and milk products are being supplied through milk co-operative societies, local private dairies and individual hawkers. There are three famous dairies; Heinz India Private Limited, Bhole Baba Dairy Industry and Rama Dairy Products Limited, located in the surroundings of the city. Besides these private co-operative units, there are a number of individual hawkers and milkman, who bring milk and milk products to the city in order to cater its increasing demands. Some of them collect milk from surrounding small settlements and sell it here. In this work, only those milk vendors have been considered who carry their milk by bicycle, motorcycle and automobiles. Considering the perishable nature of commodity, which needs its delivery at its destination within 2-3 hours, it covers an area of 15 km radius from the city center.

#### ***Vegetable and Fruit supply***

Dhanipur Mandi is the single wholesale market in Aligarh city, located on a distance of 2 kilometers from it. This mandi was established on January, 1st, 1986. There is also a bi-weekly market at Kwarasi, held on Thursday and Sunday. It is situated only 1 km from Aligarh Municipal Boundary.

Aligarh city has a very large wholesale fruit market, Sarsol Mandi, which serves not only its own population, but its surrounding areas too. Sarsol mandi was established along Grand Trunk Road leading to Delhi (5 km from the city) in July 1989. Sarsol mandi works as the main hub for buying and selling fruits in the city.

#### ***Daily commuters***

Workers who commute daily, for different purposes, using horse cart, auto-rickshaws, buses, bicycle and as pedestrians, have been surveyed for demarcating the zone of commuters of the city. It has been revealed that about 75 percent of the commuters are coming to the city from Atrauli, Gabhana, Iglas and Koil tahsils within a distance of 8 to 20 km. On the other hand, only 25 percent of the commuters reach the city from the outer boundary. As Aligarh city is a center of urban functions, it has great demand of labour workforce. The main employment attractions are factories, shops and constructional sites. One of the most developed is the lock industry, which has attracted thousands of workers.

#### ***Transport services***

Aligarh city is well served by efficient road network. Aligarh city has a radial road pattern and

major national, state and district roads which led out of Aligarh city in different directions, looking very much like the spokes of a wheel. The bus system in Aligarh comprises both public (District Transport Corporation) and private sectors. The most important means of road transportation is the services of State Road Transport Corporation, which provides buses from four terminals at two stations in the city proper, Gandhi Park and Masudabad Bus Stations. Both these stations provide services with the plying of more than 300 buses and cater the services to more than 15,000 passengers each day. Besides these, there are nine other bus stations in non-public sector rendering services to different towns and villages of Aligarh district. These bus stations are located on different directions of the city and provide services to more than 10,000 passengers daily through 289 buses.

#### ***Educational services***

The data for delineating the zone of education services have been collected from three post graduate colleges i.e., Dharam Samaj Degree College, Sri Varshney College and Tika Ram Kanya Mahavidyalaya; three inter colleges, namely Maheshwari Inter College, Chiranji Lal Inter College and Naurangi Lal Inter College; and Industrial Training Institute; all of them are located in different parts of Aligarh city. There are only three post graduate government colleges which serve the fringe of Aligarh city. Higher percent of students' enrolment have been noticed from the immediate countryside of the city. Unlike students' enrolment, percentage of settlements has experienced slight fluctuations at a 10-15 km radius, afterwards it starts declining. Besides, Aligarh is best known for Aligarh Muslim University. Many schools and colleges have mushroomed on the outskirts of the city. Some of the reputed institutions are: Delhi Public School on Agra Road, Delhi Public School Civil Lines on Ramghat Road, Al-Barkat Public School, Ayesha Tarin Model Public School, Heritage International School, Wisdom Public School, St. Fidelis Public School, Iqra Public School, Krishna International School, Neehar Meera National Public School, Al-Barakat Institute of Management and Technology, Aligarh Unani and Ayurvedic College, Ingraham Public School and Ingraham Institute of Science and Technology, Shivdan Singh Institute of Management and Technology, Aligarh College of Engineering and many more.

#### ***Medical services***

There are four leading government hospitals located in different parts of Aligarh city: Jawaharlal Nehru Medical College (JNMC) at Medical Road, Gandhi Eye Hospital at Ramghat Road, Malkhan Singh Hospital at Rasalganj and Deen Dayal Hospital at Kwarasi. As most of the urban centers up to the

distance of 80-90 km are not as advanced in providing medical treatment as Aligarh city, higher numbers of urban centers come under its influence for getting health services, despite being situated at greater distances.

## **b. Occupational structure of the population**

### ***Ratio of non-agricultural workers***

The mean percentage of non-agricultural workers to total workers for Koil tehsil, comes to 44.8 percent (Census of India, 2011). Therefore, the villages having greater share than this average, tends to show the increasing urban influence and hence they have been included in the rural-urban fringe. For grading the intensity of this determinant, the standard deviation method has been adopted. Considering this, the mean percentage of the non-agricultural workers has been taken as the lower threshold for delimiting the rural-urban fringe.

Villages attaining lower values than the mean percentage have been taken as peripheral rural areas. Villages showing values in between average 44.8 and average + 0.25 Standard Deviation or (44.8 + 6) fall within the rural fringe of the city. With regard to the delimitation of urban fringe, the villages having average + 0.25 S.D. to average + 0.75 S.D. (50.7 to 62.7) values have been considered within secondary fringe, while the villages having values higher than 0.75S.D. (63) are included in primary fringe, as they show higher degrees of urban character.

As many as 76 villages have been found to fall within the primary urban fringe zone, whereas the number of villages comprising secondary urban fringe and rural fringe area are 49 and 24, respectively. Thus a total of 149 villages encompass the rural urban fringe of Aligarh city.

## **c. Demographic determinants**

### ***Population growth***

Above 24 percent growth of population in Koil tehsil, during the period comprised between 2001 and 2011, has been taken as the lower limit of rural fringe boundary. Villages showing values in between mean to mean +.25 S.D. (24.7 to 24.7 + 14.3), mean to .25 S.D. to mean +.75 S.D. (39.1 to 67.7) and mean +.75S.D. (67.7) and above, have been taken within rural, secondary urban and primary urban fringe respectively. Thus 76 villages come under fringe zone and it comprises 12 villages of primary fringe, 17 of secondary fringe and 47 villages of rural fringe.

### ***Population density***

The density of population is the most significant factor to evaluate the city influence on its fringe area. The mean rural density of the Koil tehsil is 904

persons per sq. km (Census of India 2011). This average density has been considered as the lower threshold for fixing the outer limit of the rural-urban fringe. Further, the villages under study are showing heterogeneity as far as their demographic density is concerned, due to which the standard deviation is as high as 1353. Therefore, villages having average density to average +0.25 S.D. value (903.7 to 903.7+338.3) are termed as rural fringe. Further, villages having value more than this up to average + 0.75 S.D. (1242 to 1919) value are assumed as secondary urban fringe and villages having higher density (1919) than this have been classified as primary fringe. By this determinant 10, 30, 29 villages come under primary urban fringe, secondary urban fringe and rural fringe of the city. Thus, according to this index, 69 villages fall in rural-urban fringe of the city.

### ***Literacy***

The total rural literacy rate for the tehsil is 70.8%. The average literacy has been taken as the lower threshold for fixing the outer limit of rural-urban fringe. For further grading of the intensity of this factor standard Deviation (S.D.) methods seems to be helpful. Considering this, villages with average + 0.25 S.D. (70.8 + 2.1) i.e. 73% of literacy are taken as peripheral areas of rural-urban fringe. The villages having average + 0.25 S.D (70.8 + 2.11) to average + 0.75 S.D (70.8 + 6.3) and above average + 0.75S.D. (77.2) percent of literate population are termed as secondary and primary fringe, respectively. Thus, according to this index, a total 142 villages lie in fringe zone, 68 being in primary, 45 in secondary and 29 in rural fringe.

### ***Sex ratio***

At rural-urban zonal level, the sex ratio indicates continuous increase as one goes farther from the city. Keeping this view in mind, villages having value of average (881) to average - 0.25S.D (881 to 881-13) females per thousand males are considered to reveal rural fringe character. Villages exhibiting value in between average - 0.25 S.D. (881-13) to average - 0.75 S.D. (881- 37.9) females per thousand males reveal secondary fringe character. The villages recording less value than average - 0.75 S.D. (881-37.9) have been taken within primary fringe zone. From this classification 112 villages fall within rural-urban fringe, including 42, 35 and 35 villages in primary, secondary and rural fringe areas respectively.

### ***Household density***

The household density, therefore, in the surrounding villages of the city gets increased. The mean rural household density of the Koil tehsil is 152.5 household per sq. km (Census of India 2011). This average density has been considered as the lower threshold for fixing the outer limit of the rural-

urban fringe. Further, villages under study are showing heterogeneity so far as their household density is concerned due to which the standard deviation is as high as 215. Therefore, villages having average to average + 0.25 S.D. value (152.5 to 152.5+ 53.6) are termed as rural fringe. Further, villages having value more than this up-to the average + 0.75 S.D. (206 to 313) value are assumed as secondary urban fringe and villages having higher density (313) have been classified as primary fringe and by this determinant, 14, 26, 29 villages come under primary urban fringe, secondary urban fringe and rural fringe of the city, respectively. Thus, according to this index, 69 villages fall in rural-urban fringe of the city.

### **Pucca Houses**

There is observed a decline in the number of Pucca houses beyond the rural fringe. In this context, villages with a score of more than 95 per cent of pucca houses tend to form primary urban fringe. Those with 85 percent to 95 per cent have been included under secondary urban fringe. The villages where pucca houses represent 75 per cent to 85 per cent make their existence within rural fringe. Thus in all 66, 93 and 36 villages fall respectively within the primary, secondary and rural fringe.

Extent and shape of the rural-urban fringe of Aligarh City

The rural-urban fringe, which is a zone immediately next to the city area and has strong reflection of city influence, has been delimited based on several available indicators. All these indicators superimposed one with another, presenting a clear result. In fringe area, the villages which have attained at least any three of indicators and lie adjoining to the city, have been considered to determine the rural-urban fringe of Aligarh. Thus, the extension of the rural-urban fringe begins from the Municipal Corporation boundary and reaches up to rural peripheral areas.

Based on this process, the rural-urban fringe zone of Aligarh city has been categorized into three groups: primary urban, secondary urban and rural fringes.

**Table 1: Villages, area and population under rural-urban fringe of Aligarh city**

Type of fringe	Number of villages	Area [sq. Km]	Population 2011
Primary urban fringe	46	95.4	140059
Secondary urban fringe	60	122.2	115409
Rural fringe	90	236.6	153890
Total	196	454.2	409358

*Source: Census of India, Aligarh District, 2011*

The primary fringe exists just beyond the municipal boundary of the city and is highly urbanized. This zone has the maximum intensity of interaction with the city, economically and culturally. The secondary and rural fringe starts beyond the outer boundary of the primary fringe. The built up area in this outer zone is discontinuous, percentage of agricultural land is relatively high, marketing facilities are partially available. There is no physically clear cut boundary between these zones, but all are interrelated and interconnected.

On the basis of determinants discussed earlier and facts, Aligarh city has influenced 196 villages with an area of 454.2 sq. km, which roughly delimit the fringe zone. It comprises primary fringe zone of 46 villages with 95.4 sq. km (23.5 per cent of total fringe area) of land. Secondary urban fringe zone of 60 villages with 122.2 sq. km. (27 per cent of total fringe area) of land and a rural fringe zone of 90 villages with 236.6 sq. km. (52 percent of total fringe area) of land. It is not a concentric belt around the city. It is core circular in shape and extends up to 15 km from the city. Towards southeast and south-west, the boundary of this zone extends up to 10-11 km, which is the least in case of fringe extension, while towards the north and northeast and south, it extends approximately up to 15 km. In the west, north-west and northeast as well, the boundary of the fringe remains well within 12-13 km from the city center as shown in Fig. 2. The fringe is generally more extended along the transport network, particularly along the main roads and highways, while in inter-sectional spaces, the fringe tends to shrink.

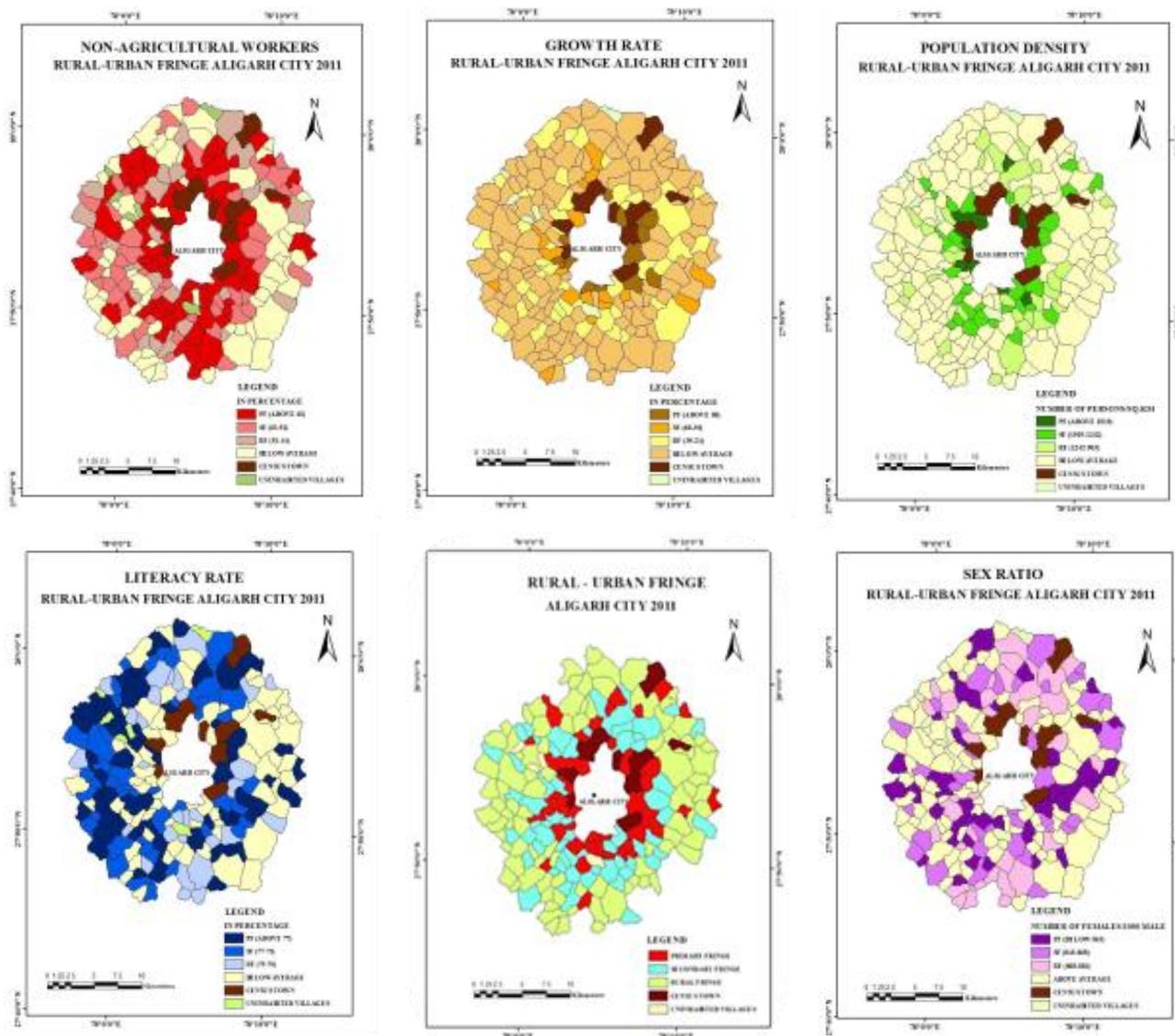
### **Conclusion**

Streaming growth and hasty expansion of Aligarh city acts as a powerful magnet for economic opportunities and has a potential to unlock the multiplication of economic activities in the city. Most important growth factor in Aligarh city is its function of education, marked by the presence of a huge campus of the Aligarh Muslim University. Industrial production and commercial trading are also responsible for economic growth in the city. Progress in manufacturing and service activities, ranging from agriculture to construction and hospitality to communication, provide a good platform for producers and consumers. The other growth factors include the development of highways, proximity to National Capital Region of Delhi in the north, the opening of Yamuna Expressway in the west and the Ganga Expressway in the east, an airport in the south, and development of industrial estates and building of residential colonies along highways.

In this way, the city and its surroundings are complementary units having precisely defined roles. The fortunes of both are interdependent. The city and countryside interaction has intensified due to the changing pattern of development and extension of transport and communication network that in turn results in changing pattern of rural-urban interaction. It has also made the relationship between city and its surroundings more complex. Therefore, an attempt has been made to demarcate the areas that maintain healthy inflow and outflow relationship with the city.

The current analysis proves that the city develops intense relationships with its surroundings on the

basis of different criteria such as vegetable supply, food-grains supply, fruit supply, milk supply, banking, education, medical and bus services etc. The study also found that the city impact has significantly transformed the social environment in the rural-urban fringe. The rural-urban fringe is characterized by the intermixing of urban way of life and rural way of living. The primary fringe households have become more urbanized. The inflow of money through sale of land and incomes from secondary and tertiary sector has contributed to this improvement, but these improvements decrease with distances from the city.



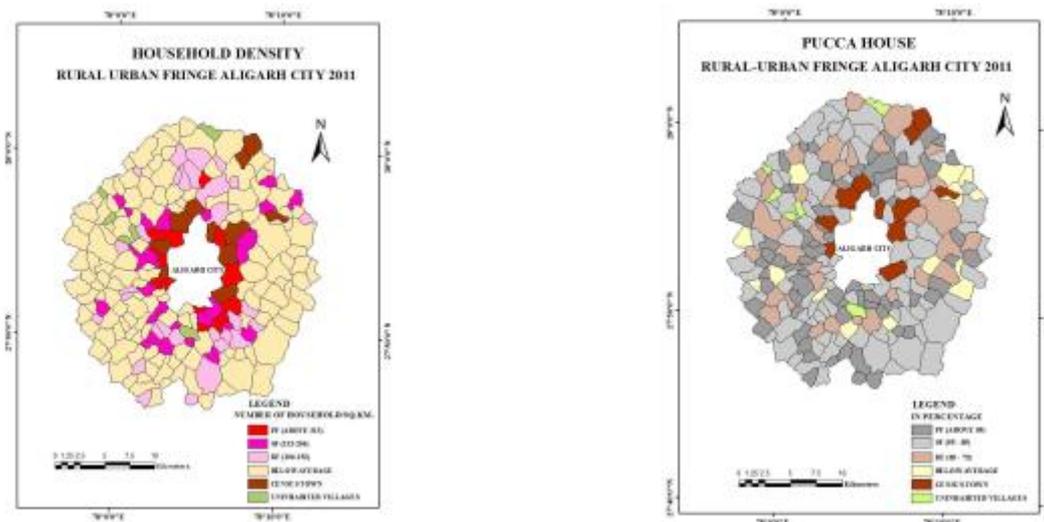


Fig. 2: Location of the study area

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