EVOLUTION OF RURAL SETTLEMENTS AND THEIR SPATIAL VARIATIONS IN ALIGARH DISTRICT

ABSTRACT

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BY

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ABSTRACT

Settlement has occupied an important place among the visual imprints made by man upon physical landscape, through the process of cultural occupancy since the dawn of civilization. The evolution and growth of settlement in an area is a result of interplay of the prevailing ecological conditions, cultural and social values of the residents, technology, management system and the settling process through time span. Settlement refers to an organised colony of human beings ranging from a simple farmstead to a highly complex city and from a temporary camp of hunters or miners to more sedentary houses of farmers and city dwellers. Settlement includes not only the various kinds of buildings put to a variety of uses but also lanes, streets, roads, parks, places of worship and playgrounds etc. In the initial stages settlement features bear simple forms and have close relationship with the environment. However, the growth of knowledge and spread of civilization increases the degree of variability in their form and size.

The spatial patterns, types, shapes, sizes and structures of dwellings of rural settlements provide clear evidence of the influence of the physico-cultural and socio-economic factors of a region.

The selection of the Aligarh District for the present study is due to its uniqueness in many respects. The District
lies in the fertile Ganga Yamuna doab, which is known as the cultural heart of the country. It is one of the most ancient settled regions having a long history of peopling and occupancy. In spite of the intermixing of various ethnic groups and cultural traits from within and outside the country in time span, the region has preserved its own culture, known as the Braj culture. It may be added that no serious study on the evolution of rural settlements and their spatial variation has been made so far in Aligarh District.

It is rather difficult to trace the multifaceted evolution of rural settlements in the study area and their spatial pattern from prehistoric, ancient and medieval eras to the modern period. This is due to the complexity of successions, absorptions and interruptions by later settlers and lack of adequate archaeological excavations in the study area. Extensive excavations in the region are practically impossible because of high density of population.

The objectives of the present study are to trace the evolution of rural settlements in sequent occupancy, to examine the influence of various factors on the spatial distribution of the settlements, to analyse the shape of villages and to suggest suitable models for rural development plans, to identify rural house types on the basis of their building materials and sizes, of the houses, to analyse the social morphology of selected villages (built-up area) and to
examine the influence of castes as well as dominant land ownership on the spatial patterning of rural houses.

The present pattern of settlement distribution is the result of a series of ups and downs of earlier settlements. In order to understand the present, it is therefore, necessary to look into the past. Keeping this aim in view, an attempt has been made in the present work to analyse the evolution of rural settlements and their spatial variations in the Aligarh District.

The following sources have been extremely helpful in providing significant clues to the understanding of the evolution of settlements and their spatial variations in the study area.
(a) Archaeological evidences
(b) Historical sources
(c) Place names, culture, cults and folk lores
(d) Written records
(e) Maps
(f) Field surveys and interviews

Quantitative techniques have been used to examine the spatial distribution and types of rural settlements and shape analysis of villages in the study region.

The Aligarh District lies 27° 29' to 28° 11' north latitude and 77° 29' to 78° 38' east longitude in the state of Uttar Pradesh. It covers an area of 5024 square kilome-
trees, out of which 4978 square kilometres is rural and the rest is urban. It is situated in the fertile middle part of Ganga Yamuna doab which has been under agricultural occupation for centuries. It has witnessed the emergence of 1749 rural settlements, out of which 1704 are inhabited. According to 1981 census the District has a population of 2565450 persons spread over an area of 5024 square kilometres. The density of population is about 511 persons per square kilometre. About 65 per cent of the population of the District is engaged in agricultural activities and about 77 per cent of its people live in rural areas.

Physiographically, the Aligarh District consist of a vast alluvial plain having a gentle slope from north to south and south east. The general topographical layout of the study area is, therefore, very similar to that of the rest of the doab. The region is bounded by two great rivers, i.e. the Yamuna in the west and the Ganga in the east, intersected by numerous tributaries, forming many small lakes & depressions. The whole topography of the District has a saucepan appearance. On the basis of the nature of alluvial deposits, the study area may be divided into two parts, i.e. the Khadar (new alluvium) and the Bhanger (old alluvium). The former occupies a lower level and forms the inundable lowland fringes along the rivers while the latter forms the upland tract above the normal flood limit. The central part of the
District has many lakes and depressions, creating a serious problem of waterlogging during the rainy season.

The area under study falls under the monsoon climate, characterised by a cool and dry winter (November to February), a hot and oppressive summer (March to mid June) and the rainy season (mid June to October). The maximum mean temperature in December varies between 29°C and 23°C, while mean minimum temperature during the month ranges from 12°C to 8°C. The maximum temperature rises to 41.7°C in May and to 39.8°C in June. The average annual rainfall of the District is about 65 cm. The soils of the District vary from loamy to clayey and sandy, depending upon the topographical conditions. Of the total cropped area of the District, 56.49 per cent is irrigated, canals and tubewells, being the main sources of irrigation.

Physical homogeneity provides suitable conditions for the growth of agrarian economy in the study area. However, at micro level, there are variations in the agrarian landscape. This is due to the differential interaction of physical environment and socio-economic attributes, which affect the nature of a human habitat. About 77.66% of the total area is net-sown. Mursan Block has the highest percentage of net sown area in the District. There are no mineral deposits except those of kankar and reh.
Due to the absence of any important minerals, the study area lacks large scale industrial establishments. Yet medium and small scale industries have been developed in the District. It is well-known for its locks, electrical equipments and light engineering goods and other metal products. In the year 1988, the District had 213 industrial units registered with the Industrial Directorate. Glassware, agricultural implements, locks, soap, silicates and candles are the principal small scale industries in the rural areas of the District.

The study area has the benefit of efficient means of transport and communication facilities. The total length of the state highways in the District is about 207 kilometres, while that of metalled roads is 1373 kilometres.

The District has a large number of rural market centres. These markets are periodic in nature, where different types of commodities such as food grains, vegetables, fruits and spices as well as animals are bought and sold by the inhabitants of the surrounding areas.

Population is one of the important factors determining the nature of human settlements in terms of size and economy. A perusal of the population figures relating to the Aligarh District indicates that since the 1901 census there has been a steady population growth in the District, the only
exception being the period between 1901-1921, when it registered a negative growth. Since 1921 the population has been increasing continuously. The present distribution of population in the Aligarh District is the result of many interrelated physical and cultural factors. According to the 1981 census the average rural population density of the District is 513 persons per sq. km. At the block level there are considerable variations in the density of population due to differences in soil fertility and prevailing environmental conditions. The Tappal block of the District records lowest density, i.e., below 350 people per sq. km.; whereas the highest rural density in the District is found in Mursan Block i.e., where the Tappal Block lies in the infertile terrain of the Yamuna khadar while Mursan Block lies in the fertile and irrigated tract of the Aligarh District.

Caste structure is the most important social factor in determining the size of a rural habitation. Dwellings of the people of high castes tend to be concentrated at one place, while the houses of the low castes people are set apart in different localities. There are a number of gradations in the hierarchy of Hindu castes. Muslim society is also divided into high and low castes.

The beginnings of the rural settlements in the study area go back to the prehistoric period. This is borne out by the legends and folk lores of the area, the presence of a large number of mounds, and more convincingly, the archaeo-
logical excavations in different parts of the District. The abundance of mounds suggest that the area had a number of settlements in the ancient period. Archaeological excavations show that the settlements of this region date back to at least 1500 B.C. and that the area has been under the sway of many dynasties. In order to understand the present formal pattern of the rural settlements of the Aligarh District, a study of its histogenesis, i.e., the evolution of its settlements, assumes considerable significance. Hence an attempt has been made in the present work to trace the evolution of the rural settlements in the District, taking into account the place-names, culture, cults, archaeological evidences historical as well as written records, since no single evidence is strong enough to trace the evolution of rural settlement in the study area.

The study of place-names help to trace the evolution of rural settlements because their suffixes and prefixes are closely related to the physico-cultural background of an area, since there is a complex relationship between names of places and their geographical surroundings. Indian villages have a varied nomenclature, even in the same region there are diversities because of variations in physico-cultural and socio-economic conditions at micro-level. There place-names are often influenced by the geographical environment which provides clues to the evolution, growth and decay of earlier human settlements. It has been found that different names
have been assigned to the same place in different historical periods. Such changes of place names are due to the changes of people inhabiting the settlements and also result from changes in their socio-economic conditions. During the field studies of the district it has been found that a large percentage of the names of the villages have suffixes or prefixes like, Pur, Pura, Nagla, Garh, Garhi, Sarai, Khora, Khurd, Kalan, Maufi, Chak etc. and these affixes usually refer to a ruling chief or a god, or a goddess or the topographical features or the vegetation of the area.

Occupation of land has been a universal process in the formation of territories among corporate political groups throughout human history. Territory formation was the first step in the process of settling at lower level. During the course of land occupancy and actual settling process, emotional and historical ties developed among the inhabitants, which tended to bind them to live together in a territory. Such a territorial occupation required autonomy for the occupants to function as a viable unit. Many cultural institutions such as shrines, markets, fairs, and places associated with gods and godlings came up in the course of the settling process and these made the inhabitants to feel that some places were vital for the well-being of the group and must be defended. The occupied land, the shrine, the family burial ground and sites of local festivals also generated a sense of belonging to the territory settlers.
which was shared by the non-corporate group with those of the corporate political group. As such, the territory became a complex symbol of possessiveness, means of sustenance, well being, security and culture evolved over a period of time. Initially, human settlements had no fixed territorial system. However, later these territories developed as clan based republics headed by their chiefs.

During the ancient period a fixed territorial system came into existence, and this has continued up to the modern period, with minor intrusion into their boundaries. In the medieval period there was a three tier political structure in almost all parts of India; At the top was the central government, in the middle was the provincial government and at the base was the hegemony of the locally dominant corporate group. An occupied territory was the primary clan area and known as Paragna. A Paragna was segmented into sub-clan or secondary clan areas known as tappas, which were subdivided into smaller territorial units known as gaon (grams). As a result of this three tier division, there evolved a hierarchy of settlements. During the British period, a five-tier territorial system was introduced, i.e., the pargana, the tappa or turf, the taluka, the patti and the gaon in descending order. The parganas were maintained as sub division of a tehsil and were used as revenue units, and they
continue to function as such. Taluqdari and zamindari and other territorial rights of land corresponding to them gave not only weight, but also formed the basis of surveys and records of holding rights. Four years after India achieved independence, the Zamindari Abolition Act was passed by the Uttar Pradesh legislature and by January, 1956, all the Zamindari estates had been abolished. The Aligarh District has been divided into seventeen blocks, and these have been subdivided into Adalat Panchayats, each one of which has 8 to 12 villages under its jurisdiction. These units are often independent of the clan boundaries and other social ties.

Information regarding the territorial evolution of the District in the ancient period is not available. So the present study is primarily based on medieval sources, particularly on the information contained in the Ain-i-Akbari of Abul Fazl and on the Misl-i Bandobast of 1866. During Akbar's reign (1556-1605), a new unit of administration was introduced, i.e., the sarkar. Koil, (the old name of the Aligarh District) was a sarkar of the suba of Agra. It contained 21 mahals or paragnas and four daastur (revenue) circles. The sarkar of Koil covered an area much larger than that of the present Aligarh District. There were many zamindar clans which held lands in the region. Some of the more important of these clans were the Chauhans, the Badgujars, the Porouchas, the Gahlots, the Bangars, the Pundirs, the Jats and the Brahmins. A study of these zamindar
clans between the sixteenth and the nineteenth century reveals incursions into the territories of these mahals, their patterns of settlement, areas of jurisdiction and changes in the position of these clans in the region during the period.

The evolution of rural settlements in sequent occupancy in the Aligarh District has been studied under three periods, i.e., ancient, medieval and modern. Excavations at various sites of the study area have revealed that settlements of this region began around 1500 B.C. The earliest remains, i.e., pieces of Ochre Coloured Pottery (OCP, 1800-1300 BC) have been found at Jalali. Then successive remains of different periods, Black and Red Wares (BRW - 1300 - 1200 BC), Painted Grey Ware (PGW 1300-700 BC) have been recovered from different places in the District, such as Sankra, Morthal, Hathras Qila, Sasni etc. A large ruined brick stupa and a small building have been found in Balai Qila, which indicate that this site once had a Buddhist settlement. A piece of sculpture belonging to the Kushan period has been recovered from Lakhnau near Hathras tehsil which dates back between 145 and 176 A.D. Very few remains of the Gupta period have been found in the District. Among these are a female head with a striking style of coiffure and the image of Maha Vishnu. The region is also rich in the relics of the tenth and eleventh centuries A.D. The images of post-Gupta period are still being worshipped in village temples at many places in the
study area. A large number of pieces of pottery and sculptures of the medieval period have also been recovered from different mounds in the Aligarh District.

It is clear from the foregoing discussion that the region was continuously settled from the prehistoric to medieval period, though it is very difficult to trace the patterns of settlements during the different periods until extensive excavations have been conducted.

Though Aryans had completed their colonization by the end of the seventh century B.C., the region was affected by the migration waves of Rajput clans at the beginning of twelfth century A.D. Migrations of various other corporate groups or clans followed the Muslim invasion in 1194 A.D., when the fortress of Koil was taken by Qutubuddin Aibek. From that time migration of Muslims continued upto the eighteenth century. In this way a distinct pattern of socio-economic and cultural territorialization emerged in the study area. It is true that many of the rural settlements of today in the District do not appear to have been established on a planned basis. They appear to have just grown. During the Muslim period the villages of the study area remained practically unchanged as Muslims preferred to live in towns rather than in the countryside. Even with the establishment of the British rule the village type remained almost the same, although the need for living within the village wall was no
longer felt by the people due to the establishment of peace and security in the country.

Since the beginning of the twentieth century, the diversification of industries, development of transport and communication facilities have together contributed to the growth of many settlements in different parts of the District.

After independence (1947), rural settlements in the study area witnessed a general tendency of dispersal because of changed economic conditions, loss of the hold of traditional as well as socio-religious beliefs and customs and the abolition of the zamindari system. The consolidation of land holdings, the extension of the means of transport and communication, electricity, irrigation, banking and marketing facilities to the rural areas, improvement in the methods of farming, have all contributed to this trend in recent years. The phenomenal increase of population and consequent demand for more land for farming and housing has not only led to the widespread shrinkage of forest cover but also to the reclamation of barren lands. The new administrative institutions like development blocks, and village panchayats and public buildings belonging to primary schools, rural health centres, panchayat bhawans (village council house), community centres etc. have led to a change in the rural landscape of the study area. A large number of new settlements have grown up
around these centres under programme of providing house-sites and credit facilities to harijans and landless labourers.

Owing to its homogeneous relief and fertile alluvial soils, the Aligarh District has an almost uniform distribution of rural settlements. However slight variations may be seen at micro-level due to difference in local relief, sources of water supply, drainage lines, soil types, patterns of land use, transport facilities, social attributes and population density, etc. Factors like deeply cut ravines usar lands, ill-drained soils, proneness to floods and non-availability of drinking water etc. On the one hand, and bhanger lands, well drained fertile soils and availability of fresh water, on the other hand, have also militated against strictly uniform distribution of settlements in the District. The size (area and population) and density of rural settlements is closely related to spacing. With increase in distance between settlements the density of villages tends to decrease. In the study area the average areal size of village is 2.95 Km$^2$. The highest per village areal coverage (4.237 Km$^2$) is in the Tappal Block of Khair tehsil while the lowest areal size (1.582 Km$^2$) is found in Mursan Block of Hathras tehsil. The average population of a village in the study area is 1193 persons. There are 72 villages, 4.23 per cent of the villages in the District, inhabited by less than 200 people. Two thirds of the total number of villages in the District are inhabited by 500 to 999 people. Exceptionally large villages, inhabited by more than 5000 people represent only
0.94 per cent of the total number of villages in the study area. The average density of villages in the Aligarh District comes to 36 village / 100 km² of area, while the average inter village spacing is 1.83 kilometre. The range of spacing varies between 1.35 kilometre (Mursan block) and 2.21 kilometre (Tappal block). The correlative index between the number of villages in a unit and spacing is taken as one of the indices for classifying rural settlement into different types. With the assumption that the settlements are distributed randomly, an attempt has been made to test the degree of deviation from the random situation, with the help of nearest neighbour analysis. The result shows that Rn values of all blocks in the study area are above 1.0 and that the expected mean distance (rE) is higher than the variance (V). Thus the settlements are more regular than random, because the value of expected mean distance (rE) is always higher than variance and Rn value is more than 1.0. So Dacey's Regular Poission Probability law is quite applicable in this case, because the empirical variance mean ratio here is always less than 1, and the mean, in every case, is more than the variance.

Rural settlements of the District has been classified into three different types - compact settlements, mostly covering the areas along the Yamuna and Ganga rivers; semi-compact type which are generally associated with bhanger tract, and hamleted settlements which are found through out
the region. The hamleted settlements is a result of socio-economic and physico-cultural factors. The term 'pattern' is often equated with the term 'shape'. However, there are geometrical dissimilarities between these two terms. A closed curve has a shape whereas a non-closed collection of point has a pattern. Settlement pattern denotes the shape or arrangement of settlements in relation to natural or man-made features such as streams, ridges, canals and roads etc. Patterns of rural settlements of the study are influenced by physico-cultural factors, state of insecurity in the past, and the present social ethos of the rural society. On the basis qualitative or classical approach, a number of settlement patterns have been identified. Rectangular and square settlement pattern are the characteristic features of the entire study area. The geometrical or quantitative approach of shape analysis is based on the elementary packing theory; The circle is considered to be an ideal geometrical figure owing to its maximum packing capacity, compactness and better accessibility. Hence, the circular geometry has been used for the computation of shape in the present analysis. A study of the village shapes of 174 sample villages of the Districts show the predominance of rectangular & square pattern. This is mainly due to the rectangular system of land division, i.e., the bigha system, prevalent during ancient times. There are only two villages which represent
very elongated shape, while three villages may be categorized under circular shape.

The second basis of shape analysis is the number of contacts between a village and its neighbouring villages. The mean contact number of sample villages is 5.648, which is very near to 6, a feature of a strictly hexagonal system. This is further corroborated by the fact that 63.8 per cent of the sample villages record contact numbers between 5 and 7.

There appears to be no correlation between contact index, population density, and shape index, because of the homogeneous nature of the study area. Transformation of village shapes takes place in order to minimise the transport cost, to bring territorial limits of a village within easy reach of the village site and to accelerate the pace of economic progress and modernization. For the transformation of village shape, three areas from discrete ecological setting have been selected and suggestions have been advanced, using Thiessen's Polygons and Hexagons of varying 'K' values for the rural development plans.

Rural dwellings constitute the basic element of cultural landscape and occupy an important place in the geographical analysis of human settlements. They provide a clear evidence of the complex relationship between man and his environment. The distributional pattern of rural
dwellings generally follows the pattern of rural population distribution and is determined by the ecological condition of a region.

According to 1981 census, there are 332513 rural houses in the District, with an average density of 68.87 houses per square kilometre. The maximum and minimum densities 84.20 houses and 58.60 houses per square kilometre are found in Sasni and Tappal blocks respectively. House types of the region have been classified on the basis of their building materials and sizes and shapes. The study reveals that mud and unburnt brick wall with thatched and mud roof houses constitute 50 per cent of the total rural dwellings. Burnt brick wall with burnt brick, stone and lime roof dwellings (pucca dwellings) cover about 25 per cent of the total number of rural houses, while rest of the dwellings consist of mixed materials used in walls and roofs.

The size of a dwelling reflects the economic condition of the dweller and the size of household. The sizes of the houses in the Aligarh District vary from palatial buildings to single room huts, which mark the difference between the rich and the poor. One and two room dwellings together constitute more than two third of the total number of rural houses of the District and offer shelter to 71.81 per cent of its total rural population. The three and four room dwellings, which are nearly 20 per cent of the total rural houses in the District, provide accommodation to over one-
fifth of the total rural population. Mostly the rural houses in the study area are multipurpose one, used for sleeping, fodder keeping cattle, storing etc. Generally the housing conditions and village environment are far from satisfactory. The houses are constructed in close proximity to one another, allowing little ventilation. There are many big and small pits full of contaminated water near the inhabited sites emitting foul smell, which cause diseases and infections. A few suggestions have also been given to improve the housing conditions and village environment of the rural areas of the Aligarh District.

The morphological structure of the sample villages (built up area) in the study area is mainly determined by their socio-economic as well as physical attributes. Landownership and caste system have played an important role in determining their spatial and morphological structure. Sample village studies reveal that Brahmins, though occupying the highest rank in the social hierarchy, do not hold the central or the best available sites of these villages, whereas people of the second and third order of the social hierarchy, such as Kshatriya and Vaishyas, occupy that sites, as they have the largest land holdings in these villages. The lowest strata of the rural society, namely people belonging to the scheduled castes generally live in congested residences on the prephery of these villages, away from higher caste dwellings. The stigma of pollution creates a
sense of ritual distance between different castes as well as determines the spatial arrangement of their respective dwellings in the villages. Distance among various castes based on religio-ritual notions is decreasing due to interdependence of functional ties between the people of higher and lower castes, which tends to reduce caste barriers in spite of the stigma of untouchability attached to the latter. This makes the rural settlements compact and unified.

The analysis of the spatial patterning of houses of different castes reveals that caste inhibitions contemplate the people of different castes to live in separate settlement units. However the latest houses of the low caste people are built near the residences of the high caste people, in these sample villages, owing to the growth of population and changes in the socio-economic conditions.
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This is to certify that Mr. Ateeque Ahmad has pursued his research work and prepared the present thesis entitled *Evolution of Rural Settlements and Their Spatial Variations in Aligarh District*, under my supervision and guidance. This thesis is his original work and is being submitted to the Aligarh Muslim University for the degree of Doctor of Philosophy.

K. Z. Amani
(K.Z. AMANI)
TO

MY FATHER

who is no more
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Introduction
INTRODUCTION

Settlements occupy an important position among all the visual imprints made by man upon the physical landscape through the process of cultural occupancy since the dawn of human civilization. The evolution and growth of a settlement in an area is the result of the interplay of the prevailing ecological conditions, cultural and social values of the residents, technology, management system and the settling process through time span. In the initial stages, settlements bear simple forms and have close relationship with the environment. However increase of knowledge and growth of civilization increases variability in the forms and sizes of settlements.

Spatial patterns, types, shapes and sizes, the structural morphology of the dwellings (building materials, architectural design, ground plans, orientation etc.) and socio-spatial patterning of the houses of settlements provide clear evidence of the influence of the physico-cultural and socio-economic features of a region.

Rural settlement geography is a relatively recent branch of human geography in the English-speaking world. In Germany and France, however, its tradition is fairly old. The word 'rural' has been derived from the Latin word ruralis, which in its turn has been formed from ruris or rursis meaning
'the country'¹ The word 'settlement' has its origin in the Old English word 'setl' meaning 'seat' or 'place of rest' (to place) denoting a 'settled colony'. But in modern geographical literature it refers to an organised colony of human beings ranging from a simple farmstead to a highly complex city and from a temporary camp of hunters or miners to houses of more sedentary people like farmers and city dwellers. Settlements include not only different kinds of buildings put to a number of uses but also lanes, streets, roads, parks, places of worship and playground etc. A rural settlement is a complex entity, which has been defined as the distribution of buildings by which people attach themselves to the land for the purpose of primary production.² But this definition amounts to the exclusion from examination some important parts of rural settlement geography such as building materials, architectural styles, land use and fence types etc. This approach of Stone was broadened by Jordan who defined the subject as the study of the form of cultural landscape, involving its orderly description and attempted

'Form of the cultural landscape' is a term which needs clarification. It is synonymous with settlement morphology and includes (a) vertical arrangements and dimensions (such as number of storeys in houses), (b) horizontal arrangements and dimensions (such as the distribution of buildings, floor plans of houses, or pattern of fences and fields), and (c) material composition (such as brick vs. wood in house construction or live hedges vs. wire fences).

The most significant theoretical framework of settlement formation has so far been developed by C.A. Doxiadis. He sets forth five principles, illustrated with hypothetical diagrams (Fig.1). The first principle is the maximization of man's potential contacts with natural elements, (e.g., water, trees, etc.), with other people and other cultural elements (e.g., buildings, roads, etc.). The second principle is the minimization of effort required for the achievement of man's actual and potential contacts, according to the general principle of least effort. The third principle is the optimization of man's protective space at every movement individually or in a group, in any situation or locality, whether it is temporary or permanent, whether he is alone or part of a group. The fourth principle is the optimization of the quality of man's relationship with

FIVE PRINCIPLES OF SETTLEMENT-FORMATION

1ST MAXIMIZATION OF POTENTIAL CONTACTS
GIVEN CERTAIN CONDITIONS IN A CERTAIN AREA

MAN WILL SELECT THE LOCATION WHICH ALLOWS A MAXIMUM OF POTENTIAL CONTACT

END AT A MINIMUM OF EFFORT IN TERMS OF ENERGY TIME AND COST

3RD OPTIMIZATION OF MAN'S PROTECTIVE SPACE IF HE IS ALONE

OR WITH OTHERS

4TH OPTIMIZATION OF THE QUALITY OF MAN'S RELATIONSHIP WITH HIS ENVIRONMENT

THE FIVE ELEMENTS OF HUMAN SETTLEMENTS ARE NOW OUT OF BALANCE

8TH OPTIMIZATION IN THE SYNTHESIS OF ALL PRINCIPLES

FIG. 1
his environment, consisting of nature, society, shells (buildings and houses of all sorts), and networks (lanes, street, roads, communications, etc.). The fifth principle is that man organizes his settlements in an attempt to achieve an optimum synthesis of the previous four principles. This optimization works naturally through time and space, as well as the prevailing conditions and man's ability to create a synthesis.

There are several works on rural settlements, giving their evolution, pattern, types, distribution, etc., described under two sets of grouped factors i.e., the physical and the cultural. Rarely has there been an attempt made to dwell on the total situation, i.e. the settling process. None of the above factors in the study of rural settlements can be dealt with without taking the process of settling and space articulation into consideration.

Apart from space articulation or territoriality, there are also other pertinent factors, which are capable of general application. Doxiadis has developed a four fold frame which can be applied to composite individual settlements of all sizes in a territory as well as to its constituent parts (Fig.ii). Hypothetically, any settlement consists of four parts: (i) homogeneous part, (ii) central part, (iii) circulatory part, and (iv) special part. These parts are
PARTS OF HUMAN SETTLEMENTS

ANY SETTLEMENT CONSISTS OF:

- Homogeneous Part
- Central Part
- Circulatory Part
- Special Part

A VILLAGE CONSISTS OF:

- Homogeneous Part (Fields)
- Central Part (Built Up)
- Circulatory Part (Roads and Paths)
- Special Part (Temple)

THE BUILT UP AREA OF THE VILLAGE CONSISTS AGAIN OF:

- Homogeneous Part (Houses)
- Circulatory Part (Street)
- Central Part (Shops)
- Special Parts (School or Temple)

FIG. 11
always subject to change but they are always present in a living settlement.1

The scientific study of settlement geography began in Germany with Ritter's work whose theme of man-land interdependence provided a base for the study of the subject in the early nineteenth century. Later, Kohl, Richthafen, Ratzel, Meitzen, Grandman, Martiny, Christallar and Nitz in Germany, Blache, Brunches, Demangeon and Blanchard in France, Lefeure in Belgium, Bowman, Hall Kohn, Stone, Jordan and Hudson in the United States, Bunge, Bulund, Hagerstrand in Sweden, Aurousseau in Austria, Ahlmann in Scandinavia, Howton, Chisholm and Haggett in Britain, Ahmad, E.; Singh and Mukerjee, in India and Doxiadis in Greece made significant contributions in the field of settlement studies.

Rural settlement geography in India has not received adequate attention, compared with as other branches of geography. During 1960-70, R.L. Singh initiated a number of studies of rural settlements in the Ganga Valley. The first description of the Indian village can be seen in Kautilya's Arthasastra.2 In modern times, the first systematic approach


to the subject can be found in the works of Baden Powell\textsuperscript{1} and Mukerjee.\textsuperscript{2} Mukherjee has thrown light on the dwellings of Indian communities, while Baden-Powell has mainly described their social and land-revenue characteristics with particular reference to land-owning castes and clans. Singh has analysed the evolution of rural settlements in the Middle Ganga Valley over a long span of time, based on the territorial patterning of different clans in relation to the various physical and cultural factors. Ahmad has described types and patterns of rural settlements in Uttar Pradesh in relation to physical and cultural factors. Interesting results could be observed in the work of Nitz., who has compared the field pattern of northern India with that of Germany on the basis of historical growth and castes structure.

It is worth mentioning that the analysis of multifaceted evolution of rural settlements and their spatial variations in an ancient settled region like the Aligarh District is a difficult task. This is due to a complexity of successions, absorptions and interruptions by later settlers on the one hand, and lack of adequate data and records on the other. However, an attempt has been made in the present work to trace the evolution of rural settlements

\begin{enumerate}
\item Baden-Powell, B.H. 'Indian Village Community', London, (1896).
\end{enumerate}
and their spatial variations in the Aligarh District, with the help of the available sources and field survey.

The beginnings of the rural settlements in the study area go back to the prehistoric period. Excavations at various sites of the District have revealed that the settlements of this region had begun around 1500 B.C. The earliest remains, i.e., pieces of Ochre Colour Pottery (OCP) have been found at Jalali. Then, successive cultural remains of different periods have also been recovered from different places in the region. Aryans came to India, gave up their nomadic habits and set up permanent settlements along the tributaries of big rivers. The dwellings in their settlements were made of wood and bamboo and they do not differ much from those found in many other parts of India as well as in the study area even today. The Aryan migration started in the region in the ninth century B.C. and had been completed by the end of the seventh century B.C. The region was at first affected by the migration waves of Rajputs clans at the beginning of the twelfth century A.D., and migration of various corporate groups or clans on a much larger scale followed the Muslim invasion in 1194 A.D., when the fortress of Koil was captured by Qutubuddin Aibek. Since waves of migration continued up to eighteenth century, each of which has left its imprints upon the study area, a distinct socio-economic and cultural ethos has emerged in it. It is rather
difficult to trace the patterns of ancient and medieval settlements until extensive excavations have been conducted, which is impossible on account of the high density of population in the region. So the existing rural settlements have been taken into consideration for spatial analysis.

The majority of the people of the study area live in villages. This is a clear indication of agricultural development and stability on the fertile upper Ganga Yamuna doab. Initially, people lived in scattered hamlets, and later they clustered together in favourable spots either along the water courses or highways, which and gave rise to the compact village type. Several historical and physico-cultural factors such as better means of transport and communication, efficient irrigation and improvement of socio-economic condition of the people together with the increase of population have been the main causes of the clustering of human habitations in many parts of the study area. In contrast to the compact type, there is the scattered type of rural settlement occurring in infertile tracts, usar infested areas, and areas with poor irrigation and transport facilities in the Aligarh District.

The rural settlements of the District do not appear to have been established on a planned basis, but to have just grown. Some of the settlements are still found surrounded by walls, especially in the north western part of the Aligarh
District, which indicates that they were established at a time when settlers needed protection from outside attack. Moreover, in most cases the shape of the village is roughly rectangular. Other geometrical shapes, such as square, semi-circular and elongated are also found in some areas. A detailed description of the shapes of villages along with the layout of the village roads is to be found in a treatise on village plans, called "Mansara Shilpasatra", believed to have been compiled in the fifth century B.C. It is therefore, very likely that some of the settlement conformed to the traditional village plans, indicating thereby that there has been a continuity in the growth of settlements from the Aryan period to the present time through ancient, medieval and modern periods in India in general and in the study area in particular. This is also corroborated by the fact that the villages of Buddhist time, like of those today, were compact and self-sufficient and extended in a linear form along the principal waterways. With the decline of Buddhism and the disappearance of rural republics by the end of the fifth century A.D., the compactness of the village was broken and settlements got scattered into hamlets. During the Medieval period, villages remained practically unchanged as the Muslim preferred to live in towns rather than in the countryside. With the establishment of the British rule, the village type remained almost the same although the need for living within the village wall was no longer felt by the people due to the
restoration of peace and security in the region. The surplus rural population came out of the village ramparts and established hamlets in the neighbourhood of their fields.

The selection of the Aligarh District for the present research is due to its uniqueness in many respects. The District lies in the fertile Ganga Yamuna doab. The Aligarh District has an agrarian base and presents diverse physico-cultural and socio-economic conditions at micro level in its different parts. It is one of the most ancient settled region and has a long history of peopling and occupancy. Several archaeological findings, historical records and local legends pertaining to the pre-historic time, show that the study area was initially occupied by the Kols. In spite of the intermixing of various ethnic groups and cultural traits from within and outside the country the study area has preserved its own traditions, culture, myths and related norms and values, which has resulted in shaping the uniqueness in its identity and is known as the Braj culture. It may be added that no serious study on the evolution and spatial variation of rural settlements has been made so far in the District.

Objectives of the Present Study

The theme of the present study is an analysis of the various aspects of the evolution of rural settlements and their spatial variation in the Aligarh District. Keeping this in view the main objectives of this study are as follows:
(1) To trace the evolution of rural settlements from prehistoric times to modern period with the help of cultural ecology and place names analysis, and also to examine the territorial evolution of different clans in the study area between 1600 and 1833 A.D.

(2) To identify the influence of various physico-cultural and socio-economic factors on the distribution, types, spacing and dispersion of rural settlements in the study area.

(3) To study the factors that are responsible for the formation of different patterns of rural settlements, to analyse the shapes of villages and to suggest suitable plans for rural development in the Aligarh District.

(4) To identify rural house types on the basis of their building materials and sizes and to suggest suitable house plans for the District.

(5) To analyse the social morphology of selected villages (built-up areas) based on the religio-ritual and secular dominance models, and also to examine the influence of castes and dominant landownership on the spatial patterning of rural houses in the study area.

Methodology

The present pattern of settlement distribution is the result of a long process of extension, growth and retreat of settlements. In order to understand the present formal
pattern of rural settlements it is, necessary to look into the past. Keeping this aim in view an attempt has been made to analyse the evolution of rural settlements and their spatial variations in the Aligarh District.

The following sources have been extremely helpful in providing significant clues to the understanding of the evolution of settlement patterns in the District:

(a) Archaeological findings
(b) Historical sources
(c) Written records
(d) Place names, culture, cults and folk lore
(e) Maps
(f) Field surveys and interviews

Archaeological findings comprise earliest remains, i.e., pieces of ochre coloured pottery (OCP), black and red ware (BRW), painted grey ware (PGW), classical northern black polished wares (NBPW) and medieval glazed ware (MGW). These finds reveal that the region has been extensively inhabited since prehistoric time. A large number of terracotta male and female figurines, plaques, sculptural pieces, corroded coins, burnt bricks, fragmentary inscriptions on stones, statuettes, ruined brick stupas etc. have been found in the study area. These evidences shed light on the sway of different dynasties from prehistoric period as well as ancient and medieval
period. The antiquities recovered from the study area are well preserved in the Mathura Museum.

Written records include 'Ain-i-Akbari by Abul Fazl, Misl-i Bandobast (1866), (Miscellaneous papers of revenue settlement), Institute Gazette, District Gazetters, Gazetteers of the United Provinces of Agra and Oudh, Memoir North West Provinces of India, Memoirs Statistical Descriptive and Historical Account, Alygarh and a large number of books on regional and local history. These are preserved in the State archives, revenue records rooms of the District and tehsil headquarters and libraries.

Culture, cults, folklore, legends, and oral history as narrated by the people, interviews and field surveys have been used to trace the place names of the villages.

To examine the spatial distribution and types of settlements in terms of spacing, degree of dispersion and concentration, quantitative techniques have been used in the following manner.

\[ D = 1.0746 \sqrt{\frac{A}{N}} \]

\[ R_N = \frac{r_0}{r_E} \]

For the identification of settlement types, village and hamlet ratio as well as inter village spacing has been taken into consideration.
For the analysis of the pattern or shape of settlements both qualitative (classical), and quantitative (modern) approaches have been applied. Shapes of settlements have been measured taking 10% of villages as a sample on random basis, using the following formula.

\[ S = \frac{A}{\pi} R^2 \]

The shape analysis of settlements has also been made by taking into account the number of contacts between a village and its neighbouring villages. Dirichlet/Thiesen Polygons and Hexagons have been used for proper planning of rural settlements. The composition of building materials has been taken into consideration for the classification of rural houses. Social morphology or spatial patterning of built-up areas of selected villages of different types belonging to different tehsils of discrete ecological settings at micro-level has been analysed on the basis of religio-ritual and secular dominance models.

The study is primarily based on field work and analysis of relevant topographical maps as well as orally recorded history. Field work has involved extensive traversing through the study area with the aim of observing the landscape features of the study area. Observation of the landscape includes a careful examination of the village landscape its settlement morphology, house types, building
materials used, ground plans, modes of house construction and religious symbolism attached it to (if any) and general living condition of the people. Such detailed field work on the core elements of rural settlements has, however been limited to three selected villages.

The Survey of India topographical sheets of the District on the scales 1:250,000 and 1:50,000 have formed the basis for studying the distribution, types and patterns of rural settlements in the Aligarh District. Similarly for a morphological study of the of sample villages cadastral maps (scale 16"=1 mile or 1.3960) have been used, while the nearest neighbour analysis is based on the tehsil maps contained in the District Census Handbook, 1981, duly corrected, all the maps being joined together to form the District map. Various atlases such the National Atlas, Uttar Pradesh in Maps, Census Atlas of U.P. and Atlas of the Mughal Empire, have also been used for drawing the outlines of the District and for identifying the territories of the study area during the medieval period.

The collected data, both primary and secondary has been presented in tabular form and analysed, using different quantitative techniques to derive specific conclusions regarding dispersion, spacing, shape analysis and settlement types. Sample choropleth mapping has been adopted throughout the work. A plethora of tables has been avoided by
cartographic representation, Community Development Blocks have been chosen as areal units for the analysis, and Panchayat level analysis has been taken in the study of settlement types. Nearest neighbour distances for all the villages of the study area have also been measured.

Plan of the Study

The entire study has been divided into seven chapters excluding conclusion and suggestions. Chapter I deals with the general physical and cultural setting of the study area with emphasis on physiography, drainage, climate, soil, as these are the basic physical factors in determining the settlement formation and growth, and also provides an account of various cultural attributes, e.g., land use, cropping pattern, crop-association, irrigation, transportation and communication, manufacturing activities and rural market centres, socio-economic factors which directly affect the spatial patterning of rural settlements.

Chapter II deals with the demographic structure and distribution of castes in the District. Since the patterns of rural settlement distribution and social morphology of the dwellings in an area are greatly affected by its demographic characteristics and composition of castes in it.

Chapter III throws light on the evolution of rural settlements in sequent occupancy, taking into account the place-names analysis, culture and cults, archaeological
evidences and written records. It also deals with the evolution of territorial units through land occupancy of various zamindars clans or corporate political group between the sixteenth and the nineteenth century, who functioned as the dominant local power in different parts of the region and always occupied the best available sites of the territory and allowed other, non-corporate group of men and women to settle on lands given to them to carry out their socio-economic activities within its organisational framework.

Chapter IV is concerned with the analytical study of different physico-cultural and socio-economic factors which have affected the distribution, siting and types of rural settlements. It describes the sizes of the rural settlements in terms of area and population and discusses the nature of spacing and dispersion with the help of quantitative techniques.

Chapter V examines the various patterns of rural settlement found in different parts of the study area in response to the physical and cultural factors. These patterns have been identified on the basis of the Survey of India topographical sheets and have been checked and modified with the help of village cadastral maps and through personal observation, wherever possible. Shape analysis of the villages has been based on quantitative techniques, taking into account 10% of sample villages on random basis.
Further, relationship between among contact index, population density and areal size of the villages has been studied. The present researcher has recommended that Thiessen polygons and hexagons be adopted as model while planning the developments of the villages in the study area.

Chapter VI deals with the evolution, distribution and density of rural houses in the study area. It also assesses the impact of various physico-cultural and socio-economic factors on building materials, shapes, sizes and morphology of rural dwellings. Suitable rural house plan and a few remedial measures have been suggested for improving the village environment.

Chapter VII seeks to analyse the social morphology of three selected villages (built-up areas), based on the religio-ritual and secular dominance models. The influence of castes and dominant land-ownership on spatial patterning of rural houses of these three selected villages of the District have been examined through field observation.

In the end conclusions have been drawn. Some suggestions have also been made for future studies in the present area of investigation.
Chapter I
General Physical and Cultural Setting
GENERAL PHYSICAL AND CULTURAL SETTING

Before assessing the characteristics of a rural landscape, it is essential to have an overview of its ecological and cultural attributes, which shape the geographical identity of a region. This is a prerequisite for the analysis of human settlements in spatiotemporal context. With the assumption that the environment affects the nature of a human habitat, some of the important physical and cultural features of the Aligarh District are discussed in the following paragraphs.

The Aligarh District has some of the most ancient human settlements in Uttar Pradesh. It is located in the western part of the State, at a distance of about 126 Km. from Delhi. It lies in the central part of the Ganga-Yamuna Doab. The District comprises the northernmost part of the Agra Division. It is bounded by Bulandshahar District in the north; Mathura District in the south and south-west and Etah District in the east and south-east. Its north-eastern boundary, formed by the river Ganga, separates the Budaun District from it, whereas its north-western boundary, formed by the river Yamuna, separates it from the Gurgaon District of Haryana state. (Fig. 1.1) The Aligarh District extends from $27^\circ 29'$ to $28^\circ 11'$ north latitudes and $77^\circ 29'$ to $78^\circ 38'$ east longitudes. The greatest width from east to west is about 116 kilometres and the maximum stretch from north to
GENERAL PHYSICAL AND CULTURAL SETTING

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south is about 72 kilometres. The District, according to 1981 census, has a population of 2565, 450, spread over an area of 5024 square kilometres. The density of population is about 511 persons per square kilometres. About 65 per cent of the population of the District is engaged in agricultural activity and about 77 per cent of its people live in rural areas. Its rural population is 1974113, while the urban population is 591337. The District has been divided into six tehsils, namely, Koil, Sikandra Rao, Hathras, Atrauli, Khair and Iglas. These tehsils are further sub-divided into seventeen blocks namely, Jawan, Dhanipur, Lodha, Akrabad, Sikandra Rao, Hasayan, Khair, Chandaus, Tappal, Mursan, Sasni, Hathras, Atrauli, Gangiri, Bijauli, Iglas and Gonda, spread over 1769 villages both inhabited and uninhabited. The inhabited villages in the District is 1704. Table 1.1 shows areas of the blocks and the number of inhabited and uninhabited villages in each of them.

1. PHYSICAL SETTING

Physiographically the Aligarh District consists of a vast alluvial plain having a gentle slope from north to south and southeast. The highest point on the surface is about 212 metre above sea level in the north-west of the District, while on the southern border the elevation is about 204 metre. The whole District presents an almost level appearance and is remarkably homogeneous in character. Its land surface
## Table No. 1.1
### Aligarh District Administrative Unit 1981

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Geographical Area (Sq.km.)</th>
<th>Revenue Villages</th>
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<tr>
<td></td>
<td></td>
<td>Inhabited</td>
<td>Uninhabited</td>
<td>Total</td>
<td>No. of villages</td>
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<td>85</td>
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<tr>
<td>Atrauli</td>
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<td>113</td>
<td>3</td>
<td>116</td>
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<tr>
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<td>8</td>
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<tr>
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<td>92</td>
<td>2</td>
<td>94</td>
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<tr>
<td>Dhanipur</td>
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<td>103</td>
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<td>Jawan</td>
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<td>Mursan</td>
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<td>67</td>
<td></td>
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<tr>
<td>Tappal</td>
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<td>4</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>4839.9</strong></td>
<td><strong>1704</strong></td>
<td><strong>45</strong></td>
<td><strong>1749</strong></td>
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</tbody>
</table>

### Rural Area

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<tbody>
<tr>
<td><strong>Total</strong></td>
<td><strong>179.1</strong></td>
<td></td>
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</tr>
</tbody>
</table>

### Urban Areas

<p>| | | | | | |</p>
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<th></th>
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<tbody>
<tr>
<td><strong>Total Area of</strong></td>
<td><strong>5019.0</strong></td>
<td><strong>1704</strong></td>
<td><strong>45</strong></td>
<td><strong>1749</strong></td>
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</tr>
</tbody>
</table>

**Source:** [Statistical Magazine; Aligarh, Aligarh Institute of State Planning U.P., 1988, p.8 & 11.](#)

...is, at places marked by a number depressions and elevations. The depression have resulted from the action of surface water. While the elevated portions are in the form of sand ridges.
The general topographical layout of the study area is therefore very similar to that rest of the Doab. On the basis of alluvial deposits it may be divided into two parts, i.e., the new alluvium and the old alluvium areas. The former variety of soil is confined to the terraces and flood plains of the rivers and their tributaries, while the latter invariably occupies higher ground, above the flood level of the rivers. Thus in the Aligarh District, from the low Yamuna flood plains in the west, the level rises to the high upland in the centre and then further east it descends to a slight depression formed by Kali Nadi. From Kali Nadi further east, the land again rises and finally merges into the Ganga flood plains. A cross section of the remaining portion of the District provides more or less the same features. An exception is, however, the broad depression which lies in the southeast.

From the low Khadar of the Ganga river in the east, the level of the District rises sharply to the high uplands which crown the old flood bank of the river and then descends inland gradually to a depression, drained by the Nim and the Chhoiya rivers, after which, it rises again up to the banks of the Kali Nadi. Along the right bank of the Kali Nadi, is another sandy to silty belt rising from the low and narrow Khadar belt of that stream. Adjoining it is a fertile belt of loam soil which sinks gradually into the broad central depression.
Through the centre of the District, a broad belt of low-lying land runs from north-west to south-east, which is really the continuation of the belt which begins from the District of Meerut, and passing through the Ghaziabad and Bulandshahar Districts, enters Aligarh in Koil tehsil in the north. The depression is narrow in the north and gets wider towards the south and eventually enters the adjoining District of Etah. It is believed to be part of a very extensive low-lying tract which runs through the centre of the doab, parallel to the rivers Ganga and Yamuna. This tract is characterised by imperfect drainage and numerous jhils (lakes) in which surface water collects.

Beyond this depression, the surface rises again into a level plain known as the Western Uplands. In the north west, the general characteristics of the doab are maintained, loam alternates with clay in the depressions and the higher ground on the banks of the few drainage channels, till finally comes the high cliff of the Yamuna. From here, the level drops to the Khadar of Yamuna. In the southwest of the District, sandy tracts with practically no depressions are found.

Topographically, the District represents a shallow trough of saucepan-like appearance. On the basis of the topography and the nature of soil, the District may be divided into five physiographic divisions, which are as follows:
I. The Ganga Khadar

II. The Yamuna Khadar

III. The Eastern Uplands

IV. The Western Uplands

V. The Central Low-lying Tract

(Fig. 1.2) shows the physiographic division of the District.

1.1 Structure and Relief:

The Aligarh District forms part of a region which is known as the Ganga Plain, and is a depression between the Himalayas in the north and the Deccan Plateau in the south. It has been filled with alluvium brought down by the Himalayan rivers. The deposition of this alluvium commenced after the final upheaval on the mountains and has continued up to the present.¹

Perhaps a depression perhaps began to form in the Upper Eocene Age and attained greater development during the third Himalayan upheaval in the Middle Miocene Age. Since then it is being gradually filled up with sediments to form a level plain with a very gentle seaward slope.²

Geologists differ in their estimate of the thickness of the alluvial deposits in the area. On the basis of geodetic

observations, Glennie has estimated its thickness to be about 1950 metre.¹ Borings done mainly for artesian wells have penetrated only upto 1606 metre in the recent alluvium strata.² Magnetic surveys reveal local highs and lows, all of which dip steeply to the north. In 130 borings, the depth from the surface to the bedrock was found to range between 400 and 100 metre.³

During a drilling operation at a railway station, by the Central Groundwater Board, Lucknow in 1978, it was found that the real thickness of the alluvial deposits at Aligarh was only 379.5 metre. A more recent report by the Hydrological Department of Uttar Pradesh has indicated that the alluvium comprising sand, silt and clay extends to a depth of 286.69 metre at Aligarh, below which sandstone has been encountered. The rocks are everywhere of fluviatile and sub-aerial formations—massive beds of clay, either sandy or calcareous, corresponding to the silt mud and sand of modern rivers.⁴

Geologically the alluvial deposits may be classified into two sub-divisions: **Bhangar** and **Khadar**. The **Bhangar** lands or the old alluvial deposits are found in the level plains above the flood levels of the main rivers and their tributaries. The most important material in **Bhangar** lands is clay, which, at places, becomes loam or sandy loam. In this clayey part of the alluvium, irregular kankars (nodules of calcium carbonate) of various shapes and sizes are found at different levels. These have been formed due to transformation of calcareous material of alluvial deposits into lumps or nodules.

Large areas of **Bhangar** lands which were once rich agricultural tracts have become unsuitable for cultivation due to the presence of saline and alkaline efflorescence namely **reh**, which has come into existence as a result of the gentle slope of the land and the composition of the alluvium. Usually the Himalayan rivers and their tributaries carry various salts in solution which percolate to the sub-soil of the area they traverse. In areas where there is no proper surface drainage these salts keep accumulating by leaching from the neighbouring regions. During the dry seasons, the soluble salts are sucked up in the solution by capillary action to the surface and are deposited there in the form of a white efflorescence. As in many parts of the Aligarh District the slope of the land is less than one foot to a
mile and parts of it lack drainage, such formations are not uncommon.

The Khadar lands or the new alluvial deposits are confined to the terraces and the flood plains of the rivers and their tributaries. They are formed by the erosive action of the rivers, the main channels of which are confined to well-defined valleys and the flood level of the water remains below the general level of the country. The low level of the Khadar is in conformity with the principle that, as a river gets older, more and more of its deposits are found to be of a younger age, and as the bed of the river sinks lower, and so these younger deposits occupy lower levels than those occupied by the earlier deposits. Khadar lands are light coloured and poor in calcareous matter, and are composed chiefly of sand, silt, mud and clay. Their clay has less kankar and contains the remains of living species.

1.2 Drainage:

Water is a prime necessity of human beings next to air. The existence of water bodies has played a very important role throughout human history, in the birth of many great civilization of the world, including that of India. Water had been the centre of attraction and people have been settling along banks of small tributaries of rivers, avoiding big
rivers because of the fear of floods which recurred frequently in them. Due to the increasing pressure of population, they settled along the banks of big rivers also. Before discussing the evolution of rural settlements, it is necessary to trace all the rivers, tributaries and nalas which traverse it.

In the Aligarh District, rivers constitute a prominent feature of the landscape. They affect the land over which they flow, besides being one of the main sources of water supply. These rivers follow the general slope of the land and traverse the area from north to south and south-east. These rivers can be placed into two categories. There are those which have their sources in the snowy caps of the Himalayas and are never dry during the year. The rivers Ganga and Yamuna are representatives of this class. Then, there are rivers which have no permanent source of water supply and completely dry up or are reduced to insignificant streams in summer. Though they swell to considerable dimensions during the rainy season, like Karon, Sengar, Rind, Nim and a number of excavated and natural drains. (Fig. 1.3).

The Yamuna River:

The Yamuna has its source in the snowy peaks of the Himalayas. Coming from the north, it flows along the north-western border of Aligarh District and then moves towards
south into Mathura and Agra Districts. In Aligarh, the river flows from north to south with a minor loop and the lands along it are flat low-lying khadar plains that form a tract of low fertility. At the present time this tract is being used for grazing rather than for agricultural purposes. There is very little traffic on or across the Jamuna, and the river is of very slight importance to the District.

The Karon River:

The river Karon or Karwan, as it is known in some parts is a natural water course which rises in the north of the Bulandshahar District, and flows in a southerly direction through Khair, Iglas and Hathras Tehsils of the Aligarh District. Further southwards, passing through Mathura, it joins the Yamuna near the city of Agra. In its upper course the channel becomes broader and has been modified by the canal authorities, so that it forms the arterial drainage line for the western parts of Bulandshahar and Aligarh Districts.

In the Khair tehsil the river has a broad basin with a good deal of low ground on either of its sides. But further south, when it enters the sandy tract of Iglas tehsil, the channel gets narrower and more shallow. It remains dry during the hot season but during the rainy months it attains a width of some 170 feet and a mean depth of about 8 feet.
The Sengar River:

The Sengar Nadi is a tributary of the Yamuna and rises from the central depression of the Aligarh District. Originally, it rose from the great Adhawan Jhil of the central depression. It flows southwards through the south-east corner of the Koil tehsil. Then, moving west of village Akrabad in Sikandra Rao tehsils, it enters the Hathras tehsil. The river derives a considerable supply of water from the Lehoti Drainage cut, which is an artificial drain and has been excavated in the lowland lying area east of Aligarh. In its upper course, the river is usually dry, unless used as a canal escape, during the cold and hot months. Due to scanty supply of water from it the river is not useful for irrigation purposes.

The Rind River:

The Rind or A.ind rises in the lowlands between the two branches of the Ganga canal in the Aligarh District. The river flows in a southeasternly direction and, like most of the seasonal streams, it is almost dry in the cold and hot seasons but attains considerable dimensions during the rainy season. The Rind flows through a shallow alluvial bed. In years of unusual heavy rains, lands along it are inundated and when the river recedes, it leaves of a rich layer of alluvial soils. These soils yield good crops of cereals and need little irrigation in normal years.
Kali River:

The river Kali, also known as Kalindri, rises in Muzaffarnagar District and, before entering the Aligarh District, passes through Meerut and Bulandshahar Districts. In Aligarh the river takes a southerly course before entering Etah and separates the Atrauli tehsil from Koil and Sikandra Rao tehsils. Kali is a perennial stream and flows through a valley marked by high banks. During the summer months, however it is reduced to a narrow stream, but during the rains it becomes a river of considerable magnitude although its current is nowhere strong. During the years of exceptionally heavy rains it inundates the adjacent lands, doing much harm to Kharif crops. It flows through a belt of sandy soils of varying width.

Neem River:

Neem river is a small stream coming from the north which joins the Kali Nadi on its left bank. It is seldom dry in hot season and is inundated during the rainy season. The bed of the river has been deepened in order to improve drainage and its water is used for irrigation purposes.

Isan River:

The Isan is a tributary of the Ganges. It has its origin in several shallow depressions to the east of Sikandra Rao, in the villages of Ikbalpur, Kheria and Bargawan, where
it flows in a south easterly direction into Etah. In its natural state it was merely used as an escape for the surplus waters of the jhils during the rainy season; but it has now been converted into a drainage channel of some importance by means of two large cuts, one of which starts near Akrabad and follows the course of a canal, moving to the north of Sikandra Rao and afterwards draining the eastern part of that town, while the other cuts leads from the south of Sikandra Rao.

The Ganga River

The Ganga rises in the Gangotri glaciers behind the Kedarnath peaks where it is known as Bhagirathi. After entering the plains at Hardwar, it flows southwards upto Bulandshahar and, as it enters Aligarh, taking a south easterly course, the river forms the north eastern boundary of the District and separates Aligarh from Badaun.

A striking feature of the river, which distinguishes it from other rivers of the area is the changing nature of the stream. The river flows through a belt of recent alluvium and the main current in sufficiently stable but in the rainy seasons it generally shifts from one side to another in a belt of five to six kilometre. However with the construction of canal works at Narora in Bulandshahar changes in the course of the stream have been reduced to a considerable degree. The volume and the velocity of the river are
considerably increased during the rainy season when the low-lying areas are frequently inundated. The Khadar lands along the river are fertile, yielding good crops with very little irrigation.

b. Lakes (Jhils):

The broad low-lying areas of Aligarh are dotted with jhils but these are not permanent features. They increase in number and size as one moves from the northern border of the District to the southern border. The main jhils of koil tehsil are those at Gursikaran, Ikri and Adhawan. In the Akrabad block, the largest jhils are at Ladhua, Suhauli and Gopi, while in the Sikandra Rao block, there is a group of depressions to the south and east of Sikandra Rao itself. Another group of jhils is in Hasayan block, comprising the broad jhils of Hasayan, Bakayan, Nagla Sheikha and Jao. There are also several detached jhils in different parts of this block notably at Bhisi and Mau Chirail. The Atrauli tehsil has no jhils of any great size except the one near Dadon, through there are several shallow jhils in the depression to the south-east of Atrauli town. There are none in Iglas and very few in Hathras. The Khair tehsil is devoid of jhils except in its northeastern corner which is part of the central depressions and has large lakes of Ogar and Morehna. Jhils are important physical attributes, and act as centripetal forces for colonization by human beings.
1.3. Ground Water

Being part of the Ganga-Yamuna Doab, the study area is richly endowed with ground water resources, the major part of which is utilised for drinking and for irrigation. The data in regard the ground water resources in the Aligarh District has been collected from the Ground Water Investigation Organization, Aligarh. It reveals that the depth of water level in the District in the pre-monsoon period ranges from 2.50 metre to 12.35 metre (Fig. 1.4), and in the post-monsoon period, it varies between 2.00 metre and 11.00 metre (Fig. 1.5). The figures also shows that the level of the ground water is deeper along the high banks of the Yamuna and the Ganga; and shallower in the northern and southern part of the District. There is very little fluctuation of ground water level in central low lying tracts in the study area. This is evidenced by Table 1.2 which indicates the fluctuation of ground water level in various blocks of the District.

1.4. Climate:

The climate of Aligarh District fluctuate between the two extremes of severe cold in winter and oppressive heat in summer. It is in tune with that which normally prevails in other western part of Uttar Pradesh. Rainfall in the District is scanty, ranging from 60 to 75 centimetre per annum. Aligarh has a tropical monsoon type of climate with its
ALIGARH DISTRICT
DEPTH OF GROUND WATER IN PRE-MONSOON
1988 (DEPTH IN METRES)

SOURCE: GROUND WATER INVESTIGATION ORGANISATION, ALIGARH.

FIG. 1-4
Table No. 1.2

Pre- and Post-Monsoon Water Levels in Aligarh District, 1988

<table>
<thead>
<tr>
<th>Block</th>
<th>Pre-monsoon</th>
<th>Post-monsoon</th>
<th>Fluctuations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akrabad</td>
<td>4.80</td>
<td>3.60</td>
<td>1.20</td>
</tr>
<tr>
<td>Atrauli</td>
<td>12.35</td>
<td>11.00</td>
<td>1.35</td>
</tr>
<tr>
<td>Bijauni</td>
<td>10.95</td>
<td>9.35</td>
<td>1.60</td>
</tr>
<tr>
<td>Chandaus</td>
<td>6.05</td>
<td>4.67</td>
<td>1.38</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>7.50</td>
<td>4.70</td>
<td>2.40</td>
</tr>
<tr>
<td>Gangiri</td>
<td>11.10</td>
<td>9.83</td>
<td>1.27</td>
</tr>
<tr>
<td>Gonda</td>
<td>3.95</td>
<td>2.31</td>
<td>1.64</td>
</tr>
<tr>
<td>Hasayan</td>
<td>5.50</td>
<td>3.41</td>
<td>2.09</td>
</tr>
<tr>
<td>Iglas</td>
<td>4.32</td>
<td>3.50</td>
<td>1.30</td>
</tr>
<tr>
<td>Jawan</td>
<td>2.50</td>
<td>2.00</td>
<td>0.50</td>
</tr>
<tr>
<td>Khair</td>
<td>4.80</td>
<td>3.50</td>
<td>1.30</td>
</tr>
<tr>
<td>Lodha</td>
<td>9.40</td>
<td>8.20</td>
<td>1.20</td>
</tr>
<tr>
<td>Mursan</td>
<td>6.56</td>
<td>5.05</td>
<td>1.52</td>
</tr>
<tr>
<td>Sasni</td>
<td>12.20</td>
<td>7.50</td>
<td>4.70</td>
</tr>
<tr>
<td>Sikandra Rao</td>
<td>3.55</td>
<td>2.75</td>
<td>0.80</td>
</tr>
<tr>
<td>Tappal</td>
<td>9.35</td>
<td>8.35</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: Ground Water Investigation Organization, Aligarh, U.P.

characteristic seasonal rhythm, marked by the north-east and south-west monsoons. The District has the following are four distinct seasons:

I. Cold Weather Season (December to February)
II. Hot Weather Season (March to Mid-June)
III. Rainy Season (Mid-June to September)
IV. Season of Retreating Monsoon (October and November)
ALIGARH DISTRICT
DEPTH OF GROUND WATER IN POST-Monsoon
1988 (DEPTH IN METRES)

SOURCE: GROUND WATER INVESTIGATION ORGANISATION, ALIGARH.

FIG. 1.5
The cold weather season is characterised by cold and dry winds which blow continually during the three months. The sky is generally clear and cloud cover rarely exceeds two-tenth. During this season, temperatures fall and air pressure rises. The beginning of this season is marked by a considerable fall in temperature. Maximum temperature falls from about 29°C to 23°C, while the minimum falls from 12°C to 10°C in December. It shows a further decrease in January, when the maximum and minimum temperature are 21°C and 7°C respectively. Cold winds coming from the Himalayas also bring about a fall in the temperature for a short period. The direction of prevailing winds is normally from west and north-west to east and south-east. The winds are dry and light and generally blow at an average speed of about 3.2 kilometres, per hour. Rainfall during the season is very scanty, irregular and sporadic and is caused due to the western depressions. Total rainfall during December, January and February is only 4.35 centimetre. Winter rainfall, though small in amount, is highly beneficial to the rabi crops as it comes at a time when plants are flowering. The effectiveness of this rainfall is enhanced by the prevailing low temperatures. Hailstorms, which are sometimes accompanied by cold weather storms, may cause considerable damage to the flowering plants. However, the area affected by these hailstorms is almost always small and within this area their impact varies
greatly, one field may be severely damaged while another, just a few yards away, may remain almost untouched.¹

With these exceptions the weather during the cold season is pleasant but it does not last long. Although in February there is little change in weather except for an increase in temperature, by the end of this month, with the northward movement of the sun, temperature rapidly rises.

The hot weather season begins in March and continues till mid-June. Its beginning is marked by an appreciable rise in temperature and decrease in pressure. The mean maximum and minimum temperatures in March are about 34°C and 15°C respectively. Temperature continues to rise in April, respective maximum and minimum temperature during this month being 38°C and 21°C. The months of May and June record exceptionally high temperatures. The mean maximum temperature rises to 41°C in both the months. The mercury rises even more than 46°C on some hot days of May and June. Days are characterised by intense heat, dry air and low relative humidity. A regular phenomenon of this season is the blowing of hot and dry winds, locally called loo. Winds blow with a velocity of about 5.5 kilometre per hour in March which is reaches its maximum in June, when it is about 10.5 kilometre per hour. Humidity is lowest during these months, occasionally falling

to 2 to 3 per cent in the afternoon. Another peculiar phenomenon of this season is the occurrence of dust and thunderstorms which are locally known as *andhis*. These usually occur in the afternoons and are sometimes accompanied by rains, and despite the blinding dust, they are welcome because they bring about an appreciable decrease in temperature. The air becomes cool and one gets temporary relief from the trying heat of the day.

There is generally no rain during the summer months except for light showers accompanying thunderstorms. These, too, are sporadic, shortlived and highly variable in their amount and incidence. They are of little concern to the cultivators, as precipitation during this period has little agricultural value.

On account of the excessive heat of the summer months, a low pressure is developed in the northern part of India and by the middle of June it brings about a complete reversal in the air movement, ushering in the rainy season which is characterised by the arrival of humid oceanic currents, fall in temperatures, cool air and rainfall. The respective maximum and minimum temperature falls from 40°C and 27°C in June to 34°C and 25°C of July. Relative humidity increases from 30 per cent in May to 74 per cent at the end of June and 84 per cent in July and August. The sky is overcast, having an average cloud cover of about seven-tenths in July. The timing of the onset and retreat of the monsoon varies from year to
year. Generally, in the Aligarh District, rains set in by the end of June or the first week of July and continue till the end of September or early October. The average annual rainfall is about 70 cm, out of which 90 per cent is received during this season. Another characteristic feature is that rains do not fall continuously and there may be two or three days of continuous rains followed by a dry interval of a week or 10 days.

The season of retreating monsoon is characterised by hot and sticky weather, rise in temperature, and longer rainless intervals. With the recession of the monsoon, there is a remarkable fall in precipitation. Weather during this period is characterised by clear sky and low humidity. The average rainfall in October is only 3 cm. and the cloud cover rarely exceeds one-tenth. Relative humidity during this month comes down to 47 per cent. As the sky clears and the sun shine, the day temperature rises slightly while, due to the dryness of the air, there is a slight decrease in night temperatures. By the end of October the humid currents of the south-west monsoon are replaced by dry continental winds. By and large this is a period of transition from wet to dry weather. Usually this phase continues till the end of November when the whole area comes under the influence of northeast monsoon.

The rainfall variability is greater in June (166 per cent) and September (72 per cent), than in July (27 per cent).
and (42 per cent) in August. The high variability during the beginning and end of the season is due to the variations in the timings of the onset and retreat of the monsoon. It has also been observed that the variability of rainfall is highest in those parts which have the lowest seasonal precipitation and is least in those which have high seasonal rainfall. For agricultural operations the timing of the incidence of rainfall is more important than the annual total. A rise and fall in the total annual rainfall will not affect agriculture as much as variation in the timings of its incidence. It has been observed that rainfall is more variable in the months when its punctuality is needed most. Such uncertainties in rainfall, especially in those areas where irrigation facilities are inadequate, adversely affect agricultural operations. In the year 1988, the Aligarh District received an average of 312.53 mm. of rainfall. The tehsil-wise break up of the average rainfall (in mm.) during the various months of the year, has been given in Table No. 1.3 and shown in the map (Fig. 1.6). So it may be said that Aligarh District has a dry climate.

1.5. Soils

The soil of the Aligarh District is alluvial and is divided into two broad geological subdivisions i.e., the old and the new alluvium. The new alluvium is confined to the flood plains of the rivers and their tributaries while the
ALIGARH DISTRICT
AVERAGE MONTHLY RAINFALL
(IN MILLIMETRE) 1988

SOURCE: BASED ON THE DATA COLLECTED FROM NAZARAT, ALIGARH COLLECTORATE, ALIGARH

FIG: 16
### Table No. 1.3

**Aligarh District: Tehsil-wise Monthly Rainfall 1988 (mm.)**

<table>
<thead>
<tr>
<th>Months</th>
<th>Koil</th>
<th>Hathras</th>
<th>Atrauli</th>
<th>S.Rao</th>
<th>Iglas</th>
<th>Khair</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>51.9</td>
<td>20.0</td>
<td>29.2</td>
<td>9.2</td>
<td>14.0</td>
<td>27.0</td>
<td>142.2</td>
<td>23.7</td>
</tr>
<tr>
<td>February</td>
<td>27.0</td>
<td>24.0</td>
<td>21.0</td>
<td>30.4</td>
<td>17.0</td>
<td>21.6</td>
<td>141.0</td>
<td>23.5</td>
</tr>
<tr>
<td>March</td>
<td>2.1</td>
<td>-</td>
<td>-</td>
<td>1.8</td>
<td>-</td>
<td>-</td>
<td>3.9</td>
<td>0.6</td>
</tr>
<tr>
<td>April</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>May</td>
<td>46.1</td>
<td>32.0</td>
<td>65.2</td>
<td>62.2</td>
<td>18.0</td>
<td>25.0</td>
<td>248.5</td>
<td>41.4</td>
</tr>
<tr>
<td>June</td>
<td>195.3</td>
<td>68.0</td>
<td>49.0</td>
<td>71.4</td>
<td>60.0</td>
<td>111.7</td>
<td>555.4</td>
<td>92.6</td>
</tr>
<tr>
<td>July</td>
<td>152.3</td>
<td>62.0</td>
<td>164.2</td>
<td>182.1</td>
<td>74.0</td>
<td>84.0</td>
<td>714.6</td>
<td>119.1</td>
</tr>
<tr>
<td>August</td>
<td>328.1</td>
<td>149.1</td>
<td>178.9</td>
<td>82.3</td>
<td>105.0</td>
<td>153.7</td>
<td>997.1</td>
<td>116.2</td>
</tr>
<tr>
<td>September</td>
<td>139.8</td>
<td>88.0</td>
<td>205.9</td>
<td>184.2</td>
<td>86.0</td>
<td>113.0</td>
<td>817.1</td>
<td>136.2</td>
</tr>
<tr>
<td>October</td>
<td>29.4</td>
<td>0.4</td>
<td>58.6</td>
<td>17.0</td>
<td>6.0</td>
<td>5.1</td>
<td>111.6</td>
<td>18.6</td>
</tr>
<tr>
<td>November</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>December</td>
<td>13.4</td>
<td>-</td>
<td>3.6</td>
<td>2.0</td>
<td>-</td>
<td>19.0</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>970.4</td>
<td>443.6</td>
<td>772.0</td>
<td>644.2</td>
<td>382.0</td>
<td>538.2</td>
<td>3750.4</td>
<td>312.53</td>
</tr>
</tbody>
</table>

Source: Office of NAZARAT, Collectorate, Aligarh.

Old one is found in level plains above the flood-level of the main rivers and their tributaries. Soils in the Aligarh District differ considerably in their texture and consistency, ranging from sands through loams and silts to heavy clays that are ill-drained and sometimes charged with...
injurious salts known as *reh*. The character and quality of drainage exercises a considerable influence upon the quality and distribution of soils. Almost parallel to the rivers are found the great alluvial soil tracts of the District. For instance, the soils vary, from sandy in the eastern part to sandy loam and clayey loam in the central part of the District. Further westwards there is again a sandy loam tract which finally merges into the sandy bed of the river Yamuna. It would be worthwhile here to study the distribution and characteristics of these soils in some detail, since this affects the spatial characteristics of rural settlements.

According to the soil survey carried out by the Agriculture Department of Uttar Pradesh (1951-52), the following soil regions have been identified in the Aligarh District.

I. **Ganga Khadar**
II. **Eastern Uplands**
III. **Central Lowlands**
IV. **Western Uplands**
V. **Yamuna Khadar**
VI. **Trans - Yamuna Khadar**

I. **Ganga Khadar**

The Ganga Khadar extends over a narrow belt along the river Ganga in the north-eastern part of the District. It
comprise recent alluvium. The tract receives silty or sandy deposits year after year as a result of the overflowing of the rivers. The colour of the soil varies from light gray to ash gray and its texture is sandy to silty loam. The ground water table is unusually near the surface and during the monsoon months it is virtually right on the surface. The nearness of ground water level brings about widespread salt efflorescence on the surface especially during the summer months when salt comes up with capillary rise of sub-soil water and its subsequent evaporation. The drainage is imperfect and there is no natural flow of ground waters either laterally or downward, because the spring level is within a few feet of the surface. The soils are therefore alkaline in reaction and saline in nature, pH being usually above 8. The soil profile exhibits many distinct immature stratified layers of younger soils deposited one over the other.

II. Eastern Uplands

This soil type covers in the entire Atrauli tehsil with the exception of a narrow depression in the south and a thin belt of Ganga Khadar in the north-eastern part of the District. Its surface texture varies from good quality loam to sandy loam. The soils of this tract are very fertile, with a marked alluviation of clay towards the bottom. Normally the surface soil upto a depth of 20 to 25 cms. is well drained and can be easily ploughed and cultivated. The drainage of
this tract is good and consequently salt efflorescence in it is usually found in insignificant proportions.

III. Central Low-lands

The central low-lands cover eastern half of the Koil tehsil and the whole of the Sikandra Rao tehsil. The drainage in this tract is bad and in the monsoon months parts of it suffer from water-logging. The soils are sticky and generally clayey loam in texture. Clay content is maximum at the top but decreases with depth. Bad drainage results in the deposition of soluble sodium salts on the surface in the form of reh. During the period of drought these tracts became the infected white salt. In the northern part of this tract, a considerable portion of land has been thrown out of cultivation because of the appearance of reh. Further south, it contains the most unmanageable soils which are locally called 'chicknot'. These soils are alkaline in nature and form in the well-known usar patches of the District, as shown in Fig. 1.7.

IV. Western Uplands

The western uplands cover a sizable portion of the Aligarh District, including the entire tehsil of Iglas, almost whole of the Hathras tehsil, three-fourth area of Khair tehsil and the western portion of Koil tehsil. This area is well-drained by artificial drainages like Gandanala, and Patwaha Nala and many other natural and artificial
drainage lines meet here. Therefore the area is not affected by water logging and so there is absence of large stretches of usar soils. The soils of the areas are generally sandy in texture and brown or reddish in colour. Numerous sandy ridges are found on these soil tracts giving evidence of soil erosion. Water holding capacity of these soils is low and, consequently, they present a thirsty appearance. Their sandy nature of the soil, together with intensive cultivation, has made these soils deficient in organic matter and other plant nutrients. Water table in these areas is very low, going down at places 50 feet from the surface. The pH value of these soils varies from neutral to slightly alkaline.

V. Yamuna Khadar

This tract occurs in the extreme north-western part of the District with a varying width, from 9.65 kms. in the north to about 3.2 kms. in the south. During the rainy season these soils are over-flooded. They are clayey to clayey loam in texture and dark gray to black in colour. They are rather hard and difficult to till specially when dry; and when they are wet they form puddles and thus become unmanageable. These soils are strongly alkaline in character and their pH is usually more than 8.0. Alkalinity and poor physical character of the soils render them difficult for normal agricultural use. Yamuna clayey loam occurs in the mid-western part of
Tappal block. A small patch of such soil is also found in the eastern fringes of this block.

VI. Trans-Yamuna Khadar (Stiff Loam)

This tract is about 9 km. wide and lies almost parallel to the Yamuna Khadar tract in the form of a narrow belt east of the river Yamuna. The texture of the soils found here varies from good quality loam to sandy loam. Clay percentage in the subsoil is higher than at the surface. The colour of the surface is ash gray while the subsoils are darker. These soils are compact, having restricted drainage and all their layers contain kankar nodules. They are neutral to slightly acidic in the surface layers and slightly alkaline towards the bottom. This type of soils cover the central and eastern part of the Tappal block of Khair tehsil. The slope of the tract is less than one per cent and it has a slight amount of erosion.

The fertility of soils determine the pattern of agriculture and rural settlements. The present researcher has visited the 'soil testing laboratory in Aligarh', where samples of soils of different soil regions have been tested and their mineral contents have been analysed. It has been found that the soil of the Aligarh District are deficient in nitrogen and phosphorous and rich in potash. The soils near the banks of the Ganga in north-east and the Yamuna in
north-west are very rich in phosphorous, but towards the central low-lands potassium content decreases slightly and that of nitrogen and phosphorous increases to some extent. The high potash content of the soils gives an indication of felspar and other potash minerals. Probably both the rivers bring with them large amounts of potash containing minerals and potassium, which are deposited on the banks of the rivers, and are later transported to the lowlying areas of the Aligarh District. Hence the entire District has become rich in potassium. The semi-arid climatic conditions of Aligarh are due to the preponderance of potash in the soils. As a consequence of other potassium content, these soils have become excessively alkaline in nature which hampers the growth of microbic organism that are helpful in the fixation of nitrogen and reduce the level of agricultural productivity.

In the light of the different characteristics discussed above, the soil of the Aligarh District may be divided into four types which are as follows: (Fig. 1.8)

I. Younger Alluvial Soils
II. Calcareous Alluvial Soils
III. Saline and Alkaline Soils
IV. Older Alluvial Soils

The character of the soil influences the pattern of settlement distribution. The most fertile lands, villages are compact in form, while in the case of usar or infertile lands
most of the Villages are scattered in hamleted form. In flood affected areas, villages are mostly of small size in population and of large size in regards area.

1.6. Vegetation

The Aligarh District lies in the sub-tropical region which has a deciduous type of vegetation. The District was once largely covered with dhank jungles and was gradually turned into a cultivable area. The forest cover has now dwindled to 808 hectares. Some dhak jungles are still seen in scattered patches in the clayey and usar tracts. In the Khadar of Ganga, there is several stretches of jhau or tamarisk, an evergreen shrub, on the most recent alluvium of the rivers. In the Khadar of Yamuna, there is the narrow belt of jhau and which is followed by broad stretches of waste covered with thatching grass. The District cannot be described as well wooded. The eastern part, however, is more wooded than the western one. Mango graves and those of other trees are ubiquitous in the eastern part of the District. The canal authorities have used for this region for growing useful vegetation along the canals and the main channels. The western part of the District marked by a comparative absence of trees. The commonest tree found in the area is babul, which grows wild. Other trees include the nim, pipal, ber, faras, shisham, gular, and jamun.
2. CULTURAL SETTING

In seeking his livelihood, man is influenced not only by his physical environment but also by the culture to which he belongs. Physical features of an area, condition the nature of its agrarian economy. However, at micro level there are variations which lead to different distributional patterns of cultural landscape. Because of fertile soil, level topography and more or less favourable climatic conditions, agriculture has attained overwhelming importance in the economy of the Aligarh District, which is a producer of food and industrial raw material. Hence an attempt has been made to discuss the characteristics along with distributional pattern of the cultural landscape, of the District viz., land use, agriculture, transport system, industries and rural market centres. This analysis of the elements of the cultural landscape will help in comprehending population and settlement patterns in the study area.

2.1 Land Use

Though the study area has been under human occupancy since very early times, its occupation was rather periodic in the beginning, i.e., pieces of land were cultivated for some time and then abandoned for a period, during which newly cleared lands having greater fertility was brought under

cultivation. The present pattern of land use in the Aligarh District is the result of the interaction of physical environment with socio-economic attributes. The land use pattern of the District is illustrated in Fig. 1.9. According to it about 77.66% of the total area is classified as net-sown. Mursan Block has the highest percentage of net-sown area (88.69%), followed by Iglas (86.26%), Hathras (85.22%), Gonda (83.94%), Sasni (83.51%), Atrauli (82.15%), Khair (81.20%), Tappal (80.78%), Gangiri (80.70%), Chandaus (77.83%), Lodha (77.22%), Dhanipur (75.67%), Bijauli (71.30%), Sikandra Rao (68.93%), Akrabad (68.63%), Jawan (67.65%), Hasayan (66.20%). It may be remarked that blocks with low percentages of net-sown areas are mostly usar infested.

The area not available for cultivation in the District is 6.73%, while fallows, pastures and other culturable waste comprise 7.55% of the land of the District.

2.2 Cropping Pattern

Cropping pattern varies with differences in physical and social ecology. The Aligarh District has a total cropped area of about 629450 hectares, block-wise break up of which has been presented in Table 1.4.

Table No. 1.4
Aligarh District: Cropping Pattern, 1987-88

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Total Gross Cropped Area (in Hectares)</th>
<th>Per cent of Total Gross Cropped Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Area under Rabi Crops</td>
</tr>
<tr>
<td>Akrabad</td>
<td>31780</td>
<td>51.37</td>
</tr>
<tr>
<td>Atrauli</td>
<td>44203</td>
<td>49.98</td>
</tr>
<tr>
<td>Bijauli</td>
<td>30548</td>
<td>50.47</td>
</tr>
<tr>
<td>Chandaus</td>
<td>40316</td>
<td>57.59</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>37466</td>
<td>52.11</td>
</tr>
<tr>
<td>Gangiri</td>
<td>49786</td>
<td>49.82</td>
</tr>
<tr>
<td>Gonda</td>
<td>37796</td>
<td>60.32</td>
</tr>
<tr>
<td>Hasayan</td>
<td>33468</td>
<td>51.72</td>
</tr>
<tr>
<td>Hathras</td>
<td>30864</td>
<td>59.94</td>
</tr>
<tr>
<td>Iglas</td>
<td>33957</td>
<td>57.33</td>
</tr>
<tr>
<td>Jawan</td>
<td>35173</td>
<td>51.49</td>
</tr>
<tr>
<td>Khair</td>
<td>39734</td>
<td>59.34</td>
</tr>
<tr>
<td>Lodha</td>
<td>36970</td>
<td>54.28</td>
</tr>
<tr>
<td>Mursan</td>
<td>33723</td>
<td>57.13</td>
</tr>
<tr>
<td>Sasni</td>
<td>38055</td>
<td>54.53</td>
</tr>
<tr>
<td>S.Rao</td>
<td>31502</td>
<td>51.23</td>
</tr>
<tr>
<td>Tappal</td>
<td>46109</td>
<td>58.87</td>
</tr>
<tr>
<td>Total of the District</td>
<td>629450</td>
<td>54.58</td>
</tr>
</tbody>
</table>


There are three harvesting seasons in the Aligarh District, namely, rabi, kharif and zaid. During the rabi season, wheat, barley, arhar, gram, peas and mustard are the chief crops sown in the District, while during the kharif
season, bajra, paddy and maize are the principal crops. During the zaid harvest, some fodder crops and vegetables are grown in the study area. The blockwise distribution of the area under different harvests has been shown in Fig. 1.10.

I. Rabi Season:

Rabi crops occupy 54.58 per cent (343554 hectares) of the total cropped area of the District, while the rest of the cropped area is left as fallow land. The blockwise distribution of the area under different rabi crops has been given in Table 1.5 and has also been depicted in Fig. 1.11. It is evident from the Table that the Gonda block has the highest percentage (60.32%) of its gross cropped area under rabi crops, whereas Gangiri has the lowest proportion (49.82%) of its area cultivated during the rabi season. In other blocks, the area under this harvest vary between 49.84 per cent and 60.32 per cent of their total gross cropped area.

Among the various rabi crops grown in the District, wheat is the leading cereal occupying 35.26 per cent of the gross cropped area of the District. Tappal has the highest percentage (45.07%) of the cropped area under wheat, followed by Khair (41.32%), Gonda (40.55%), Hathras (38.37%), Iglas (38.13%), Chandaus (37.11%) and Mursan (36.64%). In the remaining blocks, wheat covers between 25 and 35 per cent of their gross cropped area.
Table No.1.5

Aligarh District: Area Under Different Crops During the Rabi Harvest 1987-88

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Rabi Harvest</th>
<th>Wheat</th>
<th>Barley</th>
<th>Pulses</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akrabad</td>
<td>51.37</td>
<td>30.67</td>
<td>7.97</td>
<td>10.58</td>
<td>2.17</td>
</tr>
<tr>
<td>Atrauli</td>
<td>49.98</td>
<td>32.68</td>
<td>6.92</td>
<td>7.78</td>
<td>2.60</td>
</tr>
<tr>
<td>Bijauni</td>
<td>50.47</td>
<td>31.08</td>
<td>7.12</td>
<td>9.83</td>
<td>2.44</td>
</tr>
<tr>
<td>Chandaus</td>
<td>57.59</td>
<td>37.11</td>
<td>10.85</td>
<td>6.85</td>
<td>2.78</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>52.11</td>
<td>33.63</td>
<td>7.89</td>
<td>7.32</td>
<td>3.27</td>
</tr>
<tr>
<td>Gangiri</td>
<td>49.82</td>
<td>26.32</td>
<td>7.98</td>
<td>12.71</td>
<td>2.81</td>
</tr>
<tr>
<td>Gonda</td>
<td>60.32</td>
<td>40.55</td>
<td>9.93</td>
<td>6.32</td>
<td>3.52</td>
</tr>
<tr>
<td>Hasayan</td>
<td>51.72</td>
<td>31.49</td>
<td>8.06</td>
<td>9.13</td>
<td>2.98</td>
</tr>
<tr>
<td>Hathras</td>
<td>59.94</td>
<td>38.37</td>
<td>8.77</td>
<td>9.89</td>
<td>2.91</td>
</tr>
<tr>
<td>Iglas</td>
<td>57.33</td>
<td>38.13</td>
<td>8.72</td>
<td>7.35</td>
<td>3.13</td>
</tr>
<tr>
<td>Jawan</td>
<td>51.49</td>
<td>35.50</td>
<td>7.64</td>
<td>6.10</td>
<td>2.25</td>
</tr>
<tr>
<td>Khair</td>
<td>59.37</td>
<td>41.32</td>
<td>10.18</td>
<td>6.08</td>
<td>1.79</td>
</tr>
<tr>
<td>Lodha</td>
<td>54.28</td>
<td>32.15</td>
<td>8.75</td>
<td>9.03</td>
<td>4.35</td>
</tr>
<tr>
<td>Mursan</td>
<td>57.13</td>
<td>36.64</td>
<td>8.92</td>
<td>7.81</td>
<td>3.76</td>
</tr>
<tr>
<td>Sasni</td>
<td>54.53</td>
<td>34.88</td>
<td>7.46</td>
<td>8.43</td>
<td>3.76</td>
</tr>
<tr>
<td>S.Rao</td>
<td>51.23</td>
<td>31.81</td>
<td>8.13</td>
<td>9.38</td>
<td>1.91</td>
</tr>
<tr>
<td>Tappal</td>
<td>58.87</td>
<td>45.07</td>
<td>7.18</td>
<td>4.41</td>
<td>2.21</td>
</tr>
</tbody>
</table>

Total of the District: 54.58  35.26  8.41  7.99  2.92


Barley occupies the second place among the rabi crops, covering an area of 8.41 per cent of the gross cropped area of the District. The blocks of Chandaus and Khair have the highest area under this crop, as is evident from Table 1.5. In the remaining blocks, less than 10 per cent of the gross cropped area is covered under this crops.
Pulses are also grown during the rabi harvest. Among the pulses grown, gram and peas are dominant and cover more than half of the gross cropped area under pulses. Gangiri and Akrabad blocks have a considerable acreage of their gross cropped area under these pulse crops (more than 10%), while in the remaining blocks, less than 10 per cent of the gross cropped area is covered by pulse crops. Besides wheat, barley, and pulses, a few other crops such as gram, peas, musterd and lentil are also grown; but such crops cover only about 3 per cent of the total cropped area of the District.

II. Kharif Season:

During the kharif harvest, 39.08 per cent (245989 hectares) of the gross cropped area of the District is sown. Table 1.6 presents the block-wise distribution of the area under kharif crops. This indicates that of all the blocks, Bijauli utilizes highest percentage (45.67%) of the total cropped area, whereas the block of Hathras utilizes the lowest (30.90%) of the total cropped area during the season.

Millet s i.e. maize, bajra and jowar are the main kharif crops, occupying 25.12 per cent of the total cropped area of the District. The cropped area under millets varies from 16.46 per cent in Hasayan Block to 36.15 per cent in Bijauli Block. It is worthwhile to remember here that the percentage of figures of the total cropped area under millets in the blocks of Atrauli, Gangiri, Bijauli, Iglas, Gonda, Lodha and
Hasayan is higher than the District average of 25.12 per cent for the total cropped area under these crops. In the remaining blocks, between 16 per cent and 23.51 per cent of the total cropped area is covered by millets. Fig. 1.12 shows the area under kharif crops.

Pulses occupy second place among the kharif crops, covering 4.08 per cent of the total cropped area. Block wise

Table No. 1.6

Aligarh District: Area Under Different Crops During the Kharif Harvest, 1987-88

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Per cent of the Total Gross Cropped Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kharif Harvest</td>
</tr>
<tr>
<td>Akrabad</td>
<td>37.67</td>
</tr>
<tr>
<td>Atrauli</td>
<td>42.84</td>
</tr>
<tr>
<td>Bijauni</td>
<td>45.67</td>
</tr>
<tr>
<td>Chandaus</td>
<td>38.77</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>39.41</td>
</tr>
<tr>
<td>Gangiri</td>
<td>42.39</td>
</tr>
<tr>
<td>Gonda</td>
<td>36.89</td>
</tr>
<tr>
<td>Hasayan</td>
<td>32.26</td>
</tr>
<tr>
<td>Hathras</td>
<td>30.90</td>
</tr>
<tr>
<td>Iglas</td>
<td>39.02</td>
</tr>
<tr>
<td>Jawan</td>
<td>41.80</td>
</tr>
<tr>
<td>Khair</td>
<td>36.26</td>
</tr>
<tr>
<td>Lodha</td>
<td>40.05</td>
</tr>
<tr>
<td>Mursan</td>
<td>39.71</td>
</tr>
<tr>
<td>Sasni</td>
<td>38.70</td>
</tr>
<tr>
<td>S. Rao</td>
<td>37.44</td>
</tr>
<tr>
<td>Tappal</td>
<td>39.21</td>
</tr>
</tbody>
</table>

Total of the District 39.08 25.12 3.87 4.08 2.36 3.65

Total Gross Cropped Area of the District (1984-85) is 629450 Hectares

distribution of area under pulses in the Aligarh District during the harvest shows that Dhanipur Block has the highest percentage (7.31%) of total cropped area under these crops, followed by block Hathras, Sikandra Rao and Sasni where 6.13 per cent, 5.91 per cent and 5.88 per cent respectively of the total cropped area is covered by pulse crops. As against this, Tappal Block has the lowest percentage (1.37%) of the total gross cropped area under pulses.

Besides millets and pulses, paddy and sugarcane are also grown during this harvest. Sugarcane is an important cash crop covering 2.36 per cent of the total cropped area of the District.

Tappal Block has the highest percentage (5.82%) of the total cropped area under sugarcane followed by Chandaus (4.11%) and Khair (3.23%), while Hathras has the lowest percentage (0.41%) under this crop. The establishment of Satha Sugar Factory has not made any significant change in the cropping pattern of the District in favour of sugarcane.

Other crops such as groundnut, oilseeds, cotton and vegetables are also grown in the District during the kharif season; but they occupy a very small proportion of the cropped area.

III. Zaid Crops:

Zaid crops are of very little importance as only 6.34 per cent (39907) hectares of the gross cropped area of the
Aligarh District is sown under these crops. The block-wise break up of the area covered under zaid crops has been presented in the Table 1.4. This shows that the highest percentage (16.02%) of the total cropped area in this harvest is found in Hasayan Block, while Tappal Block has the lowest (1.91%) of the total cropped under these crops. The important crops grown in the District during this harvest are include urad, arhar, cotton, sunflower, tobacco, maize and fodder crops etc.

IV. Double/Multiple Cropped Area:

The Aligarh District has 247814 hectares, which constitutes 39.37% per cent of the gross cultivated area, as double or multiple cropped area. The block-wise break-up of this area has been given in Table 1.4. It indicates that a significant proportion of the gross cropped area is utilized for double or multiple cropping the percentage of which vary between 34.36 per cent in Gonda Block and 44.18 per cent in Atrauli Block.

2.3 Irrigation

Irrigation plays an important role in farming operation in the study area. Canals, tube-wells and masonry wells constitute important sources of irrigation in the Aligarh District. Canals, which have a total length of 1304 kms. in the District, irrigate 92757 hectares of land. Tube-wells constitute the chief source of irrigation, accounting for
73.22 per cent of the net irrigated area, followed by canals which irrigate 26.02 per cent. The Aligarh District has a network of canals, which are mainly aligned in a north to south direction. Fig. 1.13 shows the networks of canals in the District, which comprises the following canals.

I. Upper Ganga Canal
II. Mat Branch
III. Hathras Branch
IV. Anupshahr Branch
V. Lower Ganga Canal

The Upper Ganga Canal runs through the central low lying tract of the District. It enters the District at Danpur in Jawan block, and, taking a south-easterly direction for about 40 Kms. moves to Nanau, where it is divided into Kanpur and Etawah branches. There are a number of distributaries and channels of the canal which have been realigned and modified several times. It has a head discharge of about 2500 cusecs. Its distributaries and channels, run more or less parallel to it. Its important distributaries are Koil, Harduaganj, Paira, Sumera, Machua, Sikandra Rao, Haider Nagar and Suhauli.

The mat branch enters the District in the central part of Khair tehsil, running from north to south; It crosses the western boundary of Aligarh District where it enters Mathura. It has a head discharge of about 2,000 cusecs, and is supplemented by 7 distributaries and 44 channels. Its
important distributaries are Barauda Shadipur, Jewar, Bajata, Mursan, Gorai and Sadabad.

The Hathras branch has a head discharge of about 850 cusecs. It derives its water from the Mat branch near Bhagwangarhi in the south west corner of Khair tehsil and enters the district in Iglas tehsil. This branch is supplemented by 14 distributaries and 42 channels, which together irrigate parts of Gonda, Iglas, Sasni, Mursan and Hathras blocks.

The Anupshahr branch with a head discharge of about 1560 cusecs, enters the District through the north-eastern corner of the Atrauli block. It irrigates major parts of the Bijauli block and some area of the Gangiri block, and then passes into Etah District. It is supplemented by 9 distributaries and 17 channels. Its important distributaries are Hardoi, Dadon and Ninamai on the right bank and the Bazidpur on the left bank.

The lower Ganga Canal passes through the north-eastern corner of the Aligarh District between Anupshahr branch in the west and Ganga river in the east.

The Aligarh District enjoys the benefit of having all the three sources of irrigation i.e. rivers, canals and ground-water. The gross and net irrigated area in the year 1987-88 were 437868 hectares and 353306 hectares respect-
ively. The block wise break-up of the irrigated areas in Aligarh by different means of irrigation is presented in Table 1.7 & Fig.1.14. It is clear from this Table that the net area irrigated by different means ranges between 14705 hectares in Bijauli and 27573 hectares in Tappal. Out of the net irrigated area of the District, 63.13 per cent is irrigated by private tube-wells, which 26.02 per cent, 8.26 per cent and 2.19 per cent is irrigated by canals, Government tube-wells and masonry-wells respectively. Irrigation by privately owned tube-wells is more common in Sasni Block (83.88%), followed by Mursan (82.77%) and Lodha (81.64%). In other blocks, less than 80 per cent of the net irrigated area is covered by private tube-wells. Canal irrigation is more common in Hasayan Block (53.91), followed by Dhanipur (50.16%), Sikandra Rao (49.75%), Jawan (49.11%) and Akrabad, (46.27%). In the remaining blocks, the areas irrigated by canals vary between 0.71 per cent in Lodha and 35.15 per cent in Bijauli.

Irrigation by masonry wells in the different blocks of the District varies between 0.02 per cent in Mursan Block and 8.19 per cent in Bijauli. This is so mainly due to the fact that masonry wells are utilized only when other means of irrigation are not easily available. The area irrigated by other means of irrigation in the Aligarh District is very low, as may be seen from Table 1.7 & Fig. 1.14.
ALIGARH DISTRICT
IRRIGATED AREA BY DIFFERENT SOURCES
1987-88

AREA IN HECTARES
- ABOVE 26000
- 24000-26000
- 22000-24000
- 20000-22000
- 18000-20000
- 16000-18000
- BELOW 16000

SOURCE: STATISTICAL MAGAZINE OF ALIGARH DISTRICT, 1988

FIG. 1.14
Table No. 1.7

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Gross Irrigated Area (In Hectares)</th>
<th>Net Irrigated Area (In Hectares)</th>
<th>Means of Irrigation (Per cent of the Net Irrigated Area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akrabad</td>
<td>22795</td>
<td>17081</td>
<td>46.27</td>
</tr>
<tr>
<td>Atrauli</td>
<td>27480</td>
<td>21585</td>
<td>4.09</td>
</tr>
<tr>
<td>Bijauli</td>
<td>16851</td>
<td>14705</td>
<td>35.15</td>
</tr>
<tr>
<td>Chandaus</td>
<td>29243</td>
<td>24492</td>
<td>7.81</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>28151</td>
<td>21494</td>
<td>50.16</td>
</tr>
<tr>
<td>Gangiri</td>
<td>29785</td>
<td>24532</td>
<td>27.76</td>
</tr>
<tr>
<td>Gonda</td>
<td>26148</td>
<td>22364</td>
<td>24.92</td>
</tr>
<tr>
<td>Hasayan</td>
<td>24106</td>
<td>17585</td>
<td>53.91</td>
</tr>
<tr>
<td>Hathras</td>
<td>23012</td>
<td>18525</td>
<td>30.11</td>
</tr>
<tr>
<td>Iglas</td>
<td>22837</td>
<td>20062</td>
<td>17.53</td>
</tr>
<tr>
<td>Jawan</td>
<td>28194</td>
<td>20180</td>
<td>49.11</td>
</tr>
<tr>
<td>Khair</td>
<td>28364</td>
<td>24903</td>
<td>14.54</td>
</tr>
<tr>
<td>Lodha</td>
<td>25797</td>
<td>20120</td>
<td>0.71</td>
</tr>
<tr>
<td>Mursan</td>
<td>23068</td>
<td>19430</td>
<td>16.11</td>
</tr>
<tr>
<td>Sasni</td>
<td>28134</td>
<td>21929</td>
<td>8.96</td>
</tr>
<tr>
<td>S.Rao</td>
<td>22035</td>
<td>16746</td>
<td>49.75</td>
</tr>
<tr>
<td>Tappal</td>
<td>31868</td>
<td>27573</td>
<td>17.89</td>
</tr>
</tbody>
</table>

Total of 437868 353306 26.02 8.26 63.13 2.19 0.40


2.4 INDUSTRIES

The Aligarh District occupies an important place in the industrial economy of Uttar Pradesh. All types of industries, viz., cottage, small scale and large scale, have developed in the District. It is well-known for its locks, electrical
equipment, and light engineering and other metal products. Cotton carpets and handloom woven clothes of this District have earned a great reputation. Dairy farming and glass industry have also developed in the study area. The Aligarh city and its adjoining areas are the main centres of the lock industry, while Sikandra Rao, Atrauli, Khair and Vijaygarh are centres of handloom weaving. Sasni and Mursan are well-known for their glass industry whereas Hathras is famous for cotton-ginning and ghee production.

(i) Small Scale Industries:

There are many small scale industries in the Aligarh District: In the year 1988, it had 213 such industrial units in rural areas registered with the Industrial Directorate.¹ The block-wise distribution of these, along with the number of persons employed in each of them has been given in Table 1.8.

It is clear from this Table that Sasni Block has the highest number of small scale industrial units in the study area, most of which are glass-ware manufacturing ones. Sikandra Rao Block occupies second place so far as the number of industrial units is concerned. Mursan, Khair, Gonda and Iglas blocks have 27, 24, 20 and 18 such units respectively. Other blocks of the District, have less than 10 units. In

Bijauli and Jawan blocks not a single small scale industrial unit has been registered so far.

Glass-ware, agricultural implements, locks, soap and silicates and candles are the principal small scale industries of the rural areas of the District.

Table No. 1.8

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Small Scale Industries</th>
<th>No. of Cottage/Village/Household Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Employed persons</td>
<td>No. of Units</td>
</tr>
<tr>
<td></td>
<td>in such Units</td>
<td>in such Units</td>
</tr>
<tr>
<td>Akhabad</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>Atrauli</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>Bijauli</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chandaus</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>Bhanipur</td>
<td>9</td>
<td>117</td>
</tr>
<tr>
<td>Gangiri</td>
<td>6</td>
<td>45</td>
</tr>
<tr>
<td>Gonda</td>
<td>20</td>
<td>101</td>
</tr>
<tr>
<td>Hasajan</td>
<td>11</td>
<td>68</td>
</tr>
<tr>
<td>Hathras</td>
<td>9</td>
<td>38</td>
</tr>
<tr>
<td>Iglas</td>
<td>18</td>
<td>332</td>
</tr>
<tr>
<td>Jawan</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Khair</td>
<td>24</td>
<td>206</td>
</tr>
<tr>
<td>Lodha</td>
<td>4</td>
<td>91</td>
</tr>
<tr>
<td>Muresan</td>
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<td>512</td>
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<tr>
<td>Sarsni</td>
<td>35</td>
<td>713</td>
</tr>
<tr>
<td>S.Rao</td>
<td>32</td>
<td>387</td>
</tr>
<tr>
<td>Tappal</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Total of</td>
<td>212</td>
<td>2723</td>
</tr>
</tbody>
</table>

II. Cottage/House-hold Industries:

Cloth weaving, oil-ghani, pottery, rope-making, basket-making, tanning, carpentry, blacksmithy and khandsari are the important cottage industries of the Aligarh District. The products of these industries are sent to nearby places for sale. Some of the products are also sent outside the District for the purpose.

2.5 TRANSPORT:

Roads are of immense significance in modern times. They play a dominant role in the process of development in any area. The Aligarh District has three state highways passing through it. These are the Delhi-Kanpur Road, the Pilibhit-Bharatpur Road and the Chandausi-Tanakpur-Kota Road. The total length of the state highways in the District is about 207 kms. while that of metalled (pucca) roads is 1373 kms. out of which 968 km. and 405 kms. are in urban and rural areas respectively. The blockwise distribution of metalled roads in the District has been given in Table 1.9.

It is clear from the Table that Lodha Block has the maximum length of 77 kms. of metalled road followed by Sasni, Akrabad, Khair, Iglas and Sikandra Rao having 76 km., 72 km., 69 km., 65 km. and 65 km. of metalled roads respectively. Tappal Block has the minimum length of 30 kms. of metalled roads.
Table No. 1.9
Aligarh District: Transport Facilities, 1988

<table>
<thead>
<tr>
<th>Block</th>
<th>Length of Metalled Road (in Kms.)</th>
<th>Total No. of Bus Stations/ per Lac population</th>
<th>No. of Bus Stops</th>
<th>No. of Railway Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>968</td>
<td>871</td>
<td>49</td>
<td>131</td>
</tr>
</tbody>
</table>


So far as the length of metalled roads per 100 thousand persons in the District is concerned, Akrabad Block has the maximum length of 72 k.ms. followed by the blocks of Lodha, Sikandra RAo, Iglas and Sasni with their respective road lengths of 69 k.ms., 67 k.ms., 62 k.ms. and 61 k.ms per 100,000
persons. Jawan Block with 31 km of metalled road, has the minimum facilities of metalled roads in the study area.

According to the District Credit Plan of Aligarh, 1983-85, only 251 of its villages are connected by metalled roads, whereas the remaining 1553 villages are connected by unmetalled (kaccha) roads. In addition to this, 1007 villages are located within a distance of 5 kms. from pucca roads.

According to the Statistical Magazine of District Aligarh, 1988, there are about 141 km. of roads for every 1000 sq. km. area of the District. It is planned that in the next ten years, the length of the roads per thousand sq. km. area is to be increased to 200 kms. with a view to connecting every village having a population of more than 1500 people by main roads.

Railways have been of immense help in the speedy development of the areas concerned. The Aligarh District is served by the Northern and North-Eastern Railways. The main track of the Northern Railways (Broad Guage) crosses the District in a north-south direction with the stations of Somana, Kulwa, Mahrabal, Aligarh, Daudkhan, Madrak, Sasni, Hathras Jn. and Pura along its tracks, covering a distance of 106 kms. in the District. A branch line of the Northern Railways goes from Aligarh to Chandausi and Bareilly, having the stations of Manzoorgarhi, Harduaganj, Godha and Atrauli Road in the District. A third broad guage line runs between
Hathras Jn. and Hathras Killah. The metre-gauge line of the N.E. Railway, which traverses the District from east to west with the stations of Agsauli, Sikandra Rao, Rati Ka Nagla Hathras Road, Mandu, Hathras City and Mursan, has a track length of 68 Kms. in the District.

The transport network of the study area has been depicted in Fig.1.15.

2.6 POST AND TELEGRAPH:

The Aligarh District is well served with an extensive network of post and telecommunication services. The District has a good number of post offices. In the year 1987, there were 412 post offices located in its rural areas.

Table 1.10, showing the block-wise distribution of post offices in the rural areas of Aligarh, reveals that Khair block has the highest number of 38 post offices followed by Chandaus (36), Gangiri (30), Lodha (28), Akrabad (27) and Dhanipur and Jawan (26 each), while Hathras block has only 14 post offices.

The number of telegraph offices and public call offices in the District are 45 and 48 respectively. Sasni Block has the highest number of 5 telegraph offices followed by the blocks of Hasayan and Akrabad with 4 telegraph offices each. The blocks of Khair, Iglas and Hasayan have 5 public call offices each, while Atrauli, Jawan, Mursan and Hathras have
only one public call office each. The position of other blocks in respect of telegraph & public call offices has been shown in Table 1.10.

Table No.1.10

Aligarh District: Means of Communication in Rural Areas 1988

<table>
<thead>
<tr>
<th>Blocks</th>
<th>No. of Post Offices</th>
<th>No. of Telegraphs Offices</th>
<th>No. of Telephone Connections</th>
<th>No. of Public Call Offices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrauli</td>
<td>24</td>
<td>1</td>
<td>37</td>
<td>1</td>
</tr>
<tr>
<td>Gangiri</td>
<td>30</td>
<td>3</td>
<td>35</td>
<td>3</td>
</tr>
<tr>
<td>Bijauli</td>
<td>23</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Iglas</td>
<td>19</td>
<td>3</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Gonda</td>
<td>23</td>
<td>2</td>
<td>27</td>
<td>2</td>
</tr>
<tr>
<td>Jawan</td>
<td>26</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>26</td>
<td>2</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>Lodha</td>
<td>28</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Khair</td>
<td>38</td>
<td>2</td>
<td>35</td>
<td>5</td>
</tr>
<tr>
<td>Chandaus</td>
<td>36</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Tappal</td>
<td>22</td>
<td>2</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Akrabad</td>
<td>27</td>
<td>4</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td>S. Rao</td>
<td>23</td>
<td>2</td>
<td>67</td>
<td>3</td>
</tr>
<tr>
<td>Hasayan</td>
<td>19</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Mursan</td>
<td>19</td>
<td>3</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Sasni</td>
<td>15</td>
<td>5</td>
<td>66</td>
<td>4</td>
</tr>
<tr>
<td>Hathras</td>
<td>14</td>
<td>2</td>
<td>61</td>
<td>1</td>
</tr>
<tr>
<td>Total of the District (Rural only)</td>
<td>412</td>
<td>45</td>
<td>449</td>
<td>48</td>
</tr>
</tbody>
</table>


2.7 Rural Markets:

Marketing is an important commercial activity and plays a dominant role in the overall development of an area. Each individual has his specific needs and for its fulfilment, he
requires the facility of marketing. Markets in the rural areas of the Aligarh District may be broadly classified into three categories:

I. Weekly and Bi-weekly Markets;
II. Regulated or Daily Markets;
III. Animal Hats

I. Weekly and Bi-weekly Markets:

These markets, locally known as hats or painths, are periodic markets held weekly or bi-weekly in the open or along the road side in various villages. These are local markets where different types of commodities such as food grains, vegetables, fruits and spices etc. are brought and sold by the inhabitants of the surrounding areas. A majority of farmers unload their farm produce at these local markets for sale. In the Aligarh District, 81 weekly and 30 bi-weekly markets are held on different days in different villages. Gangotri Block has highest number of 15 villages holding weekly or bi-weekly markets, followed by Sikandra Rao and Bijauli with 12 and 11 villages respectively holding such local markets. The blockwise break up of weekly, bi-weekly and daily markets has been given in Table 1.11, while their areal distribution has been shown in Fig. 1.16.

A large majority of weekly markets are held in villages of above 500 population size. Out of the total number of 81 villages, where such markets are held, 16, 25, 30 and 5
DISTRIBUTION OF RURAL MARKET CENTRES

ALIGARH DISTRICT

1988

INDEX

Weekly Market
Monthly Market
Daily Market
Animal Market

2 STATISTICAL MAGAZINE OF ALIGARH DISTRICT 1990.
villages respectively fall in the population sizes of 500-1000, 1000-2000, 2000-5000 and above 5000 respectively. Girdharpur in tehsil Khair with a population of 73 persons only is the smallest village having the facility of a weekly market.

Table No. 1.11

Aligarh District: Blockwise Number of Villages Having Marketing Facilities 1981

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Weekly Market</th>
<th>Bi-weekly Market</th>
<th>Daily Market</th>
<th>Animal Hat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nos.</td>
<td>%</td>
<td>Nos.</td>
<td>%</td>
</tr>
<tr>
<td>Akrabad</td>
<td>6</td>
<td>7.41</td>
<td>2</td>
<td>6.67</td>
</tr>
<tr>
<td>Atrauli</td>
<td>7</td>
<td>8.64</td>
<td>1</td>
<td>3.33</td>
</tr>
<tr>
<td>Bijauli</td>
<td>8</td>
<td>9.88</td>
<td>3</td>
<td>10.00</td>
</tr>
<tr>
<td>Chandaus</td>
<td>2</td>
<td>2.47</td>
<td>1</td>
<td>3.33</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>8</td>
<td>9.88</td>
<td>7</td>
<td>23.33</td>
</tr>
<tr>
<td>Gangiri</td>
<td>8</td>
<td>9.88</td>
<td>13.33</td>
<td>1</td>
</tr>
<tr>
<td>Gonda</td>
<td>2</td>
<td>2.47</td>
<td>2</td>
<td>10.00</td>
</tr>
<tr>
<td>Hasayan</td>
<td>3</td>
<td>3.70</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hathras</td>
<td>2</td>
<td>2.47</td>
<td>3</td>
<td>10.00</td>
</tr>
<tr>
<td>Iglas</td>
<td>1</td>
<td>1.23</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jawan</td>
<td>5</td>
<td>6.17</td>
<td>1</td>
<td>3.33</td>
</tr>
<tr>
<td>Khair</td>
<td>5</td>
<td>6.17</td>
<td>2</td>
<td>6.67</td>
</tr>
<tr>
<td>Lodha</td>
<td>6</td>
<td>7.41</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mursan</td>
<td>3</td>
<td>3.70</td>
<td>1</td>
<td>3.33</td>
</tr>
<tr>
<td>Sasni</td>
<td>3</td>
<td>3.70</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>S.Rao</td>
<td>8</td>
<td>9.88</td>
<td>4</td>
<td>13.33</td>
</tr>
<tr>
<td>Tappal</td>
<td>4</td>
<td>4.94</td>
<td>1</td>
<td>3.33</td>
</tr>
</tbody>
</table>

Total of 81

100 | 30 | 100 | 11 | 100 | 17 | 100

(Rural only)

Source: Compiled from the data collected personally from the Jila Parishad, Aligarh.
Bi-weekly markets are mostly held in villages having above 1000 population. However such market are also held in 3 villages in the District with under 1000 population. Firozpur in tehsil Sikandra Rao having a population of 370 persons, is the smallest village in the District where a bi-weekly markets are held.

II. Regulated or Daily Markets:

There are 11 villages in the District which have the facility of regulated markets. Out of these, 10 villages have populations of 2000 and above. The only village with a population below 2000 having the facility of a regulated market is Hathras Junction in tehsil Hathras.

III. Animal Hats:

Animal hats are held in 12 blocks out of 17 of the Aligarh District. In these hats, cattle such as bullocks, cows and buffaloes are bought and sold. Animal hats are held mostly in big villages having populations of more than 1000 persons. Table 1.11 gives block wise distribution of animal hats in the District.
Chapter II
Demographic and Caste Structure
90

DEMOGRAPHIC AND CASTE STRUCTURE

1. DEMOGRAPHIC STRUCTURE

Population one of the dominant factors determining the nature of human settlements in terms of size and economy. The layout of the settlements, and their vertical and horizontal growth are the direct outcome of the size of population, its pressure and density. A study of interrelationship between man and his settlement shows various trends and features of social interaction, socio-spatial and physico-cultural structure of a region, which together constitute its morphogenetic structure. Therefore, an attempt is made here to discuss the demographic characteristics of the study area.

1.1 Population Growth

A perusal of the population figures relating to the Aligarh District indicates that since the 1901 census there has been a steady population growth in the District, the only exception being the period between 1901-1921, when it registered a negative growth. This negative growth is attributed to the fact that during this period India suffered from a number of serious natural calamities, like the famine of 1897 which resulted in a reduction in birth-rate. The population growth shows two discernible trends; a decreasing population trend till 1921, and a continuous increase since 1921. During the period 1971-81 the growth of population was phenomenal. During 1901-1911, the population decreased by
2.93% and in the next decade, 1911-1921 there was a further decline in population by 8.92%. This decade saw a rapid increase in death-rate which was more than 40 per thousand, resulting in a sharp decline in population. Since 1921 the population has been increasing continuously, and so this year may be taken as a divide to denote between the decreasing and the increasing trend. The decade ending in 1931 showed a growth rate of 10.36%, which increased to 12.56% in 1941. The trend of increase of population in successive decades has been given in Table 2.1, which reveals that population growth has been following a sigmoid (S-shaped) curve, representing a rapid increase in population (Fig.2.1).

It will be seen that study area recorded a growth rate of 19.63% during 1961-71 and 21.93% during 1971-81. As a result of increased health care the mortality rate has gone down and the family planning measures have not been able to control the growth in population.

It has been noticed that the growth rate of urban population has always been higher than that in rural areas. This is mainly due to the addition of 14 small rural agglomerations of the Aligarh District which were transferred to the category of towns in 1981 census. Table 2.2 gives the list of such agglomeration which have been classified as towns in the census.
ALIGARH DISTRICT
POPULATION GROWTH
1901-81

YEARS

POPULATION IN LAKH
TOTAL POPULATION
RURAL POPULATION

FIG. 2.1
<table>
<thead>
<tr>
<th>Census Year</th>
<th>Total Population</th>
<th>Decennial Percentage Variation</th>
<th>Rural Population</th>
<th>Decennial Variation</th>
<th>Urban</th>
<th>Decennial % Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>1200822</td>
<td>--</td>
<td>982452</td>
<td>--</td>
<td>218370</td>
<td>--</td>
</tr>
<tr>
<td>1911</td>
<td>1165680</td>
<td>-35142</td>
<td>975925</td>
<td>-0.7</td>
<td>189755</td>
<td>-15.1</td>
</tr>
<tr>
<td>1921</td>
<td>1061745</td>
<td>-103935</td>
<td>879783</td>
<td>-9.9</td>
<td>181962</td>
<td>-4.1</td>
</tr>
<tr>
<td>1931</td>
<td>1171745</td>
<td>+110000</td>
<td>972843</td>
<td>+10.6</td>
<td>198862</td>
<td>+9.3</td>
</tr>
<tr>
<td>1941</td>
<td>1372641</td>
<td>+200896</td>
<td>1128372</td>
<td>+16.0</td>
<td>244269</td>
<td>+22.8</td>
</tr>
<tr>
<td>1951</td>
<td>1543506</td>
<td>+170865</td>
<td>1253988</td>
<td>+11.0</td>
<td>289818</td>
<td>+18.5</td>
</tr>
<tr>
<td>1961</td>
<td>1765275</td>
<td>+221769</td>
<td>1478577</td>
<td>+17.9</td>
<td>286698</td>
<td>+1.9</td>
</tr>
<tr>
<td>1971</td>
<td>2111829</td>
<td>+346554</td>
<td>1734798</td>
<td>+17.3</td>
<td>377031</td>
<td>+31.5</td>
</tr>
<tr>
<td>1981</td>
<td>2574925</td>
<td>+463096</td>
<td>1982781</td>
<td>+14.3</td>
<td>592144</td>
<td>+57.1</td>
</tr>
</tbody>
</table>

(1901-1981)  114.4  +101.8  +71.2

Table-2.2

New Towns added/classified in 1981 census

<table>
<thead>
<tr>
<th>Name of Towns</th>
<th>Population (1981 census)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beswan</td>
<td>4056</td>
</tr>
<tr>
<td>Chharra (Rafatpur)</td>
<td>8883</td>
</tr>
<tr>
<td>Harduaganj</td>
<td>7504</td>
</tr>
<tr>
<td>Hasayan</td>
<td>3625</td>
</tr>
<tr>
<td>Iglas</td>
<td>5235</td>
</tr>
<tr>
<td>Jalali</td>
<td>13841</td>
</tr>
<tr>
<td>Jattari</td>
<td>8243</td>
</tr>
<tr>
<td>Kauriaganj</td>
<td>6636</td>
</tr>
<tr>
<td>Khair</td>
<td>15497</td>
</tr>
<tr>
<td>Mendu</td>
<td>7195</td>
</tr>
<tr>
<td>Pilakhana</td>
<td>5877</td>
</tr>
<tr>
<td>Purdil Nagar</td>
<td>8290</td>
</tr>
<tr>
<td>Qasimpur Power House Colony</td>
<td>13871</td>
</tr>
<tr>
<td>Vijaynagar</td>
<td>3898</td>
</tr>
</tbody>
</table>


These 14 towns with a total population of 112651 accounted for 52.37 per cent of the increase in urban population of the District registered in the 1981 census. Increase in the urban population of the District was only 19.02 per cent in 1971. The highest growth in urban population of these 14 newly formed town was in Khair which had a population of 15,497 while the lowest growth was in Hasayan which was inhabited by only 3625 persons according to the 1981 census.
Table 2.3 shows block level growth of population in the rural areas of the Aligarh District between 1971 and 1981 according to which, these block may be classified into three categories:

(i) Low Growth Blocks (< 10%), which was confined to four blocks.

(ii) Medium Growth Blocks (10%-20%), covering seven blocks of the study area, and

(iii) High Growth Blocks (> 20%), it bound in comprising the six blocks.

Table 2.3

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Blocks</th>
<th>Rural Population</th>
<th>Decennial variation in percent (1971-81)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1971</td>
<td>1981</td>
</tr>
<tr>
<td>1.</td>
<td>Akrabad</td>
<td>101889</td>
<td>100058</td>
</tr>
<tr>
<td>2.</td>
<td>Atrauli</td>
<td>104099</td>
<td>129517</td>
</tr>
<tr>
<td>3.</td>
<td>Bijauli</td>
<td>87980</td>
<td>107643</td>
</tr>
<tr>
<td>4.</td>
<td>Chandaus</td>
<td>100012</td>
<td>121004</td>
</tr>
<tr>
<td>5.</td>
<td>Dhanipur</td>
<td>113829</td>
<td>1225058</td>
</tr>
<tr>
<td>6.</td>
<td>Gangiri</td>
<td>140239</td>
<td>159057</td>
</tr>
<tr>
<td>7.</td>
<td>Gonda</td>
<td>101018</td>
<td>1153989</td>
</tr>
<tr>
<td>8.</td>
<td>Hasayan</td>
<td>102443</td>
<td>102443</td>
</tr>
<tr>
<td>9.</td>
<td>Hathras</td>
<td>96300</td>
<td>106104</td>
</tr>
<tr>
<td>10.</td>
<td>Iglas</td>
<td>90960</td>
<td>103756</td>
</tr>
<tr>
<td>11.</td>
<td>Jawan</td>
<td>111592</td>
<td>130263</td>
</tr>
<tr>
<td>12.</td>
<td>Khair</td>
<td>113882</td>
<td>117502</td>
</tr>
<tr>
<td>13.</td>
<td>Lodha</td>
<td>91562</td>
<td>110486</td>
</tr>
<tr>
<td>14.</td>
<td>Mursan</td>
<td>88045</td>
<td>109454</td>
</tr>
<tr>
<td>15.</td>
<td>Sasni</td>
<td>99594</td>
<td>125380</td>
</tr>
<tr>
<td>16.</td>
<td>Sikandra Rao</td>
<td>83441</td>
<td>96164</td>
</tr>
<tr>
<td>17.</td>
<td>Tappal</td>
<td>111180</td>
<td>123503</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1734798</td>
<td>1982781</td>
</tr>
</tbody>
</table>

Source: Compiled from the District Census Handbook of Aligarh (Part A) 1971 and 1981.
iv) The highest growth was recorded in the Sasni Block (+25.89%), while it was lowest in Akrabad (+1.80%).

1.2 Distribution of Population

The present distribution of population in the Aligarh District is the result of many interrelated physical and cultural factors.

There is general agreement that physical conditions such as topography, fertility of soil, climatic conditions and water availability and cultural factors such as agriculture, irrigational facilities, industries, accessibility and means of communication affect the pattern of population distribution in an area. The size of population determines the nature and pattern of human settlement, while its distribution shows the nature of man's adjustments with physical resources. Fig. 2.2 shows the general pattern of population distribution in the Aligarh District in 1981 and reveals that, by and large, the distribution of population is more or less homogenous, as the study area lies in an area which has hardly any physical variations. However, at the micro-level variation in population distribution are clearly discernible. For instance in the low lying and unproductive tracts of the Yamuna Khadar the population is unevenly distributed whereas in the middle zone, a number of large size agglomerations have over 5000 people each.
ALIGARH DISTRICT
DISTRIBUTION OF RURAL POPULATION
1981

EACH DOT REPRESENTS 500 PERSONS.
1.3 Density of Population

The population density gives a relative picture of the population distribution in a region, and provides an idea of the population pressure upon the resource base. It varies according to the units of measurement and gives different values for different categories of land use. Blocks have been taken as units in the present study for the purpose of examining the regional variations in population density in the Aligarh District.

According to the 1981 census the rural population density of the District is 513 persons per sq. km., which is much higher than national average (221 persons per sq.km.). There are considerable variations in the density pattern among various blocks due to differences in soil fertility and prevailing environmental conditions. Table-4 shows the pattern of density in different blocks of the study area. For a study of the spatial patterning of density blocks of the Aligarh District, its blocks can be grouped into five categories (Fig. 2.3).

(i) Areas of Very Low Density (below 350 persons per sq. km): This area comprises only one block, namely, Tappal, the density of which is lowest in the District, the main reasons being its location in the infertile terrain of the Yamuna Khadar.
### Table 2.4

**Density of Rural Population 1981**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Blocks</th>
<th>Area Sq.km</th>
<th>Population</th>
<th>Density person/km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Akrabad</td>
<td>278.0</td>
<td>10058</td>
<td>360</td>
</tr>
<tr>
<td>2.</td>
<td>Atrauli</td>
<td>283.6</td>
<td>129517</td>
<td>456</td>
</tr>
<tr>
<td>3.</td>
<td>Bijauli</td>
<td>250.6</td>
<td>107643</td>
<td>430</td>
</tr>
<tr>
<td>4.</td>
<td>Chandaus</td>
<td>329.7</td>
<td>121004</td>
<td>367</td>
</tr>
<tr>
<td>5.</td>
<td>Dhanipur</td>
<td>287.8</td>
<td>1225058</td>
<td>435</td>
</tr>
<tr>
<td>6.</td>
<td>Gangiri</td>
<td>345.3</td>
<td>159057</td>
<td>461</td>
</tr>
<tr>
<td>7.</td>
<td>Gonda</td>
<td>286.4</td>
<td>1153989</td>
<td>403</td>
</tr>
<tr>
<td>8.</td>
<td>Hasayan</td>
<td>284.1</td>
<td>102443</td>
<td>361</td>
</tr>
<tr>
<td>9.</td>
<td>Hathras</td>
<td>237.3</td>
<td>106104</td>
<td>447</td>
</tr>
<tr>
<td>10.</td>
<td>Iglas</td>
<td>256.6</td>
<td>103756</td>
<td>404</td>
</tr>
<tr>
<td>11.</td>
<td>Jawan</td>
<td>293.2</td>
<td>130263</td>
<td>444</td>
</tr>
<tr>
<td>12.</td>
<td>Khair</td>
<td>320.4</td>
<td>117502</td>
<td>367</td>
</tr>
<tr>
<td>13.</td>
<td>Lodha</td>
<td>267.7</td>
<td>110486</td>
<td>413</td>
</tr>
<tr>
<td>14.</td>
<td>Mursan</td>
<td>226.3</td>
<td>109454</td>
<td>484</td>
</tr>
<tr>
<td>15.</td>
<td>Sasni</td>
<td>268.6</td>
<td>125380</td>
<td>467</td>
</tr>
<tr>
<td>16.</td>
<td>Sikandra Rao</td>
<td>257.5</td>
<td>96164</td>
<td>373</td>
</tr>
<tr>
<td>17.</td>
<td>Tappal</td>
<td>368.7</td>
<td>123503</td>
<td>335</td>
</tr>
</tbody>
</table>


**(ii) Areas of Low Density** (351-390 persons per sq. km.):

There are five blocks in the District which have low density viz., Akrabad, Hasayan, Sikandra Rao, Chandaus and Khair.

**(iii) Areas of Moderate Density** (391-430 persons per sq. km.): There are four blocks in the District with moderate density e.g. Bijouli, Iglas, Gonda and Lodha.

**(iv) Areas of High Density** (431-470 persons per sq. km.):

Dhanipur, Jawan, Atrauli, Sasni, Gangiri and Hathras are six blocks of the districts which have high density of population.
Areas of Very High Density (471 and above persons per sq.km.): The highest rural density in Aligarh is concentrated found in Mursan Block.

It is clear from the foregoing analysis that the Aligarh District is an area of relatively high density of population. The only exceptions are the regions which are either agriculturally unproductive or lie in the flood plains of rivers.

1.4 Occupational Structure of Rural Population

The structure of rural occupation of a population affects the several socio-cultural and demographic characteristics of an area in a number of wages. It reflects the nature and trend of economy of a region. In the study area, 27.32% of rural population consists of workers, of which 68.63%, engaged in primary sector (cultivators, agricultural labourers, mining, quarrying, livestock, forestry, fishing, hunting and plantation). Of the total number of male workers while 69.19% and 44.63% respectively work in the primary sector. Table 2.5 shows the occupational structure of rural population in the Aligarh District. The sex structure of the rural workers is given in Table 2.6. The dominant that position of agriculture among rural occupations is obvious. Out of the total working population
### TABLE 2.5

**OCCUPATIONAL STRUCTURE OF RURAL POPULATION (1981)**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>%age of workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>Primary Sector</td>
<td></td>
</tr>
<tr>
<td>1. Cultivators</td>
<td>49.00</td>
</tr>
<tr>
<td>2. Agricultural labourer</td>
<td>18.97</td>
</tr>
<tr>
<td>3. Mining, quarrying</td>
<td>0.04</td>
</tr>
<tr>
<td>4. Livestock, Forestry, Fishing, Hunting, Plantation</td>
<td>0.62</td>
</tr>
<tr>
<td>Secondary Sector</td>
<td></td>
</tr>
<tr>
<td>5. House hold Industry</td>
<td>4.23</td>
</tr>
<tr>
<td>6. Manufacturing ex-household</td>
<td>6.03</td>
</tr>
<tr>
<td>7. Construction</td>
<td>0.92</td>
</tr>
<tr>
<td>Territory Sector</td>
<td></td>
</tr>
<tr>
<td>8. Trade &amp; Commerce</td>
<td>5.66</td>
</tr>
<tr>
<td>9. Transport, storage &amp; communications</td>
<td>2.62</td>
</tr>
<tr>
<td>10. Other services</td>
<td>11.98</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: General Economic Table of Uttar Pradesh (1981)
Compiled from District Census Handbook, Aligarh District 1981.

Of the District, the overwhelming majority i.e. 81 per cent work in the primary sector. The Table also gives the occupational structure by sectors for rural and urban areas separately. Of the total number of male and female workers in the rural areas of the District, those working in the primary sector comprise 81.50% and 61.37% respectively. Fig. 2.4 presents the normal occupational structures of the study area.
### TABLE 2.6

**OCCUPATIONAL STRUCTURE BY SECTOR (1981) (in %)**

<table>
<thead>
<tr>
<th></th>
<th>Total Population</th>
<th>%age</th>
<th>Total</th>
<th>%age</th>
<th>Primary</th>
<th>Secondary</th>
<th>%age</th>
<th>Tertiary</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some other Demographic Characteristics

Apart from an analysis of the distribution and density of population, it is equally important to study its physical and cultural characteristics as well. Among the physical characteristics, age and sex structure are important, while literacy level, marital status and occupational structure are significant cultural traits.

1.5 Age and Sex Structure: Age composition is an indicator of the potential labour supply and is a pointer to the trends in the growth of the population. The age structure is directly influenced by three variables: mortality, fertility and migrations, which are interdependent of each other. The age-sex structure in the study area can be constructed either by using the absolute number of both the sexes in different age groups or by using percentages representing the proportion of males and females in each group within the total population. Figure 2.5 shows the pyramid of age sex structure which reveals the youthfulness of the population. Table 2.7 shows that the proportion of population goes in decreasing in the successive age groups.

The Table indicates that (40.9%) of the total rural population is in the working age group, 20-60 years. The corresponding proportion among males (39.17%) is considerably lower than that among females (42.98%). This is apparently an
### TABLE 2.7

**AGE-SEX STRUCTURE (1981)**

<table>
<thead>
<tr>
<th>Age-Group</th>
<th>Total Population</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% (1982781)</td>
<td>of total</td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>28.15</td>
<td>302728</td>
<td>28.00</td>
</tr>
<tr>
<td>10-14</td>
<td>14.64</td>
<td>164509</td>
<td>15.21</td>
</tr>
<tr>
<td>15-19</td>
<td>9.08</td>
<td>109481</td>
<td>10.12</td>
</tr>
<tr>
<td>20-24</td>
<td>7.45</td>
<td>79005</td>
<td>7.30</td>
</tr>
<tr>
<td>25-29</td>
<td>6.43</td>
<td>66843</td>
<td>6.18</td>
</tr>
<tr>
<td>30-34</td>
<td>5.57</td>
<td>56901</td>
<td>5.26</td>
</tr>
<tr>
<td>35-39</td>
<td>5.13</td>
<td>51171</td>
<td>4.73</td>
</tr>
<tr>
<td>40-44</td>
<td>5.00</td>
<td>52094</td>
<td>4.81</td>
</tr>
<tr>
<td>45-49</td>
<td>4.27</td>
<td>41534</td>
<td>3.84</td>
</tr>
<tr>
<td>50-544</td>
<td>4.38</td>
<td>49410</td>
<td>4.57</td>
</tr>
<tr>
<td>55-59</td>
<td>2.67</td>
<td>26865</td>
<td>2.48</td>
</tr>
<tr>
<td>60-64</td>
<td>3.07</td>
<td>34654</td>
<td>3.20</td>
</tr>
<tr>
<td>65-69</td>
<td>1.45</td>
<td>15161</td>
<td>1.40</td>
</tr>
<tr>
<td>70+</td>
<td>2.60</td>
<td>29959</td>
<td>2.77</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Census of India 1981 Series-22 Uttar Pradesh Part VIII & B H.H. Table.
indication of the fact that the a large number of its males in working age groups migrate from the District in pursuit of employment. This is due to heavy pressure of population on land and lack of employment opportunities locally.

The ratio of females per 1000 of male population in the rural areas of the Aligarh District was 833 in 1981, while it was 834 in 1971. In urban areas of the District the ratio was 861 in 1981, while it was 833 in 1971, which was the highest in the District. The overall sex ratio of the study area was 840 in 1981 and 832 in 1971. The highest ratio of females in the District was in 891 in 1901, followed by 857 in 1951. Sex ratio in the District has been fluctuating from decade to decade as shown in Table 2-8. The data shows a steady increase of males over females which is a feature, that is common to most of the district of northern India.

**TABLE 2-8**

**SEX-RATIO (NUMBER OF FEMALES PER 1000 MALES)**

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>895</td>
<td>876</td>
<td>891</td>
</tr>
<tr>
<td>1911</td>
<td>858</td>
<td>821</td>
<td>852</td>
</tr>
<tr>
<td>1921</td>
<td>855</td>
<td>801</td>
<td>845</td>
</tr>
<tr>
<td>1931</td>
<td>857</td>
<td>776</td>
<td>842</td>
</tr>
<tr>
<td>1941</td>
<td>852</td>
<td>801</td>
<td>843</td>
</tr>
<tr>
<td>1951</td>
<td>863</td>
<td>832</td>
<td>857</td>
</tr>
<tr>
<td>1961</td>
<td>865</td>
<td>841</td>
<td>861</td>
</tr>
<tr>
<td>1971</td>
<td>834</td>
<td>833</td>
<td>832</td>
</tr>
<tr>
<td>1981</td>
<td>833</td>
<td>861</td>
<td>840</td>
</tr>
</tbody>
</table>

The marital status of a population refers to the proportions of single, married, widowed and divorced people. Both age structure and sex ratio influence these proportions. Like other districts of Uttar Pradesh, Aligarh has relatively more 'never married' males than females, and more married females than males. This can is due to be the fact that girls marry at much younger ages than boys. As against 57.07% of males in the District who had not married at all, the corresponding proportion among females is 45.88% only. The marital status by broad age in the District groups is given in Table 2.9.

It is notable that the incidence of child marriages in the District is not very frequent. In comparison to male, child marriage is relatively higher in proportion among females. According to the table only 13.94% of females in the age group of 15-34 belonged to the category of never married. The corresponding proportions among males are much higher more than three times, particularly in the age group of 15-34.

As the table clearly shows divorce is not much prevalent in the study area. It is only natural that with restrictions prevalent among the Hindus on widow remarriage, the proportion of widows should be appreciably higher than that of widowers in each age group. Yet in age group of 15-34 the number of widowers is greater than that of widows. This is due to the lack of medical facilities in rural areas.
### Table 2.9

**Marital Status and Age Sex Structure in %**

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>0-14</th>
<th>%</th>
<th>15-34</th>
<th>%</th>
<th>35-59</th>
<th>%</th>
<th>+60</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>M 465546</td>
<td>99.64</td>
<td>138712</td>
<td>44.43</td>
<td>9136</td>
<td>4.13</td>
<td>3045</td>
<td>3.82</td>
<td>616920</td>
<td>57.70</td>
</tr>
<tr>
<td>F 378084</td>
<td>(99.17)</td>
<td></td>
<td>(13.94)</td>
<td>(0.44)</td>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.12)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Married</td>
<td>M 1575</td>
<td>0.34</td>
<td>169694</td>
<td>54.35</td>
<td>194236</td>
<td>87.86</td>
<td>56009</td>
<td>70.21</td>
<td>421627</td>
<td>39.00</td>
</tr>
<tr>
<td>F 3070</td>
<td>(0.81)</td>
<td></td>
<td>(85.05)</td>
<td>(11.40)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
</tr>
<tr>
<td>Widowed</td>
<td>M 55</td>
<td>0.012</td>
<td>3367</td>
<td>1.08</td>
<td>17413</td>
<td>7.88</td>
<td>20485</td>
<td>25.68</td>
<td>41331</td>
<td>3.82</td>
</tr>
<tr>
<td>F 20</td>
<td>(0.005)</td>
<td></td>
<td>(0.93)</td>
<td>(11.40)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
<td>(54.12)</td>
</tr>
<tr>
<td>Divorced or Separated</td>
<td>M 10</td>
<td>0.002</td>
<td>439</td>
<td>0.14</td>
<td>290</td>
<td>0.13</td>
<td>126</td>
<td>0.158</td>
<td>866</td>
<td>0.08</td>
</tr>
<tr>
<td>F 5</td>
<td>(0.001)</td>
<td></td>
<td>(0.06)</td>
<td>(0.066)</td>
<td>(0.10)</td>
<td>(0.10)</td>
<td>(0.10)</td>
<td>(0.10)</td>
<td>(0.10)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>Unspecified status</td>
<td>M 51</td>
<td>0.011</td>
<td>18</td>
<td>0.00</td>
<td>5</td>
<td>0.002</td>
<td>109</td>
<td>0.137</td>
<td>183</td>
<td>0.01</td>
</tr>
<tr>
<td>F 71</td>
<td>(0.019)</td>
<td></td>
<td>(0.02)</td>
<td>(0.002)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Total</td>
<td>M 467237</td>
<td>100.0</td>
<td>312230</td>
<td>100.0</td>
<td>221080</td>
<td>100.0</td>
<td>79774</td>
<td>100.0</td>
<td>1080925</td>
<td>100.0</td>
</tr>
<tr>
<td>F 381250</td>
<td>(100.0)</td>
<td></td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
</tr>
</tbody>
</table>

1.6 Literacy: According to 1981 census there was 31.34 per cent of literacy in the Aligarh District. The proportion of literate among females was lower (16.24%) than that of males (44.04%), and percentage of literates lower in rural areas (27.24%) than in urban areas (43.24%). Table 2.10 shows

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Literate Person</th>
<th>Literacy %age</th>
<th>Blocks Year 1981</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
</tr>
<tr>
<td>Akrabad</td>
<td>22194</td>
<td>5279</td>
<td>27473</td>
</tr>
<tr>
<td>Atrauli</td>
<td>28917</td>
<td>6174</td>
<td>35091</td>
</tr>
<tr>
<td>Bijaui</td>
<td>19780</td>
<td>2716</td>
<td>19496</td>
</tr>
<tr>
<td>Chandaus</td>
<td>29396</td>
<td>6843</td>
<td>36239</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>29362</td>
<td>7486</td>
<td>36848</td>
</tr>
<tr>
<td>Gangeri</td>
<td>26242</td>
<td>4740</td>
<td>30982</td>
</tr>
<tr>
<td>Gonda</td>
<td>27837</td>
<td>4434</td>
<td>32273</td>
</tr>
<tr>
<td>Hasayan</td>
<td>23072</td>
<td>5275</td>
<td>28347</td>
</tr>
<tr>
<td>Hathras</td>
<td>27625</td>
<td>8710</td>
<td>36335</td>
</tr>
<tr>
<td>Iglas</td>
<td>24686</td>
<td>4336</td>
<td>29022</td>
</tr>
<tr>
<td>Jawan</td>
<td>29639</td>
<td>7234</td>
<td>36873</td>
</tr>
<tr>
<td>Khair</td>
<td>29401</td>
<td>5989</td>
<td>35390</td>
</tr>
<tr>
<td>Lodha</td>
<td>27229</td>
<td>6545</td>
<td>33774</td>
</tr>
<tr>
<td>Mursan</td>
<td>26429</td>
<td>4992</td>
<td>31451</td>
</tr>
<tr>
<td>Sasni</td>
<td>31782</td>
<td>9447</td>
<td>41229</td>
</tr>
<tr>
<td>Sikandra Rao</td>
<td>22196</td>
<td>5189</td>
<td>27385</td>
</tr>
<tr>
<td>Tappal</td>
<td>27856</td>
<td>5064</td>
<td>32920</td>
</tr>
<tr>
<td>Rural</td>
<td>450643</td>
<td>100455</td>
<td>551098</td>
</tr>
<tr>
<td>Urban</td>
<td>165457</td>
<td>90568</td>
<td>256025</td>
</tr>
<tr>
<td>Total</td>
<td>616100</td>
<td>191025</td>
<td>807123</td>
</tr>
</tbody>
</table>

that highest percentage of literates in the District was in Sasni Block (32.88%) followed by in Lodha Block (30.57%), while Gangiri Block recorded the lowest percentage of literates (19.48%) in the study area.

1.7 Religious Compositions: Religion is the basic cultural characteristic of a population. The religious composition of the Aligarh District is given in Table 11; Like other rural areas of Uttar Pradesh, Aligarh District is also dominated by

**TABLE 2.11**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Religion</th>
<th>Total</th>
<th>Rural</th>
<th>Urban</th>
<th>% of total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hindu</td>
<td>2225531</td>
<td>1791095</td>
<td>434436</td>
<td>86.43%</td>
</tr>
<tr>
<td>2.</td>
<td>Muslim</td>
<td>339047</td>
<td>189015</td>
<td>150032</td>
<td>13.07%</td>
</tr>
<tr>
<td>3.</td>
<td>Christian</td>
<td>2282</td>
<td>494</td>
<td>1788</td>
<td>0.09%</td>
</tr>
<tr>
<td>4.</td>
<td>Sikh</td>
<td>3540</td>
<td>1060</td>
<td>2480</td>
<td>0.14%</td>
</tr>
<tr>
<td>5.</td>
<td>Buddhist</td>
<td>700</td>
<td>329</td>
<td>371</td>
<td>0.03%</td>
</tr>
<tr>
<td>6.</td>
<td>Jain</td>
<td>3751</td>
<td>742</td>
<td>3009</td>
<td>0.14%</td>
</tr>
<tr>
<td>7.</td>
<td>Others</td>
<td>65</td>
<td>37</td>
<td>28</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2574915</td>
<td>1982772</td>
<td>592144</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Hindus (86.43%), followed by Muslims (13.17%). Other religious groups were Christians (0.09%) Sikhs (0.14%), Jains (0.14%), Buddhists (0.03%) members of, which were mainly concentrated in urban areas.

2. Caste Structure

Caste is one of the most important social factors in determining the site of a rural habitation. As has been mentioned in the sixth and the seventh chapter, the dwellings of people of high caste tend to be concentrated at one place and the houses of people low caste are set apart in a different locality. In ancient Vedic literatures there are several references regarding the origin of castes. According to the Rigveda there were four castes which originated from the supreme being. Brahmins came from His mouth; Kshatriya from his arms; Vaishya from his thighs; and Shudras from his feet. As the mouth is the main organ of speech Brahmins were entrusted to work as teachers. The arms, being are the seat of strengths, the functions of Kshatriyas was to defend the empire. The thighs were the principal repository organs so Vaishyas were destined to provide food to others. The Shudras originated from the feet, and therefore their duty is to serve others just as the feet serve the other parts of the body.  

inferior human being and addressed them as "dasa" meaning 'slave'. They were regarded as untouchables. They were placed in the lowest strata of the society and were prevented from participation in religious and social ceremonies. Brahmans, were considered to be the most privileged caste, and placed in the highest strata of the society. Which Shudras or untouchable caste were supposed to belong to the lowest strata. The plight of the untouchables was pitiable. They suffered from a number of socio-economic and political disabilities. They were not allowed to use the village well, pond, temple, or bathing ghats. They were also denied the right to reside in areas, where the houses of higher castes are situated. A separate area in all big cities was allotted where they used to dwell in worst type of slums. In the villages, their lot was even worse. They were not allowed to enter into occupations which were reserved for the members of high caste. They were compelled to stick to their traditional occupations. Land was virtually reserved for the higher castes. They were confined to their position as a landless labourers in the village. Before the abolition of the zamindari system their first duty was to work for a landlord without any remuneration. Thus their position was virtually that of slaves and, in certain circumstances, even worse than a slave. As this system is based on the birth of an individual, shift from one caste to another was very difficult. Many efforts have been made by the social
organization and the government to improve the socio-economic status of the untouchables. The Untouchable Offences Act was passed in 1955. In accordance with the provision of this Act every person is free to perform all kinds of religious and social functions and perform worship of its liking. He or she is free to use all public places like ponds, wells, rivers and roads. Any act committed against this provision has been made punishable. The constitutional measures have, no doubt removed the constitutional disabilities of the untouchables but they have failed to change the prevailing attitude of abhorrence of higher caste people towards those of lower castes in the rural areas. However certain changes are being witnessed in the urban areas due to industrialization, westernization and sanskritization. Industries have thrown all caste into one lot. Among high caste people there is a tendency to become westernized in their dress, diet, manners and speech. In the process of sanskritization people of the lower castes tend to adopt the way of life of that of the higher castes. Therefore the rigidity of caste system is gradually losing its force in urban areas. However, in the rural areas the caste system is still present in its rigid form which determines the siting and segregation of the rural dwellings.

Since the 1931 census, publication of data about the distribution of castes at tehsil level has been stopped. There is non-availability of the literature regarding this
distribution from any other source. The present information is, therefore, based on the District Gazetteer published in March 1909, and the census of 1931.

2.1 Distribution of Caste

The ratio of Hindus and Muslims in the Aligarh District differs widely between the various tehsils, the latter comprising of 6.5 per cent of the population in Iglas and 8.4 per cent in Khair, while the figure is 9.5 in Hathras and 11.9 per cent in Sikandra Rao. It is 15.6 per cent in Atrauli and over 18 per cent in Koil. The wide difference between Koil and other tehsils in this respect is due to the large Muslim population of the city of Aligarh. The District has 18 castes with more than ten thousand members, which together make up nine-tenths of its Hindu population.

Chamars: are numerically the strongest caste, being the largest group in all tehsils except Khair and Iglas, in which Jats predominate. Chamars comprise 21.56 per cent of the Hindu community and form the bulk of the working population of the District. There are many subdivisions of the caste, the chief of these being Jatavs who are found in all parts of the District. The chamars are tanners and curriers by tradition and they still do a considerable business in hides and skins.

Brahmins: The second place is among the Hindu castes is that of the Brahmins who constitute 13 per cent of the Hindu
population in the District. They are found throughout the District, especially in the south and west, their numbers being relatively small in Atrauli and Sikandra Rao. They are mainly landowners and cultivators, but many Brahmans in the District have become rich by money-lending and banking. The Brahmins of the study area are principally Sanadhs and Gours, the former being a branch of the great Kanaujia subdivision, while there are fair numbers of the Saraswat and Gautam sub-castes.

Jats: The Jats are more numerous in the Aligarh District than in any other district of U.P. except Meerut forming 10.43 per cent of the Hindu community. They are strongest in the Khair and Iglas tehsils, but large numbers are also found in Hathras and other parts of the District. They have innumerable sub-divisions, of which the strongest are the Gujars and Thakurels, while others are Panwars, Dagars, Tomars, Mahurs and Sinsinwars. The Jats in the eastern tehsils like Atrauli, Sikandra Rao, appear to be comparatively modern immigrants, and in several instances they state that their ancestors had accompanied the armies of Suraj Mal of Bharatpur.

Rajputs: The distribution of Rajputs in the district is very uneven. They comprise nearabout 9 per cent of its Hindu population. They form the chief landowning caste in the district, and their occupation is almost wholly agriculture. They hold very large area which they till with fair success.
The Rajput community comprises representatives of many clans, though only a few are of any importance in the District such as Jadons, Chhonkars and Jaiswars. The Chaudharis are more evenly distributed, but are strongest in Khair, Sikandra Rao and Koil. They trace their descent to the ancient rulers of Delhi. The Pandits are found mainly in Sikandra Rao and Koil tehsils. Bargujars are the strongest in Atrauli, Sikandra Rao and Koil. Then follow Gahlots, chiefly in Hathras and Atrauli. Other clans include the Tomars in Hathras and Iglas, the Panwars in Hathras and Sikandra Rao, the Kachhwahas in Koil, the Solankhis of Hathras and the Rathors of Atrauli. In the Atrauli tehsil there are considerable numbers of Gaurahars, who are Rajputs of a low rank, who are also found in the neighbouring parts of Badaun. Banias are found in all parts of the Aligarh District, especially in and near the large towns of Hathras and Aligarh. A subdivision of the Banias is the Agarwalas. They predominate in every tehsils except Sikandra Rao. The main caste amongst the Banias are the Barasenis, the Maheshris, the Chausenis, the Jaiswars and the Khadelwals, the last of whom are mainly found in Hathras tehsil. The Barasenis, like the Agarwalas, state that their ancestors had come from Agroha in Punjab. The Jaiswars, like so many sub-division of these castes, trace their origin to the ancient town of Jais in Rai Braeli, but they are more numerous in Aligarh than in any other District of U.P.
Many other Hindu castes are found in the Aligarh District, such as Lodhas, Gadariyas, Korkis, Kahars, Dhangis, Khakrobs or sweepers, Ahirs, Ahars, Nais, Barhais, Kachhis, Kumhars, Fagirs, Jogis, Bairagis, Goshains, Dhobis, Kayasthas and Malis. The Lodhas are hard working and efficient cultivators. Gadariyas are mainly found in Sikandra Rao and Koil tehsils. They are herdsmen by profession. The Ahirs are mainly confined to the Atrauli and Sikandra Rao tehsils, their presence in Atrauli tehsil being due to the grazing facilities of the Khadar. Other castes are Gujars (who are almost confined to the southern part of the District) Sonars, Darzis, Nats and Kaniars etc.

Muslims: The Muslim population shows as great a diversity of castes as that found among the Hindus. Of the whole community the Sunnis are larger in proportion than the Shias, the latter sect mainly comprising to the Saiyids of Jalali with their relatives dependents in other parts of the District. The Sheikhs are generally found in Koil, Hathras and Atrauli tehsils. They are land owners and cultivators, a considerable number being are engaged in trade and industry also. The Sheikhs have many sub-divisions which like, the Qurreshis, the Siddiqis, the Faruqis, the Bani Israilan, the Ansaris the Usmanis and the Khurasanis etc. Pathans are unevenly distributed, in the District two third of them inhabiting the Atrauli and Koil tehsils.
Their oldest settlement seems to have been at Jalali. The leading Pathan families, such as the Sherwanis and the Dataulis came to the District in comparatively recent times. Of the many different clans of the Pathans, the chief are the Ghoris, mainly in Atrauli and Koil. The Pathans are mainly landholders and cultivators.

There are many other Muslim castes which are of very little importance. The Tellis, the Bhishtis, the Qassabs and the Mewatis are found evenly in all parts of the District, but the Qassabs and the Mewatis are strongest in Sikandra Rao and their ancestors are said to have migrated from Mewat during the eighteenth century. The Saiyids are chiefly of the Husaini sub-division, but many other sub-castes of their are also found in the District, such as the Rizwi, the Bukharis, the Zaidis and the Tagwis. Muslim castes with a small numbers are the Lohars, who are very strong in Sikandra Rao, followed by Guiars, Julahas, Bhangis, Ghosis, Faqirs, Manihars, Dhobis and Mughals etc.
Chapter III
Evolution of Rural Settlements
EVOLUTION OF RURAL SETTLEMENTS

The interplay of historical and socio-economic factors with physico-cultural determinants has produced a social structure of Aligarh District which is quite distinct from that of other regions. The intermixing of various ethnic groups and cultural traits from within and outside the country have produced a complex pattern. The beginnings of rural settlements in the region go back to the pre-historic period. This is borne out by the legends and folklore of the area, the presence of large number of mounds, and, more convincingly, by the archaeological excavations in different parts of the District. The abundance of mounds suggest that the area had a number of settlements in the ancient period. Archaeological excavations have shown that settlements of this region date back to at least 1500 B.C. and that the area has been under the sway of many dynasties. Thus, the present pattern of settlement distribution is the result of a series of ups and downs of earlier settlements. This is why the study of its historical evolution is most relevant to the present work. In order to understand the present formal pattern of the rural settlements of the Aligarh District a study its histogenesis, i.e., the evolution of its settlements assumes considerable significance.

Hence an attempt has been made here to trace the evolution of the rural settlements of the District, taking
into account the place-names, culture archaeological evidences and written records since no single evidence is strong enough to reconstruct the evolution of rural settlements in the study area.

1. Place-Names Analysis

Place-name analysis has enjoyed much importance in the field of settlement histogenesis as it is a valuable source of the study of the evolution of cultural landscapes, especially those of rural settlements. According to Brunhes, place names are the fossils of Human Geography. The study of place names helps to trace the evolution of rural settlements because their suffixes and prefixes are closely related to the physico-cultural background of an area, since there is a complex relationship between names of places and their geographical surroundings. Kemble (1849) discovered the significance of place-names ending in ing and ingham in the evolution of Saxon settlements of southeast England. These suffixes point to the clans which had settled in the places which now bear their names. Alice Mutton (1938) has traced various phases of the settlement of the Black Forest and the Rhine areas, based on the evidences furnished by the place-

name endings and their distribution.\(^1\) Dickinson (1949) has studied the evolution of German settlements with the help of place-name suffixes. He has traced the evolution of various plans of rural settlements and discussed the distribution of settlements types in Germany with the help of the place-names.\(^2\) Maxwell (1965) has successfully traced the origin and evolution of settlements around Sheffield through various phases of its colonization on the evidence.\(^3\) Nitz (1972) has attempted to trace the evolution of Teutonic settlement in southern and western Germany with the help of such evidence. He points out that when belligerent groups of Teutonic folk had permanently settled down, they named their settlements after the groups of inhabitants who again named themselves after the head of the leading family. According to him, village names with the suffix *ingen* added to a person's name, belong to the period of Teutonic colonization.\(^4\)


Indian villages have a varied nomenclature and even in the same region there are diversities because of variations in physo-cultural and socio-economic conditions at micro level. Their place names are often influenced by the geographical environment which provide clues to the evolution, growth and decay of earlier human settlements. It has been found that different place names have been assigned to the same place in different historical periods. Such changes of place name are due to the change of people inhabiting them and have also resulted from changes in their socio-economic condition. During the course of field studies related to the present work, it has been found a large percentage of the names of the villages of the Aligarh District have suffixes or prefixes like, Pur, Pura, Nagla, Garh, Garhi, Sarai, Khera, Khurd, Kalan, Maufi, Chak etc. and these affixes usually refer to a ruling chief or a god or goddess and or the topographical features or the vegetation of the area. Thus, it may be inferred that villages are somehow or the other associated with the physico-cultural and socio-economic conditions of a region. So place-name analysis has been used as a tool to trace the evolution of rural settlements of the study area. Different place names of the Aligarh District along with their associations are shown in Fig. 3.1.

Before discussing the association of the place-names of the Aligarh District with physico-cultural factors it would
be better to take up the name of the District itself. Such an analysis will reveal the histogenesis of the area.

Aligarh and its immediate surroundings were known by the name of Kol (Koil). This settlement was known by different names at different times such as Kol, Muhammadgarh, Sabitgarh Ramgarh and Aligarh.

Kol, the earliest name of Aligarh, included not only the city but the entire District, though its geographical limits kept changing from time to time. The origin of the name of Kol (Koil) is obscure. In some ancient texts, Kol has been used in the sense of 'tribe' or 'caste', name of a place or a mountain or the name of a sage or a demon. According to Skanda Purana, Kol was a malechha tribe that wandered in the forests of the Himalayas, while according to Bramhavaivarta Purana it was a mixed caste (varnasankar). Padma Purana refers to Kol as an aboriginal caste.¹ References to Kol have also been found in the medieval sources like Tabaqat-i-Nasiri and A'in-i Akbari. Kol is referred to in the former in connection with its capture by Qutubuddin Aibek in 1192 A.D.²

In A'in-i Akbari, Abul Fazal lists Kol among the mahals of

Akbar's empire. The study area is now usually referred to as 'koil' rather than 'kol'.

According to the local tradition, the name Kol (Koil) was given to the place by Balaram, brother of Srikrishna, who slew here the great demon (ausura) Kola, with the assistance of the Ahirs. A significant tradition that is mentioned in the Municipal records of Kol (Koil), is that Raja Buddha Sen, Son of Mitra Sen, of Jalesar, while going to Delhi, once halted near a kol (lake) along with his counsellors and built a fortress there. On account of this lake the place was named 'Kol'. Prior to the excavation of the Aligarh Drain, the north-western part of the Aligarh town was full of water throughout the year, which also gave rise to the growth of a deep morass there.2 Probably, the presence of a large jhil (lake) in the vicinity of Koil gave the place its present name. According to the census of India 1872, there were about 35,081 Kols (a tribe of weavers) in the region.3 They are still found in large numbers in the District as professional weavers. It is thought that the settlement of this tribe in


the area before the Turkish conquest gave Koil its name. Many authorities such as Fuhrar,\(^1\), Hodiwala\(^2\), and Atkinson\(^3\), state that when Mohammad son of Umar was the governor of Koil during the reign of Ibrahim Lodi, he built a fort at Koil and lent his own name to it, calling it Mohammadgarh, while Sabit Khan who was the governor of this region during the period of Farrukh Siyar and Mohammad Shah, rebuilt the fort and named the town after his own name Sabitgarh. After the occupation of Koil by the Jats in 1775, it was renamed as Ramgarh and finally, when a Shia commander, Najaf Khan, captured Koil, he gave it its present name, i.e., Aligarh. These authorities also state that the name of the town also changed with the name of the forts. Sabit Khan, who was the governor of Koil, showed a keen interest in building activities. He built a fort about three miles north of the centre of the town of Koil; which is now known as the Aligarh fort. The name of the place is generally spelt as Aligarh, but the British authorities sometimes, spelt it 'Allygurh'. During the Maratha occupation of the fort, its name remained unchanged. After the British annexation, when the entire territory of the United Provinces (now Uttar Pradesh) was reconstituted and


for the first time in 1804, Aligarh was constituted as a district. Koil became the name of one of the tehsils of the Aligarh District, with its headquarters at the old site of Koil which continues to have the same place-name.

1.1 Place-names Associated with Culture and Cult

A major portion of the Alligarh District has Vrai culture. The word vraj or barai, in vedic literature, the Ramayana and the Mahabharata, has been used for 'cowshed' and 'pastoral land'.

Mathura, the heart-land of the braj culture, was noted for its pasture lands, forests and horned cattle, especially cows. Being the birth place of Lord Krishna, Mathura District attained a special status among the holy places of India. As Krisha belonged to a family of cow-herds (yadavas), he passed his early life and youth in grazing herds in the meadows and forests of Mathura and Brindaban with his cowherd and milkmaid companions. Due to its association with Sri Krishna, its physico-cultural and socio-economic attributes attained religious sanctity. He became the base not only of a cult of worship but also a distinct culture in which he himself, his beloved Radha, brother Balaram, parents and friends became central figures. Aligarh District, having close links with Mathura, has

therefore many place-names associated with braj culture. A comparison of the place-names associated with forest and trees of the area with those of Mathura district, shows that the place name in both the districts have the same affiliation. For example:

<table>
<thead>
<tr>
<th>Aligarh</th>
<th>Mathura</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Koil</td>
<td>Koela Alipur</td>
<td>Swampy ground</td>
</tr>
<tr>
<td>Kajroth</td>
<td>Kajroth</td>
<td>From Kadali</td>
</tr>
<tr>
<td>Pisava</td>
<td>Pisava</td>
<td>From Pasavya (Sanskrit) fit for cattle</td>
</tr>
<tr>
<td>Dhakpurah</td>
<td>Dhakpurah</td>
<td>From dhak tree (buteafrondosa)</td>
</tr>
<tr>
<td>Chhonkra</td>
<td>Chhinkra</td>
<td>From chhonkar tree, (prosopis spicigera)</td>
</tr>
<tr>
<td>Khandia</td>
<td>Khandia</td>
<td>From khandi forest</td>
</tr>
</tbody>
</table>

If one ignores the administrative boundary between the two districts, Aligarh may be placed in the same geographical belt of that of Mathura. Thus the literal definition of vraj (braj) is as much applicable to Aligarh as it is to Mathura. It is well known that among all the epithets of Srikrishna, those associated with the cow stand very prominent. Cow protection and its worship has become an integral part of the

2. Ibid., p.350.
braj Culture. The place names Gobla, Gobra, Gomat, Gokulpur, Gopalpur, Gopi, Govindpur, Govind Nagar and Govardhanpur, clearly indicate that these places have strong cultural associations with the Braj culture. Obviously these places have been named after the epithet of Srikrishna, with religious overtones. Maintenance of gaushals (cowsheds) is not as popular in the Aligarh District as in Mathura. But according to information gathered from different location in Aligarh, Gomat, Barhad, Harduaganj, Dadon, Hathras, Sasni and Aligarh city it has been found that prior to the establishment of dairies, gaushalas existed at these places and the entire village population was responsible for their maintenance. In the place names associated with Hindu mythology, the influence of Krishna and his close associates appears to be the dominant one. Place names of Kanhoi, Daupur, Hardua and Balrampur indicate that from the earliest times the region was under the influence of braj culture.

A large number of local Hindu gods and godlings also influenced the cultural set-up of the Braj region. Place-names, such as, Kanaua, Karasvara, Kalua, Darkaula are good examples of this. Some gods, goddesses and divines were worshipped out of fear and were supposed to be associated with the evil spirit. They were Masani, Nagarsen, Kaila Debi, Bhumiya, Burhe Baba, and Zahar Pir or Goga Pir.¹ The place

names of Koras, Jakhera, Jakhota, Darkoula, Darkauli, Kailora, and Kalua of the area are said to have derived their names from the local gods or goddesses. At some of these places they are still held in great esteem.

Besides the Krishna cult, there are other cults in the region which have influenced the rural life of the people of the District. The Chinataharan temple of Hathras, Achleswar and Khereswar temples of Aligarh city, Mahadeva temples of Beswan and Sikandra Rao are some of the important shrines of Lord Siva in the District. Siva lingums (phalluses) have been discovered from a large number of mounds of the area. Some of them have been installed in the temples and some are still lying over the mounds. These lingums are being worshiped as Kherapatis (Lords of the Mounds), and are considered protectors of the villages. There are five village in the District names of which are directly associated with Lord Siva - Sankra, Shivala, Bhadesi, Shankerpur and Mahamai. It appears that here Siva worship was one quite popular. A large number of Mahadeva temples have been found in the area but they have gradually lost their popular appeal. Lord Ram is also popular in the study area. There are many villages in the District which have been named after him, Laksmana and Sita. Rampur, Ram Nagar, Ramgarh, Laksmanpur and Sitahari are some of the examples.

There is nothing peculiar regarding the Muslim culture of the District. The pattern is more or less the same as in
other parts of north India. Being the headquarters of the Muslim governors and officials, the old town of Koil became a central place of the Muslim immigrants from the beginning of the thirteenth century A.D. Atrauli, Sikandra Rao, Jalali, Pilkhna, Nanau, Gangiri and Tappal are other examples of early Muslim settlements. At these places medieval mosques, tombs, shrines and madarsahs (schools) are found. The distinction between Muslim and non-Muslim culture is very clear at these places. Elements of Muslim culture may be discerned in some villages of Atrauli, Koil, Khair and Sikandra Rao tehsils. The Muslim masses of these places may be distinguished on the basis of their social customs. Rural Muslims have been greatly influenced by the Braj culture. In many villages, social customs, dress, food habits and dialect of the Muslims and non Muslims are generally the same. Some of the local gods and goddesses are also worshiped by the illiterate rural Muslims, who have been newly converted from low castes. Due to the impact of urbanization and westernization, certain cultural changes such as dress and social customs are being seen in the rural areas of the District. On the whole, the area is dominated by Braj culture, which has overshadowed every other culture.

1.2 Place-names Associated with Forests

From the study of the place-names of the Aligarh District, it appears that the area was once largely covered
with forests, thickets and groves. In 1833 Hutchinson observed that the District was covered to a great extent with heavy dhak (butea-frondosa) jungles. In addition, the khadar of the Ganga and the Yamuna were also full of jhau (tamarisk). In the Yamuna khadar a narrow belt of jhau was followed by broad stretches of vast covered with thatching grass. The tract provided valuable pasturage for the cattle. The increase in village sites and the growing value of agricultural land led to a marked decrease in the area under groves. During the periods of third (1822-1904) and fourth (1937-1940) regular settlement such decrease was very remarkable. Akbar and Jahangir visited Koil, (the old name of Aligarh District) on hunting expeditions. Jahangir says in his memoirs that in the forest of Koil, he killed wolves. From the traditional account of the District contained in the Misl-i Bandobast (files of revenue records) of the District, it appears that a fairly large number of villages

were under forest cover prior to being inhabited. The presence of words having association with different kinds of vegetation (in actual or corrupt forms) such as *khandi*, *ghana*, *juraiya*, *arangia*, *jhaup* or *jhan* and *shikar* in a large number of village names, suggests that these places were once covered with forests or thickets. In addition to these, there are villages which are named after trees found in the forests e.g. *armi*, *jamun*, *dhak*, *mahua*, *imli* *shisham*, *bakaven*, and so on. At some of these places, not a single tree with which the name of a particular village is associated can be found today.

It is obvious that the region was covered with fairly dense vegetation which was subsequently cleared by the inhabitants during the course of settlement. Hence there are many village names indicating the burnings or clearings of forests, such as Barauli, Jaroth, Jarothi, Bankati, Barotha etc. denoting a settlement founded after the cutting down or burning of a forest. Other names like Amni, Janera, Hasayen, Jaraiya and Kadali signify forest settlement. Many villages in the District are associated with the *pipal* tree (*ficus religiosa*) and *pakar* (*ficus infectoria*) such as Pipali Nagla, Kadirpur, Pipal garhi, Piploi, Pipali, the *pipal* gaon, Piploth and Pakhondna etc. These two trees are considered sacred by the Hindus. Similarly various villages have been named after trees like *imli* (tamarind), for example, Imloth, Imlani and Ratanpur Imlia etc., *Mahua* e.g., Maho, Mahua
etc. and Khajur (arabika) e.g., Khajurauth. In the same way, village names such as Neem Khera, Amosi, Jamuni, Kansera, Barotha etc. indicate their close association with different trees.

1.3 Place names Associated with Topography and Siting

A large number of village names in the Aligarh District are associated with topographical features like rivers, mounds, depressions, and the characteristics of the soil. Place names analysis shows that there are three villages in the District designated after the bhur soil, viz., Bhuria in tehsil Sikandra Rao and Bhuria Majra Kasar and Bhuria Majra Rampur in tehsil Atrauli. Rehsupur in tehsil Koil which is named after reh soil, given has also been given to 29 villages in the District having inferior quality of soils. The suffix and prefix like khera, used in village names denotes earthen mound Villages like Khera Kishan, Gaon Khera, Balukhera, Bhawan Khera, Khera Firozpur and Khera Parsauli can be cited as examples of this. Dariyapur, Gangabas and Gangiri indicate that the villages bearing these names are closely associated with rivers.

1.4 Place names Associated with Animals

Bagh or tiger is the only wild animal with which some of the village place names are associated. Baghna, Bagh Sasni, Baghau, and Baghraya villages are good examples of this. These locations must have been covered with forests.
having wild animals in the past. Some of the earlier human settlements which came into existence as a result of the cleaning of the forest land might have been occasionally visited by tigers.

1.5 Place-names Associated with Castes and Communities

There are many villages in the Aligarh District which have been named after castes and communities inhabiting them. Such villages are mainly hamlets that are attached to the main villages. Nagla Chamar, Chamar Patti, Nagla Jato etc., are named after communities of the scheduled castes. Likewise various hamlets are also designated after other low castes communities such as Nagla Fakira, Nagla Kunji, Nagla Jughar and Nagla Madho etc. Many villages in the District have been named after different castes of Muslims, like Shekhpur, Shekhpur Kutub (after the Sheikhs), and Nagla Mian (after the Saiyids). During the medieval period the District was ruled by many prominent Muslims chiefs who founded many villages. The place-name analysis of the villages clearly indicates that they have been named after some of the rulers of India, like Akbarpur, Akrabad (after Akbar), Jahangirabad, Jahangirpur, Jahangirpur Kondra, Jahangira (after Jahangir), Sikandarpur Ghherat, Sikandarpur Kota (after Sikandar Lodi), and Firozpur after Firoz-Tughlak.

1.6 Place-names Associated with Ages and Sizes of Settlements

A large number of villages using suffixes and prefixes like, Khurd, Kalan Buzurg and pur, pura, nagla, garh, garhi
nagar etc., indicate the sizes and ages of villages. Village names ending in kalan or khas and khurd or pura designate generally the earlier and late settlements respectively and 'big' and 'small' as the these Persian words imply. Mamota Kalan, Shahpur Kalan, Sataloni Kalan, Kherala Kalan, Luheta Khurd, Shahpur Khurd, Khera Khurd, Bizona Khurd, Badha Khurd, Alipura, Hirpura, Sotipura, and Birpura may be cited as examples of such names. The suffix, buzurg used in a village name, denotes a larger village size. Kheria Buzurg, Husainpur Buzurg, Tikari Buzurg are the good examples of this. Similarly, village names having terms like garh, and garhi, suggest former seats of the local chiefs where the people used to assemble for safety and security. Villages, Madhogarh Hasangarh, Kishangarh, Manzoorgarh and Sikargarh are examples of such villages.

1.7 Place-names Associated with Grants

There are many village names related to land grants which a chief or zamindar gave as charity or reward to his officials and servants. Suffix and prefix like Maufi (without charge) and chak (a piece of land) used in village names indicate the settlements of medieval period, founded by Muslim rulers. These rulers used to grant free lands to their

servants and officials for service rendered by them. Later, these areas got settled and were named according to the nature of the grants. Villages Doriyia Maufi, Salimpur Maufi, Chakathal and Chak Kheria may be cited as examples of such villages.

2. Evolution of Territorial Units Through Land Occupancy

The occupation of land has been a universal process for the formation of territories among corporate political groups throughout human history. The dominant corporate group always occupied the key points of a territory and allowed other, non-corporate groups of men and women, to settle on a land given to them in order to carry out their socio-economic activities within its organisational framework. Thus territory formation was the first step in the process of settling at lower level. Due to this, there has been a strong link between settlement pattern and economic activity. Territory formation in the initial stages was not usurpation of a region but the occupation of a virtually virgin or thinly populated land by a group of study people on a small scale. Such an area had enough scope for expansion of the settlement and development of socio-economic and political institutions with a view to ensuring peaceful existence and defence. During the course of

land occupancy and actual settling process, emotional and historical ties developed among the inhabitants, which tended to bind them to live together in a territory. Such a territorial occupation required autonomy for the occupants to function as a viable unit. Many cultural institutions such as shrines, markets, fairs, and places associated with gods and godlings came up in the course of the settling process and these made the inhabitants feel that some places were vital for, the well being of the group and must be defended. The occupied land, the shrine, the family burial ground and sotes of local festivals also generated a sense of belonging to the territory among the settlers which was shared by the non corporate group with those of the corporate political group. As such, the territory become a complex symbol of possessiveness, means of sustenance and well-being and security and culture evolved over a period of time.

At the time of the original occupancy there was no fixed territorial system. However, later these territories developed as clan based republics headed by their chiefs.¹ During the medieval period there was three-level political structure in almost all parts of India. At the top was Delhi or central government, in the middle was the regional or provincial administration and at the base was the hegemony of

the locally dominant corporate group. An occupied territory generally termed *raja* or *laga*, was the primary clan area and came to be known as the *pargana*. The *pargana* was segmented into sub-clan or secondary clan areas known as *tappas*, which were subdivided into smaller territorial units known as *gaon* (grams). As a result of this three-tier division, there evolved a hierarchy of settlements, the original chief settlements at the *pargana* and *tappa* levels developed as quasi-urban settlements because of their respective territorial and sub-territorial commands of leadership and resources, whereas the *gaon* evolved as the basic rural unit of settlement with local resource utilization and political power. Under the prevailing linear political system, these three units i.e., *gaon*, *tappa*, and *pargana* were territorially structured on the functional principles of kinship and descent from the ancestor or founder of the dominant clan.1 These settlements were, thus, arranged on the basis of hierarchy, both areally and functionally from the very beginning and continued to remain so until forces of modernization broke them up.

During the British period, a five-tier territorial system was introduced, i.e., *paragana*, *tappa* or *turf*, *taluka*,

The Britishers brought about enormous changes in the civil and administrative set up. The paragnas were maintained as subdivisions of a tehsil and were used as revenue units, and they continue to function as such. Earlier, tappa was used as a fiscal division, but later, the British recognized the tappa as a sub-clan territory. Not only were taluqdari and zamindari and other territorial rights of land corresponding to them given weight, but they also formed the basis of surveys and records of holding rights.¹

Four years after India achieved independence the Zamindari Abolition Act was passed by the U.P. Legislature in May 1951, and by January, 1956, all the zamindari estates were abolished. The Aligarh District was divided into seventeen administrative cum planning divisions, called development blocks, and these have been sub-divided into Adalat Panchayats which 8 to 12 Villages per Adalat Panchayat, on an average. These units are often independent of the clan boundaries and other social ties.

The foregoing discussion reveals that different people and societies had introduced their own methods of spatial organizations and agricultural systems, which, during the course of time, intermixed and metamorphosed and thus the present territorial system was evolved which has a distinct structural pattern.
The objective of the present study is to discuss the various zamindar clan of the Aligarh District from the sixteenth to the nineteenth century, who functioned as corporate territorial groups and served as dominant local power in different parts of the region. Information regarding the territorial evolution of the District in the ancient period is not available. So the study is primarily based on medieval sources, and particularly on the information contained in Ain-i-Akbari and Misl-i-Bandobast (miscellaneous papers of revenue settlement) of 1866, preserved in the Revenue Records Room of the Aligarh Collectorate and at paragana or mahal and village levels. Information regarding earlier times is based on local tradition. Information gathered from these sources has been supplemented with the data collected during field survey.

During Akbar's reign (1556-1605) a new unit of administration was introduced, i.e., sarkar. Koil was a sarkar of the suba of Agra. It contained 21 mahals viz., Atrauli, Akbarabad (present Akrabad), Ahar, Pahasu, Bilram, Pachlana, Tappal, Thana, Farida, Dibai, Jalali, Chandaus, Khurja, Sikandra Rao, Saron, Sidhpur, Shikarpur, Koil Gangiri, Marahra, Malikpur and Nuh. (Fig.3.2). The sarkar was divided into four dastur (revenue) cirkless, i.e., Thana Farida, Marahra, Haweli Koil and Akbarabad. The mahals of Pahasu, Dibai, Malikpur, Shikarpur, Nuh, Khurja, Thana Farida, Ahar,
Chandaus and Tappal wave included in the dastur circle of Thana Farida; the mahals of Sorom, Pachlana, Marahna, Bilram and Sidhpur were in the dastur circle of Marahra, the mahals of Koil, Jalali, Sikandra Rao and Gangeri were in the dastur circle of Haweli Koil, and the mahals of Akbarabad and Atrauli were in the dastur circle of Akbarabad. The sarkar of Koil covered an area much larger than that of the present District of Aligarh. It contained 1.52 times more area than the present District.\(^1\) Thirteen of the twenty one mahals of sarkar Koil and the mahals of Agra sarkar, lay wholly or partly within the present limits of Aligarh District. Most parts of the paraganas of Hathras and Mursan were included in the mahals of Jalesar and Mahaban of Agra Sarkar. Small portions of the mahals of Dibai, Pahasu, Bilram, Marahra, Nuh and Mohaban, which are now in the district of Bulandshahar, Etah and Mathura, were included in the present District of Aligarh. A study of zamindar clans between the sixteenth and the eighteenth century reveals incursions on the territories of these mahals, their pattern of settlements, areas of jurisdiction and successive changes therein in the region during the period.

There were many zamindar clans which held lands in the region. Some of the important of these clans were Chauhans, Badgujars, Porouchs, Gahlots, Bangars, Pundirs, Jangharas, and

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Jats, Brahmans, Afghans, Bhals, Kiras, Jadons and Kayesthas. The territorial jurisdiction of these zamindar clans have been clearly marked out in Fig. 3.3 and 3.4. These figures have been prepared on the basis of the data contained in the Misl-i Bandobast and the actual position recorded in 1833, in which year the first regular settlement was completed. Fig. 2 shows the position of the zamindar clans upto the sixteenth century, which is based on traditions recorded in the Misl-i Bandobast. It may be noted that the Misl-i-Bandobast information has been supplemented with data collected during the field survey of the region. By and large, the present local traditions confirm earlier ones contained in Misl-i-Bandobast. The zamindar clans have been a dominant factor in encouraging the evolution and growth of rural settlements in the region. So the study of the territorial jurisdiction of different zamindar clans is essential in order to trace the evolution of the villages in the study area. The account of some of the important clans along with their areas of settlement is given below.

1. Chauhans Figs. 3.3 and 3.4 show the position of the Chauhans in the region in different periods. Fig. 3.3, based on tradition contained in Misl-i-Bandobast, indicates that the Chauhans dominated in the paragna of Khair, Chandaus and Morthal and were also found in the paragna of Tappal and Atrauli as well as in the western part of Sikandra Rao. By
1833, they had lost half of their holdings in the pargana of Tappal while they retained their major holdings in Chandaus. In Khair, they conceded at least half of their lands to the Jadons and the Brahmans. In Morthal they retained their traditional area. In Atrauli their area seems to have doubled, and in Sikandra Rao too it had expanded. The presence of Chauhans in the paragnas of Koil and Atrauli in the sixteenth century is nominal. This may be explained by the absence of information in the Misli-i-Bandobast. According to it the places were under the Chauhan zamindars even in sixteenth century. The villages of Qasimpur, Jawan, Tejpur, Mohanpurah, Raipur and Loharah of paragana Morthal are said to have been captured by the Chauhans during the Sultanate Period, after clearing away the Muslims. According to a tradition these areas have been held by the Chauhans since the 12th Century A.D., and that Manik Rai Chauhan migrated from Rajputana and captured Sikandra which was then dominated by the Chandelas. Bilram Singh, son of Manik Rai Chauhan, founded Bilram (in Etah District) and his descendants established many other settlements in the region. Jarauli, Kachaura, Katai, Porah, Dahgawan, Agsauli (Aksauli),

2. Information from Brij Mohan Sharma of Satha.
3. A few sculptures, assignable to 11th and 12th centuries A.D., have been discovered recently from the mound at Sikandra Rao proper. They have been preserved in the Archaeological Laboratory of the A.M.U., Aligarh
Bargawan, Mandi, Jansoi and Sindhauli are cited as examples of some of the rural settlement of Chauhan zamindar clans.\(^1\) The south-western part of Sikandra Rao was formerly included in the mahal of Marahra and its north-eastern corner was included in that of Bilram. Bilram and Marahra belonged to the Aligarh District till 1824 and 1838 respectively.\(^2\)

I **Badgujars** Fig. 3.3 that Badgujar zamindar clans held the entire paragana of Barauli and a few portions of the northern part of pargana Atrauli in the sixteenth century. According to the *Misl-i Bandobast*, villages Gaonri, Tamkoli, Pratappur, Potha and Malikpurah of Pargana Barauli were granted to Rao Pratap Singh, the ancestor of the Badgujars of this pargana, by Raja Prithvi Raj Singh of Delhi, as a reward in twelfth century A.D. Rao Pratap Singh made Barauli his capital. A large number of villages of this pargana are said to have been founded by the Badgujar zamindars.\(^3\)

II **Poruch:** According to information called from *Misl-i Bandobast*, the Poruch zamindars held 40 villages in the central part of Hathras pargana and 14 in the eastern part of

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1. Information from Niranjan Singh Chauhan Journalist, Sikandra Rao.
Mursan during the sixteenth century. Villages Dariyapur, Madanpur, Tatapur, Aliya, Mitai, Gajrauli, Hathras, Mandu, Lakhnu, Pabloi, Khonda Hazari and Garhi Quandhari are some examples of such settlements. Due to incursion of the Jats into their territorial jurisdiction, their position declined in the region (Fig. 3.4).

III Gahlots

The Gahlot zamindars had settled in the southernmost part of the paragna of Hathras and south-eastern corner of Mursan. According to information contained in Misl-i Bandobast, Hansraj came here in 1225 A.D. from Loni Chittorgarh and founded the village of Chursen. His descendant, Alu Singh, was converted to Islam during the reign of Shahjahan in 1631 A.D. and was named by emperor Alah Khan. He founded the Village of Alahpur. The Misl-i Bandobast also mentions the names of other places from where the Gahlots migrated to this region. According to it, Ahiran migrated from Jewar and founded the village Ahavi in 1566 while Thakur Mirza founded Mirzapur village.

IV Jats

The Jats are mainly concentrated in Hathras and Mursan (Fig. 3.3). They trace their descent to Makhan, who at the end of the sixteenth or the beginning of the seventeenth century, led a tribe of Thenwa Jats from Rajputana into the
neighbourhood of Mursan. Nand Ram, the successor of Makhan, established himself in the region of Mursan. Villages Udaibhan Bhakroi, Kakravali, Gubrai, Gopalpur, Kuravali and Dengra were founded by the Jats during the fifteenth century. Shahzadpur, Lustain, Sathia, and Rampur are the earliest settlement of the Jats in paragna Hathras. About Daulatabad, the Misl-i Bandobast furnishes the information that it was founded by Daulat, a Jat cultivator. According to Smith, the Jats of Tappal first settled in Khandia, from where they dispersed until they occupied the whole of Tappal and parts of the adjacent parganas. Twenty villages in the Tappal paragna are said to have been founded by the Jats: The settlements of Thakural Jats are found in the Hasangarh paragna and in Pisawah.

V Brahmins The Brahmin zamindars are scattered throughout the Aligarh District. But there are three prominent belts of their zamindari in it (Fig. 3.3). One is located in the south-eastern corner of paragna Khair, than other in the western part of Tappal and the third in the southern part of the paragna of Mursan.

In Tappal, villages Devaka, Morargarh, Hetalpur and Adampur were founded by Brahmin zamindars. In paragna Khair, 

2. Smith, W.H., op. cit., p. 27.
there are 15 villages which were held by the Brahmin zamindars roundabout 1600 A.D. Villages Arni, Nagla Assu, Balipur, Andla, Kasison, Nandpur Pala, Nayela, Biharipur and Bhojpur were founded by the Brahmin Zamindars. In paragna Hathras, one Keshav Brahmin acquired a forest from the Poruch chief of Dariyapur, and after clearing it, founded a village there after his own name, i.e. Nagla Keshon. Village Naga Jodha was founded by one Jodha Ram, a Brahmin cultivator. In paragna Mursan Brahmins founded many villages in the sixteenth century. Villages Khutipurah, Rathbangarhi, Senpur, Darshana and Mohanpur may be cited as examples of such settlements. During the succeeding centuries, the position of Brahmin zamindars was further strengthened (Fig. 3.4). Under Maratha rule, Pandit Ganga Dhar held the talluga of Iglas as freehold.¹ In 1833, Brahmins held nine villages in paragna Tappal, 23 and a half in Khair, 21 in Mursan and 45 in Hathras. Enjoying the privilege of being the priestly caste, the Brahmins acquired a number of villages as muafi (freehold) lands. Later, they extended their zamindari possessions even more and, as bankers and money lenders, and thereby acquired a large number of other villages.

VI Afghans Before the battle of Khanwa in 1527, when Babur's position was precarious. Koil had been captured by

¹ Hutchinson, J.R., op. cit. p. 218.
Iliyas Khan Sherwani.\(^1\) The Sherwani Pathans of the Aligarh District claim their descent from the Afghan tribe of Sarwan (corrupted to Shwerwani).\(^2\) Villages Nausha, Barla, Pahripur, Hasanpur, Chharra and Gangiri were originally held by the Sherwani zamindars.\(^3\) Abbas Khan, in his detailed history of the Sherwani tribe and their settlements from the earliest time to the twentieth century, furnishes valuable information regarding the Sherwanis of this region. Dadon, Dataoli, Budhagaon, Bilone Kanobi, Hasanpur, Bhamori, Barla, Mangupur, Alifpur and Parora are some of the earliest settlement of the Shwerwanis in the region during the seventeenth and eighteenth centuries.\(^4\) The Afghans of Sikandra Rao trace their earliest settlements in the region to the reign of Sultan Sikandar Lodi, It is said that Sikandarpur was named after the Sultan. Villages, Arifpur, Asoi, Barishhpur, Fatehpur, Khizrpur Qasba, Phulrai Mughal Garhi, Sakhipur, Aba Talippur and Sanjarpur were held by the Afghan zamindars in the sixteenth century. Naz Khan, the ancestor of the present leading Sherwani families, settled permanently in Gangiri.


\(^3\) Ibid, pp. 138, 260, 286.

\(^4\) Ibid, pp. 174-300.
His three sons, Daud Khan, Khan Zaman Khan and Ghulan Mohammad Khan acquired a large area of land, in the region and, by 1833, the Sherwanis were holding nearly the entire paragna of Gangiri and partly that of Atrauli.

There are other minor zamindar castes which claim antiquity. Some of them are Rajputs, such as Jadons, Gujars, Rathors, Pals and Dors in paragna Tappal; Tomars in Koil and Iglas; Gauras in Hathras and Madawar and Chhonkars in Atrauli and Gangiri. The Ahirs, Lodhas, Dhusars, Baniyas, Dhobis, Gadariyas, Kalars, Rewaris and Aherias are said to have founded some of the earliest villages of the District. The Sheikhs, particularly of Nanau and Pilakhna, settled in the region during the time of Babur after ousting the Dhonkar Rajputs. They trace their descent to Shaikh Ghuran, who is said to be founded some villages in the area.

On the basis of the above discussion about the position of different zamindar clans from the sixteenth century to 1833, it may be concluded that the Chauhans, who were once dominating in tehsil Khair, were reduced to the second position and that Jats extended their zamindari considerably to gain the first position in the Aligarh District, and that the Jadons, who were not on the scene in the sixteenth century, appeared as a dominant clan, later while the possessions of other zamindars clans like the Poruchs, the Gohlots, the Bangars and the Kirar were reduced greatly in
tehsil Hathras, their villages being acquired by the Jats and the Jadons.

3. Rural Settlements in Sequent Occupancy

On account of the non-availability of concerned literature, the history of the human occupancy of the study area is shrouded in obscurity. An analysis of the cultural traditions made previously, indicates that the region which forms part of the Ganga-Yamuna doab, has been one of the most ancient settled places in the country. Such traditions, are based on the villagers' own perception of the past and hence their historical authenticity is questionable. Some literature and historical accounts on the settlements in the Doab in general are available. However, there is hardly any mention of early settlements in the Aligarh District. Excavations made in the nineteenth and the twentieth century have shed some light on the ancient history of the region. Hence for the present study, the literary historical account of the Ganga-Yamuna doab as a whole and the archaeological evidences found in the Aligarh District have been taken into consideration. The evolution of rural settlement in sequent occupancy has been studied under the following heads:

1. Ancient period
2. Medieval Period
3. Modern Period
3.1 Ancient Period (upto 1193 A.D.)

No historical account of the Aligarh District before the twelfth century AD is available. Excavations in late nineteenth century conducted by Cunningham and Fuhrer, as well as recent excavations by the archaeological section of the Department of History, Aligarh Muslim University, Aligarh, have shed some light on the ancient cultural history of the region.

Excavations at various sites of the region have shown that settlement of this region had begun around 1500 BC. The earliest remains i.e., pieces of ochre coloured pottery (OCP 1800-1300 B.C.) have been found at Jalali. Then, Black and Red wares, (BRW - 1300-1200 BC), have been recovered from five places, viz., Sankra, Morthal, Hathras Qila, Sasni, and Harduaganj. Though the sites are not numerous, broken pieces of the Black and Red ware have been regularly found in deposits. The region is also rich in the deposits of painted grey ware and its associated wares. A large number of fragments and even complete pots of the classical and crudely painted grey ware (P.G.W. 1300-700 BC) have been recovered from different sites of the District, such as Hathras Qila.


Sasni, Komri and Tuskan in tehsil Hathras; Harduaganj, Madrak and Morthal in tehsil Koil; Bharatpur Bajera and Tapppal in tehsil Khair; Dhansari and Sankara in tehsil Atrauli and Vijayagarh in tehsil Sikandra Rao. The painted grey ware deposits of some sites of the District bear the similarity to the classical painted grey ware deposits of Atranji Khera, (Etah) adjoining Aligarh District. Figure 3.5 indicates historic settlements sites of different period. On the basis of the association of the painted Grey ware with the Mahabharata and the various carbon 14 datings, it is inferred that this culture was prevalent in this region in the period from 1000 to 600 B.C. The Classical Northern Black Polished Ware (NBPW, 700-200 B.C.) have been recovered from three places in the District, Sasni and Komri in tehsil Hathras and Dhansari in tehsil Atrauli. Its associated wares and antiquities have also been noticed in abundance in the


4. Gaur, R.C.; Date of Painted Grey ware, paper read at the Seminar on painted Grey ware, August (1968), A.M.U., Aligarh.
SETTLEMENTS SITE OF DIFFERENT PERIODS

ALIGARH DISTRICT

LEGEND
- OCHRE COLOUR POTTERY (OCPP 1800-1200 BC)
- PAINTED GREY WARE
- WARE WITH BLACK POLISH
- EARLY HISTORIC CULTURE
- MEDIEVAL WARE (1000 AD)

FIG. 3.5
area. These finds reveal that the region has been extensively inhabited since 600 B.C.

Though it is not possible to trace the successive evolution of settlements in the early historical periods, it is almost certain that the region was occupied by pre-Aryan people during prehistoric times. The presence of Shiva temples in the District clearly indicates that the study area was once occupied by non-Aryans because Shiva was a purely non-Aryan god. Though, archaeological evidences of the earliest settlement of the Aryan people in the area are not available, it may be surmised that their society was mainly rural, based on an agricultural economy. They must have cleared the vegetation along the tributaries of the Ganga and the Yamuna rivers to settle in this region. They must have made their colonies and named these after the name of the chief of their tribes, or clans. By the end of the seventh century B.C., the Aryanisation of the area had been completed and a four tier political organisation had been evolved i.e., tribal kingdom (rastra), containing tribes (jana), tribal units (vish) and villages (grana). The smallest unit of a settlement was the griha (house) followed by kula (habitation of joint family) which was headed by the eldest male number of the family called kulapa. Villages were the basic units

of administration and were generally of three types: the majority of them were those which had grown out of inter-mixing of the Aryan and non-Aryan settlers whose main occupation was agriculture. The habitat (vatsu), around the village deity was surrounded by gram-kshetra, (cultivated fields) beyond which lay vraja (forests and pasture lands). The second type was the paccanta grama (border village) inhabited by aboriginals or degraded tribes. The third type consisted of villages mostly occupied by artisans and craftsman. The houses of the period were made of wood and bamboo and they did not differ much from those found today.

The settlements of the Arayan may be classified on the basis of their function into six different types, which are as follows:

(i) Goschala (cattle ranch)
(ii) Palli (a small barbarian settlement)
(iii) Durga (forc)
(iv) Kharrata or Pattan (town)
(v) Nagar (city)

The head of the protector of an Aryan village was known as **gramini**.\(^1\) There was a joint family system in these villages, and its organization was based on decimal system.\(^2\) Aryan settlements were divided into eight different types, on the basis of their layout and plan, which are as follows:

(i) **Dandaka** (resembling a staff)

(ii) **Sarvatobhadra** (happy in all respect)

(iii) **Nandyavarta** (abode of happiness)

(iv) **Padmaka** (like lotus flower)

(v) **Prastava** (conch-shaped)

(vi) **Karmuka** (bow-shaped)

(vii) **Chatarmukha** (having four faces or walls)

Fig. 5 shows the plan and layout of Aryan villages. Each village was surrounded by a wall and a ditch for defence purposes. There were generally a gate in the middle of each of the four sides, dividing the village into four quarters. The centre of the village was generally occupied by a temple, tank or public hall.\(^3\) The four quarters were further subdivided by straight streets. Each quarter was inhabited by people of a particular caste or profession, the best quarters


being generally reserved for Brahmins and people of other high castes.¹

During archaeological excavations, Cunningham recovered some fragments of Buddhist sculptures from Lakhno, Gohan Khera, Sankra and Balai Qila in Roil.

A large ruined brick stupa, conical in shape, and a small building, have been found in Balai Qila, which indicate that this site once had a Buddhist settlement.

These early settlements were in the form of compact and self-sufficient villages. According to the size of the villages, they were variously gamak (small village), gama (ordinary village), nigama gama (big village), dwara gama (suburban village), and pachhanta gama (urban village). Around the villages there were arable lands (gramakshetra), a common pasture land for the cattle and a jungle to provide timber and fuelwood.² There was a gramika (headman) in every village either nominated by the king or elected by grama vriddhas (village elders), to manage the affairs of the village and the maintain peace and security.³

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From the geographical position of Koil, it appears that it was included in the Saursema mahajanapada. From the extent of the empires of the Maurya, the Sakas, the Kushanas and the Naga rulers and their firm hold over Mathura, it may be inferred that Koil might have successively passed under the sway of these dynasties. There are four objects belonging to Kushan period in Mathura museum which were recovered from different site of the Aligarh District. The most significant of these is the Bodhisattava image recovered from Lakhnau in Hathras tehsil, dated 113 A.D. (Plate 3.1). The attitude of the image is the same as that of a Bodhisattava statue of Sarnath. The front of its pedestal is separated from the feet. On the top of the pedestal, there is a fragmentary inscription of a line which given the name of a Kushan emperor, which could be Maharajasya, Devaputrasya or Huvishkasya. On the basis of the epigraphic evidence it appears that the dates of these four relics range from 106 to 138 A.D. A piece of sculpture belonging to Kushan period has also been recovered from Lakhnau near Hathras tehsil, which dates back to between 145 and 1767 A.D. Another


sculpture of a male figure belonging to the same period has been collected from village Jawar in Iglas tehsil.¹ The fourth sculpture has been recovered from the town of Beswan. This is one of the ancient villages of the District. It is said that this village was founded by rishi Vishwamitra. A large number of antiquities, including terracotta male and female figurines, plaques, sculptural pieces and a few corroded coins belonging to the Kushan period, have been excavated from different mounds of the village. Some pieces of sculpture and terracotta figurines bearing foreign ethnic features have been recently excavated from the village (Plate 3.2). A few coins, belonging to the Indo-Scythian era, were found by Cunningham in Saigarh Khera² and by Fuhrer from Khera Bajhera³. A large number of burnt bricks of the Kushan and later periods have been found scattered over many mounds of the Aligarh district, in Lakhnau, Tuskan, Gohankhera, Sankra and Bajhera Khera. These reveal that settlements were widely dispersed during these periods.

Very few archaeological remains of the Gupta period have been found in District. Among these are a female head with a striking style of coiffure found at Mahokhera (Plate 3.3), and the image of Maha Vishnu, recovered from village

³ Fuhrer, op.cit., p.2.
PLATE NO.3.1 Bodhisattva Image (Kushan Period)

PLATE NO.3.2 Male Head with Foreign Ethnic Feature (Kushan Period)

PLATE NO.3.3 Female Head with a Striking Style of Coiffer
Bhankri in tehsil Hathras. The latter is preserved in the Mathura Museum. Other antiquities in fragmentary form such as a statuette of Vishnu in his boar incarnation, a female figure probably that of Vaishnavi, a small Vishnu image, and few moulded bricks has been recovered from different site of the District, belonging from the fifth to the ninth century A.D.\(^1\) It appears that during the Gupta period, a temple of Baghwan Vishnu was built at Bhankri and images were installed therein. The images of Maha Vishnu found in the place has three faces. The central face is human, while the right and the left ones are those of the boar and the lion respectively (Plate 3.4). Another interesting image and some fragments of sculpture have been recovered from Gorai-dhana\(^2\) and Jawar\(^3\) in tehsil Iglas (Plate 3.5). The doab region and Koil were included in the empire of the Guptas. Koil was also part of the empire of Harsha.\(^4\) Later, Gurjar Pratihar rulers exercised their control over Mathura\(^5\), and so Koil must have been included in their dominion.

\[\begin{align*}
1. & \quad \text{Nagar, M.M. A new Type of Vishnu Image From Aligarh;} \\
& \quad \text{JUPHS, Vol.10, (1945), pp.98-100.} \\
2. & \quad \text{Agrawala, V.S., A Catalogue of The Brahminical Images in Mathura Art, JUPHS, Vol.22, Part 1-2, p.124.} \\
3. & \quad \text{Agrawala, V.S., op.cit., p.106.} \\
4. & \quad \text{Bajpayi, K.D., op.cit. Vol.1, p.125.} \\
5. & \quad \text{Ibid., p.129.}
\end{align*}\]
The region is also rich in the relics of the tenth and the eleventh centuries A.D. The images of post-Gupta period, belonging to these centuries, are still being worshipped in village temples at many places such as Harduaganj, Barhad Sikandra Rao, Hathras, Kailora, Bheyan, Kauriaganj, Katai, Mandi, Bilona and Mendu. The demolition of the Koil minaret in 1862 yielded various mutilated sculptural pieces which had once adorned the Dor Rajput temple at BalaiQila at Koil. Most of the recovered pieces of sculpture and images found there represent the incarnation of Vishnu, e.g., Andhkasur Vadha-murti (image showing the killing of Andhkasur) and Krishna with Radha respectively (Plate 3.6).

Among the ancient sites of the District, Jalai deserves a special mention. Cunningham excavated two mounds from the neighbourhood of Jalali, which yielded bricks characteristic of the Sunga and the Kushan periods. In the course of field survey ten small mounds were found in and around Jalali within a radius of about 1.5 kilometre. Jalali itself is situated on a mound. Many fragments have been collected from these mounds. These have been analysed and dated with the help of carbon-14 dating by the archaeologists in the Department of History, Aligarh Muslim University, Aligarh, and were found belonging to different cultural periods such

PLATE NO. 3.4 Image of Maha Vishnu (Gupta Period)

PLATE NO. 3.5 Balaram Bearing a Vannala (Gupta Period)

PLATE NO. 3.6 Andhakesur Badha Murti (Post Gupta Period)
as Ochre Coloured Pottery (OCP), Painted Grey Ware (PGW), Grey Ware (GW), Red Ware (RW), Northern Black Polished Ware (NBPW) and medieval glazed ware. A large number of pieces of pottery and sculpture of the medieval period have also been recovered from different mounds in the Aligarh District, such as in, Koil, Sikandrarao, Tappal, Charra, Dhansari, Kanka, Jhasipur, Rutari, Gaon khera, Hasangarh, Dataoli and Jartoli etc. (Fig.3.5). These wares suggest that during the medieval period rural industry had received impetus. Glazed ware is evenly distributed throughout the region.

The ancient history of Koil does not lend itself to a comprehensive and systematic account. Yet archaeological evidence makes one thing clear that the region has remained in the occupation of different rulers in different period and that they have all left their cultural imprints upon its physical landscape.

It is clear from the foregoing analysis that the region was continuously settled from ancient to medieval period, though it is very difficult to trace the pattern of settlement during the different periods, until extensive excavations are conducted, which is impossible on account of the high density of population in the region.

3.2 Medieval Period (1193–1757)

As stated above nothing definite is known about settlements in the study area till the twelfth century.
By the beginning of the twelfth century, the Tomars belonging to a Rajput clan, had established their kingdom in Delhi, and Dor Rajputs, who were their vassals held sway over the town and fort of Koil. Bargujars, are said to have fought on the side of Pirthvi Raj against the Chandels of Mahoba and earlier, they are said to have assisted his grandfather in driving Tomars out of Delhi, and which had resulted in the establishment of the Chauhan Dynasty. They were amply rewarded by Prithvi Raj and were allowed to rule over Koil.¹

The end of the twelfth century marks the beginning of Muslim invasions and the tilting of military balance in their favour. Dors and Bargujars were uprooted and the fortress of Koil was taken by Qutubuddin Aibek in 1194, and Hisamuddin Gulbak was appointed its governor.² At that time Koil was considered to be the most celebrated fortress in India. Qutubuddin Aibek founded what is known as the Slave Dynasty of Delhi which had Koil in its fold. Balban, one of the rulers of the dynasty, while he was governor, constructed a minar (tower) at Koil, in 1253. Which stood where Balai Qila is situated now.³ (Plate 3.7). Soon after his accession to the throne in 1265, Sultan Ghiasuddin Balban, directed a

campaign against the rebellious chiefs of the Doab. During
the course of this expedition he constructed a fortress at
Jalali and assigned it to the Afghans. He also built a mosque
at Jalali in 1266-1267.¹

From 1194 till 1526 the region was ruled by Turk or
Afghan kings of Delhi through their governors. The hegemony
of the Slave Dynasty over the region spanned from 1194 to
1290, that of the Khiljis from 1290 to 1320, of the Tughalaqs
from 1320 to 1414 and of the Lodhis from 1451 to 1526. During
these regimes, Koil continued to be an important place and
figures again and again in contemporary narratives from late
twelfth century to early sixteenth century.

After the death of Jalaluddin Khalji in 1295, Alauddin
Khalji, placed Koil with other district of the doab, within
the Khalisa² (area where the land revenue and other taxes
were collected by the assignees for the imperial treasury).
Barni, mentions in his memoirs that in all the khalisa
districts of the doab, rigorous revenue measures were
enforced by the Sultan and half of the produce was taken as
land revenue.³ As Koil was included in the khalisa districts

¹ Barni, Ziya-uddin, Tarikh-i Feroz Shahi, ed. Sir Saiyid,
Bibliotheca Indica, Asiatic Society of Bengal, Calcutta
(1862), p.5.-.
³ Ibid., p.306.
of the doab, it was also affected by these measures. Throughout the early medieval period Koil appears to have been an important city. The term chitta was after used to refer to Koil, which was a commonly used term for a large or metropolitan city.¹

During the reign of Muhammad bin Tughlaq, the doab region was convulsed by a peasant rebellion. To quell the revolt, Mohammad Tughlaq summoned forces from Koil. Ibn-i Battuta the Moorish traveller mentions in his account that Koil was also ravaged by the rebellion. He visited Koil and its vicinity in August 1342. He furnishes information about the topography, the condition of the common people and the armed rebellion mentioned above. About Koil he observes: "It is a beautiful city possessing gardens. Most of the trees are mango trees".² He also went to Jalali, and found many ridges near and around it, formed by the ravines of the Kali Nadi which flows one mile north east of Jalali. Soil erosion had lead to fantastic ridge formations, as the surface of the ground was broken by deep narrow intersecting channels of the ravines. These ridges appear in the form of hillocks. It is very interesting that a village near Jalali is named Paharipur, (hilly settlement). Apart from the ridges formed

by the ravines of the Kali Nadi, there are many ancient mounds in the vicinity of Jalali on both sides of the Kali Nadi and Sunehra, Paharipur, Azadpur, Shahjahanbad and Sikandrabad, are situated on these mounds. The number and dimensions of these mounds must have been larger at the time of Ibn-i Battuta, who describes them as hillocks.1 During the course of his journey he observed the countryscape quite closely. He usually found ponds in thickly populated villages. It is interesting to note that a large number of place names of the region are associated with ponds, tanks and sheets of water. such as pokhar, kunda, diggi, dabha, daha, nimna, dariva, tal etc.

The Aligarh District was also remained under the sway of the Tughlaq dynasty for some period. After the death of Ferozshah Tughlaq in 1388 A.D, the country in general and the study area in particular, fell into a state of disorder. This period witnessed frequent confrontations between Sultan Mubarak Shah and Sultan Ibrahim Sharqi of Jaunpur. It is said that when the advance of the Sharqi ruler towards Badaon was reported to Sultan Mubarak Shah in 1436, he crossed the Jamuna near Tappal, and, after subjugating Jartauli, marched to Atrauli, where he encamped for some time to watch the

1. Ibid, p.533.
movements of the Shariqi ruler. It was reported to the Sultan that the ruler of Jaunpur had moved southward and had encamped near gasha (township) Burhanabad in the vicinity of Etawah. Mubarak Shah moved from Atrauli and halted at the gasha of Bain Kotah (the present Bain Kalan).

During the early years of the reign of Ibrahim Lodi, Umar Khan was given charge of Koil. He built the fort of Mohammadgarh in 1525, which later came to be known as Aligarh. The Kali Masjid in Mohammad Bani Israilan is one of the examples of the Lodi style of architecture in the study area. During this period the city of Koil was fortified and was provided with four gates. The names of these gates survive to this day, i.e. Delhi Gate, Madar gate, originally Badaon Gate, Turkman Gate and Sasni Gate. On the southern side of the Balai Qila or Uppar Kot, behind the Kotwali, a portion of the fortification wall, made up of square blocks of kankar (pebbles) may still be seen. (Plate 3.8). At one place, a deep tunnel constructed on the principle of a true arch, made of lakhauri bricks, crosses the wall just below its base (Plate 3.9).

At the periphery on the southwest side of Koil, where a moat once existed, a settlements known as Khai-Dora

1. Ibid, pp.207-208.
PLATE NO. 3.7 Koil Minarate

PLATE NO. 3.8 Fortification Wall of Koil (Medieval Period)

PLATE NO. 3.9 Tunnel across the fortification wall.
(khai=moat; dora=line) was established its name indicating its origin.

The second quarter of sixteenth century marks the establishment of the Mughal empire which continued to rule till the middle of the nineteenth century. Koil retained its importance throughout the Mughal period and almost all Mughal kings visited it. During Babar's period, many stone buildings must have been erected at Koil. However there are no traces of these buildings and Babri Mandi is the only reminder of the period. Babur visited Koil, Atrauli and Sikandra Rao. He got a mosque constructed at Pilakhna, a village in the Aligarh District. It is rectangular in plan and is enclosed by walls about two metre high from the ground level. This mosque is a building of considerable architectural merit.

During Akbar's reign, Koil was the capital of an administrative sarkar which was divided into four 'dasturs' (revenue circles) and twenty one mahals (parganas). Its importance is testified by the fact that it had a 4000 strong cavalry and 79,000 strong infantry and the area under it was in a high state of tillage. Indigo cultivation had reached a

3. Ibid., p.588.
high level of production which had made Koil an important commercial centre, Indigo grown here was exported to Samarkand, Kashghar and Armenia.¹

According to Raja Mohammad, many noted Muslim families of Koil settled in and around Koil, Pilakhna and Naanu during the reigns of Humayun and Akbar.² A few inscriptions survive in the study area from Akbar's time, associated with a number of important personalities. The chief mosque of Sikandra Rao was built by Sabdil Khan in 1585 (Plate 3.10). It is situated in a mound, known as Qila, near the tehsil headquarters. It has considerable architectural merit. It is made of lakhauri bricks and Kankar blocks. It is surmounted by three octagonal hemispherical domes, the central one being larger than the other two. The domes are crowned with inverted lotuses and pinnacles. The shape of the domes, the design of the battlement and the rear minarets shed light on Mughal architecture. Three monuments of Akbar's period are situated in the area known as Bagh-i Gesu Khan³ now a common graveyard in Koil. One of these is the tomb of Mir Gesu Khan made of red sandstone (Plate 3.11). It is an impressive

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¹. Early Travels in India (1583-1619), edited by William Foster, Delhi, (1968), p.179.
³. Ibid., p.207.
PLATE NO. 3.10 Jama Mosque, Sikandara Rao
(Medieval Period)

PLATE NO. 3.11 Tomb of Mir Gaus Khan
(Akbar's Period)
building on a high plinth, with three latticed screens with different geometrical patterns, surmounted by a large low dome.

The District, during the reigns of Akbar's successors, Jahangir and Shahjahan, retained the importance which it enjoyed in during his period. In 1631 an English traveller, Peter Mundy, visited Koil and Sikandrabad and left an interesting account of his the area. On his way back, he passed through the villages of Chherat and Shaikhupur. At the southern outskirts of the city of Aligarh on the G.T. Road, there is a village known as Kukari Khera urf Aurangabad,\(^1\) where there is still a gate of massive dimensions, locally known as the Diamond Gate. Though, now it is without any inscription, it is representative of the typical Mughal architectural style. Probably, the gate was constructed during Aurangzeb's reign. Hence one of the names of the locality is Aurangabad. With the expansion of the city, the village has merged into it and now forms a locality of the city known as Naurozabad.

Towards the beginning of the eighteenth century, after the death of Aurangzeb, Mughal power started dwindling in the region and Jats emerged as a powerful zamindar caste. The rise of the Jats was probably the most important feature of

\(^1\) Census of India (1951), District Population Statistics Uttar Pradesh, Vol. 6, Aligarh District, S.No.206, p.23.
the social and political history of the region in the early part of the century. The Jats of Aligarh claim their descent from Makhan, who, at the end of the sixteenth or the beginning of the seventeenth century, led a tribe of Thenwa Jats from Rajputana into the neighbourhood of Mursan. They claim that their arrival in the area dates back to about 1646, when their ancestor, Bikram Thakur, drove out the Janghara Rajputs and Kalaras who inhabited the area at the time.1 This dynasty founded Mursan.2 Among other castes in the district, the Jats took maximum advantage out of the political unrest and instability that prevailed in the region during the eighteenth century. Largely the extension of Jat zamindari seems to have occurred at the expense of the Rajputs.3 In fact, Jats were already on the political and social scene during the reign of Aurangzeb's, who had appointed Nund Ram Jat as the Faujdar (army commander) of the District. Nund Ram died in 1665 leaving fourteen sons and the Jats of today are mostly their descendants. In the first half of the eighteenth century, Sabit Khan was appointed Governor of Koil by Muhammad Shah. He took a keen interest in the construction of buildings at Koil. The fort of Sabitgarh


(Aligarh fort), the tomb of Allah Rakhsh, (1717) reconstruction of the present Jami Masjid of the city (1/24), the founding of Harduaganj market, repairs of the Jami Masjid at Jalali (1724) and old fortress of Koil, extension of shrine of Shah Faiyaz of Atrauli and the construction of a tank which was linked with the Jami Masjid of the Aligarh city through an underground channel, may be cited as examples of this. During the seventeenth and eighteenth centuries, Koil was a very important centre of learning and education. It had scholars specialising in different branches of learning and students from other places came to Koil to study under them.

The second half of the eighteenth century was a period of military and political instability. In 1738, Mohammad Khan Bangash, a nawab of Farrukhabad, ruled over some areas of the District; but his successor had to surrender part of his domain, including parts of Koil, to the Marathas. In 1753 Surajual Jat strengthen his position by ousting Bahadur Singh Bargujar from Koil.

In 1760 Ahmad Shah Abdali captured the Ramgarh fort. During his stay in India due to his oppressive rule, the town

3. Joon, Ram Sarup, op. cit. p. 82
of Koil was much disturbed. Abdali, who had secured the neutrality of Surajmal, defeated Marathas at Panipat in 1761, and, as a reward for his neutrality, he recognized Surajmal's suzerainty over the territory of Koil.¹

Surajmal died in 1763 the Marathas marched to Koil in 1769 and wanted to capture the Ramgarh fort; but, obtaining six lac rupees from the Jats in lieu of this, they returned to Deccan temporarily. The fall of the Mughal empire, coupled with the exit of the Marathas from the region, created conditions of insecurity and uncertainty in it. So a large number of fortresses (garhis) were built by the Jats, commonly of mud for defence purposes. There are about seventy-five place-names in the region, which bear the pre-fix or suffix of garhi (mud fortress). A large number of them are found in the Jat dominated areas. The remains of these garhis may still be seen at Mau, Mursan, Tuskan, Sanakra, Hathras, Morthal, Chandaus, Pisawa, Baswan, Gorai, Deorai, Chharra, Barla, Khair, Sasni, Kachaura, Bijaigarh and Iglas. (Fig.3.6). These were buildings of considerable strength around each of which a large number of settlements emerged.

3.3 Modern Period:

The zamindars fought desperately against the British to save the region from their hands but failed to do so. As a

1. Ibid.
result, political confusion prevailed in the area which led the rural people congregating in large villages for security. After 1857, following relatively peaceful political conditions, the study area witnessed a new phase of rural settlement.

The fort of Sansi\textsuperscript{1}, was the first to be attacked by the British. The Kachaura (Sikandra Rao) mud fort was the next to be taken by the British after a well contested battle. In August 1803, General Lake advanced towards Aligarh, and, after occupying the town of Koil, moved towards Saheb Bagh and made it his head-quarters. On 4th September 1803 the British army attacked the Aligarh fort\textsuperscript{2} and captured it. However, the British could not crush the defiant and stubborn people and their local leaders such as those of Pitambarpur, Chandausi, Atrauli, Dibai, Hathras and Mursan.

After the British occupation of the area in 1804 the present district of Aligarh was formed. It was divided into six tehsils, namely Koil, Atrauli, Sikandra Rao, Iglas and Hathras. Agriculture was its mainstay. At the commencement of the British rule there were large tracts of forests, mainly of dhak (butea frondosa), which have now given way to

\begin{enumerate}
\item Major William Thorn, 'Memoirs of The War in India, conducted by General Lake (1803-1806), London, (1893), pp. 95
\end{enumerate}
cultivation. In spite of political stability on the one hand and increase in cultivated area on the other, vagaries of weather took their toll throughout the nineteenth Century, leaving deserted villages in their wake. During the second half of the century the population of the District grew at a fast pace—from about seven lac in 1847 to about twelve lac in 1901 and the density increasing from 186 to 241 people per square kilometres. The District had 1799 settlements, including both towns and villages. At present the Aligarh District has 20 towns and 1749 villages, out of which 45 villages are uninhabited.

By the beginning of the twentieth century, industrial activity had been firmly established and had diversified in the District. According to Nevill, the most important industry in Aligarh was that of cotton. Spinning and weaving from locally grown cotton was an old practice. Cotton industry got a fillip after the expansion of export trade. Henderson mentions thirty-four cotton mills run by steam, employing about 3000 workers, and a large number of hand ginning units in the District. The region was also celebrated for its cotton rugs and carpets with, 300 looms at work.

Other industries had also started in the District by the beginning of twentieth century. Crude glass, glas

bangles, and bottles were manufactured in various parts of the District. There were European style factories, such as a flour mill and a lime-factory at Hathras, a Saltpetre refinery at Sikandra Rao, and stone quarries at Koil and Hathras. By 1907, brass and iron lock industry had been established and there were twenty-seven lock works in Koil, Hathras, Iglas and other places. Close on the heels of industrial and agricultural development, trade also flourished in the District. Prior to the British occupation, cotton, food-grains, indigo and indigo seeds were exported from the study area. Trade developed rapidly after the construction of canals and metalled roads, the latter contributing much to the growth of Hathras. The impact of railways was much greater and export of food-grains, oilseeds, raw cotton, ghee (cooking fat), indigo, wrought metal, sugar, hides and Indian piece goods was made possible. Development of markets also followed. Hathras evolved as a centre for trading in cotton, sugar and food-grains and became an important market in the District. On a smaller scale, local markets such as those of Hardauganj, Atrauli, Khair, Sinkandra Rao, Sasni, etc. also contributed their mite to the trading activity in the District.

Introduction of railways was an important milestone in the evolution and growth of the rural settlements in the region. The first line to open was that from Tundla to
Aligarh, in March 1863. The Aligarh - Bareilly line was opened in 1872, Aligarh-Mathura metre gauge line in 1875 and Hathras-Kasganj line in 1884.

Aligarh being a central halting place for travellers to and from Delhi, Agra, Mathura etc. Many serais were established on the periphery of the Koil town, along its entrance roads; and when Koil expanded it took these serais into its fold. An altogether new settlement was founded by Claude Russell now called Russellganj. According to Atkinson, there were a large number of Imambaras (places of Shia rituals) and many Hindu temples, including the Achaleshwar Temple in the region. The British developed the city of the Aligarh in the north, between the old Koil town and the Aligarh fort and designated it as the Civil Lines. The railway station, the judges' court, the clock tower, the collectorate, the head post office, the government press, the government school, the jail, the hospitals and a church were built there. The buildings of Aligarh Institute and the scientific society founded by Sir Syed Ahmad Khan, were also constructed in the Civil Lines. Subsequently around these nuclei a large number of settlements emerged. The Aligarh District was subdivided into a number of administrative units district, sub-division (tehsil/ pargana) thana and revenue

2. Ibid., p. 516.
Though the British like their predecessors, did not interfere in the village organization in general, the pattern of settlement, was considerably modified after the establishment of their rule. The people began to move out of the confines of their village, constructing their new dwellings in open spaces near their fields, a fact which subsequently led to the development of hamlets. The Department of Revenue Administration has prepared detailed large scale survey maps of individual villages, showing agricultural plots, inhabited sites, roads, water bodies, forests, etc. which throw some light on the pattern and distribution of rural settlement in the region.

After independence (1947), rural settlements in the study area have witnessed a general tendency of dispersal, because of changed economic conditions. Loss of the hold of traditional as well as other socio-religious beliefs, and customs, the abolition of the zamindar system (1951), the consolidation of land holdings, extension of the means of transport and communication, electricity, irrigation, banking and marketing facilities to the rural areas, improvements in the method of farming with the use of high yielding varieties of seeds, fertilizers, pesticides and new farm machinery have all contributed to this trend in recent years. The phenomenal increase of population and consequent demand for more lands for farming and housing has only led to the widespread shrinkage of forest cover but also to the reclamation of
usar (barren) lands. The new administrative institutions like Development Blocks and Village Panchayats and public buildings belonging to primary schools, rural health centres, panchayat bhawans, (Village council house), community centres etc. have contributed a lot to a change in the rural landscape of the study area. A large number of new settlements have grown up around these centres. The programme of providing house-sites and credit facilities to Harijans and landless labourers, the abolition of bonded labour, the massive drive for linking villages having more than 1500 people with main roads, the extension of health services and drinking water facilities to villages have made the impact on the settlement patterns in the rural areas of the District. Due to these developments, new settlement sites are emerging closer to the fields or along the transport routes. A study of the field surveys of the District has clearly revealed that while the number of revenue villages has remained almost constant for the last four or five decades, a large number of new hamlets have emerged as farmsteads or shops/markets in villages to make room for the fast growing population.
Chapter IV

Rural Settlements: Spatial Distribution and Types
RURAL SETTLEMENTS: SPATIAL DISTRIBUTION AND TYPES

A settlement is the most distinctive form of cultural landscape. It is a man-made habitat on the earth's surface representing an organized colony of human beings including the building in which they live or work or store or use otherwise and the tracks and streets over which their movements take place.\(^1\) The distribution of settlements is defined as the frequency with which they occur in a given place. A rural settlement is a relatively small and simple agglomeration of houses at a favourable site, primarily associated with agriculture and related processes. Such settlements vary from region to region in types and in pattern of distribution, and each one of these settlements is unique having its own personality. However in the present study general conclusions from specific facts and indices of measurements have been drawn to interpret distributional pattern and inter-relationship among the rural settlements, with the help of size (population, and area), spacing (observed, expected, index of randomness) and other characteristics. On the basis of these findings an attempt has been made to measure the degree of concentration or

dispersion and to classify rural settlements into different types.

1. Rural Area/Village and Hamlet

Before discussing a settlement type and its spatial pattern, it is necessary to define 'rural area' and 'village and hamlet' along with the relationship which exists between them, and further to see whether or not these terms can be used in the study area. The main difference between a village and a rural area is that while the latter reflects the totality of rural landscape the former is a part of it. The term 'village or rural area' is usually refers to revenue mauza, as defined in 1961 census, according to which a rural area generally follows the limits of a revenue village which has a definite surveyed boundary and is a separately administrative unit with separate village accounts. It may have one or two hamlets, each bearing a different name. Thus a village is a tract of land, inhabited or not, which has been demarcated as a unit for revenue purposes.¹ It may be identified as a human aggregation with a definite position and area bearing a particular place-name and usually surrounded by agricultural lands associated with its territory. In the present study area a village refers to a cluster of houses or more than one such cluster. The main

inhabited site is known as Khasgaon or Abadi khas, while it may have one, two or sometimes more hamlets distinguished by different names, generally suffixed or prefixed by some words like pura, nagla, tola, toli, etc. These hamlets generally form small clusters of homesteads in the village territory situated at some distance from the main settlement site, mostly occupied by mixed or depressed caste or untouchables, who live in relative social isolation and are hired for field operations by well-to-do high caste farmers.\(^1\) There are some examples of hamlets inhabited by people of higher castes also, in which different groups live more or less independently.\(^2\) These units may be regarded as settlement cells or sub-villages. Sometimes the village may not have any settlement and may be grouped as 'uninhabited' in the census, locally called as nachiragi or bechiragi (lampless). There are 1,704 inhabited and 45 uninhabited villages in the Aligarh District.

2. General Distribution and Siting of Rural Settlement

The study area, forming part of the Ganga-Yamuna doab, owing to its homogeneous relief and fertile alluvial soils,


has an almost uniform distribution of rural settlements (Fig. 4.1). However, slight variations may be seen at micro-level due to differences in local relief, sources of water supply, drainage lines, soil types, patterns of land use, transport accessibility, social attributes and population density, etc. Such factors like deeply cut ravines usar (barren) land, ill-drained soils, proneness to floods and non-availability of drinking water etc. on the one hand, and well-drained fertile soils and availability of fresh water on the other hand militated against a strictly uniform distribution of settlements in the study area. River Kali has played a crucial role in the selection of sites for human habitation in proto-historic times and Jalali has been proved to be the oldest site of human habitation in the area, dating back to around 1500 B.C., as revealed by recent archaeological excavations. The historical evidence is available in the form of a number of relics features belonging to Buddhist, Bhor, Meo and Rajput settlers who established their colonies in this area. Recently developed markets, roads, tracks and communication lines have made very little impact on the general distributional pattern of the settlements, except for the growth of a few hamlets arising out of the main village to avoid congestion or to respond to new socio-economic situations. Rashupur, Lalitpur Majra, Khitkari, Khera, Kiratpur, Nagla Madho, Rahatpur etc. along the roads present examples of each settlements (Fig. 4.2 G.I.).
The Aligarh District is bound by two rivers, the Ganga and the Yamuna, in the east and the west respectively. Both streams have influenced the selection of sites for human habitation in the study area. The low lying areas along these two rivers are inundated during the rainy season. So, large tracts of land are very sparsely inhabited, and the sizes of their villages. There are also very small. Figs. 4.2 A B D clearly show the arrangement of houses along a street running almost parallel to the river course in such villages. Protective embankments erected along the Ganga have provided facilities for settling along the river, thus forming compact villages like, Kanchanpur, Kokheta, Raipur, Gopalpur, etc. Similarly, along the Kali Nadi are found a number of semi-compact villages showing a linear pattern (Fig. 4.2 C). The central low lying area of the District, which becomes sometime waterlogged during rainy season, also contains semi-compact villages.

Tank-site settlements are common in Sikandra Rao and Khair tehsils as well as the Gonda block in Iglas tehsil. Besides small depression and lake site settlements are also found in Tappal block of Khair tehsil (Figs. 4.2 A E F). The tank and lakes in the region together with various patches of infertile usar lands have made their impact on the distributional pattern of settlements in such areas (Fig. 4.2 J).
The western part of Hathras tehsil generally and the entire Mursan block in particular have an even distribution of settlements—very small villages and hamlets because of high water table, fertile and well irrigated lands in these areas.

3. Size of Villages

The size (area and population) and density of rural settlements is closely related to spacing. With an increase in distance between settlements, the density of villages tend to decrease.1 In the study area the average areal size of villages is 2.95 km², which is greater than the Uttar Pradesh average (2.34 km²), but less than that of India average (5.02 km²). Figure 4.3 shows areal size of a village in the District per km² on the block level. Table 4.1 clearly indicates that the highest per village areal coverage (4.237 km²) is in Tappal block of Khair tehsil while the lowest areal size (1.582 km²) is found in Mursan block of Hathras tehsil. Generally, villages located in the Yamuna Khadar and the southern part of the Ganga Khadar, especially the Tappal block of Khair tehsil and the Gangeri block of Atrauli tehsil, have larger areal size of villages (3.487 to 4.237 km² per village), while villages of smaller average areal size

are found in Hathras (2.044 km² per village) and Koil tehsil (2.549 km² per village) respectively.

TABLE 4.1

DISTRIBUTION OF AREA AVERAGE PER VILLAGE SQ. KM. AT BLOCK LEVEL (1981)

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Blocks</th>
<th>Area sq.km.</th>
<th>No. of settlements</th>
<th>Average per village sq.km.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Akrabad</td>
<td>278.0</td>
<td>85</td>
<td>3.270</td>
</tr>
<tr>
<td>2.</td>
<td>Atrauli</td>
<td>283.9</td>
<td>113</td>
<td>2.512</td>
</tr>
<tr>
<td>3.</td>
<td>Bijauni</td>
<td>250.6</td>
<td>83</td>
<td>3.019</td>
</tr>
<tr>
<td>4.</td>
<td>Chandaus</td>
<td>329.7</td>
<td>92</td>
<td>3.583</td>
</tr>
<tr>
<td>5.</td>
<td>Dhanipur</td>
<td>287.8</td>
<td>98</td>
<td>2.936</td>
</tr>
<tr>
<td>6.</td>
<td>Gangeri</td>
<td>345.3</td>
<td>99</td>
<td>3.487</td>
</tr>
<tr>
<td>7.</td>
<td>Gonda</td>
<td>286.4</td>
<td>83</td>
<td>3.450</td>
</tr>
<tr>
<td>8.</td>
<td>Hasayan</td>
<td>284.1</td>
<td>93</td>
<td>3.054</td>
</tr>
<tr>
<td>9.</td>
<td>Hathras</td>
<td>237.3</td>
<td>107</td>
<td>2.217</td>
</tr>
<tr>
<td>10.</td>
<td>Iglas</td>
<td>256.6</td>
<td>103</td>
<td>2.491</td>
</tr>
<tr>
<td>11.</td>
<td>Jawan</td>
<td>293.2</td>
<td>108</td>
<td>2.714</td>
</tr>
<tr>
<td>12.</td>
<td>Khair</td>
<td>320.4</td>
<td>96</td>
<td>3.337</td>
</tr>
<tr>
<td>13.</td>
<td>Lodha</td>
<td>267.7</td>
<td>134</td>
<td>1.997</td>
</tr>
<tr>
<td>14.</td>
<td>Mursan</td>
<td>226.3</td>
<td>143</td>
<td>1.582</td>
</tr>
<tr>
<td>15.</td>
<td>Sasni</td>
<td>268.6</td>
<td>115</td>
<td>2.335</td>
</tr>
<tr>
<td>16.</td>
<td>Sikanda Rao</td>
<td>257.5</td>
<td>65</td>
<td>3.961</td>
</tr>
<tr>
<td>17.</td>
<td>Tappal</td>
<td>368.7</td>
<td>87</td>
<td>4.237</td>
</tr>
</tbody>
</table>


The average population of a village in the study area is 1,193 persons. Figure 4.4 shows the average population of a village at block level. Table 4.2, shows that only 14.26 per cent of villages of the District have populations of above 5000. Table 4.3 shows the average population per
TABLE 4.2
CLASSIFICATION OF VILLAGES BY POPULATION RANGES (1981)

<table>
<thead>
<tr>
<th>Range of Population</th>
<th>Number of villages in each range</th>
<th>Percentage of villages in each range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 200</td>
<td>70</td>
<td>04.11</td>
</tr>
<tr>
<td>200-499</td>
<td>319</td>
<td>18.72</td>
</tr>
<tr>
<td>500-1999</td>
<td>1072</td>
<td>62.91</td>
</tr>
<tr>
<td>2000-4999</td>
<td>225</td>
<td>13.20</td>
</tr>
<tr>
<td>5000-9999</td>
<td>18</td>
<td>1.06</td>
</tr>
<tr>
<td>10,000 &amp; above</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>Total</td>
<td>1704</td>
<td>100.00</td>
</tr>
</tbody>
</table>


village in the different blocks of the Aligarh District. The highest per village population (1606 persons) is found in Gangiri followed by Sikandra Rao (1479) and Tappal (1420), while the lowest per village population (765 persons) is found in Muran followed by Lodha (825) and Hathras (992).

The classification of villages of the District based on size of population has also been taken into consideration while studying the spatial distribution of rural settlements in it. The villages of the District have been divided into six population groups - containing from less than 200 to more
### TABLE 4.3

**DISTRIBUTION OF POPULATION (AVERAGE VILLAGE SIZE) AT BLOCK LEVEL 1981**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Blocks</th>
<th>Population</th>
<th>No. of settlements</th>
<th>Average per village</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Akrabad</td>
<td>100058</td>
<td>85</td>
<td>1150.09</td>
</tr>
<tr>
<td>2.</td>
<td>Atrauli</td>
<td>129517</td>
<td>113</td>
<td>1146.16</td>
</tr>
<tr>
<td>3.</td>
<td>Bijauni</td>
<td>107643</td>
<td>83</td>
<td>1296.90</td>
</tr>
<tr>
<td>4.</td>
<td>Chanduas</td>
<td>12004</td>
<td>92</td>
<td>1315.26</td>
</tr>
<tr>
<td>5.</td>
<td>Dhanipur</td>
<td>125058</td>
<td>98</td>
<td>1276.10</td>
</tr>
<tr>
<td>6.</td>
<td>Gangiri</td>
<td>159057</td>
<td>99</td>
<td>1606.63</td>
</tr>
<tr>
<td>7.</td>
<td>Gonda</td>
<td>115389</td>
<td>83</td>
<td>1390.22</td>
</tr>
<tr>
<td>8.</td>
<td>Hasayan</td>
<td>102443</td>
<td>93</td>
<td>1101.53</td>
</tr>
<tr>
<td>9.</td>
<td>Hathras</td>
<td>106104</td>
<td>107</td>
<td>991.62</td>
</tr>
<tr>
<td>10.</td>
<td>Iglas</td>
<td>103756</td>
<td>103</td>
<td>1007.33</td>
</tr>
<tr>
<td>12.</td>
<td>Khair</td>
<td>117502</td>
<td>96</td>
<td>1223.97</td>
</tr>
<tr>
<td>13.</td>
<td>Lodha</td>
<td>110486</td>
<td>134</td>
<td>824.52</td>
</tr>
<tr>
<td>14.</td>
<td>Mursan</td>
<td>109454</td>
<td>143</td>
<td>765.41</td>
</tr>
<tr>
<td>15.</td>
<td>Sasni</td>
<td>125380</td>
<td>115</td>
<td>1090.26</td>
</tr>
<tr>
<td>16.</td>
<td>Sikandra Rao</td>
<td>96164</td>
<td>65</td>
<td>1479.44</td>
</tr>
<tr>
<td>17.</td>
<td>Tappal</td>
<td>123503</td>
<td>87</td>
<td>1419.57</td>
</tr>
</tbody>
</table>


than 5000 persons. Table 4.3 A shows the distribution of the population of villages in the District. There are 72 villages i.e. 4.23 per cent of the villages in the District inhabited by less than 200 people, whereas 318 villages comprising 18.66 per cent of villages contain between 200 and 499
<table>
<thead>
<tr>
<th>S.No. Blocks</th>
<th>Total No. of villages</th>
<th>% of villages</th>
<th>Very Small Villages Below 200 persons</th>
<th>Small Villages 200-499 persons</th>
<th>Medium Villages 500-999 persons</th>
<th>Large Villages 1000-1999 persons</th>
<th>Very Large Villages 2000-4999 persons</th>
<th>Over Growth Villages Above 5000 persons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1. Akbarad</td>
<td>85</td>
<td>4.99</td>
<td>3</td>
<td>4.17</td>
<td>3.50</td>
<td>13</td>
<td>4.09</td>
<td>15.29</td>
</tr>
<tr>
<td>2. Agra</td>
<td>113</td>
<td>6.63</td>
<td>6</td>
<td>2.78</td>
<td>2.04</td>
<td>19</td>
<td>5.97</td>
<td>14.39</td>
</tr>
<tr>
<td>3. Bijauli</td>
<td>83</td>
<td>4.87</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. Chanda</td>
<td>92</td>
<td>5.40</td>
<td>4</td>
<td>4.17</td>
<td>3.03</td>
<td>11</td>
<td>3.46</td>
<td>11.11</td>
</tr>
<tr>
<td>5. Dhanpur</td>
<td>96</td>
<td>5.75</td>
<td>2</td>
<td>2.78</td>
<td>2.04</td>
<td>19</td>
<td>5.97</td>
<td>14.39</td>
</tr>
<tr>
<td>6. Gangi</td>
<td>99</td>
<td>5.81</td>
<td>3</td>
<td>4.17</td>
<td>3.03</td>
<td>11</td>
<td>3.46</td>
<td>11.11</td>
</tr>
<tr>
<td>7. Gonda</td>
<td>83</td>
<td>4.87</td>
<td>3</td>
<td>4.17</td>
<td>3.61</td>
<td>15</td>
<td>4.72</td>
<td>18.07</td>
</tr>
<tr>
<td>8. Hasayan</td>
<td>93</td>
<td>5.46</td>
<td>3</td>
<td>4.17</td>
<td>3.23</td>
<td>20</td>
<td>6.29</td>
<td>21.51</td>
</tr>
<tr>
<td>9. Hathras</td>
<td>107</td>
<td>6.28</td>
<td>3</td>
<td>4.17</td>
<td>2.80</td>
<td>24</td>
<td>7.55</td>
<td>22.43</td>
</tr>
<tr>
<td>10. Iglas</td>
<td>105</td>
<td>6.05</td>
<td>5</td>
<td>6.94</td>
<td>4.85</td>
<td>25</td>
<td>7.86</td>
<td>24.27</td>
</tr>
<tr>
<td>11. Jawa</td>
<td>108</td>
<td>6.34</td>
<td>4</td>
<td>5.56</td>
<td>3.70</td>
<td>17</td>
<td>5.35</td>
<td>15.74</td>
</tr>
<tr>
<td>12. Khair</td>
<td>96</td>
<td>5.63</td>
<td>1</td>
<td>1.39</td>
<td>1.04</td>
<td>16</td>
<td>5.03</td>
<td>16.67</td>
</tr>
<tr>
<td>13. Lodha</td>
<td>134</td>
<td>7.56</td>
<td>4</td>
<td>5.56</td>
<td>2.99</td>
<td>34</td>
<td>10.69</td>
<td>23.57</td>
</tr>
<tr>
<td>15. Sasi</td>
<td>115</td>
<td>6.75</td>
<td>8</td>
<td>11.11</td>
<td>6.96</td>
<td>16</td>
<td>5.03</td>
<td>13.91</td>
</tr>
<tr>
<td>16. Sisandra Rao</td>
<td>65</td>
<td>3.81</td>
<td>2</td>
<td>2.78</td>
<td>3.08</td>
<td>10</td>
<td>3.14</td>
<td>13.38</td>
</tr>
<tr>
<td>17. Tappal</td>
<td>87</td>
<td>5.11</td>
<td>5</td>
<td>6.94</td>
<td>5.75</td>
<td>11</td>
<td>3.46</td>
<td>12.64</td>
</tr>
</tbody>
</table>

Source: Compiled from the Primary census hand book and village and town directory of Aligarh District 1981.

A = No. of villages; B = % of the Districts; C = % of the Block.
persons. The Table further shows that two thirds of the total number of villages of the District are populated by between 500 and 999 people. Very large size villages with populations ranging between 2000 and 4999, are small in number and constitute 13.20 per cent of the total number of village of the District. Exceptionally large villages, inhabited by more than 5000 people represent only 0.94 per cent of the total number of villages in the District.

Figure 4.5 display the distribution of the population size of the villages at block level. It is clear from the Table and the Figure that there is uneven distribution of the population of villages between different categories and between different blocks of the District. The proportion of villages of very small size varies from 1.04 per cent in Khair to 11.19 per cent in Mursan whereas the District average is 4.23 per cent. Similar variation between different categories is also seen between the different blocks of the District.

The village density (Fig. 4.6) has been arrived at by counting the number of villages per 100 km$^2$ of area. The average density of villages in the study area comes to 36 villages/100 km$^2$ of area. The highest value is found in Mursan block (63 villages/100 km$^2$) followed by Lodha (50), Hathras (45), and Sasni (42), while the lowest value is noticed in Tappal block (23 villages/100 km$^2$) followed by
Sikandra Rao (25), Chandaus (27), and Gangiri (28). The village density per 100 km$^2$ in the District varies between 23 and 63.

4. Spatial Analysis

The spacing of rural settlements denotes the locational arrangement of villages with respect to one another. To analyse this dimension, classical geographers have considered spacing as a basis for the classification of rural settlements into different types. In Sweden, Switzerland, Poland and France, geographers have used fixed spacing as a unit for the measurement of concentration and dispersion.\(^1\)

However, no statistical tool provides a perfect vision of distributional pattern because every unit has its own trend and identity as regards socio-cultural and spatial characteristics.\(^2\) So none of these methodologies can have universal application. The theoretical basis of the relationships between settlement density and spacing was first provided by Robinson and Barnes for the analysis of dispersed rural


\(^2\) Singh, K.N., "The Territorial Basis of Medieval Towns and Village Settlement."
population of Midwest, U.S.A. and Ontario.\textsuperscript{1} Their formula is based on the concept of uniform distribution formerly devised by Christaller. This was later modified by Mather\textsuperscript{2} in the following manner:

\[ D = 1.0746 \sqrt[3]{A/N} \]

Where, \( D \) = theoretical distance between points or settlements in hexagonal arrangement.

\( A \) = area; and

\( N \) = number of settlements per unit area

The computation of theoretical inter-settlement distances at block level clearly indicates the pattern of spacing in the District (Fig. 4.7) which, according to the range of spacing varies between 1.35 kilometre (Mursan block) and 2.21 kilometre (Tappal block). As many as 7 blocks show spacing which is less than the District average (1.83 kilometre) while the remaining 10 blocks show more than this average spacing. Table 4.4 shows the inter-village spacing

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
Block & Inter-village Spacing (km) \\
\hline
Mursan & 1.35 \\
Tappal & 2.21 \\
\hline
\end{tabular}
\end{table}


at block level. Inter-village spacing, can be grouped into five categories as, very low, low, moderate, high and very high spacing.

**TABLE 4.4**

AREA AND INTER-VILLAGE SPACING
BLOCK LEVEL 1981

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Blocks</th>
<th>Area sq.km.</th>
<th>No. of settlements</th>
<th>D Inter-village spacing (in km.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Akrabad</td>
<td>278.0</td>
<td>85</td>
<td>1.943</td>
</tr>
<tr>
<td>2.</td>
<td>Atrauli</td>
<td>283.9</td>
<td>113</td>
<td>1.703</td>
</tr>
<tr>
<td>3.</td>
<td>Bijauli</td>
<td>250.6</td>
<td>83</td>
<td>1.867</td>
</tr>
<tr>
<td>4.</td>
<td>Chanduas</td>
<td>329.7</td>
<td>92</td>
<td>2.034</td>
</tr>
<tr>
<td>5.</td>
<td>Dhanipur</td>
<td>287.8</td>
<td>98</td>
<td>1.841</td>
</tr>
<tr>
<td>6.</td>
<td>Gangeri</td>
<td>345.3</td>
<td>99</td>
<td>2.006</td>
</tr>
<tr>
<td>7.</td>
<td>Gonda</td>
<td>286.4</td>
<td>83</td>
<td>1.996</td>
</tr>
<tr>
<td>8.</td>
<td>Hasayan</td>
<td>284.1</td>
<td>93</td>
<td>1.878</td>
</tr>
<tr>
<td>9.</td>
<td>Hathras</td>
<td>237.3</td>
<td>107</td>
<td>1.600</td>
</tr>
<tr>
<td>10.</td>
<td>Iglaas</td>
<td>256.6</td>
<td>103</td>
<td>1.696</td>
</tr>
<tr>
<td>11.</td>
<td>Jawan</td>
<td>293.2</td>
<td>108</td>
<td>1.770</td>
</tr>
<tr>
<td>12.</td>
<td>Khair</td>
<td>320.4</td>
<td>96</td>
<td>1.963</td>
</tr>
<tr>
<td>13.</td>
<td>Lodha</td>
<td>267.7</td>
<td>134</td>
<td>1.518</td>
</tr>
<tr>
<td>14.</td>
<td>Mursan</td>
<td>226.3</td>
<td>143</td>
<td>1.351</td>
</tr>
<tr>
<td>15.</td>
<td>Sasni</td>
<td>268.6</td>
<td>115</td>
<td>1.643</td>
</tr>
<tr>
<td>16.</td>
<td>Sikandar Rao</td>
<td>257.5</td>
<td>65</td>
<td>2.138</td>
</tr>
<tr>
<td>17.</td>
<td>Tappal</td>
<td>368.7</td>
<td>87</td>
<td>2.212</td>
</tr>
</tbody>
</table>

4.1 Very Low Spacing (< 1.50 km)

This group consists of only one block that of Mursan. The value of its spacing is 1.35 km. It covers 4.7% of the total area (4842.10 square kilometre) lying in the south western part of the District. It has 5.5 per cent (109,459 persons) of the total rural population and 8.4 per cent (143) of the total number of villages of the District. The average village density of this block is (63 villages/100 km²). The Mursan block has a well drained, fertile and highly productive land. This block is a good example of an agricultural economy characterised by hamleted villages. This is the result of the availability of fertile land, high water table, accessibility to means of transport and communication and presence of cultivators of diverse castes like Adhirs, Jataus, Lodhas, Kurmis, Rajputs, Dheomars, Brahmans and Muraos etc. In this block most of the castes belong to the lower ladder of the society who live in villages of small sizes. All these factors are accountable for very low spacing of villages in this area.

4.2 Low Spacing (1.51 - 1.70 Km.)

This group covers an area of 1030.2 square kilometre or 21.2% of the total area of the District. It includes four development blocks, viz. Lodha, Hathras, Sasni and Iglas. The lowest spacing in this group is in Lodha (1.51), while the
highest is in the Iglas block (1.69). It contains of 22.5 per cent (445726 persons) of the District's rural population and 26.9 per cent (459) of its inhabited villages. Here average area per village ranges from 2.00 km² (Lodha) to 2.49 km² (Iglas), while village density shows variations between 40 (Iglas) and 50 (Lodha) per 100 km² of area. The development of transport, communication, irrigational facilities like canal and tube-well irrigation, and fertile soils are responsible for the growth of semi-compact settlements in these areas.

4.3 Moderate Spacing (1.71 - 1.90 km.)

This group comprises five development blocks, namely, Atrauli, Jawan, Dhanipur, Bijauli and Hasayan. The value of spacing in these blocks ranges from 1.70 km (Atrauli) to 1.87 km (Hasayan) and covers 28.9 per cent (1399.6 km²) of the District's area. It has 29.04 per cent (495) of the total number of inhabited villages and 30.0 per cent (594,924) of the total rural population of the District.

4.4 High Spacing (1.91 - 2.10 km.)

Relatively high spacing prevails in five development blocks of the District, viz., Akrabad, Khair, Gonda, Gangiri and Chandaus. They comprise 32.20 per cent (1559.8 km²) of the total of the study area. The areal size of villages in these blocks ranges between 3.27 km² (Akrabad) and 3.58 km² (Chandaus) and they together have 30.9 per cent (61310) of
the total rural population of the District and 26.7 per cent (455) of its inhabited villages. The number of villages per 100 km² of rural area in these blocks ranges from 27 villages to 30 in Chandaus and Sikandra Rao respectively which results in large inter-village spacing and big villages. Unproductive 'usar' lands, lack of irrigational facilities and inadequate means of transport and communication are the basic causes for higher inter-village spacing in this area.

4.5 Very High Spacing (above 2.1 km)

Very high spacing is found in two development blocks of the District, viz., Tappal and Sikandra Rao. These areas are characterised by numerous jhils and tales and contains usar land, particularly, in the Sikandra Rao block. In Tappal block, land is infertile and the eastern part of this block is inundated by floods during the rainy season, so that most of its areas are rendered uninhabited. Besides, lack of irrigational facilities, transport and communication are also responsible for very high inter-village spacing in these two blocks. They cover 12.93 per cent (626.2 km²) of the total area of the District, 8.92 per cent (152) of the total number of its inhabited villages and 11.07 per cent (219,667) of its total rural population. Since spacing in these blocks is very high, the areal coverage of settlements is also high. The average size per village is 3.96 km² in Sikandra Rao and 4.23
km² in Tappal and the number of settlements per 100 km² is 25 in Sikandra Rao and 23 in Tappal.

The foregoing discussion reveals a direct relationship between spacing and settlement size in the different blocks of the Aligarh District. It is obvious that where spacing is high, villages are of larger sizes, with a small number of hamlets having higher densities of population, which results in compact structure of settlements. On the contrary in areas of low spacing, settlements are generally smaller in size with low pressure of population and scattered distributional pattern, viz., hamleted type settlements.

A radial distribution of rural settlement can be interpreted with the help of theoretical spacing and settlement density per km². Figure 4.8 shows that, as spacing decreases, village density increases and vice-versa. According to the relationship between these two factors rural settlement may be classified into different types. Low spacing (< 1.40 km) with high settlement density (> 63 settlement per 100 km²) may be taken as an index of hamleted type; medium spacing (< 1.81 km) with medium settlement density (30-50 per 100 km²) is an indicator of semi-compact structure, while high spacing (> 2.00 km²) may be taken as an index of compact structure. Since these indices are not sufficient for the classification of rural settlement,
RADIAL DISTRIBUTION
FUNCTION OF RURAL SETTLEMENT

NUMBER OF VILLAGES PER 100 KM²

VERY LOW SPACING

HAMLETED

LOW SPACING

SEMI COMPACT

MODERATE SPACING

COMPACT

HIGH SPACING

\[ 1.0275 \sqrt{\frac{A}{N}} \]

FIG. 48
others may also be considered to classify the rural settlement.

5. Nature of Dispersion

Dispersion of rural settlement is a function of several factors, including the process of evolution, the time lag, and the everchanging socio-economic conditions under the influence of scientific and technological progress. Several statistical techniques of measuring degree of dispersion and concentration have been evolved by Stone and Hudson. But these have no precise connotations and their significance levels vary from region to region, due to physio-cultural variations. An attempt has been made here to measure the degree of dispersion, taking on the basis of the observed mean of nearest inter-village straight line distance ($r_0$), village density ($d$) and expected distance ($r_E$). This method is known as nearest neighbour distance approximation analysis. In this analysis it is assumed that points are distributed randomly in accordance with a Poisson Probability Function, which assumes that each location has an equal chance of containing a point, while in the real world settlements are neither always evenly spaced, nor are they spaced in a strictly random pattern. Thus dispersion may be

defined as the degree of deviation of set of points from random relative to some delimited area. It is true that the actual establishment pattern can hardly be predicted through any statistical analysis because every unit has its own trend and identity. It is more so in an ancient settled area where the settling process has seldom been in accordance with any geometrical pattern.

The first suitable approach towards dispersion analysis has been initiated by plant ecologists Clark and Evans in their analysis of the distributional pattern of various species over a given space. According to them, the index of randomness (RN) can be computed by using the following formula:

\[ RN = r_0/r_E, \text{ where } r_E = \frac{1}{2 \sqrt{d}} \]

\[ = 2 r_0 \sqrt{d} \]

For the present analysis, development block has been taken as the standard areal unit for measurement of RN values, and all the inhabited settlements in the different blocks of Aligarh District have been taken into consideration in the present study.


The index of randomness (RN) has been calculated by applying the above-mentioned formula. This provides a measure of the degree to which the distributional pattern of the observed inter-village distance deviates from random expectation. The value of this index ranges from 0.0 (complete concentration) through 1.0 (random) to 2.149 (ideal or normative hexagonal lattice). This index of RN value can be "correlated with variance (V) for further testing, which can be computed by the mathematical formula.  

\[ V = \frac{(4-n)}{4} \]  

When the value of rE is greater than V, the distribution is termed regular; when the value of V is greater than the rE, it is termed clustered; and the term random is applied to a case when V and rE are equal, i.e., the variance-mean ratio is one. In the present case, the value of rE is always more than V, thus representing a regular rather than random pattern.

The test of the significance of rE is made out with the hypothesis of Poisson Probability on the basis of standard error (rE)^2 which is given as:

\[ \sigma rE = \frac{0.26136}{\sqrt{nd}} \]


2. Clark and Evans, op. cit., p.450.
where, \( n \) denotes the total number of villages in an areal unit, while \( d \) = density of villages per km\(^2\).

Another index of the test, i.e. statistics of standard variate of normal curve (C), can be calculated, following the formula propounded by King.\(^1\)

\[
C = \frac{rO - rE}{\sigma E}
\]

The upper and lower ranges of random matching at 95% probability level will be computed by using the following formula.\(^2\)

\[
i.e. = \frac{2 \sigma E \pm rE}{rE}
\]

The width of the range of randomness depends upon the number of points (villages). The greater number of the points, the smaller the range and vice versa. Figure 4.9 shows the range of random matching at 95 per cent probability level and reveals that all blocks of the District are well above the random range indicating a clear tendency towards regularity.

Table 4.5 shows the result of the RN values and different indices calculated with reference to the nearest neighbour analysis for each development block of the District.

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2. Ibid., p.103.
RANGE OF RANDOM MATCHING

HASAYAN

JAWAN
HATHRAS
LODHA
AKRABAD
BIJALI
ATRAULI
DANIPUR
CHANADUS
GANGERI
KHAI
SIKANDRARAOD
SASNI
GONA
MURSAN
TAPPAL

NUMBER OF VILLAGES (IN HABITED) PER BLOCK

FIG. 4.9
### TABLE 4.5

SPACING AND NATURE OF DISPERSION OF RURAL SETTLEMENTS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Blocks</th>
<th>d/km²</th>
<th>D</th>
<th>rO</th>
<th>rE</th>
<th>RN</th>
<th>V</th>
<th>OrE</th>
<th>C</th>
<th>Di</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akrabad</td>
<td>0.305</td>
<td>1.943</td>
<td>1.350</td>
<td>0.905</td>
<td>1.492</td>
<td>0.224</td>
<td>0.051</td>
<td>8.725</td>
<td>0.691</td>
</tr>
<tr>
<td>2</td>
<td>Atrauli</td>
<td>0.398</td>
<td>1.703</td>
<td>1.150</td>
<td>0.793</td>
<td>1.450</td>
<td>0.172</td>
<td>0.039</td>
<td>9.179</td>
<td>0.674</td>
</tr>
<tr>
<td>3</td>
<td>Bijauli</td>
<td>0.331</td>
<td>1.867</td>
<td>1.273</td>
<td>0.869</td>
<td>1.465</td>
<td>0.206</td>
<td>0.050</td>
<td>8.080</td>
<td>0.687</td>
</tr>
<tr>
<td>4</td>
<td>Chandaus</td>
<td>0.279</td>
<td>2.034</td>
<td>1.332</td>
<td>0.947</td>
<td>1.407</td>
<td>0.245</td>
<td>0.051</td>
<td>7.550</td>
<td>0.657</td>
</tr>
<tr>
<td>5</td>
<td>Dhanipur</td>
<td>0.340</td>
<td>1.841</td>
<td>1.227</td>
<td>0.857</td>
<td>1.432</td>
<td>0.200</td>
<td>0.045</td>
<td>8.222</td>
<td>0.662</td>
</tr>
<tr>
<td>6</td>
<td>Gangiri</td>
<td>0.286</td>
<td>2.006</td>
<td>1.329</td>
<td>0.935</td>
<td>1.421</td>
<td>0.239</td>
<td>0.050</td>
<td>7.880</td>
<td>0.655</td>
</tr>
<tr>
<td>7</td>
<td>Gonda</td>
<td>0.289</td>
<td>1.996</td>
<td>1.193</td>
<td>0.930</td>
<td>1.283</td>
<td>0.263</td>
<td>0.053</td>
<td>4.962</td>
<td>0.599</td>
</tr>
<tr>
<td>8</td>
<td>Hassayan</td>
<td>0.327</td>
<td>1.878</td>
<td>1.447</td>
<td>0.874</td>
<td>1.656</td>
<td>0.209</td>
<td>0.047</td>
<td>12.191</td>
<td>0.767</td>
</tr>
<tr>
<td>9</td>
<td>Hathras</td>
<td>0.450</td>
<td>1.600</td>
<td>1.128</td>
<td>0.745</td>
<td>1.514</td>
<td>0.152</td>
<td>0.038</td>
<td>10.079</td>
<td>0.703</td>
</tr>
<tr>
<td>10</td>
<td>Iglas</td>
<td>0.401</td>
<td>1.696</td>
<td>1.066</td>
<td>0.789</td>
<td>1.351</td>
<td>0.170</td>
<td>0.041</td>
<td>6.756</td>
<td>0.624</td>
</tr>
<tr>
<td>11</td>
<td>Jawan</td>
<td>0.368</td>
<td>1.770</td>
<td>1.260</td>
<td>0.824</td>
<td>1.529</td>
<td>0.186</td>
<td>0.041</td>
<td>10.634</td>
<td>0.715</td>
</tr>
<tr>
<td>12</td>
<td>Khair</td>
<td>0.299</td>
<td>1.963</td>
<td>1.287</td>
<td>0.914</td>
<td>1.408</td>
<td>0.228</td>
<td>0.049</td>
<td>7.612</td>
<td>0.658</td>
</tr>
<tr>
<td>13</td>
<td>Lodha</td>
<td>0.500</td>
<td>1.518</td>
<td>1.080</td>
<td>0.707</td>
<td>1.528</td>
<td>0.137</td>
<td>0.032</td>
<td>11.656</td>
<td>0.713</td>
</tr>
<tr>
<td>14</td>
<td>Mursan</td>
<td>0.631</td>
<td>1.351</td>
<td>0.837</td>
<td>0.629</td>
<td>1.108</td>
<td>0.108</td>
<td>0.028</td>
<td>7.429</td>
<td>0.615</td>
</tr>
<tr>
<td>15</td>
<td>Sasni</td>
<td>0.428</td>
<td>1.642</td>
<td>1.046</td>
<td>0.764</td>
<td>1.369</td>
<td>0.150</td>
<td>0.037</td>
<td>7.621</td>
<td>0.636</td>
</tr>
<tr>
<td>16</td>
<td>Sikandra Rao</td>
<td>0.251</td>
<td>2.138</td>
<td>1.374</td>
<td>0.996</td>
<td>1.380</td>
<td>0.271</td>
<td>0.065</td>
<td>5.815</td>
<td>0.639</td>
</tr>
<tr>
<td>17</td>
<td>Tappal</td>
<td>0.235</td>
<td>2.212</td>
<td>1.252</td>
<td>1.031</td>
<td>1.214</td>
<td>0.291</td>
<td>0.058</td>
<td>3.810</td>
<td>0.559</td>
</tr>
</tbody>
</table>
while Figure 4.10 gives the measurement of the spatial patterns of rural settlements in the study area. The RN values ranging from 1.214 (Tappal block) to 1.656 (Hasayan block) reveal a clear tendency towards regularity.

On the basis of RN values, dispersion in different blocks of Aligarh District may be classified under five categories, as indicated in Figure 4.11.

5.1 Least Regularity ( < 1.300):

This group includes two blocks, Tappal and Gonda, having RN values of 1.21 and 1.28, respectively. It covering 13.52 per cent of the area of the District (655.1 sq.km) and 10 per cent (170) of its total number of inhabited villages. The area is inhabited by high to medium size villages (average area per village being 3.45 to 4.23 km²) and these two blocks have 12 per cent of the population of the whole District. The observed inter-village distance (rO) is 1.252 km. in Tappal and 1.193 km in Gonda, while the expected inter-village distance is (rE) 1.031 and 0.930 km. in the respective blocks, which is lower than the observed distance. The intensity of random disturbance (Di) is 0.559 and 0.599 respectively, which is less than 1, while the standard variate of normal curve (C) is 3.810 and 4.962. The village intensity (per 100 km²) is 23 and 28 in respective blocks, which is lower than that of the rest of the blocks of the District. These blocks are located in the western margin of
the District and present similar picture with small differences because some parts of these blocks, particularly in the Tappal block are subject to early inundation which renders most the lands uncultivated. So the villages are big in size and compact form in Tappal, while Gonda is free from inundation but due to local physio-cultural variations the villages are relatively small in size and semi-compact in form.

5.2 Low Regularity (1.301 - 1.400):

Low regularity is found in four blocks covering 20.8 per cent area of the Aligarh District (1009 km²) and containing 25 per cent of its villages (426) and 22 per cent of its total rural population. These four blocks are Mursan, Iglas, Sasni and Sikandra Rao. The density of village per 100 km² ranges from 25 to 63 villages - in Sikandra Rao and Mursan block respective. The area is inhabited by small to large villages, the values varying from 3.96 km² (Sikandra Rao) to 1.58 km² (Mursan). The observed inter-village distance ranges from 1.374 km (Sikandra Rao) to 0.837 km (Mursan). The inter-village spacing (D) is 2.138 km and 1.351 in the two blocks respectively. The expected inter-village distance (rE) shows lower values, ranging from 0.996 km to 0.629 km in Sikandra Rao and Mursan blocks respectively.

5.3 Moderate Regularity (1.401-1.500)

Areas of moderate regularity comprise seven blocks of the Aligarh District - Chandaus, Khair, Gangi ri, Dhanipur,
Atrauli, Bijauli and Akrahad. This group covers 43.3 per cent (2095.7 km²) of the total area of the District, and 39 per cent (666) of the total number of its villages and 43.4 per cent of its total rural population. The inter-village spacing in this group of blocks varies from 1.703 km (Atrauli) to 2.138 km (Chandaus) while the village density (per 100 km²) is highest in Atrauli (39 villages) and lowest in Chandaus (27 villages). The size of villages varies from 2.51 km²/village (Atrauli) to 3.58 km² (Chandaus). This indicates the existence of comparatively big villages in these blocks.

5.4 Moderately High Regularity (1.501-1.600)

Moderately high regularity has been found in three blocks of the District, viz., Hathras, Lodha and Jawan. They together cover 16.5 per cent (298.2 km²) area of the Districts and 20.5 per cent of its villages (349). They occur in the low lying areas of the Aligarh. The inter-village spacing in these blocks varies from 1.77 km (Jawan) to 1.51 km (Lodha). These blocks have villages of medium size, their values varying from 1.99 km² (Lodha) to 2.71 km² (Jawan).

5.5 High Regularity (> 1.600)

This area includes only the Hasayan block of Sikandra Rao Tehsil, with RN value of 1.656, incorporating 5.9 per cent (284.1 km²) of the area of the District and 5.5 per cent (93) of its total number of inhabited villages. The observed
inter-village distance \((r_0)\) in this block is 1.45 km, while the expected inter-village distance \((r_E)\) in it is lower (0.874) than the observed distance. The intensity of random disturbance \((D_i)\) in the block is 0.767, which is less than 1. This block is located in the south west of the District and the western margin of Sikandra Rao tehsil, which does not have much usar land. It is characterised by relatively high agricultural intensity, easy accessibility, and high water table which have together resulted in a highly regular distributional pattern of settlements in it.

On the basis of the foregoing discussion it may be concluded that the trend of dispersion has in every case been found towards regularity. So Dacey's 'Regular Poission Probability Law'\(^1\) is quite applicable in this case, because the empirical variance mean ratio here is always less than 1, and the mean, in every case, is more than the variance. The deviation index of nearest neighbour has also been tested with the use of normalised index of random disturbances whose intensity has been measured by using following mathematical formula.\(^2\)

\[ \text{Deviation index of nearest neighbour} = \frac{D_i}{\sqrt{N}} \]

225

\[ Di = \frac{r_0}{(1.0750/\sqrt{d})} \]

Table 4.5 clearly shows that the normalised index (Di) values, in the various block of the District ranges from 0.559 (Tappal) to 0.767 (Hasayan), indicating a clear tendency towards regularity.

6. TYPES OF RURAL SETTLEMENTS

Settlements may be classified on the basis of the distribution of occupance units and the nature of nucleation in a clearly demarcated area of a revenue village, having its own physical as well as cultural features. In a regional framework this signifies relationship between settlements within space.\(^1\) It stands of a set of relatively homogeneous units defined by specific criteria. Although settlements hardly admit of any logical classification due to the complexity of their sites and forms geographers have suggested many possible methods of classifying them on the basis of size (e.g., large, medium, small etc.), siting (e.g., valley side, riverside, road side etc.); time (e.g. prehistoric, ancient, medieval, modern etc.) and functions (e.g. agriculture, fishing, commerce etc.). The present classification of rural settlements is based mainly on the number and nature of settlement clusters in a village

---

incorporating the physical as well as cultural ingredients. The appendant hamlets locally known as purvas or tolas and the central cluster as khas gaon within the territorial limits of a mauza or a revenue village have been taken into consideration for examining the types of settlement in the study area.

Broadly speaking, there are two distinct types of rural settlements i.e., the compact and the dispersed, with several intermediate stages in between these two. In compact settlements, also known by terms such as 'clustered', 'nucleated', or 'agglomerated', houses are closely knit together and are separated by passages meant for traffic or circulation. Dispersed settlement are also called 'scattered', 'fragmented' or 'diffused'. Here the dwellings are scattered, each one of them being attached to its respective farm. A perusal of the topographical sheets of the Survey of India (scale 1 cm = 500 m) of the area coupled with field observation of the rural landscape of the Aligarh District reveals that there are wide variations in rural settlements in it. In between the two main groups, there is a great variety of intermediate types. In fact, it is not possible to put these rural settlement into watertight compartments because every settlement has its own distinct
and unique personality. However three main types of rural settlements have been identified in the study area (Fig. 4.12).

I. Compact or single site or non-hamleted villages.

II. Semi-compact or semi-hamleted villages having two to four hamlets.

III. Hamleted villages, with five or more hamlets.

A number of methods have been suggested by different scholars for the classification of rural settlements. Singh has proposed a scheme to identify settlement types taking into account the village and hamlet ratio of a village. If the number of villages is equal to the number of hamlets in a settlement, it is designated as 'compact', if village are less than half of the number of hamlets it is called 'dispersed', and if their number is more than half of the number of hamlets it is termed 'semi-compact'.

Villages where houses are concentrated at central sites have been designated as 'compact'. Such concentration may have only one family or more than one hundred houses. Villages in which the number of hamlets vary between two and


four, have been designated as 'semi-compact', whereas those consisting of five or more than five hamlets have been identified as 'hamleted'. Uninhabited villages have been ignored, and therefore the present study covers only 1704 inhabited villages of the District.

6.1 Compact Settlements:

According to Ahmad, the term 'compact settlement', signifies the concentration of almost all the dwellings of a 'mauza' (village) in one central side. In the Aligarh District, compact settlements cover the largest area, as is clear from Table 4.6. Out of the total number of 1704 villages of the District, 1105 (64.84%) fall in this category. Although compact villages are found in large numbers in almost all parts of District, they are most common in Tappal (82.75%) followed by Atrauli (82.30%), Lodha (78.35%), Chandaus (71.73%), and Iglas (70.87%) Blocks, while Gonda block has the smallest percentage of such villages i.e. 37.34%. Need for security from wild animals, clan solidarity, particularly among the Rajputs and the Jats, the Jajmani system and prevailing social conditions, must have forced the people to congregate at one place under the shadow of their respective chiefs or leaders. Most of the compact

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### Table 4.6

**Villages Classified According to Their Types - 1981**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Blocks</th>
<th>No. of Villages</th>
<th>Compact villages with single site</th>
<th>Semi-compact villages having 2-4 hamlets</th>
<th>Hamleted villages having 5 or more hamlets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>1.</td>
<td>Akrabad</td>
<td>85</td>
<td>54</td>
<td>63.52</td>
<td>26</td>
</tr>
<tr>
<td>2.</td>
<td>Atrauli</td>
<td>113</td>
<td>93</td>
<td>82.30</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Bijauni</td>
<td>83</td>
<td>44</td>
<td>53.01</td>
<td>32</td>
</tr>
<tr>
<td>4.</td>
<td>Chandua</td>
<td>92</td>
<td>66</td>
<td>71.73</td>
<td>26</td>
</tr>
<tr>
<td>5.</td>
<td>Dhanipur</td>
<td>98</td>
<td>57</td>
<td>58.16</td>
<td>36</td>
</tr>
<tr>
<td>6.</td>
<td>Gangiri</td>
<td>99</td>
<td>50</td>
<td>50.50</td>
<td>32</td>
</tr>
<tr>
<td>7.</td>
<td>Gonda</td>
<td>83</td>
<td>31</td>
<td>37.34</td>
<td>32</td>
</tr>
<tr>
<td>8.</td>
<td>Hasayan</td>
<td>93</td>
<td>43</td>
<td>46.23</td>
<td>38</td>
</tr>
<tr>
<td>9.</td>
<td>Hathras</td>
<td>107</td>
<td>77</td>
<td>71.96</td>
<td>23</td>
</tr>
<tr>
<td>10.</td>
<td>Iglas</td>
<td>103</td>
<td>73</td>
<td>70.87</td>
<td>20</td>
</tr>
<tr>
<td>11.</td>
<td>Jawan</td>
<td>108</td>
<td>63</td>
<td>58.33</td>
<td>43</td>
</tr>
<tr>
<td>12.</td>
<td>Khair</td>
<td>96</td>
<td>66</td>
<td>68.75</td>
<td>22</td>
</tr>
<tr>
<td>13.</td>
<td>Lodha</td>
<td>134</td>
<td>105</td>
<td>78.35</td>
<td>29</td>
</tr>
<tr>
<td>14.</td>
<td>Mursan</td>
<td>143</td>
<td>103</td>
<td>72.02</td>
<td>35</td>
</tr>
<tr>
<td>15.</td>
<td>Sasni</td>
<td>115</td>
<td>73</td>
<td>63.47</td>
<td>37</td>
</tr>
<tr>
<td>16.</td>
<td>Sikandra Rao</td>
<td>65</td>
<td>35</td>
<td>53.84</td>
<td>15</td>
</tr>
<tr>
<td>17.</td>
<td>Tappal</td>
<td>87</td>
<td>72</td>
<td>82.75</td>
<td>12</td>
</tr>
</tbody>
</table>

**Source:** Primary Census Handbook of Aligarh District - 1981, District Census Hand Book of Aligarh - 1961 and Office of the Revenue Record, District Collectorate, Aligarh.
settlements in the District are nucleated around a temple, a mosque or a pond. In many cases, forts or headquarters of former ruling chiefs (Zamindars or Rajas) have served as nuclei for such settlements. The advent of modern means of transport such as railways and metalled roads and the social customs of castes segregation have played an important role in disturbing the compact nature of such villages (Fig. 4.13 A, B).

6.2 Semi-Compact Settlements:

Semi-compact settlements represent an intermediate type between clustered and dispersed ones. Such a settlement comprises include the main village and an outlying hamlet which is closely connected with the main village by foot-paths or cart-tracks. Such settlements cover about 27.75% of the total number of villages in the District. Hasayan has the highest proportion (40.86%) of such settlements followed by Jawan (39.81%), Bijauli (38.55%), Gonda (38.55%) and Dhanipur (36.73%). Atrauli (13.27%) and Tappal (13.79%) have the smallest proportions of such settlements.

The origin of this type of settlements may be attributed to the increasing pressure of population on the central site of a village, which forced large families to seek space outside it, but within the limits of its territory, because of socio-economic considerations. Besides the outgrowth of the main or central site, a hamlet may also
be formed due to the inhabitation of labour or service castes, existence of a place of worship or settling of immigrants from other villages. Such hamlets derive their names from the predominant castes residing therein e.g. Lodha Tola, Ahiran, Khurmeon, Chamrauti, Dhobiyan, Passiyana, Babhanauti, etc. or after the name of their founders, such as Allehpur, and Chursen in Hathras block. Figure 4.13 C indicates semi compact of rural settlements.

6.3 Hamleted Settlements:

These settlements are characterised by the presence of several small hamlets and isolated habitations spreading over the entire village territory. Cart-tracks and foot-paths form links between these hamlets. In such villages, physically separated clusters are closely associated with each other by cultural and social ties. The system of the establishment of hamlet was encouraged by Rajput, Muslim and other zamindars. Land grants were made to establish separate purwas or tolas for various castes, especially lower ones, which is very well indicated by the names of the hamlets the first part of the name invariably indicating a caste and the second name a hamlet e.g. Chamaran Purwa, Pasin Purwa, Ahiram Purwa, Lodhan Purwa, Jatau Tola etc. Many Hindu agricultural castes (Kurmis, Koris etc.), business communities (Banias, Telis

etc.), and service castes (Nais, Lohars, Julahas etc.) have also established new hamlets near fields or along roads in response to new socio-economic conditions.\textsuperscript{1} Many new hamlets may be seen along the newly constructed roads. For example, some new hamlets may be seen along Sasni-Iglas, Sasni-Bijaigarh and Hathras-Jalesar roads etc. A small proportion (7.39%) of the total number of settlements in the study area have such settlements. Hamleted settlements are most common in Gonda (24.09%), followed by Sikandra Rao (23.07%), Gangiri (17.17%) and Hasayan (12.90%). Table 4.6 shows the proportions of settlements in different blocks having five or more hamlets which range from 1.85% in Jawan to (24.09%) Gonda. Figure 4.13 D shows the hamleted type of rural settlements.

7. Factors Determining Types of Rural Settlements

A number of physical, historical, cultural and socio-economic factors have been responsible for different types of rural settlements in the study area. A particular type of settlement is not the outcome of a single factor, but a combination of several factors. Broadly, these factors may be placed into two categories.

1 Factors Contributing to Agglomeration.

2 Factors Contributing to Deglomeration.

Factors Contributing to Agglomeration

Uniformity of Relief and Soil Fertility

Agglomerated type of rural settlement has been the chief characteristic of homogeneous levelled and fertile plains. Like those of most of the parts of the study area. Although soil variations are found all over the region, and even within the limits of the same mauza, the overall productivity of the soil in major parts of the region is almost the same, which has enabled the rural population to live close together in nucleated sites. The homogeneous stretch of fertile well-watered the alluvial plains encourage large concentrations of rural settlements. The ever growing population in such plains leads to intensive farming, which is also conducive to the concentration of settlements. The general sameness of the natural scene, coupled with an almost uniform fertility of the soil over most of the plain has fostered a sense of community life and motivated the people of the study area, to live in compact settlements.

1. Water Resources:

The nature of water distribution, both surface and ground, determines the nature of rural settlement distribution.

Surface water resources such as ponds, tanks, jhils and rivers act as centripetal forces, because they are the chief
sources of water for drinking and irrigation. They make the rural people inhabited to live together at one nucleated site. There are many jhils, ponds and tanks in the Aligarh District, particularly in Sikandra Rao and Khair tehsils. In the study area masonry wells constitute the main source of water supply for domestic and agricultural purposes. Therefore, dwellings are built around them in the form hamlets and villages. In the areas of deep water table, owing to the difficulty and high cost of construction, masonry wells are infrequent and population clusters in compact villages around them; while in the zones of high water table, where such wells are more numerous because they can be cheaply constructed the population need not concentrate in one central site and is likely to spread out into several outlying hamlets in the mauza, This is true in the case of Sikandra Rao and Gonda blocks in particular. The need to store water against the seasonal distribution of rainfall and its vagaries is again conducive to the formation of compact settlements over higher and drier interfluves of the rivers. Near the rivers, construction of artificial embankments parallel to the streams as a protection from floods has encouraged the growth of agglomerated settlements, as in Sikandra, Rustam Nagar, Hamidpur, Kastauli etc. in the Bijauli block of Atrauli tehsil along the river Ganga. Collective building of dams and irrigation channels for the storage and distribution of rain water and the construction
of tanks for artificial irrigation, have also promoted the evolution of compact villages.¹

II. Cultural Factors

Communal cultivation and co-operation in conducting agricultural processes, too have initiated and promoted agglomerated settlements since early days. The earlier system of collective ownership and periodic redistribution of holdings, village groves and meadows was preceded by the intensive farming with a fixed routine of cropping, which necessitated a common agricultural routine and collective management of postures and distribution of water supply.² Thus, large several collective activities, like digging of ponds, wells and other water arteries along with agricultural practices like ploughing, sowing, irrigation and harvesting etc. have also contributed to the growth of compact settlements in the study area.

III. Fragmentation of Holdings:

This factor also acts as a centripetal force in the growth of compact settlements. "Fragmented holdings compel the people to congregate at a single central site in the

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village, because residing in the control cluster, the
villager is at a maximum economic distance from his scattered
fields".¹ In addition to this, certain other facilities in
the form of threshing floors, village wells, temples,
mosques, panchayat hall and cart-tracks are also available in
concentrated site. Difficulties of the transportation of
ploughs, cattle and carts to and from scattered plots, too,
have fostered compact settlements.

IV. Clan Solidarity

The study area has been colonized by agricultural clans
caste and tribes such as Jats, Rajputs and Bhors who believe
in forming close communities, in most cases having a
fortified structure. Compact settlements, once established
as a mark of clan solidarity, are maintained by a host of
social ceremonies and rituals.

V. Social and Economic Bonds

Apart from co-operation in agriculture, there is a good
deal of social and economic interdependence among the
inhabitants of a village. The caste structure of a village
settlement is based on division of labour which affords
certain facilities to the occupants of a compact settlement.
In compact village the presence of different castes and
tribes, particularly based on professions make the people

1. Ahmad, E., op.cit., p.82.
inter-dependent on one another. Economic advantages arising from the division of labour in agricultural operations help in maintaining social relationships and bonds not only amongst rural communities and castes, but also between landlords and tenants and between farmers and landless labourers. Several groups of artisans providing various services have been maintaining intimate relationship with groups of peasants for generations. In a compact village some of the houses are also used as small workshops which fulfils the needs of the people. Social gatherings in the centre of the village, usually under some shady tree or near the temple, the mutual rejoicing at festivals, the gathering of neighbours after the day's work near the well in summer and around the fire in winter when tales are told and information about fields and crops exchanged may be found even today. All these have made their contributions towards the establishment of compact villages.

VI. Superstitious Beliefs

There are strong superstitions about sites among certain castes in the study area. A new site for a house is avoided as far as possible owing to the fear of its proving inauspicious, unless the sanction of the priest has been obtained. In certain settlements, gods are supposed to reside on the outskirts of the village. The worship of 'deoher' or village gods is common and petty offerings are made during
appointed seasons at the mounds ('thans'). Though the spread of education is overcoming such superstitions, most people still retain a varying degree of allegiance to these gods. This is an important factor in the evolution of compact settlements. Moreover, the ancestral site of a house is usually regarded as sacred unless the family is in decay. At places in the past, construction of houses on the south or west was discouraged since these two directions were considered inauspicious.¹

VII. State of Insecurity in the Past

The state of insecurity in the past seems to have had a very powerful influence in the formation of compact settlements. During the eighteenth century no isolated habitation was considered secure unless protected by a fortification wall and ditch.² People congregated in compact settlements around the forts or mansions of the local chief or landlord which were often surrounded by mud walls so that they might defend themselves against the enemies. In fact the need for common protection and defence by the villagers may have been an important factor for the tightness of habitat.

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1. Ibid.

7.2. Factors Contributing to Deglomeration or Fragmentation of Settlements

1. Physical Factor

There appears to be a close relationship between the configuration of land and the dispersal of settlements. It may be observed that fragmentation varies in proportion to the ruggedness of the land surface. Scattered settlements are found in localities where, as a result of the uneven nature of relief, soil and ground water, cultivated land is restricted. The south-eastern, central and the north western part of the Aligarh District are marked by the presence of Usar lands, ponds and jhils, which have promoted semi-compact and hamleted types of settlements. Such settlements may also be observed in other parts of the region where such conditions exist. (Fig.4.13 C).

Abundance of surface water and high water table have also influenced the growth of fragmented settlements. When surface water in the form of tanks and ponds is plentiful each one of these may have a small hamlet around it. Of course, large tank or talas may be conducive to larger settlements. In areas where water table is high the constructive of masonry or non masonry well is cheap and easy and therefore it may be a suitable location for a small settlement. Examples of such settlements can be found in
Gangiri, Bijauli, Sikandra Rao, Hasayan and Tappal blocks of the study area.

Flood plains of large streams are also responsible for the scattering of settlements. In low-lying areas which are annually inundated during the rainy season elevations within the village are selected as suitable sites for establishing small hamlets, their number depending upon the number of such elevated sites. The khadar lands of the rivers Yamuna and Ganga and Kali Nadi are flooded every year during the rainy season. As a result, these areas are marked by the presence of semi-compact and hamleted types of settlements.

II. Socio-cultural Factors

Socio-cultural factors such as castes prejudices and the existence of low agricultural castes have been partly responsible for the growth of hamleted settlements. The caste system based on social hierarchy divided the population into various social groups. At the lowest level of the social ladder are the supposedly low caste people, the so called untouchables or Harijans which include castes like, the Pasis, the Dhimer, the Chamar and the Doms. These people have traditionally been forced to live a little away from the main site, often towards the south; while the upper castes occupied the central site. Thus the caste hierarchy has also been responsible for the dispersion of rural settlements.
Land tenancy and absentee landlordism have also made their contribution towards fragmentation of settlements. Landlords used to settle near their holdings, and agricultural labourers, who were bound by loan or by cultivable lands given in return for services rendered were required to stay a little away from the main habitation. As a result, the fragmentation of settlements took place. Besides this, most fertile fields were occupied by the landlords, while the less productive and poor lands lying away from the central site were under the possession of tenants, who built their houses near their fields. After the abolition of the zamindari system, the actual tillers of the soil became free to settle anywhere in the village, causing further fragmentation of settlements.

Improved means of transport and communication in the form of roads and railways have hardly changed the pattern of settlements, in this old settled region. However, it would appear that it did play its part in the fragmentation of settlements. The growing pressure of population encouraged new settlements along the roads. Similarly, small hamlets of retailers grew up near the railway stations. Besides railways and roads, rural service centres and markets have also played an important role in the evolution of the hamleted type of settlements.
Chapter V

Pattern of Rural Settlements —
A Qualitative and Quantitative Analysis
PATTERN OF RURAL SETTLEMENT - A QUALITATIVE AND QUANTITATIVE ANALYSIS

A rural settlement is an organised habitation of the people of the countryside, including the building in which they live and work. Its shape and arrangements are usually influenced by socio-economic conditions, religious rituals as well as the nature of physico-cultural landscape of the region. The patterns, shapes or designs of rural settlements therefore, show considerable variations from region to region.

The word 'pattern' is often equated with the word 'shape'. However, there are geometrical dissimilarities between these two terms. A closed curve has a shape whereas a non-closed collection of points has a pattern. A settlement therefore, has a shape because its boundary is a closed curve which circumscribes an area, a space of two dimensions. The pattern of points are zero dimensional objects whose pattern is operationally determined via the relative distances or spacing of the points with respect to one another. According


to the basic properties, patterns can be classified into three categories: (i) Those that have the patterns of Euclidean geometry; (ii) those that are independent of scale and density, and (iii) those which may be expressed via the relative spacing of the individuals in the distribution. In this context it should be noted that a single distribution will have different patterns at different quadrant sizes.

Settlement pattern denotes the shape or arrangement of settlements in relation to natural or man-made features such as streams, ridges, canals and roads. It is determined on the basis of the location of houses and highways. It shows the shape of the settlements and the relationship between one dwelling and another, sometimes irrespective of site. Similarly a site may have no bearing on pattern. In the study of the settlement patterns two fundamental things have to be taken into consideration. First, the pattern should be abstracted from the habitat. Secondly, the pattern should also depend upon the kind of houses people wish to construct. It may consist of cattle sheds, granaries and outhouses. Sometimes a store, a garage, a post office or a school may also determine a pattern of settlement.

1. Ibid., p.548.
Villages differ greatly from one another in shape and pattern by reason of differences in the arrangement of streets and houses. As a matter of fact, the street system within a settlement is the most crucial element because houses are generally built facing a street or a road. Moreover, cultural elements such as the location of places of worship, sometimes give a distinct character to a dwelling site. The study of a settlement pattern comprises two aspects i.e., (i) the external layout and (ii) the internal plan. As stated in the preceding chapter, both these aspects are closely related to various geographical conditions such as location, configuration of land, surface water (rivers, canals, tanks, ponds, wells etc.), the nature of soil, vegetational cover, and shape of the cultivated fields.\(^1\) Besides these physical conditions, historical events, cultural traditions, patterns of roads and streets and other features such as temples, mosques, churches, garrison etc. also influence the settlement pattern. The state of insecurity in the past and the present social ethos of the rural society are other significant factors in the development of a settlement pattern.\(^2\) Grouping of houses due to certain reasons assumes different forms as a result of which


\(^2\) Ibid., p.99.
many distinct patterns emerge. There may be settlements where no pattern is recognizable. As such, patternlessness becomes a pattern in itself and is usually the consequences of criss-cross working of various causes and functions of a settlement.¹ Arrangement of houses is conditioned factors like roads, cart-tracks, water facilities, while lanes form the skeleton of the layout of a village. Buildings located in the space within the skeleton determine the shape and form of the village, as does the flesh in the human body.²

1. HISTORICAL ANALYSIS

In the Aligarh District the interplay of historical and socio-economic factors with geographical determinants has produced a distinct pattern. Therefore, the study of its historical evolution based on archaeological evidences, historical sources, toposheats and field surveys becomes very important.

There are a large number of mounds in the District known as 'khera', 'tikri', 'kot', 'pahar', etc. spread all over the region. They suggest that it had a number of


settlements in ancient times. The earliest manifestation of culture in the region is indicated by the presence of Ochre Coloured Pottery (OCP) which has been found at Jalali and which is supposed to date back to approximately 1500 B.C. Black and red earthenware has been discovered at five places, viz., Morthal, Hathras, Qila, Sasni and Harduaganj. The study area is also rich in the deposits of painted grey and its associated wares, which have been found at many sites. These together with carbon-14 datings of some remains, make one believe that settlements were established in the area between 1000 B.C. and 600 B.C. About the nature of the settlements from where surface deposits have been collected, nothing definite can be affirmed until regular excavations are conducted. However ancient literature throws light on the Aryan village pattern. This pattern was based on the Swastika marking the cross roads of an Aryan village which ran north and south and east and west. They were terminated at the four gates dedicated to four position of the sun. Another example of settlement pattern is found in Manasara Shilpshastra. According to this plan, there were eight types


of Aryan villages: Dandaka, Sarvatobhodra, Nandyavarta, Padamaka, Swastika, Prastara, Karmuka, and Chaturmukha (Fig. 1). It is obvious from this that most of the plans were rectangular or square and did not appear to differ in essentials. Each village was surrounded by a wall with a ditch for defence purposes. There were generally a gates in the middle of each of the four quarters. The centre of village was usually occupied by a temple, a tank or a public hall. The four quarters were further subdivided by straight streets. Each block was inhabited by members of a particular caste or profession, the best quarters being generally reserved for Brahmins and people of other high castes. The easterly axis of the general plan and the intersection of the main street by north south running shorter streets bore relationship with climatic conditions. Such an arrangement ensured the advantage of sunlight and proper circulation of fresh air.

The plans of the rural settlement described above do not seem to survive at present in their true forms. Hence the

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1. Shilpashastras are old Sanskrit text which were possibly compiled about the 5th or 6th century B.C., but the tradition which they indicate are of greater antiquity (Vide Havels, Ancient and Medieval Architecture of India, (1915), p.7 footnote). P.K. Acharya translated them into English with his own comments entitled as Indian architecture in five volumes in (1927). (See Singh, R.L., "Evolution of Settlements in Middle Ganga Valley", The National Geographical Journal of India, Vol.1, part 2, (1955), pp.76-77.
PATTERN OF RURAL SETTLEMENT IN ANCIENT PERIOD

DANDAKA

SARVATOBHADRA

NANDYAVARTA

PADMAKA

SWASTIKA

KARMAKHA

PRASTARA

CHATURMUKHA

— DITCH □ TANK
□ CIRCUMAM- T—TEMPLE
— BULATORY PASSAGE

FIG. 5.1
study of the present village patterns is of vital interest. The study of a village plan, is made with reference to the layout of the basti (inhabited site) based on the arrangement of houses and village streets or lanes. This may be clearly seen in compact and semi-compact settlements.

Since settlements are the outcome of man's movement over space, the study of man's movement is of crucial importance. The present analysis is concerned with the concept of bounded space. The territorial limits of a village and its built up area form a geographical space or bounded space, within which its inhabitants live, move and perform their economic and social activities. The analysis of residential area as well as village boundary become significant as it is observed that territorial spaces in which locational decisions are made, are determined by the correlation between bounded space and other geographical factors. Here an attempt has been made to deal with the concept of bounded space in the light of classical (or traditional) view as well as geometrical (or modern) approaches.

2. Shape Analysis: Classical Approach:

The emerging methodologies since late nineteenth century indicate the traditional or classical view of shape analysis, mostly followed by Meitzan (1895) in dealing with the classification of rural settlements of Germany on the
basis of their forms and patterns. Demangeon has added to this the morphological structure of villages and their plans in describing village shape.¹ In his study of Yamato Basin, Hall used the external forms of settled areas as a basis for the classification of village patterns.² His methods have been followed by other European geographers. In India this approach has been initiated by Singh, in describing the layout of villages in the middle Ganga Valley. According to it, the entire village is divided into a number of squares or rectangles, each forming separate strips of farms, pastures of gardens with definite field boundaries like fixed village limits.³ In a settlement pattern, two elements are common, i.e., the main inhabited site and the hamleted sites while the structural arrangement of inhabited sites vary in their shapes.

The present analysis of village pattern is primarily concerned with clustered settlements, as such settlements, on account of the congregation of a number of dwellings and arrangements of associated lanes give rise to different village patterns. So the study is confined to only those

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villages which have compact or semi-compact settlements. For this analysis, villages of varying shapes have been selected from the Survey of India's topographical sheets, on the scale of 1 cm. to 500 metres or 1:500000. The villages selected have been checked during the course of the field survey and their patterns of arrangement of inhabited site were corrected on spot with the help of village cadastral maps and personal observation, wherever possible. On the basis of the above mentioned methods of observation, a number of settlement patterns have been identified, which are as follows:

Rectangular Pattern

The most common village shape of the nucleated settlements is the rectangular one. This is not true only for the area under study, but also for other parts of India, China, Japan and Italy. The main causative factors for this pattern is the rectangular division of land prevalent in ancient times known as the bigha system, comparable with the jori system of Japan, han-den of China and jugerium of Italy.1 In fact, rectangular pattern is a heritage of the ancient past, as it has been mentioned in the Manasara.2 Our

2. Ahmad, E., op.cit. p.100.
land measurement system – *bigha*, based on square units, has been responsible for the emergence of this pattern of villages. People did not want to disturb the shape of the fertile arable fields adjoining their dwellings as these fields were the chief assets and sources of livelihood of the farmers.

An aggregation of rectangular or square dwellings results in rectangular plans for villages. The rectangular alignment of dwellings with their main axis from north to south and east to west is also designed to get maximum sunlight and fresh air. Another advantage of rectangular shape lies in maximum accommodation of dwellings in a number of rows parallel to each other. In brief, whenever human habitations are agglomerated, the plan of the village conforms broadly to rectangular shape and when it did not have a natural growth, the pattern is generally irregular or roughly rectangular or square. Rectangular pattern is the chief characteristic of the study area. Ahan, Jalalpur, Pora, Rasulpur etc. are some of the example of this pattern (Fig.5.2, A1, A2, A3, A4).

2.1 Hollow Rectangular Pattern

Hollow rectangular pattern is marked by an unbuilt open space in the middle of a settlement. It is mostly found in areas of frequent strife, where the central vacant space was formerly occupied by an old fort or palace of the local
chieftain, around which the villagers congregated. In course of time the family of the chieftain was ruined or shifted, with the result that the fort or the palace disappeared and space is now marked by a mound of ruins at the centre of the settlement. Superstition does not allow people to build houses on ruined sites. Hence the neglected space remains unoccupied and results in a hollow rectangular pattern. Some other typical features like a temple, a church, a mosque, a pond, shady trees etc. in the middle of a village may also lead to the formation of such a pattern. In summer, peasants gather under the trees for relaxation and in winter evenings a bonfire may be lit around which the village folk exchange gossips. In some instances, weekly or bi-weekly markets are held in the vacant place villages of Madrak and Lakhnu around forts and village Kalai around a temple may be cited as examples of this pattern (Fig. 5.2, B1, B2, B3).

2.2 Square Pattern:

The square and the rectangular patterns are complementary to each other. Due to attractive but restrictive physical forces in a village site a square settlement may turn into a rectangle one, and vice-versa. The crossing of cart-tracks or roads leads to the formation of this pattern. Villages lying at the intersection of two cart-tracks give rise to four distinct blocks, all in square shape. Existence of thick grooves, tanks or ponds, road etc. restrict the growth of houses outside the squares. These four squares are
sometimes occupied by the four castes. Villages of Nadona, Shahbazpur, Balaquipur and Ginoli-Kishanpour are some of the best examples of square pattern of settlement in the Aligarh District (Fig.5.2, C1, C2, C3, C4).

2.3 Hollow Square Pattern:

The hollow square pattern is similar to the square pattern with a hollow or unbuilt space in the centre of the village. As in the case of a hollow rectangular settlement, the unbuilt space is caused by the presence of a tank or a temple or mosque or a garden or by any such other feature. Raipur may be cited as an example of this pattern in the District (Fig. D).

2.4 Elongated or Linear Pattern:

Elongated or linear arrangement is another common settlement pattern found in the region. It is easily recognised by a simple arrangement of houses along a road, lake shore or river bank, etc. This is mostly due to the effect of the site, physical or cultural forces in the site which either restrict the growth of some settlements in a particular direction or foster its extension in others. The danger of inundation in the flood prone areas and the advantage of proximity of a river for obtaining drinking water in flood free areas are some of the physical factors which cause elongation of settlements. Among cultural factors, metalled or unmetalled roads and railway lines also
exert result in the elongation of villages. Roads and cart-tracks attract the people to settle along them. In the past the danger of troops or organised robbers attacking the villagers prevented the growth of settlements along the roads, but now a days a considerable number of market villages may be seen along transport arteries. Hassain, Pisawa, Jattari, Ognipur are some of the best examples of elongated type of villages in the Aligarh District which have developed along roads or cart-tracks (Fig. E1, E2, E3, E4).

2.5 Circular Pattern:

Circular settlements, which may have several variations, result from an attempt to build a maximum number of houses at one site. Such houses are generally built around the mansion of the local zamindar or clan chief or around the village well. This pattern is a heritage of the past, particularly of the eighteenth and nineteenth centuries, when the security of the villagers was uncertain. A considerable number of such a type of semifortified settlements have a circular pattern. "The circular form was a natural result of maximum aggregation for the purpose of defence, around the mansion of the local zamindar, who used to protect the peasants against a for-ay by a neighbouring chief.\(^1\) The village Maihgora and Bisara in the Aligarh District may be

\(^1\) E. Ahmad, op.cit., p.105.
cited as examples of circular pattern of settlement. In some cases natural barriers like shallow marshes or lakes, etc. or religious buildings like temples or mosques, ponds, wells or market places, etc. also produce such a circular pattern. Due to the presence of these cultural features in the centre, hollow circular pattern is developed. Purdilnagar and Chandaus are the best examples of such a hollow circular pattern in the District. The presence of a mosque in the centre of Purdilnagar and of a temple in the centre of Chandaus are the factors responsible for their circular form (Figs. F1, F2, F3, F4).

2.6 Radial Pattern

This sort of village pattern is similar to the circular pattern with a slight variation in the internal as well as external structure of the layout. The radial pattern of settlement is conditioned by the radiating character of cart-tracks or lanes,1 which converge on a central point, such as the house of the zamindar, a place of worship, a sweet water well or a village shop etc. Parsara, Budhaka and Kachaura may be cited as examples of this pattern in the District (Figs. G1, G2, G3).

2.7 Chess-Board Pattern:

The chess-board or grid iron pattern denotes a "right angled mesh of streets with or without a central rectangular

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FIG. 5.2

SOURCE: SURVEY OF INDIA TOPOGRAPHICAL SHEET NO.

53 H 53 E 54 T 54 E 54 E
16 13 2 14 13

TEMPLE
market place. Such a plan is the typical feature of some large rectangular and square villages. In such large villages two or more streets meet each other at right angles and a few other subsidiary lanes run parallel to the main street, which give rise to such a pattern. Generally the village is divided into several wards or tolas, each inhabited by the people of a distinct caste. Jalali, Bajhauta, Mau Chirail are some of the typical examples of this pattern in the study area. (Figs. 5.2, H1, H2, H3).

2.8 Double Nucleation:

This is characterized by two villages so near to each other that it one of them must have grown up by colonization upon the edge of the other. Among the physical and cultural features a small 'nala', ponds, canal, road, railway line, etc. are important factors producing such a pattern. From revenue and administrative point of view, each village may have a separate entity, but geographically them two are one. Such a pattern may also develop as a result of market attraction. Villages of Ratanpur - Husainpur, Chhonda-Gawa, Tikari-Khera and Basai-Basgoi are some of the examples of twin villages in the Aligarh District (Figs. 5.2, 11, 12, 13, 14).

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2.9 Fan Pattern

Such a pattern usually develops where some focal point is situated at one end of the village. This focal point may be a tank, a river side, a road or a place of worship. This pattern also develops at the convergence of routes. It is more conspicuous if the focal object has a curved line convex to the village. Village Tappal located in tehsil Khair in an example of such a pattern in the Aligarh District (Fig.1).

2.10 Triangular Pattern:

This pattern occurs on a site where the growth of the settlement is restricted on three sides by certain physical or cultural factors. Cart-tracks, roads, rivers etc. may restrict the growth of a settlement. This pattern may also come into existence at the junction of three roads. Kauriaganj, Tahirpur and Rukhala may be cited as examples of this pattern in the District. It is not a common pattern in the study area (Fig.5.2, K1, K2, K3).

2.11 L-Shaped Pattern

L-pattern is a subsidiary pattern of the rectangular or square form. It comes into existence when two roads or cart-tracks meet at right angles and attract the people to settle along them. This type of settlement is not common in the Aligarh District. Village Dadon is a good example of such a pattern.
2.12 Amorphous Pattern

The amorphous form of rural settlements is found in an area "where several settlements and farmsteads are found scattered, connected by foot-paths and cart-tracks having no definite shape. Such villages are dotted with numerous hamlets and individual farm-steads, all being very small and are linked with the central hamlet by uneven paths. Such an irregular distribution of settlements with no definite pattern, is called the amorphous pattern. This pattern may be seen in tehsils of Sikandra Rao and Atrauli as well as the Mursan Block of Hathras tehsil. Kastli, Sarai, Nagla Adu and Maloli may be cited as examples of this pattern in the District. (Figs.5.2, M1, M2, M3, M4).

3. Regional Distribution:

As has been observed above, patterns of settlements are determined by various micro-geographical conditions such as site characteristics, transport arteries and available local facilities. Since these local conditions are not the same in the region under study, it cannot be clearly demarcated into sub-regions according to particular settlement patterns. Even though the predominance of particular settlement patterns can be identified in certain sub-regions.

Rectangular and square settlement pattern are the characteristic feature of the entire study area. They are found in areas of compact and semi-compact settlements. The
northern part of tehsil Khair, Koil and Atrauli and the eastern part of tehsil Hathras are well marked with such settlements. There are a number of hollow rectangular settlements in the area under study, but hollow square settlements are rare in it.

Circular settlement pattern, which is related to the need of defence, occurs in areas which have been most disturbed in the past. Such settlements are found in Khair, Iglas, Atrauli and in some parts of Koil and Sikandra Rao tehsils. In fact, large settlements of circular form reflect their ancient character. Elongated or linear settlement pattern is found in the western part of the district, particularly along roads and cart-tracks.

The chess-board pattern is the characteristics of large settlements and is not uncommon in areas of compact settlements. Radial pattern is found in Hathras and Sikandra Rao tehsils, while amorphous pattern is frequently met with in tehsil Sikandra Rao as well as in the south-eastern parts of Atrauli tehsil.

Other patterns such as Fan pattern, L pattern, triangular pattern etc. exist in condition that favour such settlements. The number of settlements with such patterns is very small.
4. Shape Analysis: Geometrical Approach

The geometrical or quantitative approach of shape analysis is based on the 'elementary packing theory' which analyses the village shapes in respect of 'efficiency of movement'. This theory postulates "two measures of efficiency: (i) efficiency of movement as measured by the distance from the centre of outlying parts within the territory, and (ii) efficiency of boundaries as measured by the length of the territory's perimeter".¹ The second of these criteria is more valid because decision and movement are closely associated with village boundaries. As a matter of fact, three geometrical properties, area, shape and connectivity, are the characteristics of bounded space where any simply connected shape can be represented by a polygon with any number of sides of equal or variable length.² Circles tend to have an infinite number of sides and vertices, but their series over a region either tend to overlap or to leave a number of gaps. So three kinds of regular tessellations, i.e., triangle, square, and hexagons (Fig.5.3 a), are most suitable for packing an area where hexagon retains most of the characteristics of a circle in

². Bunge, W., Theoretical Geography, London, (1962), pp.73-74; See especially chapter Four: 'The measurement of Shape'.
EFFICIENCY OF ALTERNATIVE TYPES OF REGULAR POLYGONS IN RELATION TO DISTANCE FROM CENTRES AND PERIMETER LENGTH

FIG. 5.3
terms of minimising the distance, movement and absence of any gap. Here the circle is considered to be an ideal geometrical figure owing to its maximum packing capacity, compactness and better accessibility. So circular geometry has been used for the computation of shape in the present analysis.

Early theorists like Christaller and Losch have used the hexagonal shape to explain spacing, distribution and settlement area. However, it has been lately observed that a rectilinear or rhomboidal pattern of lattice could also serve as an alternative to the hexagonal one.

The concept of shape analysis was initiated by Thompson. It was later adopted and developed by Miller in the shape analysis of drainage basins. He concluded that drainage shape $S$, could be expressed as the ratio of the area of the drainage basin $A_b$, to the area of the circle having the same perimeter $A_c$, i.e. $S = A_b/A_c$. The same formula has been adopted by Haggett in the shape analysis of Brazilian settlements where Shape Index ($S$) of a village may be


expressed as the ratio of the area of the village (A) to the area of the circle with the longest axis (L) as a perimeter (\(\pi R^2\)). So,

\[ S = \frac{A}{\pi R^2} \text{ or } 4\frac{A}{\pi L^2} \text{ or } 1.27 \frac{A}{L^2} \]

Here the constant value 1.27 is adjusted in such a manner that the circle would have a maximum index of 1.00, and minimum value of 0.0; values for the three other theoretical lattices being 0.42 for triangular, 0.64 for square, and 0.83 for hexagonal shapes. To represent the shape ratio of a circle in percentage, multiplier of 100 may be added. Simmons, Boyce and Clark, have analysed the shapes of urbanized areas rather than their population using the framework of circular geometries, while Wilkins and Shaw have taken the population attribute as well as urbanized area and have also tried to develop formulae for the measurement of shape distortions and their testing procedure.\(^2\)

Since these methods are complicated ones, like Thomson's which measure is often concerned with three


dimensional shape, they have not been used for the present analysis.

From the foregoing discussion, it may be concluded that Miller's formula is more appropriate for the shape analysis of Indian villages. Hence an attempt has been made in the present work to apply his formula to calculate the shape values of selected villages.

Out of 1,704 villages in the Aligarh district, 174 (about 10% of the total) have been selected on random basis for the present study. The shape analysis of these villages reveals that in reality settlements do not conform to any of the three lattices, discussed above. Moreover, these settlements differ from one another in a number of respects. Shape indices obtained as per Miller's formula for 174 sample villages of the District are given in Table 5.1. The Table shows that 69.44 per cent of the sample villages, (121 out of 174) lie between the shape indices of 0.3 and 0.7, the average shape index of the study area being 0.5994. A perusal of Table 5.2 shows that 18.97 per cent of the villages conform roughly to rectangular or square shape. As stated above, this is mainly due to the rectangular system of land division, the bigha system, prevalent during earlier times. There are only two villages which represent very elongated shape i.e. < 0.1. These two villages are Rustampur Akhan (Lodha Block) and Shikargarhi (Jawan Block),
<table>
<thead>
<tr>
<th>Village</th>
<th>Shape Index ($)</th>
<th>Village</th>
<th>Shape Index ($)</th>
<th>Village</th>
<th>Shape Index ($)</th>
</tr>
</thead>
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<td>Altipur Taluka Dariya</td>
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<td>Nagla Bijaiya</td>
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</tr>
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<td>Amokhari</td>
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<td>0.51</td>
<td>Chotua</td>
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<td>Dand</td>
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<td>Khirsioli</td>
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<td>Sukha</td>
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<td>-</td>
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<td>Gangabas</td>
<td>0.32</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nagla Jyothi</td>
<td>0.49</td>
<td>Kanchanpur</td>
<td>0.87</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dehat Sasni</td>
<td>-</td>
<td>Nanochane</td>
<td>0.77</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
while three villages may be categorised under circular shape i.e. > 0.9. They are Sangila Nagla Bari and Sukha (Mursan Block) and Suratgarh (Atrauli Block). The frequency of villages in different shape-groups has been plotted in Fig. 5.3b, which represent the sequence of triangular, square and hexagonal lattices. This Table shows a general trend from elongation to square, and unlike in Brazil, the area does not show gaps between groups of frequency distribution of shape indices.

The second characteristics of shape analysis is the number of contacts between a village and its neighbouring villages. In the regular hexagonal system the contact number is 6, while for the triangle the number is three, and it is four for the square. The contact numbers in the study area have been indicated in Table 5.2 along with the histogram (Fig. 5.4).

The mean contact number of sample villages is 5.648 which is very near to 6 observed in a strictly hexagonal system and thus it is which may be deemed to be representative of the study area. This is further corroborated by the fact that 63.8 per cent of the sample villages record contact number between 5 and 7. The contact index (contact number/village area) as shown in Table 5.2 and Fig. 5.4 C shows that 56.32 per cent of the sample villages have contact indices between 1 and 3.
TABLE 5.2
SHAPE CHARACTERISTICS OF SAMPLE VILLAGES

<table>
<thead>
<tr>
<th>Shape Index</th>
<th>Contact Index</th>
<th>Contact Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency %</td>
<td>Groups Frequency %</td>
</tr>
<tr>
<td>0.01-0.1</td>
<td>2 1.15</td>
<td>&lt;-1 10 5.75</td>
</tr>
<tr>
<td>0.1-0.2</td>
<td>16 9.20</td>
<td>1-2 39 22.41</td>
</tr>
<tr>
<td>0.2-0.3</td>
<td>13 7.47</td>
<td>2-3 49 28.16</td>
</tr>
<tr>
<td>0.3-0.4</td>
<td>32 18.39</td>
<td>3-4 30 17.24</td>
</tr>
<tr>
<td>0.4-0.5</td>
<td>41 23.56</td>
<td>4-5 18 10.36</td>
</tr>
<tr>
<td>0.5-0.6</td>
<td>33 18.97</td>
<td>5-6 7 4.02</td>
</tr>
<tr>
<td>0.6-0.7</td>
<td>15 8.62</td>
<td>6-7 6 3.45</td>
</tr>
<tr>
<td>0.7-0.8</td>
<td>14 8.05</td>
<td>7-8 5 2.87</td>
</tr>
<tr>
<td>0.8-0.9</td>
<td>5 2.87</td>
<td>8-9 4 2.30</td>
</tr>
<tr>
<td>0.9-0.10</td>
<td>3 1.72</td>
<td>&gt; 9 6 3.45</td>
</tr>
</tbody>
</table>

= 174 100.00  = 174 100.00  = 174 100.00

X = 0.59942  X = 3.397  X = 5.638
There appears to be no correlation between contact index, population density, and shape index (Fig. 5.5) because of the homogenous nature of the study area. Due to some forces of attraction population density becomes very high at some places. Table 5.3 gives a list of selected villages showing various categories of village shapes to highlight the relationship between shape and area/population of the villages.

5. Transformation of Village Shapes:

Transformation of village shapes takes place in order to minimise the transport cost, bring territorial limits of a village within easy reach of the village site and to accelerate the pace of economic progress and modernization. Village shapes are usually transformed into serial or regular polygons, or hexagons. The concept of shape transformation into serial polygons with varying area and shapes was first mooted by a German mathematician, G.L. Dirichlet, in mid-nineteenth century. Instead of the equilibrium system of economic and spatial area, he found tessellation of serial polygons with maximum packing density which he defines as, "the ratio of the area of a circle to the area of a polygon in which the circle is inscribed. Since this density will be evidently less than 1, the

<table>
<thead>
<tr>
<th>Villages</th>
<th>Block</th>
<th>Area/km²</th>
<th>Population Density/km²</th>
<th>Shape Index</th>
<th>Contact Number</th>
<th>Contact Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Circular and Semi-Circular</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sangila Nagla Bari</td>
<td>Mursan</td>
<td>2.08</td>
<td>356</td>
<td>0.99</td>
<td>6</td>
<td>2.88</td>
</tr>
<tr>
<td>Surat Garh</td>
<td>Atrauli</td>
<td>2.16</td>
<td>703</td>
<td>0.99</td>
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<td>Sukha</td>
<td>Mursan</td>
<td>1.64</td>
<td>277</td>
<td>0.96</td>
<td>5</td>
<td>3.05</td>
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<tr>
<td>(b) Hexagonal</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Plasallo</td>
<td>Khair</td>
<td>4.00</td>
<td>313</td>
<td>0.85</td>
<td>6</td>
<td>1.50</td>
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<td>Pohina</td>
<td>Jawan</td>
<td>2.90</td>
<td>358</td>
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<tr>
<td>Marchandpur</td>
<td>Atrauli</td>
<td>0.88</td>
<td>673</td>
<td>0.82</td>
<td>4</td>
<td>4.56</td>
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<tr>
<td>(c) Square and Rectangular</td>
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<td>Tappal</td>
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<td>339</td>
<td>0.63</td>
<td>7</td>
<td>4.56</td>
</tr>
<tr>
<td>(d) Triangular</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simrauthi</td>
<td>Tappal</td>
<td>6.78</td>
<td>325</td>
<td>0.42</td>
<td>7</td>
<td>1.03</td>
</tr>
<tr>
<td>Shahpur</td>
<td>Chandaus</td>
<td>3.29</td>
<td>384</td>
<td>0.42</td>
<td>7</td>
<td>2.13</td>
</tr>
<tr>
<td>Sikandarpur</td>
<td>Bhatras</td>
<td>2.02</td>
<td>278</td>
<td>0.43</td>
<td>5</td>
<td>2.50</td>
</tr>
<tr>
<td>(e) Klongateck</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rustampur Akhan</td>
<td>Lodha</td>
<td>0.56</td>
<td>634</td>
<td>0.07</td>
<td>6</td>
<td>10.74</td>
</tr>
<tr>
<td>Shikargarhi</td>
<td>Jawan</td>
<td>0.66</td>
<td>887</td>
<td>0.12</td>
<td>5</td>
<td>7.58</td>
</tr>
<tr>
<td>Ramgarh</td>
<td>Mursan</td>
<td>1.83</td>
<td>589</td>
<td>0.12</td>
<td>10</td>
<td>5.45</td>
</tr>
</tbody>
</table>
required, polygon will have density closest to 1. Serial polygon is known as 'cellular net' in Geography, 'mosaic' in Ecology, 'Dirichlet' or 'Voronoï' in Mathematics and 'Thiessen' in Meteorology. According to it, "diagonals are drawn between village-centres and perpendicular bisectors are erected to form a network of serial polygons." The main advantage of such polygons lies in the fact that they enclose within them areas that are nearer to the village centre than to any other centre and no change in the existing village site is necessary to have effective control over the enclosed territories. The second method, that of the hexagons, used by W. Christaller (1933) in his 'Central Place Theory' is based on the concept of uniform space and is very popular in geographical writings owing to its maximum packing capacity and uniform size.

Based on the foregoing discussion of the transformation of village shapes, three areas of discrete ecological settings from different tehsils related to physico-cultural factors of the Aligarh District (Figs. 5.6, A, B, C) have been taken for the present analysis as samples for transformation


TRANSFORMATION OF VILLAGE SHAPES INTO THIessen POLYGON'S AND HEXAGON'S

* VILLAGE  ○ RURAL MARKET CENTRE  --- VILLAGE BOUNDARY  --- METALLED ROAD

----- SERVICE AREA  ------ IDEAL TRANSPORT

FIG. 5.6
into Thiessen polygons and hexagons. It has been found that village sites are mostly related to physico-cultural factors whereas market centres mostly of bigger size have developed at the intersection of roads or along the roads.

The transformation of village boundary into regular polygons indicates that, as the number of market centres increases, sales in individual market centres decrease. This trend denotes the low cumulative purchasing power of persons inhabiting in the region concerned. Within this frame, Christaller's K value can also be tested which will show inverse relationships, that is, an increasing K value signifies better economic efficiency of a region, as shown in Figs.5.6, A3, B3, C3, according to which it has increased from 7 to 9 in one case and to 21 in another.

The transformation of village shapes into the hexagonal system is comparable to the theory of connectivity, which follows from Christaller's traffic principle. In fact, increasing K value affects connectivity in the same fashion as may had clearly seen in Figs.5.6, A3, B3, C3, where the increasing K value signifies increasing trend in connectivity by denoting better purchasing power. It is significant that Thiessen polygons are the most suitable for

the transformation of village shapes into regular polygons, because in this method the settlements are taken into consideration as they are (Figs. 5.6, A1 B1 C1).

It may be concluded from the foregoing that shape analysis by qualitative method indicates the role played by different physico-cultural factors operating in a region; whereas quantitative analysis gives the picture of an ideal pattern of settlement. So village shape analysis is most useful, as a tool for the purpose of village planning. In this regard either of the two methods could be adopted, but the quantitative or geometrical approach is more appropriate as it is more logical.
Chapter VI
Rural Dwelling and House Types
RURAL DWELLINGS AND HOUSE TYPES

Rural dwellings constitute the basic and universal element of cultural landscape, and occupy a significant place in the geographical analysis of human settlements. They represent human imprints upon the physical landscape and provide a clear evidence of the complex relationship between man and his environment. Houses are, thus, products of cultural traditions and natural conditions, and form a universal element of cultural landscape as well.

The term 'rural dwelling' includes not only residential houses ranging from the humblest huts of the poor to the most elaborate and massive city mansions, but all other human structures as well, where people congregate or where their goods are stored, such as schools, factories, warehouses, churches, etc. A house may be defined as a structure or part of a structure, inhabited or vacant, a shop or a shop-cum-dwelling or a place of business, workshop, school etc. with a separate entrance.

Housing is one of the three basic human needs i.e. food, cloth and shelter. A house is used by man as a resting place.

place to recoup his lost energy and also to protect himself from the vagaries of weather and wild animals. Though houses differ in their physical appearance and in the cultural attainment of their inhabitants, their basic purpose remains more or less the same.

Agglomeration of houses marks the origin of settlements and reflects the nature of a region, since their character is related to the environment and the cultural heritage of a people.¹ Rural dwellings are well adapted to the environment of a region which determines the nature of building material used in their structure on the one hand and the form of the roofs on the other. As such, a peasant's house is of great geographical interest since it is a reflection of the direct influence of the environment. Peasants' dwelling are rather simple in their structure and layout. Geographical factors and social needs combine to produce an architecture in which fashion or style plays little or no part. The peasant, with most meagre resources at his disposal constructs a simple structure, using locally available building material. Therefore, it is obvious that rural dwellings reflect the cultural heritage, functional needs and positive and negative aspects of non-cultural environment.

The Aligarh District is an almost homogeneous level plain. It is a part of the Ganga-Yamuna doab, drained by two

major rivers in the east and west, Ganga and Yamuna respectively, and a number of minor rivers in between. Although it is a uniform plain, there exist diversities at micro-level in physio-cultural and socio-economic conditions. Similarly, variations in religious rituals and caste structure are also found throughout the region. These factors influence the form, layout, architectural design and building material of the rural dwellings of the District. An attempt has been made here to study the role of physio-cultural environment on distribution, building materials and layout of the rural dwellings in Aligarh.

It has been said earlier that the physical environment and culture of the people largely influence the form, function and structure (both internal and external) of houses. Rural house types in the District clearly indicate the role of such factors. For example, available building material points to the micro regional characteristics of geology, soil and vegetal cover. The size and height of houses and use of different materials indicate the economic condition of the people. Two or three storeyed houses of the Rajputs speak of the relatively better economic condition of their families in contrast to one or two room dwellings of the Jatau (scheduled caste) population. The climatic elements, particularly temperature, wind direction and rainfall, influence the orientation and structure of rural
dwellings. Flat mud roofs, a salient feature of the rural houses of the District, distinguish these houses from those in other parts of the upper Ganga plain. This type of roof effectively keeps off internal heat and, if well-laid, may last up to 20 years under normal conditions. Climate remains the main consideration of the people while building their houses facing the east instead of the west. The former are better ventilated and receive sun rays of early morning, while the latter are subjected to the scorching after-noon sun, as well as westerly dust storms in the summer season. An open courtyard is an inseparable feature of rural houses because it provides ample sunshine and heat to the inhabitants during the winter and a comparatively cool place for sleeping during summer nights. Rural houses not only provide shelter, but also serve as work places for handicraft and cottage industries and retail shops to sustain the rural economy. Different mode of activities of the people result in differences in the structures, styles, sizes and plans of the houses of tradesmen, blacksmiths, carpenters and shop keepers etc. Similarly institutions such as schools, banks, hospitals, post offices, panchayat buildings etc. are designed to meet their specific needs. A marked contrast between the houses of the rich and the poor people may also be seen in the region. Prosperous sections of the population have better houses, mostly made of brick but the houses of the poor sections are made of mud.
1. Evolution of Rural Dwellings

Historical and archaeological evidence clearly reveals that rural dwellings in the study area go back to 1500 B.C. This is borne out by the legends and folk-lore of the area, by the presence of a large number of mounds, and more, convincingly, by the archaeological excavations in different parts of the District. The present form of rural dwellings is the outcome of thousand of years of cultural and economic progress in the study area. They have passed through different stages of development in their sizes, layouts morphology, architectural styles etc. It is known that settled life began with the onset of the neolithic age. It is generally believed that the earliest form of human dwelling was the cave. Then people started living in man-made dwellings, i.e., thatched huts, along the tributaries of major rivers or near other water bodies. The shape of the huts, in all probability, must have been circular or oval. It is presumed that the pre-historic men, taking their cue from shady trees like the banyan, constructed their first circular huts consisting of reed, twigs, tree leaves etc. in the forests of the region to lead a more sedentary life. These

types of houses are still seen along the Yamuna, Ganga and Kali rivers of the District. In due course, these huts were clustered together and the whole settlement was protected with fencing of tree trunks and bamboo etc. Some of these huts were arranged in rectangular or square shape. Thereafter, as a result of the development of economy and improvement of skills, an addition of courtyard was made to each of them which provided protection for the cattle besides having other functions.\(^1\) Brown bricks and stone were the predominant building materials during the Buddhist period.\(^2\) Archaeological remains of the Gupta and the Harsha Vardhana period suggests that the arts flourished in the District.\(^3\) During the ascendancy of the Meos, Kols and Bhars, a change took place in the pattern of the dwellings of the region. Their houses were generally made of clay and wood with circular and rectangular structures using reeds or thatching grasses to construct conical roofs on wooden poles.\(^4\)


\(^4\) Ibid., pp.22-25.
It is clear from the historical sources that the Aligarh District was covered with dhak (butea frondosa) jungles and the Khadar of Ganga and Yamuna were full of Jhau (tamarisk).\(^1\) A narrow belt of jahu in the Jamuna Khadar can still be seen, followed by broad stretches of plains covered with thatching grass.\(^2\) These materials which were locally available must have been used in the construction of rural dwellings when people first settled in this region. There is a gap and a lack of conformity between the ancient and the medieval periods. Nothing definite is known about the dwellings of the region till the twelfth century.\(^3\) During the Mughal period most of the tombs, mosques and buildings built by the rulers show magnificent blending of Indian and Persian architecture in the District. The minar (tower) at Koil, the fortress and the mosque at Jalali, the fort at Koil, the mosque of Sikandra Rao, the gates of the fortress at Balai Qila such as the Delhi Gate, the Madar Gate, the Turkman Gate and the Sasni Gat,\(^7\) some monuments of Akbar's period found in Bagh-i-Gesu Khan, now a general graveyards in Koil are good examples of this blend. Stone seems to be the most common building material used during this period.

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Similarly, during the British period, new types of building materials like cement, brick, lime and iron-bars gained wide popularity, especially in the construction of government buildings. But the rural dwellings were deprived of such material. Only the mansions of the affluent people like zamindars, jagirdars and public buildings used this material. In post-independence period, certain changes in the structure and plan of the rural dwellings have taken place due to improvement in the socio-economic condition of the people. Burnt brick, cement, mortar, iron bars, stone slabs which were earlier used only by affluent people or in public buildings, are now being used even by the people belonging to the middle income group in the District. The majority of the rural houses in the region continue to be built with available local materials like mud, wood, thatching grasses and so on. Such houses are quite common along the rivers Yamuna, Ganga and Kali.

2. Distribution of Rural Dwellings:

The distributional pattern of rural dwellings generally follows the pattern of rural population distribution and is determined by the physio-cultural and socio-economic condition of the region. However, minor variations do exist in the distribution and characteristics of rural dwellings between one parts of the region and another. The density of the rural houses has been calculated, taking into account all
the revenue areas of the village including agricultural lands, orchards and waste-lands, since data of the built-up area of village settlement is not available. For calculating density, only the actual area under settlement should have been taken into consideration. But due to non-availability of relevant data, the density of rural houses/sq. km. has been calculated on the basis of the number of occupied residential houses of a block/area of the block.

The distribution of rural dwellings and their plans are, to a great extent, influenced by socio-economic status of persons inhabiting them. According to 1981 census, there are 3,32,513 rural houses in the District, with an average density of 68.87 houses per square kilometre.

Table 6.1 shows the density of rural dwellings per square kilometre of the District at the block level. The maximum and minimum densities 84.20 houses/km² and 58.60 houses/km² are found in Sasni and Tappal blocks respectively. Most of the blocks having density of more than 70 houses/km², lie in the Ganga Khadar and in the central part of the region. Densities ranging from 58 houses/km² to 65 are found in Akrabad (62.94), Sikandra Rao (63.84), Gonda (64.07), Hasayan (64.17) and Iglas (65.50). Higher density of houses is due to fertile soil, better means of irrigation and transport etc, while lower density is due to usar lands and poor means of irrigation and transport. Figure No.6.1 shows the density of rural dwellings in the district.
TABLE 6.1
DISTRIBUTION OF RURAL HOUSES AND DENSITY AT BLOCK LEVEL

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Area sq. km.</th>
<th>Occupied residential houses</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akrabad</td>
<td>278.0</td>
<td>17497</td>
<td>62.94</td>
</tr>
<tr>
<td>Atrauli</td>
<td>283.9</td>
<td>20705</td>
<td>72.93</td>
</tr>
<tr>
<td>Bijauli</td>
<td>250.6</td>
<td>17651</td>
<td>70.43</td>
</tr>
<tr>
<td>Chandaus</td>
<td>329.7</td>
<td>19689</td>
<td>59.72</td>
</tr>
<tr>
<td>Dhanipur</td>
<td>237.8</td>
<td>21054</td>
<td>73.15</td>
</tr>
<tr>
<td>Gangeri</td>
<td>345.3</td>
<td>26048</td>
<td>78.04</td>
</tr>
<tr>
<td>Gonda</td>
<td>286.4</td>
<td>18327</td>
<td>64.00</td>
</tr>
<tr>
<td>Hasayan</td>
<td>234.1</td>
<td>18232</td>
<td>64.17</td>
</tr>
<tr>
<td>Hathras</td>
<td>237.3</td>
<td>18470</td>
<td>77.83</td>
</tr>
<tr>
<td>Iglas</td>
<td>256.6</td>
<td>16832</td>
<td>65.60</td>
</tr>
<tr>
<td>Jawan</td>
<td>293.2</td>
<td>21759</td>
<td>74.21</td>
</tr>
<tr>
<td>Khair</td>
<td>320.4</td>
<td>19075</td>
<td>59.53</td>
</tr>
<tr>
<td>Lodha</td>
<td>267.7</td>
<td>17923</td>
<td>66.95</td>
</tr>
<tr>
<td>Mursan</td>
<td>226.3</td>
<td>17688</td>
<td>78.16</td>
</tr>
<tr>
<td>Sasni</td>
<td>268.6</td>
<td>22617</td>
<td>84.20</td>
</tr>
<tr>
<td>Sikandara Rao</td>
<td>257.5</td>
<td>16439</td>
<td>63.84</td>
</tr>
<tr>
<td>Tappal</td>
<td>368.7</td>
<td>21607</td>
<td>58.60</td>
</tr>
<tr>
<td>Total of the District</td>
<td>4842.1</td>
<td>332513</td>
<td>68.67</td>
</tr>
</tbody>
</table>


3. Morphology of Rural Dwellings

The analysis of rural dwellings involves considerations of natural environment and socio-economic condition of the region which are responsible for variations in architectural styles, ground plans, sizes and shapes and building materials of the houses. However, certain features such as courtyard
(angan, anganai) and verandah (osara or osari) have been found to be common in most of the north Indian rural dwellings.¹ In spite of the physio-cultural and socio-economic variations at micro level certain features such as courtyard, verandah and raised platform are common in the rural dwellings throughout the Aligarh District.

3.1 Courtyard (Angan)

The most important feature of rural dwellings in the study area is the courtyard or angan, which is a rectangular or square open space occupying the centre, front, or back of the houses Fig.6.2. It is often enclosed by rooms on all sides or on two or three sides by rooms and remaining sides by walls of about 1.5 to 2 metre in height. The courtyards in the houses of upper and middle class people are used for maintaining family privacy, while poor people consider it as the best source of relief from congested accommodation and a place where they can keep their cattle and agricultural implements. Besides, it is also used for sleeping purposes for women and children during the summer and sun-basking during the winter. Other uses include drying, grinding, threshing, cooking and various social and religious activities.

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ALIGARH DISTRICT

MORPHOLOGY OF RURAL DWELLINGS

ROOM
RAISED-PLATEFORM

ROOM
RAISED-PLATEFORM

ROOM
RAISED-PLATEFORM

ROOM
RAISED-PLATEFORM

ROOM
BAITHAK

VARANDAH

COURT-YARD

BAITHAK

VARANDAH

COURT-YARD

COURT-YARD

VARANDAH

TH—THATCHING
DP—DUBARI OR POLI
BR—BATHROOM
LA—LABATARY
CS—CATTLE SHED
ST—STORE
KI—KITCHEN
FS—FODDER STORE
A—HANDPUMP
O—WELL

FIG. 6·2
3.2 Verandah

The second important feature of rural dwellings in the region is the roofed or thatched verandah. Usually there are two verandahs in a dwelling inner and outer. While almost every house is provided with a verandah, its size varies according to the nature and size of a house. A single-roomed house usually has a small verandah in front of it extending a metre ahead of the front wall, which is most useful as poor people do most of their domestic work in it during the daytime. It is also used for sleeping during the night, because a single roomed house is usually not properly ventilated. In the houses of upper and middle class people, such a verandah is known as baithak and (parlour). Sometimes it is also converted into a shop for selling small items of daily need (Plate No61). It is also used as a work place by village craftsmen like carpenters, blacksmiths, and weavers (Plate No62). The verandah in the inner side of the house surrounding the entire courtyard is mostly used as a sitting and sleeping place for the female in mates and children. Part of it is sometimes used as cow-shed, or for storing foodgrains and fodder etc. These verandahs are supported by walls of mud, or burnt or unburnt bricks or wooden pillars and are open enough to permit sunlight and air get into the adjoining rooms. Inner verandahs all around the courtyard not only protect the walls and floor during the rains but
also serve as a covered passage to rooms during hot summers and the rainy season.

3.3 Raised Platform

A raised platform or chabutra in front of the main entrance is an integral part of the rural houses of the area. It is used by the males as a meeting place in the evening. Since this platform faces a lane or street the women belonging to the upper and middle class families rarely use it because they are supposed to remain secluded from the male members outside. However, the women of the weaker section of the society do not have such a restriction imposed upon them and therefore it is used for different purposes by both men and women from the poorer classes. The chabutra is connected to a 'dubari' (entrance room) (Fig.6.2) which runs from the main entrance to the inner courtyard. It has a simple or stylish wooden door, depending upon the status of the residents.

An interesting associated feature of rural habitation is the place outside the houses, where the droppings of the cowdung are collected, dried, and heaped into a miniature hut shaped structure called bitorah (Plate No63). They are covered with straw or plastered with liquid dung mixed with straw to preserve them from rains. It is the daily duty of the village women to form during cakes of different shapes and piled them up after drying them. Generally these bitorahs are to be found on the outskirts of a settlement?
The morphological characteristics and sizes of rural dwellings of the area are shown in Fig.6.2, which clearly reveals that the basic unit of an average rural house is a rectangular room which forms the dwelling place of poor families. This one-room house usually has a raised platform in front of it thatched or unthatched which varies from 4 to 8 metre in length and 2 to 4 metre in breadth. A two-room house is usually an extension of one room to meet the growing need of more accommodation. Such type of dwellings form an I-shape. A three room house usually has an L-shape, in which the third room is generally used by the males as a baithak (parlour). A house of four rooms generally has a U-shape, which provides for a courtyard (angan) and the main entrance (dubari). Dwellings of five or more rooms rectangular or square shape generally have angan, a varandah, a kitchen and a store room. Rooms, having two doors - the inner one which opens into the courtyard and the outer one forming main entrance of the house, are the biggest of all the rooms of a house. The outer door or the main entrance is not exactly opposite to the inner door so that privacy of the courtyard may be maintained. Sometimes in the dwellings of the upper class people there is also a back door. The front doors of the houses are found generally located toward the east for getting the benefit of mild sunrays in the morning and pleasant shade in the afternoon.
4. House Types And Their Regional Distribution:

The physico-cultural environment and the socio-economic condition of the people influence the form, function, structure and layout of their houses. Building materials and architectural forms are expressive of the physical factors of a region whereas the ground plan is related to the socio-economic conditions of the resident. The Aligarh District has different types of dwellings within settlement units, variation from one area to another, depending upon the building materials available and the socio-economic conditions of the people. This leads to the classification of house types of the region into two main categories.

1. Based on Building materials
2. Based on size and shape

4.1 Based on Building Materials

The building material used for making the wall and the roof generally indicates the economic condition of the inhabitants. Majority of the rural houses use the building material which is available locally. The rich build houses of burnt bricks, cement, concrete and iron sheets while the poor and middle peasants build mud-walls and flat clayey roofs of sun-dried unburnt bricks and cover it with tiles or thatch. Mud, wood, bamboo, sugarcane leaves and stalks of plants such as arhar etc., form the basic local materials for the
construction of rural houses in the District. Mud or clay, the most universal of all the building materials, is widely used in the rural houses of the study area because it is a part of level plain wherein plenty of cheap clay is available to construct walls and roofs which can easily be formed into different shapes even without the help of skilled workers and hence the houses built with such materials are simple and economical. The construction of mud walls is simple. Heaps of damp mud ('lou da') are piled up to form a layer of 30 to 50 centimetre in height (called 'radda'), and, when it is dried and has become compact a fresh layer is added to obtain the required height (4 to 5 metres). The roof is covered in the same way.

Table 6.2 shows various types of wall and roof materials used in the rural houses of the study area. It has been found that 51.49 per cent of rural houses use mud and unburnt bricks as wall material. Similarly, mud and thatch roofing materials contribute 69.62 per cent of the total rural houses. On the basis of the building materials, rural house in the District may be put into the the following four distinct categories:

1. Grass, Reed and Bamboo Walled Houses with Thatched Roofs

This is a common feature of the rural houses of the poor people. Though the quality of thatch depends on the availability of local vegetation and crops, its use is
TABLE 6.2

DISTRIBUTION OF RURAL HOUSES BY PREDOMINANT MATERIALS OF ROOF AND WALL

<table>
<thead>
<tr>
<th>Material of Wall</th>
<th>Total Households</th>
<th>MATERIAL OF ROOF</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Thatch &amp; Brick,</td>
<td>Metal Sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mud roof, stone,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>tiles, lime</td>
<td></td>
</tr>
<tr>
<td>All Material</td>
<td>335425 (100.00)</td>
<td>233535 (69.62)</td>
<td>85410 (25.46)</td>
</tr>
<tr>
<td>Grass, leaves, reeds or bamboo</td>
<td>17315 (5.16)</td>
<td>16790 (5.00)</td>
<td>...</td>
</tr>
<tr>
<td>Mud &amp; Unburnt Bricks</td>
<td>72705 (51.4)</td>
<td>169385 (50.49)</td>
<td>895 (0.26)</td>
</tr>
<tr>
<td>Burnt bricks</td>
<td>143645 (42.82)</td>
<td>46970 (14.00)</td>
<td>84080 (25.05)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1760 (0.52)</td>
<td>390 (0.11)</td>
<td>435 (0.13)</td>
</tr>
</tbody>
</table>


Note: Figure in the brackets shows the percentage of the total rural houses of the district.
determined by the income level of the dwellers. People of lower castes and poor people find it cheaper and more convenient to make thatched roofs of phuna, kane or leaves by fastening them with moist branches of arhar or strings in a rectangular framework of bamboo. This readymade cover is placed over ridge poles of logs or bamboo. Such kind of houses account for about 5 per cent of the total number of rural dwellings of the District. They are found in the western margin of Tappal Block and in the eastern margin of Atrauli Block, particularly along the flood prone areas of Yamuna and Ganga rivers. Such a type of houses may also be seen in some areas of Sikandra Rao tehsil and at some places along the bank of Kali river. Such houses generally have one or two rooms with 3 to 5 metre in length and 2 to 3 metre in width. The inner part of the wall is plastered or smoothened with a mixture of clay and cowdung. They are very susceptible to damage caused by fire, floods and storms.

1. Mud and Unburnt Brick Walled Houses with Thatched and Mud Roofs

A Majority of the rural people, especially cultivators and agricultural labourers live in mud walled houses with flat clay and mud roof dwellings. Mud walls are constructed with unsorted clay or unburnt bricks and have mud roofs. Poor farmers and landless labourers have thatched roofs in the houses. Unburnt brick as wall material is very popular in
Tappal, Chandaus, Gonda, Akrabad, Sikandra Rao, Biajuli and Atrauli blocks. Such houses are found in almost all parts of the study area. They account for nearly 50% of the total rural dwellings of the District. The thatched (chappar) verandah is a common feature of these dwellings. Such a chhappara in front of the main entrance is a typical feature all over the region. The poor man's house generally has no inner courtyard, but a chhapar in front of the single roof dwelling which provides additional space for cooking, receiving guests or keeping the cattle during the night (Plate No. 6.4).

III. Burnt Brick Walled Houses with Thatched, Mud and Tiles Roofs

The burnt brick walled houses with thatched or mud roof dwellings cover about 14 per cent of the total rural dwellings of the District. Tiled roof houses constitute only 0.61 per cent of the total number of houses in the study area. They may be seen in Atrauli, Koil and Sikandra Rao tehsils and particularly in the areas of clayey loam soils, i.e., in the vicinity of Kali Nadi. These roofs are more durable than those of thatched and mud and are cheaper than brick or stone roofs. Tiles are manufactured locally by village potters and baked in ordinary fire wood. These tiles are placed systematically on a framework of wood obtained from local trees which rests on the gable of the wall supported by transversely fixed beams. The roof may be over hanging on one
or both sides, having very gentle slope. Mud roofs are made by spreading a thick layer of mud over a network of straw or pieces of wood or stalks of arhar, which rest upon closely spaced wooden beams or crooked branches of local trees such as mango and neem etc.

IV. Burnt Bricks Walled Houses with Burnt Brick, Stone and Lime Roof Dwellings (Pucca Dwellings)

These kind of houses cover about 25 per cent of the total number of rural dwellings of the District. Such houses reflect the prosperity of the area and the higher socio-economic status of the people residing in them. Members of the higher castes and rich people prefer to use burnt bricks in the construction of walls and use stone slabs and burnt bricks in making their roofs. The highest concentration of such houses is seen in Atrauli Roil, Hathras and Iglas tehsils, where there is a dominance of people of high castes ie. Rajputs Brahmins, Lodhas, and big land holders. Although such houses are unevenly distributed over the entire area, they are more larger in numbers in rural service centres and in areas nearer to urban centres. These are mainly single storeyed structures consisting of brick walls and pucca roofs. The height of their ceilings is usually between 3 and 4 metre while their plan is rectangular in shape. These houses have facilities of latrines, bathrooms and brick or
stone stairs. Roofs are used for sleeping purposes in summer and for drying food grains and other materials in sunshine (Plate No. 6.5).

4.2 Dwelling Types Based on Size and Shape:

The size of a dwelling reflects the economic conditions of the dweller and the size of household. Sizes of the houses in the Aligarh District vary from palatial buildings to single room huts, which mark the difference between the rich and the poor. It was observed during field surveys that one or two room houses were inhabited by the poor, while the middle class people lived in three to four rooms dwellings and the rich lived in houses having five or more rooms.

Table 6.3 reveals that one and two room dwellings together constitute more than two third of the total number of rural houses of the District and offer shelter to 71.81 per cent of the total rural population. Such houses are very small in size and represent a rudimentary form of compact structures, where men and cattle find shelter under the same roof. Such houses are cheap to construct, but are uncomfortable and unhygienic because the same room is used for sleeping, receiving guests, and as kitchen and store and for keeping cattle (Plate No.64). The three and four room dwellings, which are nearly 20 per cent of the total rural houses, provide accommodation to over one-fifth of the total
PLATE NO.6.4 Poor man's Multi-purpose Dwellings

PLATE NO.6.5 Rich man's Dwelling
TABLE 6.3

CLASSIFICATION OF RURAL HOUSES ACCORDING TO THE NUMBER OF ROOMS AND RURAL POPULATION LIVING IN VARIOUS SIZE OF HOUSES

<table>
<thead>
<tr>
<th>Type of House</th>
<th>Percentage of the total number of house</th>
<th>Per cent of the total rural population living</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-room</td>
<td>43.78</td>
<td>38.10</td>
</tr>
<tr>
<td>Two-room</td>
<td>32.35</td>
<td>33.76</td>
</tr>
<tr>
<td>Three-room</td>
<td>13.40</td>
<td>15.45</td>
</tr>
<tr>
<td>Four-room</td>
<td>5.94</td>
<td>7.07</td>
</tr>
<tr>
<td>Five-room</td>
<td>2.21</td>
<td>2.73</td>
</tr>
<tr>
<td>With 6 or more rooms</td>
<td>2.31</td>
<td>2.89</td>
</tr>
</tbody>
</table>

Sources: Compiled from Census of India, 1981, Series 21, Uttar Pradesh, Part IV, Housing Report and Tables, Allahabad.

rural population. Such houses are found mostly in Hathras, Iglas, Koil and Atrauli tehsils. Five and six room dwellings account for nearly 2.5 per cent of the total number of rural houses and accommodate 2.73 per cent of the total rural people of the District while dwellings with six room and more accommodate 2.89 per cent of its rural population.

The arrangement of rooms influences the shape of a house. One or two room dwellings usually have an I-shape,
while L-shape is found in cases of three room dwellings. U-shape dwellings, consisting of 3 limbs, with three or four rooms, are common in the District. Houses with five rooms or more are vary very greatly in form and structure.

The socio-economic status of the owner has a direct impact over the size and shape of the rural dwellings. The sample village studies reveal that people belonging to high castes and rich people like Rajputs, Brahmans, landlords, and business men, who own larger share of the village land and have accumulated wealth, generally live in well-built and spacious houses with well-knit plans. Such houses have separate kitchens, store rooms, bathrooms, cattle sheds, fodder stores, chaupals or baithakas (Plate No.6.6). Middle class people live in houses with 3-5 rooms with burnt or sun-dried brick walls and mud, burnt brick, tiled or stone slab roofs. They have outer and inner verandahs, courtyards, cattle sheds etc. Agrarian castes like Lodhas, Kurmis, Yadav (Ahirs), Muslims, etc. generally live in such middle class dwellings. The houses of the poor and lower caste people like Chamars, Pais, Koris, Dheemars, Barbhujwas, Jataus etc. are comparatively smaller in size and shape. They mainly consist of one or two rooms with mud walls and mud and thatched roofs (Plate No.6.7). Front varandahs in such houses are multi-functional in nature, used as kitchen, parlour and cattle shed. Smaller size of families and lack of purdah system enable them to live in small houses. Pig rearing is common
PLATE NO.6.6 House of a Richman

PLATE NO.6.7 Schedule Caste's (Jats) Dwellings.
among Pasis and Chamars etc. who build their pigsties adjacent to their houses.

As regards the general village morphology and environment, field studies have shown that the condition of rural houses is far from satisfactory. A large number of them are one to three room units built of mud and unburnt bricks. They are constructed in close proximity to each other, allowing little ventilation. The dwelling complexes have narrow meandering lanes and are overcrowded. There are many small and big pits full of contaminated water near the inhabited sites, emitting foul smell. Stagnant water in the pits invites mosquitoes and other obnoxious insects, which poses health hazard. Generally lavatory and toilet facilities are lacking. So open fields around the inhabited site are used as open-air lavatories. This unhygienic practice pollutes the village environment and one has to experience the unbearably foul smell while approaching it. Due to lack of proper drainage facilities village foot-paths and lanes remains dirty and uncleaned during the rainy seasons. Bad housing and lack of planning leads to unhealthy social habits, insanitary conditions, and pollution which increase the risk of diseases and infections.

In order to improve the housing conditions the houses should be simple in design and locally available material ought to be used in their construction. Such a
design suggested by the National Housing Board for the poor and middle income group, has been given in Fig. 6.3. It is a design for single roomed houses, suitable for the low income group. It provides for a multi-purposes varandah and a courtyard. The verandah can be easily converted into a room at a nominal cost. The two roomed house plan, as shown in Fig. 6.3 B, is suitable for medium and low income groups of people. The special feature of this type of house is the maintenance of the privacy of the women-folk. Fig. 6.3 C represents the structure of a three roomed house for people of this class. It consists of three rooms, a kitchen, a store and a bath room. Provision has also been made for a separate cattle shed and a fodder store. The inner courtyard affords enough privacy for women and can be used for various other purposes.
Chapter VII

Social Morphology: A Case Study of Sample Villages
SOCIAL MORPHOLOGY: A CASE STUDY OF SAMPLE VILLAGES

Morphology, which is primarily concerned with the layout, plan, and internal structure of settlements, forms an important aspect of settlement studies. The morphology of a village is closely related to the physical characteristics of its dwelling site, availability of surface water, nature of soil, cropping pattern, lay-out of the field plots and elements of the cultural landscape like historical events, social groups and their interactions, socio-economic condition of the inhabitants, community and caste structure etc. The physical morphology of a settlement is easily recognizable from the analysis of its dwellings site, topography and building materials etc., while its social morphology involves functional and social space, which are socially and culturally controlled. In fact, morphological structure, street patterning and arrangement of dwellings and location of secular buildings etc. are all governed by socio-economic and cultural factors. The village community as an integrated living whole consists of a collection of units, arranged to form a social structure, i.e. a set of social relations.

The objective of the present chapter is to study the social morphology of three selected villages of different ecological settings in the study area, and to throw light on the influence of the physico-cultural and socio-economic factors, particularly caste and land ownership, on the village morphology of these selected villages of the Aligarh District.

1. Socio-Spatial Structure

The morphological structure of the sample villages in the study area is mainly determined by their socio-economic as well as physical attributes. Land ownership and caste system have played a crucial role in determining their spatial morphological structure. Field work studies of the sample villages have shown that Brahmins, although they occupy the highest rank in the social hierarchy, do not hold the central or the best available sites of these villages, whereas people of the second and third order of the social hierarchy, such as Khastriyas and Vaishyas, occupy the central or best available sites. They have the largest land holdings in these villages. The lowest strata of the rural society, namely, people belonging to the scheduled castes generally live in congested residences on the periphery of the villages, away from the higher caste dwellings. At times, caste based hamlets also emerge within the village territory, having caste names like 'Ahiran', 'Kurmiyan', 'Chamraula', or
'Chamartola', 'Lodhian', 'Jatau Patti' etc. Such hamlets, though physically isolated from each other by intervening fields, grovelands, water bodies, streets etc., are functioning well-knit together as components of a single unit under the old Jaimani system. These dual characteristics of spatial segregation and functional integration of the socio-spatial structure of Indian villages have been very well described by K.N. Singh through his religio-ritual and secular dominance models.

1.1 Religio-Ritual Model

The Hindu social organization is based on the caste system. Caste is a very important feature of India's life and culture. No other social institution has played such a vital role as that of caste in the development of village society. The Indian society is split up into many self contained divisions of castes in which each caste has its own way of life, with its distinct profession, ideology and behaviour. People of one caste and clan are closely bound together by common traditions and beliefs. In all matters they are found very close and work in harmony. Different patterns of religio-ritual distances among various castes and jatis (sub-castes) have been found in the villages of different localities of the study area. The segregationist notions of castes such as purity, pollution, untouchability etc. maximises social distances between the higher and lower castes. The stigma of
pollution connotes a sense of ritual distance between different castes and determines the spatial arrangement of their respective dwellings in the villages. Traditionally, there is a Brahman-untouchable rituals continuum in which other caste groups occupy different positions based on their respective social status (Fig. 7.1a) Brahmins and Sudras, having their discrete social relevance, were placed at the two ends of the continuum. Such caste segregation, being maximum during the early days of the settlements, led to the establishment of caste based hamlets in the villages. In the case of compact villages, the untouchables were confined to the periphery of the settlements in south, south-east and sometimes in the north, to maintain the supposed purity of air and village environment. But with the spread of education, enforcement of social laws and functional ties, the rigidity of the caste system is gradually losing its force, with the result that certain changes in socio-spatial structure of the villages seem to be emerging.

1.2 Secular Dominance Models

Maximization of distances among various castes, based on religio-ritual notions, is being diminished with the secular outlook of villagers, especially with respect to functional ties (Fig. 7.1b) Landowners, who mostly belong to higher castes like the Brahmins and the Rajputs, depend upon lower castes for carrying out agricultural and other allied activities on their lands. On the other hand, landless
HYPOTHETICAL SOCIO-SPATIAL STRUCTURE

A. 1. COMPACT SITES  

B. 2. HEMLETED SITES

INDIAN VILLAGE-STRUCTURE

RELIGIO-RITUAL MODEL  SECULAR DOMINANCE MODEL
DISTANCE MAXIMIZATION BETWEEN DISTANCE MINIMIZATION BETWEEN
U-AND HIGHER CASTES  U-AND HIGHER CASTES
R-RAJPUT  B-BRAHMIN  A-AHIR  K-KAYASTH
H-BHUMIHAR  M-KUMHAR  N-BARBAR  G-GONR  S-SERVICE
C-CASTES  U-UNTOUCHABLE-CHAMAR etc.

FIG. 7.1
labourers, mostly belonging to the low castes like the Jatavs and the Dhanuks, have to depend upon higher castes for their livelihood. This functional inter-dependence generates an atmosphere of co-operation in the countrysides in which caste barriers tend to be disregarded in spite of the stigma of untouchability attaching to the lower castes. This brings down the distance between these two social groups, making rural settlements compact and unified. It has been found that the dominant land-owning caste in a village of the first, the second or the third hierarchy of castes i.e. Brahmins, Kashtriyas or Vaishyas, determines the socio-economic position of the villagers. They wield power in the rural areas and manipulate the politics of the villager community in their own interest. People of the land owning caste invite families of different castes to settling in their villages. They allocate them cites for home stead, cultivable lands, and village resources, thus providing members of other castes a living under the traditional village Jajmani system.

Examples of the following three sample villages may be cited to show the spatial organization of different castes in relation to the locally dominant caste. The Jats, the Vaishyas, the Brahmins and Lodhyas have been the dominant land-owning castes who originally settled in these villages. Other castes were brought in as followers to make the
settlements function under the \textit{Jaimani} system, and to provide them with goods, services and cheap labour for agricultural and allied purposes. The new socio-economic conditions have brought in significant changes in age-old social traditions. Now functional interdependence is least affected by discrimination based upon caste and creed. Agsauli, Barauli, and Tikari-khera, villages of the Aligarh District have been taken as case studies to analyse the socio-morphological structure of the built-up areas.

2. Agsauli Village

Village Agsauli is located at 27°44' North latitude and 78°29' East longitude in Sikandra Rao block of Sikandra Rao tehsil of the Aligarh District. It is situated about 14 Kilometres in the northeast from the Sikandra Rao tehsil headquarters. Metalled roads from this village lead to Gan-giri and Kachaura to its north and south respectively, while at a distance of about half a kilometre, where Kachaura road crosses the Kanpur-Achnera railway line lies the railway station of Agsauli. The settlement of the village is spread over a mound (tila) sloping gently from its centre towards its peripheries. It is a large sized agricultural village having a population of 5,845, according to the census of 1981.

I. Histogenesis

The early history of this village is obscure. A study of the historical sources and personal interviews with the
inhabitants of the villagers have made it possible for the present researcher to trace its histogenetic process. Its name is derived probably from the agasti (Seshaniagrandiflora), a small soft wooded tree with big beautiful edible flowers, which is found here in large numbers.  

This place is mentioned in the account of the strife between Ahmad Khan Bangash and Shujauddaulla (1763). At that time, together with its surrounding areas, it was reported to be covered with dense forests. The local people assert that it takes its name from a saint named Agasti who had established his ashram here. The ashram associated with his name is situated on Sikandra Rao-Kasganj Road and has a large temple attached to it. But it does not appear to be more than fifty years old. The area is dominated by Pundhir Rajputs. The settlement of Agsauli is compact, consisting of 1043 houses arranged in rectangular shape. The settlement pattern of this village is intimately related to its predominantly alluvial soil and its cropping pattern. It was only in the middle of the nineteenth century that the present form of settlement began to evolve and the village expanded in all directions, and acquired a rectangular shape. Expansion


in the south east direction could not take place proportionately because of the presence of a big tank there. In the light of present tendency towards the construction of houses and the presence of the tank in the south east, availability of land will be the main consideration in determining siting of the future dwellings and the expansion is most likely to take place in the north and north-east as well as in west and south-west.

The physico-cultural and socio-economic condition of the village has its impact on its morphological plan and layout. The presence of the mound, a large tank and arable land have all influenced the pattern of its settlement. Various social customs and traditions appear to have determined the clustering of houses belonging to different castes of the village. Its morphological structure, based on caste segregation, is very interesting. Residences of the people of different castes, such as the Rajputs, the Vaishyas, the Brahmins, the Koeris, the Chamars\*, the Harijans\*, the Dhimars and the Kumhars etc. are situated in different sectors, with minor intrusions (Fig. 7.2). It is interesting to note that all the four corners of the village

\* Though traditionally Harijans embrace all categories of the lower castes classification given in this analysis which puts Chamars and Harijans in separate categories, is based on the perception of class distinction of the villagers in the areas surveyed by the present researcher.
AGSAULI VILLAGE
SOCIAL MORPHOLOGICAL STRUCTURE

INDEX

VAISHYA
KUMHAR
RAJPUT
LOHAR & BARHI
KOERI
BRAHMIN
DHIMAR
FAKIR
CHAMAR
HARIJAN
DHobi
GARHARIA
ROAD
SHOP
POND
TEMPLE
WELL
SEEDS STORE
CO-OPERATIVE SOCIETY
DHARMASHALA
PRIMARY SCHOOL

FIG. 7.2
are occupied by Pundhir and Jadon Rajputs, while its central portion is inhabited by the money-lending Vaishya families. Although, numerically the village is dominated by the Rajputs and the Chamars, economically it is dominated by the Vaishyas, who possess pucca houses in the heart of the settlement. A small market running from east to west divides the village into two parts. The Brahmins are concentrated on its southern part in a small strip parallel to village lanes and near the temple. The eastern and marginal areas in the south are occupied by the Chamars, the Harijans, the Dhobis etc. The village has a sizeable number of Koeris whose houses are concentrated mainly along the western margin of the village. Adjacent to the houses of Koeris a few houses of carpenters and lohars (ironsmith) are found. Muslim fakirs, who work mostly as agricultural labourers, live adjacent to the Harijans, while Dhimars and Kumhars (potters) have their houses along the northern margin of the village. A few houses of Garharias (shepherds) may be seen in the north eastern part of the village.

The building materials used in the dwellings of Agsauli village give indicate the economic condition of the villagers. About 67% of the houses of the village are kaccha. They are mostly composed of mud walls and thatched or mud roofs. The rest of the houses are pacca. They have burnt-brick walls with stone, burnt brick or wooden roofs. About
53% houses are double-storeyed and are owned by rich people, particularly the Vaishyas, the Rajputs and the Brahmins, reflecting the prosperity of their owners. The houses of this village, are, in most of the cases, rectangular in shape and though they have not been built to any set plan or architectural style, they are well suited to the geographical environment. Most of the older residential houses of the cultivators have a chabutra (raised platform) in front, which communicates with a dubari (entrance room), adjacent to the side wall, from which runs a passage for the entrance to open in the inner courtyard. The verandah or dalan is an inseparable part of each of these houses. Most of the new houses, constructed during the last decade, have no dubari and the main entrance directly opens in the inner courtyard.

There are 40 petty shops, two primary schools and one junior high school, one dharamshala, a seed store, a cooperative society which are the important service centres of Agsauli village. Two temples and a mosque are its religious centres. The village is electrified, but the supply of current is very poor. No medical facilities are available in the village. Its inhabitants have to go for medical aid either to Sikandra Rao or to Kasganj.

The occupational structure of the village is mainly caste-oriented. The Vaishyas mostly carry on the business of
money-lending, though a few of them have agricultural lands also. The Rajputs and the Brahmins are the chief land-owning castes, while the Chamars, the Harijans and the Fakirs are landless agricultural labourers while professionals like lohars, dhimars carpenters and koris etc. render different socio-cultural services to the inhabitants under the jajmani system. Out of the total population of 6585, about 31% are workers of which about 74% depend upon cultivation, while 9% are engaged in cottage industries like weaving, tanning etc. and 4% in trade and commerce, and the rest perform other services. Thus agriculture is the main occupation of the villagers, while the presence of a large number of non-working people indicates that there is considerable unemployment in the village.

3. Barauli Village:

Village Brauli is situated at 28°23' North latitude and 78°56' east longitude. It lies in the Gangeri Block of the Atrauli tehsil of the Aligarh District. The village is at a distance of about 18 kilometre south-east of the tehsil headquarters and about 38 kilometre north-east of the Aligarh city. It has a built up area of 16 hectares, with 265 houses, all arranged in rectangular shape. It is a medium-sized compact settlement. The village consists of five mohallas and has features of an old settlement with a multiple caste composition.
Histogenesis

The histogenesis of the village and its relation with its place names are lost in obscurity. The old people of the village say that their ancestors used to tell them that this area was once thickly covered with bar trees (Ficus indica). During the settling process it was gradually cleared and most probably it acquired its name from the tree. Paul Whalley also says that this region was once full of bar trees.1

The spatial morphology of the village is governed by its level ground and presence of a large tank in the south. Its dwellings are concentrated in a roughly rectangular pattern. This reflects a compact nature of settlement. The village is a multi-caste settlement with a clustering of cultivating castes, though other castes are also diffused over the area.

The internal arrangement of social groups is largely governed by the caste and community structure of the village. The structure of the village reveals that Lodhey Rajputs (Hindu) and Pathans (Muslim) inhabit distinct quarters in the village settlement, separated in most cases by lanes and streets. People of other castes like the Barhis (carpenter),

the Dhimars, the Nais, the Chamars, the Dhobi etc. also live in separate blocks (Fig. 7.3). The predominant land owning castes are the Lodhya Rajputs, followed by the Pathans. The Lodhyas were the first to settle in the Barauli village; and then came the Pathans. Lodhya Rajputs occupy the central part of the settlement, with minor intrusions, while Pathans who come next in the economic, hierarchy of the village, occupy its northern part. People belonging to service classes under the jajmani system like the Barh's (carpenters) Nais (Barbers), the Dhimars or the Kumhars (potters) and the Dhobis (washermen, have their distinct blocks in the northern and north eastern fringes of the village, while landless agricultural labourers—mostly the Chamars and the Harijans are settled in marginal areas in the north, south and east of the main settlement. The functional morphology of the village is not very complex; because of the predominance of subsistence agriculture economy. Most of the houses are used for residential purposes as well as for keeping cattle and storing agricultural produce.

Functionally the houses can be grouped into three types: ghar (residential quarters), gher (place for used as cattle sheds and for storing things) and ghar-gher (used for all purposes). The ghers are mostly built in the outer margin of main inhabited site in the north western and western parts, while the central, northern and western sides contain
residential quarters. There are six petty shops which cater to the daily needs of the villagers. The village has one primary school and one junior high school. It has a temple and a mosque which are located in the Hindu and Muslim community areas respectively. Other public buildings of local importance in the village are the Panchayat Hall and Dharamshala.

Out of the total number of houses in the village, 48% are **pucca**, with flat roofs, while 46% are **kaccha**, made of mud walls and flat mud roofs. The rest of the houses i.e. 6% are of the mixed type. Mud walled with thatched roofed dwellings are inhabited by the poorer sections of the village community. On an average, there are about 6 persons living in one house. Housing conditions in the village are moderately good, although there are no set plans. Most of the houses have two **kothas** (medium size rooms) with a **dalan** (verandah), one **kothari** (small room) and a courtyard. There is no separate kitchen in two-thirds of the houses. Most of the houses have a rectangular ground plan. Economically prosperous Lodhay Rajputs and Pathans of the village have separate hand pumps for their domestic needs.

According to the census of 1981, the Barauli village has a population of 1579 persons, out of which about 29% is engaged in various activities.
Agriculture is the main occupation of the villagers, in which 70% of its working population is engaged, while 21% workers ply household industries like handloom, leather tanning, ghani oil, carpentry, pottery etc. and the rest are engaged in trade and other services.

4. Tikari-khera village

Village Tikari-khera is located at 27°41' north latitude and 87°11' east longitude in the Sasni block of Hathras tehsil at a distance of 18 kilometre north-east of Hathras city, about 8 kilometre to the east of Sasni and about 7 kilometre from Bijaigarh to the south-west. The Komri canal passes at a short distance to the west of the village and the track along the canal affords a pathway to it. The settlement of the village is spread over two sites. The main village, named Tikari, is situated on a level ground, while Khera, as its name indicates, is spread over a tila or mound in close vicinity of the river Senger. During the rainy season, the village is inundated due to flooding of the river. According to the census of 1981, Tikari-khera has population of 2099.

Histogenesis:

The Misl-i Bandobast of Hathras tehsil reveals that the village was founded by Tikam a Kirar Rajput, whence, according to one of the theories, it derives its name,
Tikari. The village was held by Raja Tikam Singh Jat from 1833 to 1869. Through interviews with some elderly people of the village, the present researcher came to know that it is also thought that it might have got its name from the shrub of *tikari* which is very common in the area.

The suffix *khera* indicates the presence of a mound, which contain Redware deposits of an earlier settlement.

The present built-up area of the village is divided into two parts, (Fig.7.4), connected by a *kachcha* road and winding cart-tracks (*chak roads*). The village has 445 houses. Like the other two villages discussed above, the internal arrangement of social grouping of the village is largely governed by its community and caste structure. The houses of Kirar Thakurs are situated on the mound, while the main inhabited site, which consists of an alluvial plain, is occupied by people of other castes.

Numerically, the Takurs are the leading caste followed by the Baghelas (Herdsmen), the Brahmins and the Jats. The central part of the settlement is occupied by the Vaishyas and the Brahmins, while the southern portion is inhabited by the Thakurs, except for a few houses of the Jats and the Kirar Thakurs along the south western margin of the village. The Harijans and the Chamars live in the north along the main track, while in the north-eastern portion lie the houses of the Muslims, the Koeris, the Kumhars and the Dhimars.
Thakurs, Jats and Brahmins are the chief land-owning castes of the village. Over half of the village land is owned by members of these three castes. They mostly live in spacious *pucca* houses with big courtyards. People belonging to other communities like Chamar, Harijans, Dhimars, Muslims, Dhobis and Barhi etc. live in one or two-room houses without any provision for ventilation or sanitation. The economic position of Thakurs, Jats, Brahmins and Vaishyas is sound, while Chamar, Harijan, Baghelas, Dhimar, Dhobi and Muslim are poor in terms of both land and wealth. Some of them work as daily wagers and casual labourers in the agricultural fields of Thakurs, Jats and Brahmins, under the *ja`man`i* system, while the rest of them are engaged in household industries, such as lock making, pottery, carpentry etc.

Some of the Baghelas follow their ancestral occupation, i.e. sheep and goat rearing. Vaishyas are engaged in trade and money-lending. Of the total population, about 25% is working and 75% is non-working. Out of the total number of workers, 78% are engaged in agriculture, while 9% and 4% are engaged in sheep and goat rearing and household industry respectively.

The spatial morphology of the village is governed by its level and fertile ground, which determines the shape of the settlement. The main inhabited site of the village is
level and fertile, surrounded by tanks on three sides, i.e. north-east, south-east and west. These factors contribute to the compactness of the settlement and its roughly rectangular pattern. Due to the hazards of the floods, a hamleted settlement is situated on a mound which, too is a compact and almost triangular habitat.

The functional morphology of the Tikari-khera village is the same as that of the other two villages discussed above because of the predominance of subsistence agricultural economy. Dwellings in the village are multi-purposes ones since they are used as residences, shops, cattle-sheds, fodder and fuel stores as well as workshops. The village has a primary school and a junior high school, in Tikari and Khera respectively. A primary health centre is located in Khera. There are two temples, one in the north and the other in the west of Tikari. There are four petty shops in the main settlement, which cater to daily needs of the villagers.

The foregoing analysis of the socio-spatial morphological structure of three selected villages of the Aligarh District i.e. Agsauli, Barauli and Tikari-khera, shows the existence of the habitations of most of the people belonging to services castes near to those of the higher castes, thus forming a closely knit social structure. This is due to the economic dependency of the former on the latter groups of castes under the jaimani system. The analysis of
the spatial patterning of different castes reveals that segregation is closely associated with the castes of the inhabitants, resulting in the formation of distinct settlement units.

Thus the pattern of the religio-ritual-cum-functional interactions is the factor that is responsible for spatial distribution of different castes which is clearly represented in the settlement pattern and the socio-spatial organization of the sample villages.

To sum up, the morphology of the three selected villages discussed above shows that while close socio-economic relationship between different castes results in compact settlements, caste inhibitions force people of different castes to live in separate settlement units.
Conclusions and Suggestions
CONCLUSIONS & SUGGESTIONS

From the foregoing discussion regarding the evolution of rural settlements and their spatial variation in Aligarh District, following conclusions may be drawn.

The Aligarh District is primarily agricultural in composition. Its rural society is tradition bound and the caste system still plays a dominant role in it, though winds of change have started blowing across it, which have begun to affect the rigidities of the hierarchy of castes.

The region has a very long history of settlement and has witnessed many phases of settlement growth and retreat, the last of which began with the Rajput colonization at the beginning of the twelfth century A.D., when the Tomars, belonging to a Rajput clan, established their kingdom in Delhi, and Dor Rajput, who was his vassal held sway over the town and fort of Koil.

The existing location, distribution and types of rural settlements are mainly controlled by physico-cultural factors.

The quantitative analysis of spacing of rural settlements at block level has revealed that there is a direct relationship between spacing and size of settlements in the study area.
The study of deviation from random situation, on the basis of first order nearest neighbour distance approximation analysis, of rural settlement in the Aligarh District has revealed that settlements are more regular than random. Hence the 'Regular Poisson Probability Law' is quite applicable in the case of settlements in the area under study.

An analysis of the shapes of the villages in the study area shows that the average shape index of the study area being 0.5994. Thirty three villages (18.97 per cent) conform roughly to rectangular or square shape, two villages have very elongated shape, while three villages may be categorised under circular shape.

Contact index, population density and areal size did not show any significant correlation due to more or less homogeneous environmental conditions in the region.

Transformation of village shape into Dirichlet / Thiessson Polygons and Hexagons ought to be taken into consideration, while making plans for rural development. It has been found that village sites are mostly determined by physico-cultural factors whereas market centres have developed at the intersection of roads or along the roads. As the number of market centres increases the service area of individual market centres decreases. Increasing Christaller's K values may be taken as an index to represent better
efficiency of purchasing power and development on the one hand and transport connectivity of a region on the other, which should be taken into account while making plans.

The morphology of the rural dwellings in the study area shows that the building materials and architectural styles are the expression of the physical factors of the region, whereas the ground plans are closely related to the socio-economic conditions of the residents. Mud or clay, is widely used in the District, because plenty of cheap clay is available to construct walls and roofs. The size of a dwelling reflects the economic conditions of the dwellers. One or two room houses are inhabited by the poor people, while the middle class people live in three to four rooms dwelling and rich people live in houses having five or more rooms. The condition of rural houses in the study area is far from satisfactory. They are constructed in close proximity to each other, allowing little ventilation. Bad housing and lack of planning lead to unhealthy social habits, insanitary conditions, foul smell, etc., which increases the risk of diseases and infections.

A study of the socio-morphological structure of the three selected villages (built up areas) of the Aligarh District reveals that the economic power of the people rather than caste plays a decisive role in the selection of best available site for settlement.
The analysis of the spatial patterning of rural dwellings of different castes shows that segregation is closely associated with the castes of the inhabitants, resulting in the formation of distinct settlement units.

In the light of above conclusions some suggestions have been made for the improvement of housing conditions and village environment, and planning for rural development and for future studies in the present area of investigation.

1. In order to improve housing conditions, houses should be simple in design, making use of available material. Such a design has been suggested by the National Housing Board for the poor and middle income groups.

2. Congestion of houses may be reduced by providing extension sites for them. This can be achieved by filling up dirty ponds and pits lying near the inhabited sites.

3. All the villages and hamlets should be properly linked with one another with pucca or kaccha roads. Streets and lanes of settlements should at least be brick-lined.

4. Sewage system needs improvement by providing soakpits for individual houses and pucca drainage for streets, both of which should be cleaned periodically.

5. Cattle pens and sheds should be at some distance from dwelling sites with a view to improving facilities for health and sanitation.
6. There should be provision of dry latrines near the inhabited sites to avoid the unhygienic practice of defecating in the open fields.

Implementation of the above mentioned suggestion, involves a high cost. So the government and voluntary or social organizations should help the rural people by providing money and labour resources, to improve their living conditions and to make the village environment more hygienic.

7. Transformation of village shape into Dirichlet / Thiessen Polygons and Hexagons should be taken up as one of the measures for the planning of rural development.

8. The present study has highlighted only a few aspects of rural settlements geography. Planning will be facilitated if further research is oriented to find out the process of human adjustment to environment. There should be an indepth study of linkage between process of settlement and its structure in a settlement pattern to devise spatial organization for optimum mobilization of resources. Detailed data on migration are necessary, at village level to know the process that controls the structures. Similarly, detailed economic data are needed to analyse the growth or decline of rural economy to facilitate proper planning of rural settlements.
glossary
<table>
<thead>
<tr>
<th>Local Name</th>
<th>English Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abadi</td>
<td>Inhabited part of a village site</td>
</tr>
<tr>
<td>Angan</td>
<td>Open court-yard of the house</td>
</tr>
<tr>
<td>Babool</td>
<td>A moderate sized - <em>Accacia arabiea</em> evergreen tree.</td>
</tr>
<tr>
<td>Baithaka</td>
<td>Resting place</td>
</tr>
<tr>
<td>Banjar</td>
<td>The cultivable wasteland</td>
</tr>
<tr>
<td>Basti</td>
<td>Settlement site</td>
</tr>
<tr>
<td>Bhanger</td>
<td>Old alluvium</td>
</tr>
<tr>
<td>Bhita</td>
<td>The elongated earthen mound</td>
</tr>
<tr>
<td>Bhur</td>
<td>Light soils</td>
</tr>
<tr>
<td>Bhusa</td>
<td>By product after thrashing and separation of grains such as wheat</td>
</tr>
<tr>
<td>Bigha</td>
<td>A local land measure equivalent to 0.625 acre.</td>
</tr>
<tr>
<td><strong>Black-And-Redware</strong></td>
<td>According to B.B. Lal, &quot;Pottery whose interior and the top part of the exterior are black and the lower part of the exterior is red. The colour effect is produced by putting the pot upside-down in the kiln. In India such pottery appeared as early as 2000 B.C. and continued, of course, with modifications, up to the beginning of the Christian era.</td>
</tr>
<tr>
<td>Brahman</td>
<td>Highest, Hindu caste, India</td>
</tr>
<tr>
<td>Burha Baba</td>
<td>A local godling of Kumhars (potters). He is worshiped on the third of the half of Baisakh and is offered millet, rice and curd.</td>
</tr>
<tr>
<td>Chak</td>
<td>Block of land</td>
</tr>
</tbody>
</table>
Chamar | A low caste Harijan
---|---
Chamartoli | Hamlet of Chamars
Chandrabedhi tank | Tank having north-south elongation
Chauhan | A ruling dynasty and a Rajput clan
Clan | Exogamous group claiming descent from a common group
Dastur | District (during the Mughals)
Dastur-ul-Amal | Administrative manual
Deorhi | In the context of Newsletters, it means the camp of a ruler or chief on the move.
Dhaincha | A green - Sesbania acumanuring crop
Dhammar | A devotional song associated with the worship of Zahar Pir (s.v.).
Dih | High land due to deserted settlement site
Doab | Land between the rivers
Dubari | Entrance room of the house
Gaon | A village settlement
Garhi | A mud fortress, a castle
Gaushala | Cow - shed
Gher | Female House
Goid | Agricultural land adjacent to the settlement
Hat | Market place
Imambara | A building where the festival of Muharram is celebrated.
Jagir | Land or villages given by state as a reward for services. It was made for a lifetime and it was not inheritable. The holder of such grant is known as Jagirdars.
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jajmani</td>
<td>A system involving reciprocal relation, India.</td>
</tr>
<tr>
<td>Jhil</td>
<td>Small lake</td>
</tr>
<tr>
<td>Jori</td>
<td>A field system</td>
</tr>
<tr>
<td>Jungle</td>
<td>Forest</td>
</tr>
<tr>
<td>Kacha</td>
<td>Unmetalled</td>
</tr>
<tr>
<td>Kaila Devi</td>
<td>A local goddess, who gave her name to the village of Kailora.</td>
</tr>
<tr>
<td>Kankar</td>
<td>Calcareous nodules</td>
</tr>
<tr>
<td>Khadar</td>
<td>New alluvium</td>
</tr>
<tr>
<td>Kharif</td>
<td>Season of summer crops (mid June of October).</td>
</tr>
<tr>
<td>Khasgaon</td>
<td>Main village settlement</td>
</tr>
<tr>
<td>Kherapati - Lord of Khera</td>
<td>(mound), i.e. Siva. A large number of mounds of this Districts have yielded massive phalluses, hence they are considered Kherapati (protector of the mound).</td>
</tr>
<tr>
<td>Khitta</td>
<td>A piece of land a territory</td>
</tr>
<tr>
<td>Loo</td>
<td>Hot wind</td>
</tr>
<tr>
<td>Maafi land</td>
<td>Rent free land</td>
</tr>
<tr>
<td>Madar</td>
<td>A large shrub</td>
</tr>
<tr>
<td>Mahal</td>
<td>A fiscal unit, a subdivision of sarkar</td>
</tr>
<tr>
<td>Mauza</td>
<td>A revenue village</td>
</tr>
<tr>
<td>Nachiragi or Bechiragi</td>
<td>With out habitation</td>
</tr>
<tr>
<td>Nadi</td>
<td>River</td>
</tr>
<tr>
<td>Nalalh</td>
<td>A seasonal stream</td>
</tr>
<tr>
<td>Neem</td>
<td>A tropical tree</td>
</tr>
</tbody>
</table>
**Northern-Black-Polished-Ware:** According to B.B. Lal "A distinctive pottery with a highly lustrous surface, usually black but sometimes steel-grey, silvery or golden. It is wheel made, normally thin-sectioned and well fired, giving a metallic ring. Main concentration in northern India: Date 600-200 B.C."

**Ochre-Coloured-Pottery** - According to B.B. Lal "Orange to deep-red pottery, found so far mostly in warm-out condition to the extent that the surface rubs off by mere handling, leaving an ochrous colour on the fingers, hence the name. Extent upper Ganga valley-prior to 1200 B.C."

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pargana</td>
<td>Administrative division of a tehsil</td>
</tr>
<tr>
<td>Pucca</td>
<td>Metalled</td>
</tr>
<tr>
<td>Puras</td>
<td>Hamlet</td>
</tr>
<tr>
<td>Purdah</td>
<td>Veil</td>
</tr>
<tr>
<td>Purwas</td>
<td>Hamlets, also puras</td>
</tr>
<tr>
<td>Rabi</td>
<td>Season of winter crops</td>
</tr>
<tr>
<td>Rajput</td>
<td>Highest Hindu caste after Brahmins</td>
</tr>
<tr>
<td>Ras (Ras-lila)</td>
<td>A folk-play which represents Krishna and Gopis in amorous sport. According to Growse, &quot;This is an un-written religious drama, which represents the most popular incidents in the life of Krishna&quot;. It is fire combination of dance, vocal and instrumental music.</td>
</tr>
<tr>
<td>Reh</td>
<td>Salt efflorescence</td>
</tr>
<tr>
<td>Sarkar</td>
<td>A fiscal unit, sub-division a subah (province)</td>
</tr>
<tr>
<td>Shashtras</td>
<td>Religious literature of Hindus</td>
</tr>
<tr>
<td>Subah</td>
<td>Administrative unit during Mughal period</td>
</tr>
<tr>
<td>Sudras</td>
<td>Lowest caste people in India</td>
</tr>
</tbody>
</table>
Tappa  A unit of land – revenue administration, smaller than a pargana

Tehsils  Administrative division of a district

Tola  Hamlets

Urs  Anniversary of saints

Usar  Land full of sodium salt which renders it unfit for cultivation (saline alkali or Alkali soils).

Zamindari  A land tenure system

Zila Parishad  District level administrative body for rural areas, India.

Zahar Pir (Goga Pir)  A popular local god venerated both by the Hindus and Muslims alike. He is said to have been a Hindu with the title of Goga Pir, who has been later on converted to Islam as Zahar Pir. A number of folk-songs are attributed to him.
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PLATE NO.7.1 General View.

PLATE NO.7.2 Central Site of the Village

PLATE NO.7.3 An Old Monument
AGSAULI VILLAGE

PLATE NO. 7.4 A Big Temple

PLATE NO. 7.5 Site of Godling
BARAULI VILLAGE

PLATE NO.7.6 A General View

PLATE NO.7.7 Schedule Caste's Habitation

PLATE NO.7.8 Palace of Rao Raj Kumar Singh
PLATE NO. 7.9  A Big Mosque

PLATE NO. 7.10  Dharamahala-cum-Primary School