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 spans settlement refers to an organized 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 problem of human settlements has emerged as one of the most challenging issues particularly in the underdeveloped countries of the world. About 65 per cent of the world’s population still lives in rural areas. Since the country is dominated by agrarian economy and most of the population is concentrated in villages, the study of rural settlements in India should be given prime importance.
The selection of the Meerut District for the present research is due to its uniqueness in many respects. The District lies in the fertile Ganga Yamuna doab. The 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 regions and has a long history of peopling and occupancy. Hastinapur was the most celebrated city of the ancient period. The beginning of the rural settlements in the study area goes back to the prehistoric period. Excavations at various sites of the District have revealed that the settlement in this region had begun around 1800 B.C. The earliest remains, i.e., Harappan pottery have been found at Alamgirpur. In spite of inter-mixing of various ethnic groups and cultural traits from within and outside the country the area has preserved its own traditions, culture, myths and related norms and values, which has resulted in shaping the uniqueness in its identity. It may be added that no serious study on the evolution and spatial variations of rural settlements has been made so far in the District.

The present study entitled “Evolution of Rural settlements and their spatial variations in Meerut District” is an attempt 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 analyze the shape of villages and to suggest suitable model for rural development plans, to identify rural house types on the basis of their building materials and sizes of the houses, to analyze 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.

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 sources which are extremely helpful in providing significant clues to the understanding of the evolution of settlement patterns are archaeological findings, historical sources, written records, place names, culture, cults, folklores, maps, 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 study is divided into six chapters. The Meerut District lies 28°32' to 29°18' north latitudes and 76°7' to 77°8' east longitudes in the state of Uttar Pradesh. It covers an area of 3911 square kilometres, out of which 3687.8 square kilometres is rural and the rest is urban. The total population of the District according to 1991 census is 3447912, out of which 2171355 people live in rural areas, which the urban population is 1276557. It is located in the
western part of the state, at a distance of 64 km from Delhi. The Ganga forms its natural boundary on the east and the Yamuna marks most of its western boundary. On the north it is bounded by Muzaffarnagar, on the south by that of Ghaziabad and on the southwest by the Delhi. The District has been divided into four tehsils, namely Baghpat, Sardhana, Mawana and Meerut. These tehsils are further subdivided into eighteen blocks, Chhaprauli, Baraut, Baghpat, Pilana, Khehra, Binauli, Saroorpur Khurd, Sardhana, Daurala, Mawana Kalan, Hastinapur, Parikshitgarh, Machra, Rasulpur Rohta, Jani Khurd, Meerut, Rajpura and Kharkhanda. There are 990 total villages in the District, out of which 900 are inhabited and 90 are uninhabited.

Physiographically the Meerut District is a vast alluvial plain with a slight slope from north to south or southeast. There is no uneven ground except in the area of the ravines near the river valleys and the scattered bhur ridges in the upland tract. The main features that affect the plain are the rivers whose valleys are of varying width and are on a lower level than the main upland tract. The District can be divided into four physical divisions – the Yamuna Hindan doab, the central depression, the eastern uplands and the Ganga khadar.

The principal rivers of the District from east to west are the Ganga, the Hindan and the Yamuna. The other ones are their tributaries. There are few Jhils of importance in the khadars of Ganga and Yamuna.
The District of Meerut experience a subtropical monsoon type of climate, which is characterized by a seasonal rhythm, produced by the southwest and northeast monsoons. The reversal of the prevailing winds takes place regularly twice in a year. The winds of continental origin blowing from November to middle of June are dry while in the other parts of the year i.e., from mid June to October, they are oceanic in nature and are wet. On the basis of direction of the winds the year is divided into two seasons:

The season of northeast monsoons
The season of southwest monsoons

The direction of the winds in the region is generally from northwest to southeast during the northeast monsoon season and from southeast to northwest during the southwest monsoon season. The season of southwest monsoon is commonly known as ‘rainy season’ and is characterized by cloudy weather, heavy rainfall and high relative humidity. The north east monsoon remains dry barring few rainy spells on account of western disturbances but is mainly characterized by intense cold in some months and intense heat in the other. On the basis of these changes in rainfall and temperature, the Indian meteorological department has divided the whole year into four seasons:

• Cold weather season from December to February
• Hot weather season from March to mid-June
• Season of general rains from mid June to September
• Season of retreating monsoon from October to November.
However the common people of Meerut District follow the agricultural calendar which recognizes three seasons corresponding with major agricultural activities.

- Cold weather season (November to February)
- Hot weather season (March to Mid June)
- Rainy season (Mid June to October)

The soils of the region are classified on geological basis under two divisions, the new alluvium and the old alluvium, also known as khadar and bhangar respectively. Casual distribution between the two is somewhat difficult but usually the older deposits occupy higher lands and the newer deposits, the lower lands in the immediate neighbourhood of the rivers.

The khadar is sandy in composition and generally high in colour. The khadar land is found in narrow strips along the rivers Ganga, Yamuna and Hindan. Bhangar or old alluvium is more clayey in composition and generally dark in colour. On the basis of texture, the bhangar soil has been subdivided into four divisions – loamy, clayey loam, sandy loam, and alkaline soil.

The District forms part of the northern subtropical deciduous type of vegetation division but as it is devoid of extensive natural negative cover.

The land use pattern reveals that about 80.33 per cent of the total area is net sown. Machra block has the highest percentage of net sown area (88.64%) while Hastinapur (68.07%). It may be marked that blocks with low
percentages of net sown areas are mostly usar infested. The area not available for cultivation in the District is 11.23% while cultivable waste and fallows comprises 4.63%. Pastures, forests and miscellaneous trees comprise 2.4% while usar and uncultivable waste comprise 1.4% of the land of the District.

There are three harvesting seasons in the region namely rabi, kharif and zaid. Rabi crops occupy 37.20% of the total cropped area of the District the kharif 56.30 per cent and the zaid occupy only 6.5 per cent.

The District enjoys the benefit of having all the three sources of irrigation rivers, canals and ground water. Out of the net irrigated area of the District, 68.96 per cent is irrigated by private tube-wells, while 5.51 per cent, 24.76 per cent 0.58 percent is irrigated by Government tube-wells, canals and masonry wells respectively.

The Meerut District occupies an important place in the industrial economy of Uttar Pradesh. All type of industries, viz., large scale, medium scale, small scale, cottage and village industries have developed in the District. There are about 30 registered units of large-scale industries.

The roadways and railways play a dominant role in the process of development in the District. The important state highways passing through the District are Meerut Bareilly Road, Meerut Bulandshahr Road, Delhi Mussoorie Road and Baghpat Saharanpur Road. The total length of the state highways in
the District is about 243 kilometres while that of metalled roads is 2356 kilometres. Out of which 1632 kilometres and 724 kilometres are in rural and urban areas respectively.

There are three broad gauge railway lines served by Northern Railways in the District. The District is also well served with an extensive network of postal and telecommunication services. There are 276 post offices located in its rural areas during 1993-94. The District has 100 public call offices in rural areas only while the telephone connections in the rural areas of the District are 681.

Rural markets are periodic markets held weekly in various villages to serve the surrounding area. The commodities sold here are food grains, vegetables, fruits, spices, cloths etc. A large majority of weekly markets are held in villages of above 500-population size.

Population is one of the most important factors determining the nature of human settlements in terms of size and economy. A perusal of the population figures of the study area indicates that since 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.

According to the 1991 census the rural population density of the District is 588 persons per square kilometres is much higher than the national average
(267 persons per square kilometres). On the basis of calculated densities the blocks may be divided into various categories. It has been concluded that the District is an area of relatively high density of population.

In the study area, 29.24% of rural population consists of main workers, of which 74.96% engaged in primary sector, 11.3% peoples are engaged in secondary sector and 13.73% peoples are engaged in tertiary sector.

The pyramid of age-sex structure, which has a broad base and narrows quickly upwards, is young and highly fertile population. This shows that the proportion of population goes on decreasing downwards. The ratio of females per 1000 of male population in the District is 835 in 1991 census.

The District has relatively more ‘never married’ males than females. But the population of married males (21.35%) and married females (21.07%) are almost equal. The never married males are 31.23% while their corresponding females are 22.31% only. The incidence of child marriages in the District is not very frequent. Divorce is also not much prevalent in the study area. The proportions of widows are higher than that of widowers because of the restrictions prevalent among the Hindus on widow remarriage.

As per 1991 census the study area constitute only 51.3 per cent literacy. The percentages of literates are lower in rural areas (46.4%) than in urban areas (59.4%)

The District is dominated by Hindus (72.83%) followed by Muslims (25.30%), Christians 0.36%) and Sikhs (0.24%).
Hindi is spoken by 79.74% of the people in the District. It is followed by Urdu (19.28%), Punjabi (0.49%), Bengali (0.03%) and others (0.06%). The dialect spoken in the study area is khariboli or western Hindi. 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 low caste houses 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 important castes found in the District are Brahmins, Rajputs, Vaishyas, Tagas, Jats, Gujars, Chamars, Bhangis etc. Among Muslims, Sayyids, Sheikhs, Pathans, Muslim Rajputs, Muslim Tagas are found here.

The beginning of the rural settlements in the study area goes back to the prehistoric period. This is borne out by the legends and folklores of the area, the presence of a large number of mounds, and more convincingly, the archaeological excavations in different parts of the District. The abundance of mounds suggests that the area had a large number of settlements in the ancient period. Archaeological excavations show that the settlements of this region date back to at least 1800 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 Meerut 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 settlements in the study area.

The study of evolution and growth of rural settlements through various periods of history indicate that the study of evolution is related to the various social, political and economic conditions of the past. It is observed that throughout the human history the settlements have evolved in relation to topography and resources of the area. The structure of rural settlements is always blended with the social and cultural history of the area in which they have evolved.

The study of place names is the subject matter of an independent, systematic discipline of typo-name. The detailed study of place names needs exhaustive work and demands careful observation of various aspects of historical geography. The place name study needs more documentary evidence of biology of domestication, archaeology, local language, traditions and customs. In the study area the analysis of place names of the rural settlements give suggestions and hints about the origin of villages. It is observed that there are many villages named after topography, soil, water bodies, flora and fauna, culture and cults and various deities. 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. pur, pura, nagla, garh, garhi, sarai, khora, khurd, maufi, chak etc.

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 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 intrusions 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 areas and known as pargana. A Pargana was segmented into sub-clan or secondary clan areas known as tappas, which were sub divided 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, 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 pargana was maintained as sub-division of a tehsil and were used as revenue units, and they continue to function as such. Taluqdar and zamindari and other territorial rights of land corresponding to them gave not only weight, but also the basis of surveys and records of holding rights. Four years after India achieved freedom, the zamindari Abolition Act was passed by the Uttar Pradesh legislature and by January 1956, and all the zamindari estates has been abolished. The Meerut District has been divided into seventeen blocks, and these have been subdivided into Adalat Panchayats, each one that 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 study is primarily based on medieval sources and particularly on the information contained in Ain-i-Akbari and various settlement reports. The zamindari clans have been a dominant factor in encouraging the evolution and growth of rural settlements in the region.

In Akbar’s days the present pargana roughly correspond to the 16 mahals, which formed a part of two sarkars (Delhi and Saharanpur) in the Suba of Delhi. Of these mahals Sardhana was included in the sarkar of Saharanpur and together with the bulk of the present District of Muzaffarnagar, formed a dastur, those of Jalalabad, Barnawa, Hapur, Sarawa, Garhemukteshwar, Meerut and Hastinapur (comprising the Meerut dastur) those of Loni, Dasna, Baghpat, Jalalpur, Baraut, Kotana, Chhaprauli and Tanda Phugana.

The study about the position of the different zamindar clans between the sixteenth century and the eighteenth century, it may be concluded that there were many zamindar clans which held lands in the region. Some of the important of these clans were Jats, Brahmins, Chauhans, Tomars, Tagas, Ranghar, Chandrals, Ahirs, Gujars, Sheikhzadas, Afghans, Pathans and Sayyids.

A study of these zamindar clans between the sixteenth century and the nineteenth century, it may be concluded that the Rajputs, who were once
dominating in the District, were reduced to the second position and that Jats extended their zamindari considerably to gain the first position in the District, and that the Gujars, Mahajans and Thuggas, who were not on the scene in the sixteenth century appeared as the dominant clans. Brahmins and Tagas also lost their holdings in 1874.

The evolution of rural settlements in sequent occupancy in the Meerut District has been studied under four periods i.e., prehistoric, ancient, medieval and modern. Excavation at various sites of the study area have revealed that settlements of this region began around (2000-1800 B.C.). The earliest remains, i.e., pieces of Harappan pottery have been found at Alamgirpur. Then successive remains of different periods, ochre coloured wares (OCW, 1800B.C.-1200B.C.), painted grey ware (PGW, 1200 B.C.-800B.C.), Northern black polished wares (NBPW, 800-200B.C.) have been recovered from different places in the District. A large ruined brick stupas and temples indicate that this place was once a Buddhist centre. Pieces of sculpture belonging to the Kushana period have been recovered from Hastinapur. Few remains of the Gupta period also found in the District. The images of Post Gupta period are still being worshiped in village temples at many places in the study area. A large number of pieces of pottery and sculpture of the medieval period have also been recovered from different mounds in the study area.

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 settlement during the different periods until extensive excavations have been conducted.

Though Aryans had completed their colonization by the end of 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 Muslims invasions in 1194 A.D when Qutubuddin Aibek captured the fort of Meerut. From that time migration of Muslims continued until 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 Muslim 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 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 has 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 abolition of the zamindari system. The consolidation of land holdings, the extent 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 for faming and housing and housing have 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 around these centres under programme of providing house-sites and credit facilities to Harijans and landless labourers.

The study area, forming part of the Ganga Yamuna Doab, owing to its homogenous relief and fertile alluvial soils, has an almost uniform distribution of rural settlements. However, slight variations may been seen at micro-level due to differences in local relief, sources of water supply, drainage lines, soils, 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 bhangar 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 4.15 Km². The highest per village areal coverage (6.741 Km²) is in the Chhaprauli block of Baghpat tehsil while the lowest areal size (2.884 Km²) is found in Meerut block of Meerut tehsil. The average population of a village in the study area is 2534.52 persons. The highest per village population is found in Chhaprauli block i.e., 4404 persons while the lowest per village population are found in Hastinapur block (1099 persons). The villages of the study area have been classified into six population groups. There are 50 villages i.e., (5.56 per cent villages) of the study area inhabited by less than 200 people whereas 53 villages comprising 5.89 percent of villages contain between 200 and 499 persons. The medium size villages (500-999) account for 13.22 per cent of the total number of villages i.e., 119 villages while large villages (1000-1999) share 26.89 per cent of the villages i.e., 242 villages. Very large villages with population ranging between 2000 and 4999 are large in number and constitute 38.77 per cent of the total number of villages of the study area. The exceptionally large villages, inhabited by more than 5000 persons represent 9.67 per cent of the total number of villages in the study area. The village density in the study area varies from 14 to 34 villages per 100 Km². The average spacing i.e., inter village distance for the study area comes to be 2.175 Km. The inter village
spacing at block level have also been grouped into five categories as, very low, low, moderate, high and very high. The study also reveals a direct relationship between spacing and settlement size in different blocks of the region. It is concluded that where spacing is high villages are of larger sizes with a smaller 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 types of settlements. The $R_N$ values ranging from 0.803 (Hastinapur) to 1.389 (Meerut) reveals a clear tendency towards regularity. The $R_N$ values have also been categorized into five groups as, clustered grouping, random grouping, low, moderate and high regularity. It has been concluded that the trend of dispersion is always towards regularity. So Dacey's "Regular Poisson Probability Law" is appropriate in this case because the empirical variance mean ratio is always smaller than 1 and the mean, in every case, is more than the variance.

The settlements are the study area has been classified into three types according to the spatial arrangement of the houses, i.e., compact, semi-compact and hamleted. The compact settlements show very spatial organization of the houses. The hamleted settlement indicates scattering of occupancy units along the loose spatial structure. The semi-compact is an intermediary stage between compact and hamleted settlements, is
characterized by the presence of a main village site along with one or two or more hamlets. Various factors affecting rural settlement types have also been discussed. These factors are of both agglomerative and deglomerative nature.

The pattern, shape or the arrangement of the settlements is solely determined by physico-cultural and socio-economic conditions of the region. 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 steams, 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 of qualitative or classical approach, a number of settlement patterns have been identified. Rectangular and square settlement patterns 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 shapes in the present analysis. A study of the village shapes of 90 sample villages of the District shows the predominance of rectangular and square pattern. This is mainly due to the rectangular system of land division, i.e., the bigha system, prevalent during ancient times.
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 5.422, which is very near to 6, a feature of a strictly hexagonal system. This is further corroborated by the fact that 63.3 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 its homogeneous nature of the study area. Transformation of villages shapes takes place in order to minimize the transport cost, to bring territorial limits of a village within easy reach of the villages sites and to accelerate the pace of economic progress and modernization. For the transformation of villages shapes, three areas from discrete ecological setting have been selected and suggestions have been made, using Thiessan’s polygons and Hexagons of varying ‘K’ values for the rural development plans.

Rural dwelling constitute the basic elements 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 1991 census, there are 3,18,185 rural houses in the District, with an average density of 86.28 houses per square kilometres. The maximum and minimum densities 119.78 houses per sq km
and 42.93 houses per square kilometres are found in Rajpura and Hastinapur blocks respectively. House types of the study area have been classified on the basis of their building material and sizes and shapes. They study reveals that mud and unburnt brick wall with thatched and mud roof houses constitute 29.5 per cent of the total rural dwellings, burnt brick wall with thatched roof cover 41.5 per cent while burnt brick walled houses with burnt brick, stone and lime roof dwellings (pucca dwellings) cover about 1.45 per cent of the total number of rural dwellings, while rest of the dwellings consists 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 study area vary from political buildings to the single room huts, which marks the difference between the rich and poor. One and two room dwellings together constitute more than 63 per cent of the total number of rural houses of the District and offer shelter to 59.4 per cent of its total rural population. The three and four rooms dwellings, which are nearly 26.21 per cent of the total rural houses in the study area, provide accommodation to over 28.39 per cent of the total rural population. Mostly the rural houses in the study area are multipurpose one, used for sleeping, keeping cattle, storing fodders etc. Generally the housing condition and village environment are far from satisfactory. The houses are constructed in close proximity to one another, allowing little ventilation. There are many big pits full of contaminated water near the inhabited sites emitting
foul smell, which causes diseases and infections. A few suggestions have also been given to improve the housing conditions and village environment of the rural area of the Meerut District.

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. Study of 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 Kshatriyas and Vaishyas, occupy the central or best available sites. Usually they have the largest landholdings in the 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 highest castes dwellings. At times caste-based hamlets have been developed within the village territory having caste names like Ahiran, Kurmiyan, Chamartola, or Jataula. The stigma of population creates a sense of ritual distance between different castes and determines the spatial arrangement of their respective dwellings in the villages. Traditionally there is a Brahmins-untouchable ritual continuum in which other caste groups occupy different positions based on their respective social status. Brahmin and Shudras, having their discrete social relevance, were placed at the two ends of the
continuum. But with the spread of education, enforcement of social laws and functional ties, the rigidity of the caste system is gradually losing its force of attraction, with the results that certain changes in socio-spatial structure of the villages seems to be emerging.

The analysis of the spatial patterning of houses of different castes reveals those caste inhabitations contemplates 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 higher caste people, in these sample villages, owing to the growth of population and changes in the socio-economic conditions.

In the last conclusions have been drawn and some suggestions have been made in connection with the betterment of the village environment.