PATTERNS OF SETTLEMENT ALONG G. T. ROAD BETWEEN DELHI AND CALCUTTA

DISSERTATION
SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
Master of Philosophy IN GEOGRAPHY

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ALIGARH MUSLIM UNIVERSITY ALIGARH (INDIA) 1996
CERTIFICATE

This is to certify that Mr. RASHID AZIZ PARIDI has completed his dissertation entitled "PATTERNS OF SETTLEMENT ALONG G.T. ROAD BETWEEN DELHI AND CALCUTTA" for the award of the degree of M.Phil. in Geography under my supervision.

(DR. ABDUL MUNIR)
SUPERVISOR.
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(RASHID AZIZ FARIDI)
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Introduction
A settlement is a collection of shelters where people live. The study of settlements is largely a product of twentieth century. Human geography is the study of relationship between man and earth of which settlement geography is a part and parcel. A settlement is man's first step towards adoption to his environment. Settlement designate an organised colony of human beings, together with their residences and other buildings (shops, hotels, banks etc.), the roads, streets which are used for travel. Settlements are situated as advantageously as possible with respect to natural features such as water, fuel, food, protection and drainage and last but not the least as access to transportation and communication.

According to Brock and Webb settlement pattern denotes the shape or arrangement of settlements in relation to natural or man made features or design such as streams, ridges, canals and roads. The pattern of settlement is determined on the basis of location of houses and the highways. The pattern of settlement exhibits the relationship between one dwelling and the other. Similarly the site may have no bearing on pattern in some cases.
In fact, highways work as sort of life lines for the country or the region in which they are situated. So, naturally, they have tremendous influence on the settlements situated along them. In some cases the highways are the very 'raison d'etre' of the settlement. Precisely these are the reasons of selecting area along Grand Trunk Road for this study. Being an old and historic road and being a highway, Grand Trunk Road has an overwhelming influence on the patterns of settlement situated along its course. The settlement along its course are mainly of linear and rectangular pattern. Checkerboard and amorphous patterns are also found as a result of continuous growth. It seems that most settlements started as linear settlements and later gone on to develop into other patterns such as checkerboard, rectangular, triangular, square or even in an amorphous pattern. Although every settlement is unique and has a personality of its own but a common thread seems to be running along in the settlement situated through the course of Grand Trunk Road. In present study, this very fact is emphasised again and again. Through the course of study this fact establishes clearly and precisely. This fact hold truth for both the urban and rural settlements. Many types of settlements can be seen
because of very large number of villages and small towns and some very prominent cities of country as Delhi, Calcutta, Kanpur, Allahabad and Varanasi are situated along the course of Grand Trunk Road. The list includes two giant metropolises Delhi and Calcutta.

The entire work is organised into four chapters. The first chapter deals with conceptual elaboration of settlement and the impact of highways on settlement patterns. Second chapter presents a survey of available literature on the topic. Third chapter of the study presents a systematic account of rural settlements patterns present in the study area. This is discussed with the help of suitable examples of rural settlements from the study area.

Fourth and the last chapter of the study presents an elaborate account of urban settlement pattern in the study area with the help of relevant examples. In third and fourth chapter, the influence of Grand Trunk Road on these patterns of settlement is clearly seen.

In the conclusion a retrospective view is taken and suggestions for the future planning strategies in view of the problems besetting the region are given.
Fig. 1. G.T. ROAD BETWEEN DELHI AND CALCUTTA
Chapter 1

Settlements and Highways
A settlement is a collection of shelters where people live. The study of settlement is largely a product of twentieth century. A settlement is man's first step towards adaptation to the environment.

One of the three basic necessities of man is shelter. In the pre-historic period, there was little difference between man and the animal. In areas of climatic extremes, man was forced to think of shelter. He used the caves, trees and bushes for his shelter. He built small shelters using woods and leaves when he was shifting from place to place. These cave sites were, perhaps the first forms of settlement units. Settlement designate an organised colony of human beings, together with their residence and other buildings (shops, hotels, banks etc.) the roads, streets which are used for travel.

Settlements are situated as advantageously as possible with respect to natural features such as water, fuel, food, protection and drainage as well as access to transportation and communication.

Every settlement is unique and has a personality of its own. Each village and farm is a distinctive item in the landscape and has no precise duplicate even among its neighbours. All large cities have certain common
attributes. Villages often occupy similar sites, share the same form and perform similar functions. It is therefore possible to adopt a comparative treatment and to attempt some classification based on size, site, situation, function, age, building materials, cultural characteristics or the layout of streets and buildings.

Settlements may be temporary or permanent, rural or urban. Temporary ones are those of migratory hunters, collectors and nomadic tribes. They are occupied seasonally and then left unoccupied or these may be so transient that these are a particular site only for a short time and are then abandoned or shifted elsewhere. Cities, towns and most villages are relatively permanent elements of the cultural landscape.

Areas of primary production from agriculture, forestry, fishing, quarrying and mining etc. are considered rural. Urban settlements have association with human activities other than production namely secondary (industries), tertiary (services) and quaternary (others like education, tourism, commerce).

Settlement pattern denotes the shape or arrangement of settlement in relation to natural or man made
features or designs such as streams, ridges, canals and roads. \(1\) (Brock and Webb 1967).

The pattern of settlement is determined on the basis of the location of houses and the highways. It shows the shape of the settlement. The villages represent a sort of growth within the physical and cultural setting of the region. The pattern of settlement exhibits the relationship between one dwelling and the other. Similarly the site may have no bearing on pattern. \(2\)

While studying the pattern of settlement many things have to be borne in mind. First the pattern should be abstracted from the habitat. Secondly, the pattern would depend on the kind of house one has in mind. The house may consist of cattle sheds, granary and outhouses. Sometimes a store, garage, post office or school may determine the pattern of settlement. \(3\)

From time immemorial the village has been a basic and important unit in the organisation of Indian Social Polity. \(4\)

The villages differ greatly from one another in shape and pattern by reason of contrast in the arrangement of streets and houses. As a matter of fact the street system within the settlement is the most essential element. When houses are built in groups the street often
plays the decisive role and the houses usually faces not the east or the west but the highway i.e. the street on the road. Besides the street system, other cultural elements such as temples and mosques render a peculiar character to the dwelling site.5

Thus the grouping of houses due to certain reasons takes different forms as a result of which many distinct patterns of settlements are developed. Yet there may be settlements where no pattern may be recognisable. As such patternlessness becomes a pattern in itself and it is usually achieved by criss-cross working of various causes and functions of settlements.6

Originally the formation of an Aryan village used to follow the plan of a 'Swastika'.7 The crossroads of an Aryan village run north and south and east and west and were terminated by the four principal gates dedicated to the four positions of Sun.8

SETTLEMENT PATTERNS IN ANCIENT INDIA

In the region under study it appears that there has been hardly any proper planning of the rural settlements. Some of the plans of rural settlements have been discussed elaborately in the ancient texts like Manasara Shilpashastra. Shilpashastras are old sanskrit
texts which were possibly compiled about the fifth or sixth century B.C. but the traditions which they indicate are of greater antiquity. Vide Havels wrote about them in Ancient and medieval Architecture of India, 1915. P.K. Acharya translated them into English with his own comments entitled as Indian Architecture in five volumes in 1927.

It is obvious that most of the plans are rectangular or square and do not appear to differ in essentials. Each village is surrounded by a wall and ditch for defence purposes. There are generally four gates in the middle of the four quarters. The centre of the village is generally occupied by a temple, tank or public hall. The four quarters are further sub-divided by straight streets. Each block is inhabited on the basis of caste or profession, the best quarters being generally given to Brahmins and the high caste. The easterly axis of the general plan and the intersection of the urban street by north south running shorter streets bear relationship with climatic conditions. Such an arrangement ensured the advantage of sun-light and the proper circulation of fresh air.

The plans of rural settlements discussed above do not seem to have survived in the true form. However, the
study of the present village plan is of vital interest. When one speak of the village plan, one refers to the layout of the Basti (inhabited site) resulting from the arrangement of houses and village streets or lanes. In this sense a definite pattern has emerged only in the case of compact or linear settlements which are very limited in number. At times the settlements are so irregularly huddled together that it becomes very difficult to recognise the definite pattern.

TRADITIONAL SETTLEMENT PATTERNS AND NEED FOR SPATIAL PLANNING

The traditional settlement pattern in most of rural India viewed in terms of a system of settlements, consists of a group of semi-independent villages weakly interlinked with one or more service villages. Because of the lack of spatial organisation in private and public investment decision making, these service villages do not form focal points of spatial interaction. The spatial interaction is split between other settlements because service facilities are distributed at several locations. Furthermore for a given area such as a block, the access standards of service villages providing a certain category of services with respect to its dependent settlement may vary widely. The access of a particular group of settlements to the nearest service settlement may be
measured by the maximum travel distance from the farthest village in that cluster to the service settlement are by the population weighted average travel distance for the group of settlements in the cluster. Wide variations in both the maximum and the weighted average travel distance may be observed for each service village and its associated cluster of settlement corresponding to a particular category of services. In addition both the number of settlements and the total population served by each service settlement usually varies significantly.

The objective of spatial planning is to reduce these wide variations in access and population served by service villages and higher level service centres by preparing a location plan for guiding new investments in service facilities such that equity and efficiency criteria are satisfied. The spatial plan also ensures that social and economic infrastructure are not dispersed randomly over space but are concentrating at certain focal points which serve as incompetent points of growth. In other words, the current spatial organisation is transformed into a desirable spatial organisation which promotes focussing of investments at certain growth centres which are selected in terms of maximising access to the population at a minimum cost.
A WORD ABOUT ROADS AND HIGHWAYS

Transport facilities on land, sea and air are indispensable for economic progress of a nation. Transport on land may be by road, railways or waterways. Pipelines are also used for transport of bulky liquids or gaseous commodities like petroleum or natural gas. Power transmission lines help in transport of power from generating units to consumers. Transport is necessary for the exploitation of our vast natural resources. Many of our natural resources remained untapped in the past because of lack of transport facilities. Transport facilities provide basic infrastructure for the development of agriculture, industry, minerals, forests and fisheries. Fertiliser, high yielding varieties of seeds and other inputs needed for agriculture are sent to the villages by utilising transport facilities. Similarly, foodgrains and commercial crops are transported to the markets. The development of an industry depends on cheap and efficient transport of raw materials and finished products. Transportation lines are the life-lines of a nation. This becomes evident in emergencies like
wars, floods, famines and other natural disasters. For defending the frontiers, as well as for national integration, transport is essential. Quick and efficient means of transport are essential for moving foodgrains and other essential commodities for people affected by floods, cyclones, droughts etc. Transport facilities enable people to move from place to place in search of employment, for business or pilgrimage or for pleasure. People are able to understand each other and appreciate differences in language, culture etc. The significance of transport is essentially felt in a large country like India with diverse people speaking a number of languages.

Roads are so old that we are not sure of the origin of the word 'road'. Most experts think it came from the middle english word 'rode' meaning a 'mounted journey'. This may have come from the old english 'rod' from the word 'riden' meaning to 'ride'.

In England, hundreds of years ago, certain main roads were higher than the surrounding ground. This was because earth was thrown from the side ditches toward the centre. Because they were higher, they were called 'highways'. These roads were under protection of the king's men and were open to all travellers. Private roads were known as 'byways'.
The first roads in the world probably followed trails and paths made by animals. These trails and paths led from feeding grounds to watering places. People followed these trails to hunt for animals. People also made their own trails and paths in searching for water, food and fuel. Explorers followed these trails as they investigate new lands.

Early roads were built in the near east soon after the wheel was invented. This was about 3000 B.C. As trade developed between villages, towns and cities, other paths or trade routes were made. One such early system of roads were the Old Silk Trade Route which ran over 6000 miles (9700 kms.) connecting China with Rome and pre-christian Europe. Merchants used this ancient route to carry chinese silk across Turkestan, India and Persia.

The first road markers were piles of stones at intervals. Trails through forests were marked by blazing trees or cutting a piece from the bark of the tree.

The Egyptians, Carthaginians, and Etruscans all built roads. But the first really great road builders were the Romans. They knew how to lay a solid base and how o give the road a pavement of flat
stones. The Romans knew that the road must slope slightly from the centre towards both sides to drain off water. This gave the road a 'crown'. The Roman road builders also knew that there must be ditches along the sides of the road to carry water away. Roman roads were built mainly to get soldiers from one part of the empire to another. These roads ran in almost straight lines and passed over hills instead of cutting around them. The Romans built more than 50,000 miles (80,000 kms.) of roads in their empire and some of them are still in use.

In the middle ages, most roads in Europe were merely clearings in the forests. There was little reason to build good roads, because most of the travel was on horseback. The cleared way was sometimes quite wide, so that robbers hiding in the woods could not leap out suddenly upon travellers. Later when more wheeled vehicles, such as wagons, came into use, the roads still remained in poor condition. Usually the roads were made up of one mudhole after another. Roads with smooth surfaces were rare in England until the 1600's.

In Europe, one man who did more for road building than anyone else up to this time was John
Loudon McAdam, a Scotsman. McAdam began building roads in England early 1800s. He is remembered for the surface he developed for roads. This kind of surface is called Macadam and is used to this day.10

ROAD DEVELOPMENT IN INDIA

Transport plays a very significant role in human society. It is the defacto barometer of economic, social and commercial progress, and carries ideas and inventions to the people and has considerably contributed to the evolution of civilization.11 It has also greatly helped nations in the spread of urbanization. There are various modes of transport but road transport among them is certainly one of the most important.

The modern period of road development in India begins with the submission of the Jayaker Committee Report when the Government of India accepted the responsibility of road construction. A concrete step was taken in 1943 when the famous Nagpur Plan was prepared.12 According to this plan, roads were classified into National Highways, Provincial Highways (now state highways), major district roads, minor district roads and village roads.
A special feature of post-independence era is the construction of Kachcha (un-metalled) and approach roads under the Community Development Programme linking thousands of villages with other roads leading towards the towns. The following table shows the progress of road construction for selected years since 1951.

**TABLE 1**
Progress of road construction (length in 000 kms):

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfaced</td>
<td>157</td>
<td>263</td>
<td>407</td>
<td>724</td>
<td>888</td>
</tr>
<tr>
<td>Unsurfaced</td>
<td>243</td>
<td>264</td>
<td>880</td>
<td>1010</td>
<td>955</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>400</td>
<td>527</td>
<td>1287</td>
<td>1734</td>
<td>1843</td>
</tr>
</tbody>
</table>

In terms of population the road length in 1980-81 worked out to about 52.74 km for every 100 sq km of area and 253 km for every one lakh population. The surfaced road length was 22.00 km for every 100 sq. km of area and 105.6 km for every one lakh of population. But the road length in 1990-91 shows about 56.08 km for every 100 sq km of
area and 218.44 for every one lakh of population. The surfaced road length comes to about 27.30 km for every 100 sq. km of area and 105.27 km for every one lakh of population. While the road length in the State of Uttar Pradesh (1990-91) worked out to about 62.48 km. for every 100 sq. km. of area and 132.58 km. for every one lakh of population. The surfaced road length in state comes to about 28.58 km. every 100 sq. km. of area and 60.65 km. for every one lakh of population. 13

Realising the importance of transport, the ancient Hindu and Moslem rulers laid great emphasis to the construction of highways linking the far corners of their empires. Some of the roads may be traced back to the medieval periods and they were laid for movement of troops. Villages were linked with one another and with a market town by cart tracts. Animal drawn carts and horses were the only mode of travel. These cart tracts could be used only in the dry season as they become slushy during the rainy season. Absence of bridges across rivers also made the roads impossible during the rainy season. Volume of traffic was small at each region but relatively self sufficient. There was no regional specialisation then as has developed at the present time.
Roads provide the most fundamental mode of transport in a modern society. The railways and airways reach only places of considerable regional importance, whereas the feeder service is done by the road which connect countless number of towns and villages, factories, farms, mines and even the remote areas. A considerable amount of surface transport is carried out by roads. Although the history of road construction in India goes back to the 4th century B.C., when Emperor Asoka built a network of roads in his empire, the present road system in the country is quite inadequate and primitive when compared to the advanced countries of the world.

Though India had roads linking major regions with one another, these roads, did not have a strong smooth surface for automobiles. The Britishers were content with the development of railway net-work and they did not take steps to build modern roads except those of strategic value for movement of troops. Realising the importance of roads for economic development, a 10 year road development scheme called the Nagpur Plan was prepared. It aimed at increasing the road length in India from 265000 km in 1944 to 400000 km in 1954. This plan adopted for first time a systematic classification of roads on
a functional basis as:

(a) National Highways
(b) State Highways
(c) District Roads
(d) Village Roads

The Nagpur plan could not be implemented owing to the paucity of funds.

Major development in road construction took place during the five year plan periods. Adequate funds were provided in the plan for improving the existing roads and laying new roads by central and state governments. During the first three five year plans and the three annual plans a total outlay of Rs. 1104 crores was spent on road development. The expenditure during the IV, V and VI plan (outlay) on road development were Rs. 862 crores, Rs. 1353 crores and Rs. 3439 crores respectively. The outlay for road development in VII plan was Rs. 5200 crores comprising Rs. 1019.75 crores in central sector, Rs. 3666.98 crores in state sector and Rs. 513.31 crores in union territories sector. A twenty year road plan was prepared in 1961. It was planned for increasing road length from 656000 km. to 1060000 km. during the twenty year period. The plan envisaged the
completion of two-lane carriage way on all the national highways. The other objectives of the plan were:

(a) to bring every village in a developed agricultural area within 6.4 km. of metalled road and 2.4 km. of any other road.

(b) to bring every village in a semi-developed area within 12.8 km. of a metalled road, and

(c) to bring every village in an undeveloped and uncultured area within 19.2 km. of a metalled road and 8 km. of any other road. The total cost of twenty year plan was estimated to be about Rs. 5200 crores. This plan has been implemented in most parts of the country.

Growth of road length in India (000 km):

<table>
<thead>
<tr>
<th>Year</th>
<th>Surfaced Road</th>
<th>Unsurfaced Road</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950-51</td>
<td>157</td>
<td>243</td>
<td>400</td>
</tr>
<tr>
<td>1960-61</td>
<td>263</td>
<td>261</td>
<td>524</td>
</tr>
<tr>
<td>1971-72</td>
<td>423</td>
<td>599</td>
<td>1022</td>
</tr>
<tr>
<td>1982-83</td>
<td>731</td>
<td>822</td>
<td>1554</td>
</tr>
<tr>
<td>1983-84</td>
<td>747</td>
<td>873</td>
<td>1620</td>
</tr>
</tbody>
</table>
It is observed from the preceding table that maximum growth has occurred after 1961. The length of the surfaced roads has increased by 465% and the length of unsurfaced roads has grown by 338% during the period 1950-51 to 1982-83.

Road transport plays an important role in the economy of the country and is particularly suitable for short and medium distances. It offers flexibility, reliability, speed and door-to-door service. Road transport forms an indispensable element of the national transportation system.

National Highways are the major roads linking state capitals, major ports and cities and towns of national importance. Under the National Highway Act 1956, the central government is directly responsible for the construction and maintenance of national highways. A total length of national highways was 33612 km. upto 31st March 1986, 4581 km. of missing road links including diversions were constructed, 22995 km. of roads were improved so as to reduce their gradient, 23933 km. of roads were widened and strengthened to make it a two lane highway and 427 major bridges were constructed. Thus the national highways ensure smooth flow of traffic along the major trunk routes. Though the national highways
constitute only 2% of the total road length, they carry nearly 33% of the volume of road traffic, thus indicating their importance. Though in terms of total length of roads, India is one of the leading countries, yet the position in relation to total area or total population is not satisfactory when compared to other nations of the world. India has 50 km. of roads per 100 sq. km. of area. Japan has 270 km., Belgium 300 km. and U.K. 146 km. per 100 sq. km. of area. In terms of population, India has 200 km. of road per 100,000 population. Japan has 970 km., Belgium 950 Km., U.K. 641 km., U.S.A. 2900 km. per 100,000 of population. Thus the existing road network is inadequate both in terms of area and in terms of population.

Under agreements reached with Economic and Social Commission on Asia and Pacific (ESCAP), important national highways have been linked with the capitals of adjoining countries like Pakistan, Nepal, Bhutan, Bangladesh and Burma. These links have been financed by World Bank. The world bank has also financed major arterial roads such as Agra-Mumbai Road, Delhi-Multan Road, Bangalore-Chennai Road and Golaghat-Laos Road.
In India roads carry about 60% of passenger traffic and about 35% of total freight traffic. The main problem in road traffic is the poor condition of roads in some states. Maintenance of roads is also not satisfactory. In rainy season, roads can not be used at all specially in the Great Northern Plain.
REFERENCES


4. Ibid, p. 27.


7. The 'Swastika' was a sacrificial symbol indicating the direction of the circumabulatory rite - Pradakshina.


Chapter II

Survey of Available Literature
Settlement patterns often reflect socio-economic condition of the area. It is one of the indicators of the physical and developmental status of the region. There are varied types of settlement patterns mirroring different aspects of natural and man-made features. Settlement geography is a part and parcel of human geography which studies the interrelationship of earth and man. It is a vital branch of knowledge adopting to the needs of time.

Because of its vitality a large number of scholars of different disciplines have contributed to the subject matter of settlement geography. Umpteen studies have been done on different aspects of the subject. The studies have their various focusses and intentions.

The extent of studies done on different aspects of settlements is so vast that they can not be recorded because of spatio-temporal scarcity. Therefore, an attempt has been made to review some of the important works concerned with settlements. A large number of studies are done on individual settlements and analyse the impact of various factors on them. A lot of work
has been done on different great centres of urban settlements throughout the world. All these studies are from 1969 to 1996.

Mrs. M. Mukherjee (1969)¹ have analysed the corelation between the number and specialization of different transport towns and districtwise distribution of taxed vehicles in Bihar.

R.B. Singh (1969)² has dealt with the distributional pattern and siting of rural settlement in Varanasi district with reference to physical environmental factors such as relief, source of water supply, drainage lines etc. and with socio economic conditions in his work.

A.B. Mukerji (1969)³ in his work has traced the history of settlements from the Jataka period. He has pointed out the geometrical pattern of individual houses. In those periods, he says wood and grasses were the major building material.

Saroj Kumar Pal (1970)⁴ has analysed the growth and performed role of urbanisation in the greater urban context of the country. According to study, cities located on the coast are more mature each with an already developed urban sprawl, while that located inland are much younger.
Surendranath Singh (1973) has shown that the settlement structure and the roof plan of the houses reflect the physical and social conditions and specify standards of living. He goes on to describe in detail the village layout and the commuters zone of Varanasi city. According to him most of the houses confirm to the layouts laid down by the sacred literature and show adoption to the geographical conditions.

V.S. Gananathan (1973) has discussed existing conditions of road transport system in India. The discussion highlights the fact that road development has been slow, uneven and unsatisfactory due to lack of coordination in sectoral planning.

R.S. Mann (1974) has attempted a discussion on the need of the consensus regarding the aim and meaning of settlement geography. He attempts to deal with the conceptual aspect of the subject and defines the aim of the subject to be the study of settlement characteristics of process, form, structure, function and environment, equating a rural settlement to an organism.

J.N. Pandey (1975) has given a detailed account of the settlement history of the village Paras Rampur on the Faizabad - Allahabad Road and an analysis of house types in the village.
Rana P.B. Singh (1975) in his work on Indian villages has discussed the concept of village settlements as revealed in ancient literature, Vedic and Post-Vedic, and the concept as it is interpreted today. According to him, the Indian villages as a physical entity represents a unit of settlement as well as forming a distinctive entity of larger socio-politico-religio-economic and settlement systems in its own territorial frame.

Gauri Dutta (1975) analyses and correlates the network of National Highways to the development of cities in India. He goes at length to describe the city development in India in reference to different major routes of India as, Delhi-Dindigul, path via Nagpur-Hyderabad-Salem, path from Delhi to Calcutta and Delhi to Mumbai are also described in detail.

Moonis Raza & Atiya Habeeb (1976) has attempted to bring into focus the matrix of specific factors responsible for and accompanying, the process of urbanisation in a colonial set up. The work analyses and derives generalisations about the 'primate' cities, with special reference to Calcutta.

C.P. Singh (1977) has analysed the characteristics and growth patterns of the towns of National Capital
Region and Delhi. He has emphasised the fact that the rapid industrialisation is not associated with appropriate development of the tertiary sector.

R.S. Dixit (1977)\(^{13}\) reviews some previous approaches to the delimitation of the umland of Kanpur and attempts to resolve the problem by considering the inflow and outflow of certain goods and services as parameters to measure the extent to the empirical umland of Kanpur, and then tests his approach quantitatively.

H.N. Misra (1977)\(^{14}\) analysed the gravity potential model to test the umland boundary of the city of Allahabad demarcated on the basis of empirical data including both rural and urban parameters. Besides, he also applied the Reill's breaking point equation to delineate the umlands of the towns within the umland of Allahabad.

Yogesh Kumar (1977)\(^{15}\) goes on to discuss the nature of the housing problem of rural migrants in cities. He suggests that rural living patterns should not be destroyed but should be adopted to solve the urban housing problems of the rural migrants.
Lallan Singh (1978)\(^{16}\) has analysed the morphological structure of the villages of Patna district. The term 'village' and its variants have been discussed in the paper.

D.K. Halder (1978)\(^{17}\) has correlated transportation system with locational advantage to city growth. He states that the rural push factor have been more significant than the urban pull factor in generating the migration streams that lead to the growth of cities.

Lallan Prasad (1979)\(^{18}\) analysed in his work the spatial pattern of rural central places in vicinity of different big settlement centres of the state.

S. Manzoor Alam (1980)\(^{19}\) has explained the historical and political factors which have influenced urbanisation and settlement system leading to hypertrophy of metropolitan centres. He states that the contrasts in the level of economic development between the metropolitan hinterlands call for dynamic policies on settlement development in India.

Satyesh C. Chakraborty (1980)\(^{20}\) in his work has presented an overview of the areas of research in the functioning of Indian Rail Road System as it has influenced the structure of the organisation of the territorial economy of India. He has correlated the
rail-road system of the country with the development of the same.

A. Aziz (1982)\textsuperscript{21} has attempted to analyse the decadal growth rates of population of towns of Uttar Pradesh from 1931 to 1971. The study highlights the fact that the pattern of growth is not always linear and the towns between themselves differ a great deal as far as rate of growth is concerned.

Saraswati Raju (1982)\textsuperscript{22} has discussed the interrelationship of social order and its attributes as caste, role of family etc. and residential pattern in urban milieu of India. He also discusses the impact of direct and indirect tax structure.

Hutakar Jha & Surendra Gopal (1982)\textsuperscript{23} have attempted the typology of the villages on the basis of an analysis of data contained in village notes relating to one hundred villages belonging to Bikram Police Station in the district of Patna.

A.K. Sharma (1984)\textsuperscript{24} has analysed the phenomenon of city primacy in developing countries with special reference to India. He has tried to explain the phenomenon with the help of independent variables such as urbanisation, migration and development.
Gautam Malick (1986)\textsuperscript{25} has dealt with the fringe growth in different cities of India. He brings out a common feature of big cities in developing countries being parasitic in nature. The three major problems of bordering the core city by the fringe population, chaotic landuse pattern and congested transport routes are well brought out.

Ashok K. Dutt and Rahul Amin (1986)\textsuperscript{26} describe the typology of South Asian cities with special reference to India. According to study, no sizable South Asian city can be designated exclusively as bazaar, colonial or planned types. Most of the South Asian cities can be described on the mixed city model.

Raj Bala (1987)\textsuperscript{27} in her work on Indian urbanisation in India as observed during the decade 1971-81. She states that the Indian urbanisation process during the 1971-81 decade was marked by many peculiar features.

Ashish Sarkar (1988)\textsuperscript{28} describes that the spectrum of urban settlement in West Bengal shows uneven pattern. The changing pattern of average size of urban settlement presents a picture typified by different growth rates.

P.L. Knox & P.J. Taylor (1995)\textsuperscript{29} goes on to discuss the globalization of the world economy. According to them this globalisation of the world economy has been most
prominently focussed upon specific cities around the world, termed world cities. The duo presents a vivid description of the role of some selected world cities in the development of settlement around the world.

B.K. Roberts (1996)\(^3\) has discussed the settlements in the context of history. According to the author rural settlements underlie today's towns and cities and still hold over half the world's population. He elaborates the changing forms and functions of these settlements.
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Chapter III

Rural Settlements
Inhabitants of the rural settlement depend for their livelihood upon the exploitation of the soil, small fishing, quarrying, mining, forestry camps etc. A typical village has secondary workers supplying services to the primary group of farmers and farm labourers e.g. shopkeepers, teachers, clergymen, the publican, postmaster, smith and garage proprietor. Besides the village consists of a part of retired people and in part of younger people who live in the village but go to work in a neighbouring town. The proportion of population in each of these classes bears to the total village population, varies with the kind of farming characteristics of the locality, the quality of the soil, the attractiveness and accessibility of the site and its place within the general settlement pattern.

The main factors influencing the rural settlement are:

(1) Nature of the topography.
(2) Local weather conditions
(3) Quality of the soil
(4) Nature of surface and sub-surface water.
(5) Pattern of landholding
(6) Social organisation and
(7) Economic conditions.
Depending on the size, the rural settlements are classified as Hamlets (a rural settlement comprising of few houses only), true village communities, villages and large villages. True village community are just ancient and long settled villages where in extreme cases, no personal property exists and everything belongs to community of peasants. Such village communities are seen in India, Malaya and France.

Besides agricultural villages, there also exists forest villages, mining and quarrying villages, fishing villages, villages chiefly supported by tourist industry, dormitory villages serving nearby towns and industrial villages. Each has its own characters:

(1) Many industrial and mining villages are unrepossessing which suffer from ugly and drab surroundings.

(2) Fishing and tourist villages are more attractively situated and in many cases possess the charm and interest of historical buildings.

(3) Most of dormitory villages are either new or consists largely of modern housing estates. In all such settlements, occupations are much more specialised than in towns and such typical urban functions as administration and wholeselling are rarely present. The
number of villages in a country and the role played by villages in the social and economic context is profound. In India around three fourth of the population live in more than six hundred thousand villages and most of these support a population of less than five hundred. It is estimated that two out of every three persons still live in villages or in hamlets and scattered dwelling all over the world.

The village has been both the cultural and physical entity since ancient times. If the physical factor of site have provided a mould for pattern formation, cultural factors have given the substance and vitality. The concept of Dih is a symbolic of traditional attachment to the site of the settlement of the growing village community while the decayed Dih has ever remained unwanted, and thus preserved amidst till the life around. The settlement has also preserved the various layers of the social fabrics with provisions for group segregation within the village territorial limit and is in consonance with the need of the time.

The villages is seldom an isolate; it is an essential part of a large territorial unit developed
in the process of land occupancy. Such territorial units have continued to this day in more or less similar form maintaining uniform rural polity though the general political order at the national as well as regional levels has been registering frequent changes.

The individual village may be dominated either by a single crop or a number of significant rural communities some of which may be insignificant on the territorial level. For instance, the Upper Doab, a territory with jat dominance does provide for muslim, rajput and tyagi villages. The region as a whole, is predominantly rural as around 80% of the total population is living in villages. There is a general tendency of greater nucleation of rural settlement in the region.

The distributional pattern of rural settlements and their types in the region are intimately related to its dominantly alluvial morphology and the predominantly agrarian economy. The nature of terrain, type of soils, facilities of water supply have also important role in the development of the settlements. Means of transport is a very important factor in this regard. In the Ganga-Yamuna doab, high fertility soil, more 'bhangar' lands, adequate irrigational facilities,
and means of well developed transport have given rise to almost uniform distribution of settlements. In 'Tarai' area of Rohilkhand-Awadh region, the settlements are, however, unevenly distributed due to high percentage of forests, marshy tracts and seasonal floods, and the villages are located on relatively higher ground. In general, the unpopulated villages are a pronounced feature of the Tarai tract due to frequent desertion of sides owing to floods and other causes and the migratory cultivation by the aboriginal tribes. On account of over flooding and changes in the river courses, villages are mostly hamleted and are often located at the points of geographical advantage, such as embankment and river bluffs etc. In the Rohilkhand and Awadh, villages are generally evenly distributed and are located above the flood level.¹

PATTERNS OF RURAL SETTLEMENTS

Pattern refers to the spatial arrangement of settlements in relation to one another. Pattern of settlement is the result of relief, climate, water supply and other socio economic factors. The simple pattern that can be identified in rural settlements are dispersed pattern and clustered pattern. Apart from these, linear and ring patterns can also be identified.
Dispersed Pattern

A dispersed pattern is one where settlements are spaced far apart from one another. Generally in places where mechanised agriculture is practised, dispersed rural settlements are found. In mountainous regions, in deserts and in semi-arid areas the settlements have a dispersed pattern.

Dispersed rural settlements are common in densely populated tracts like Kerala and West Bengal. The farmer lives in a part of the cultivated so that he can devote full attention to his farm. Such isolated houses situated in the midst of farms are called homesteads. With more intensive cultivation using well-water, farmer's house is built near the pump house so that he can irrigate the fields when there is power supply and arrange for supply of water to different fields. Farmers leave the village and set up their houses in the midst of their fields. This also leads to dispersed pattern.

Clustered Pattern

In highly fertile regions where intensive agriculture is practised, using more human labour clustered villages are found e.g. villages of Ganga Plain.
Linear Pattern

Well settlements are oriented either along a series of springs located in linear form or along a railway or a roadway, the resulting pattern will be a linear pattern. The fishing villages along the coast also have a linear pattern. That is, the settlements will be more or less arranged in a straight line. Incidentally, this study has ample examples of linear pattern of settlements because the study concentrates on the region along Grand Trunk Road.

Another example of linear pattern of settlement is called the STRASSENDORF pattern. This is called street villages in which houses are arranged on either side of a street. With the development of bus transport, such street villages with linear pattern have become more common.

Ring Pattern

When settlements are oriented along the foot of a hill encircling the hill or mound, a ring pattern of settlement results. Often, ring settlement develops in the region of water scarcity, people tend to live in a circle around a well, a pond or any other type of water reservoir.
TYPES OF RURAL SETTLEMENTS

Strong Point Settlements:

In early period people live an insecure life especially in border areas. In such places the settlement were either located on top of a hill or in the meander loop of a river to assure protection. Such settlements are referred to as strong point settlements or defence villages e.g. Durham in England was built on a hill, protected on three sides by the meander of the river water.

Spring Line Settlements:

Water is a vital need, and man from time immemorial settled nearer to the source of water. In some places specially in the limestone region people select the spring location as the site for settlements. These springs occur in a line at the line of contact of the permeable and impermeable layer. Such settlements are referred to as spring line settlements e.g. spring line villages are seen in South Dover in England and in Jammu & Kashmir state in India.

Wet Point Settlements:

In dry areas, settlements have a tendency to get oriented nearer to the source of water. Hence the settlement site is located near a spring or river. Here
the settlement seek water. Hence they are referred to as water seeking or wet point settlements. These settlements are found in the dry limestone and other region as well as in deserts.

Dry Point Settlements:

In the low-lying areas and the delta areas, which are prone to floods and in the equatorial region where damp and marshy conditions prevail, settlements have a tendency to seek dry sites. Generally in the hill site some zone above the surface land is preferred. In other places as in the equatorial regions, the houses will be constructed at five to eight metres above the surface level. Such settlements are known as dry point villages e.g. rural settlements in Kerala, and rural settlements on the river flood plain in Uttar Pradesh.

Pilgrim Settlements:

Villages are also influenced by socio economic conditions apart from physical conditions. Sometimes a village may grow around a temple, church or mosque. A sanctified spot may be located on the basis of the religious faith of the local people. Around this spot, shops and houses concentrate, giving rise to a settlements. Such villages are termed as religious
centre villages or pilgrim settlements e.g. Thiruverbadu, Lourdes etc.

**Market Settlements:**

Generally in agricultural plains some villages have weekly markets. In most cases, these villages are located along transportation lines and have easy access to other villages. People from adjoining villages congregate in such a village on market day with their agricultural products for sale and purchase of essential items required in coming week. These market settlements are those which have weekly markets and due to these markets these villages have an edge over adjoining villages and grow bigger and bigger. Some of them later go on to become a town.

**Foot-hill Settlements:**

The foot-hill region offers some possibilities for settlement. The foot-hill region has advantage of collecting products from the mountains as well as from adjacent plains. Further there is a break in the mode of transportation between the mountains and the plains at the foot-hill region. These conditions favour the development of settlement at the foot-hill. These foot-hill settlements are aligned in keeping
with the orientation of the hill e.g. Himalaya foot-hill settlements.

**Transportation Line Settlements:**

Villages have a tendency to be oriented along either roadways or railways. These villages are found situated on either side of transportation lines. These villages are referred to as transportation villages e.g. most of the villages along the railway lines in Tamil Nadu.

**Abandoned Settlements:**

Some times due to floods, famine, war, epidemics or dam construction, the original village sites may be abandoned and people move to other places and new settlements. The ruined houses are founded standing the original site as evidence of farmer villages.

**Transplanted settlements:**

People move from the abandoned villages to new places to form transplanted settlements. There could be many reasons of this shifting of sites. Naturally people will not move their houses easily. There should be a pressing need to do this. There can be quake, famine, epidemic or any other natural catastrophe or
an opportunity which could not be avoided as the reason cited for this shifting of settlement. The new place of settlement is known as transplanted settlement.

SETTLEMENT PATTERNS ALONG GRAND TRUNK ROAD

In order to know the real picture of settlement patterns, G.T. Road has been divided into three parts:

i) The portion lying in Upper Ganga Plain
ii) Portion lying in Middle Ganga Plain and
iii) The portion lying in Lower Ganga Plain.

At the outset, a brief account of rural settlements has been incorporated including their growth, types and patterns of distribution. In the later part of the study sample villages are selected for indepth study of settlement patterns. Two case studies have been taken from each region of Ganga Plain along G.T. Road. The study has been conducted on the basis of topographical sheets and field observations.

Upper Ganga Plain:

Though the region has a relatively much higher proportion of urban population rather than the middle ganga plain, the region as a whole is predominantly
rural with around eighty percent of the total population living in over fifty thousand villages of varying sizes. Most of the population (around 55%) of the region lives in medium size villages (of population 500-2000) and the proportion of the population living in overgrown villages (above population of 5000) is also considerable (7%).

According to the trends, the remarkable feature of the growth of the rural population in this region is that percentage of population living in small size villages has increased. Among the large size villages there has been a significant increase. The increase registered in the villages of this size was most probably due to declassification of a number of towns to village status in 1961.

The distributional pattern of rural settlements and their types in the region are intimately related to its dominantly alluvial morphology and the predominantly agrarian economy. The nature of terrain, type of soils, facilities of water supply and means of transport have also important role in the development of settlements. In the Ganga-Yamuna Doab, high fertility of soil, more bhangar lands, adequate irrigational facilities, and well developed means of transport have given rise to almost uniform distribution of settlements. In tarai area of Rohilkhand-Awadh region, the settlements are, however,
unevenly distributed due to high percentage of forests, marshy tracts and seasonal floods, and the villages are located on relatively higher ground. In general, the unpopulated villages are pronounced feature of the tarai tracts due to frequent desertion of sites owing to floods and other causes and the migratory cultivation by the aboriginal tribes. On account of overflooding and changes in the river courses, villages are mostly hamleted and are often located at the points of geographical advantage, such as embankments and river bluffs, etc. In the Rohilkhand and Awadh, villages are generally evenly distributed and are located above the flood level. In the Yamunapur tract, where the land is often broken, the distributional pattern of villages is governed by the availability of the level nature of the plain. The large ravine tracts are almost devoid of any settlement.

In the Ghar region of Saharanpur, the settlement sites generally follow the drainage lines and the nature and degree of slope. Compact type of settlements are widely distributed and are most dominant in the Ghar region. The semi-compact settlements are new additions due to jungle grants and extension of agriculture. Newly built roads have also attributed to the growth of these hamlets. Besides these, the linear settlements along
the Barhi Jamuna and circular pattern of settlements in Solain - Ratmau divide are noticeable.

In the Rohilkhand region, the villages are larger in the bhangar land. In general, every large village has small hamlets, situated at a distance of hardly a few hundred metres. These small sized satellite sites have usually been inhabited by the tenants and agricultural labourers who belong in most cases to the lower castes. The uplands are closely packed with village sites: the intervillage distance being a km or two. It is largely due to the rich soil of the region. The settlements of this area are mainly compact.

The villages in the Awadh plain are generally small. Because of the favourable combination of level topography, fertile soil and sufficient water supply in the interfluvial uplands, rural dwellings are collectively grouped into large compact villages. The largest continuous stretch of such villages lies in the Ghagra-Gomti interfluvial upland from the tehsils of Kheri through Sitapur, Biswan and eastern part of Sidhaul, Fatehpur and Ramsanehighat extending to Hasanganj in the Ganga-Sai interfluve.

The greater part of the Awadh Plain is occupied by semi-compact type of villages. The hamlets are mostly
younger than the main village. The majority of these hamlets bear the name of 'Khera', 'Pur', 'Pura' or 'Purwa' as prefix or suffix. Generally these hamlets bear the name of founder such as Bhima Khera, Pura Bhola Ahir, Mohan Purwa. Some hamlets are named after some caste such as Purwa Gaderi, Pasi Khera etc. In such type of rural settlements, the revenue is named after the main village, and the hamlets are mainly the dwelling places of labourers and service classes and depend upon the village for their needs.

In the long settled land of the Awadh plain the grouping of rural dwellings in the form of small hamlets is a rare feature. However such settlements are seen in the narrow Khadar of the Ganga and the Ghagra but the high bluffs are occupied by large rural settlements. In the compact part of the region, the margins of the Usar land are also studded with large and medium compact and semi compact settlements.

The village has been both a cultural and physical entity since ancient times. If the physical factor of the site have provided a mould for pattern formation the cultural factors have given the sustenance and vitality. The concept of Dih is symbolic of traditional
attachment to the site of the settlement of the growing village community while the decayed Dih has ever remain unwanted, and thus preserved amidst all the life around. The settlement has also preserved to various layers of social fabric with provision for group segregation within the village territorial limit and in consonance with the need of the time.

The village is seldom an isolate, it is an essential part of a territorial unit developed in the process of land occupancy. Such territorial units have continued to this day in more or less similar form maintaining uniform rural polity though the general political order at the national as well as regional level has been registering frequent changes.

The individual village may be dominated either by a single group or a number of significant rural communities some of which may be insignificant at the territorial level.
Fig. 2. BILSURI, CHANDERU AND DARYAPUR
SETTLEMENT PATTERN BETWEEN DELHI AND BULANDSHAHAR

Sample Study No. 1:

To find out the general pattern of settlements a sample study of rural settlements have been done in Upper Ganga Plain between Delhi and Bulandshahar. For this particular study a portion of Grand Trunk Road between the two cities was selected from Topographical Sheet No. 53H/15. The map showing this segment of road extends between 28°25'N to 28°30'N latitudes and 77°45'E to 77°50'E longitudes. The settlement patterns along this particular segment of road is compact in nature. There are three well developed compact settlements in this segment of the road, they are Bilsuri, Chanderu and Daryapur.

Bilsuri:

This rural settlement is situated at 28°26'N latitude and 77°45'E longitude. More than 90% of the area of the settlement lies on the northern side of the Grand Trunk Road and on the southern side rest of the settlement is developed. Northern side of the settlements is compact in nature but southern side of the settlement have developed on the line of linear settlement.
In this settlement there is a post office to serve the surrounding population. The village is well linked by telegraph, telephone and electric power lines. A dispensary is also there in the village. This village is only 5 km away from Sikandrabad so it enjoys all the infrastructural and market facilities available there. The distance of the village from Delhi is around 60 km, so it can be said that this village is well linked with developed town markets and other infrastructural facilities.

Chanderu:

This rural settlement is situated at 28°25'30"N latitude and 77°47'E longitude. Most of the settlements lies on the northern side of the road. Only a low percentage of the settlement is developed on the southern side. The settlement on the northern side is compact in nature and the settlement on the southern side is linear in nature. The settlement is not a big one but is connected by Grand Trunk Road to other towns and settlements. The village is connected to a power line also. This village is a typical example of small rural settlements developed along Grand Trunk Road. The village owes its development to the Grand Trunk Road in a way.
Infact the road serves as a life line for not only this settlement but also to others developed along its course.

Daryapur:

This rural settlement is situated at 25°30'N latitude and 77°47'30"E longitude. Nearly all of the settlement is situated on the southern side of Grand Trunk Road and is compact in nature. Infact this settlement is situated at the junction of Grand Trunk Road and Dodepur distributory of Upper Ganga Canal so this distributory and Grand Trunk Road connect this settlement to other settlements and infact work as life line to these settlements. The village has a rectangular shape due to its peculiar location. The village is a well developed one and a weekly (friday) market is organised which serves other settlements in the vicinity also. The village has also got veterinary hospital for the service of village livestock. The village has also services like post office and other infrastructural facilities. The Upper Ganga Canal is not very far from the village and serves the village well far irrigational purposes.
Fig. 3. DHUM MANIKPUR, DADRI AND CHITEHRA
SETTLEMENT PATTERN BETWEEN DELHI AND BULANDSHAHR

Sample Study No. 2:

A sample study of rural settlements to find out the general pattern of settlements have been done in Upper Ganga Plain between Delhi and Bulandshahar. For this particular study a segment of Grand Trunk Road between above mentioned cities was selected from Topographical Sheet No. 53H/10. The map showing this segment of road extends between 28°30'N to 28°35'N latitude and 77°30'E to 77°35'E longitude. The settlement pattern along this particular segment of road is compact in nature generally. Three well developed compact settlements are Dhum Manikpur, Dadri and Chitehra.

Dhum Manikpur:

This particular rural settlement is situated at 28°34'30"N latitude and 77°32'E longitude. More than 80% of inhabited area of the settlement lies east of Grand Trunk Road while rest of 20% lies on the western side. The houses of village make a compact arrangement in general. The village is well linked by power line and other infrastructural facilities including a post office. A minor distributary of the main Kalda
distributory (of Upper Ganga Canal) drains most of the agricultural lands of the area. It lies on the eastern side of Grand Trunk Road. The village is nucleated and resembles rectangular type of pattern. Other infrastructural facilities are also not lacking here. A telephone line connects the village to surrounding area as well to rest of the nation. As village is situated along the premier road of India it is well linked to its neighbouring settlements and also to the various centres of development situated along the road. There are fair reasons to believe that the settlement was started as a linear one but later developed into a rectangular one.

**Dadri:**

This rural settlement is situated at 28°32'N and 77°33'30"E longitude. This is a well developed rural settlement and is fairly big in its size. Most of the area of the settlement lies west of the Grand Trunk Road. Although in the village, houses present somewhat rectangular type of pattern but to the east of the Grand Trunk Road the settlement scheme is a typical linear one. The settlement is fairly big and works as a service centre for the surrounding settlements. The village is well linked with unmetalled
roads to other settlements. It is also linked by a metalled road to a parallel running northern railway main line. A telegraph and telephone line also serves the settlement. Other infrastructural facilities are also not lacking in the settlement. A public transport office, hospital, a rest house of public works department are also there to serve the village. A veterinary hospital, which is very vital to the villages because of agrarian economy which runs with the help of cattle wealth, also takes care of the livestock population. A rest house of public works department is also there to serve the settlement. In this settlement also, there are fair reasons to believe that the settlement was started as a linear settlement but later developed into a rectangular one. To the west of the settlement a road connects it to the Dadri Railway Station lying on the Northern Railway Main Line. Along the road leading to the railway station a linear settlement pattern is established.

Chitehra:

This rural settlement lies at 28°33'N latitude and 77°34'E longitude. Most of the settlement lies on the western side of the road. The settlement in general is rectangular but on the eastern side of the road it
is somewhat linear. The main Kalda distributory of Upper Ganga Canal drains the village and is of great help to the agricultural operations of this particular settlement. Like its parent source it is a permanent stream and is full of water all the year round. Chitehra is a well connected village. A telegraph and telephone line also connects the village with other parts and outside world. A post office also serves the village. The pattern of settlement on the eastern side of the road is in linear form. It seems that the settlement was started in the linear form and later developed into a compact and rectangular one.

**Middle Ganga Plain:**

About ninety percent of the population in the Middle Ganga Plain is rural living in about 74000 villages. About forty to seventy percent of the rural population lives in villages of medium size (population 500 - 1999) except in Santhal Paragna and Saharsa. About one third to one fourth congregate in small size villages (population below 500) in east U.P. Plains except in Ballia and Gonda while in Bihar Plains there is much wider variation: most of the Bihar plain has hardly twelve percent of the total rural population in small size villages and in fact below that in Champaran, Muzaffarpur, Darbhanga and Saharsa districts. In the
entire ravine belt of the Saryupar and North Bihar Plain only Basti district marks an exception by registering almost half of its population in small villages. Only Santhal Paragna excels in this respect because of the highly broken relief. In the southern plains about one fourth to one fifth of the rural people live in small villages. In the case of large villages (population 2000 - 4999) the spatial pattern is different. In the eastern U.P. Plains only one tenth to one seventh of the rural population is found in such villages. In Bihar Plains more than one third of the total population is accounted for in this group.

Some pockets of the plain, particularly the large Khadar levees of the Ganga in Ghazipur district eastward and of the Gandak, the Ghaghra, and other large rivers (while the Kosi and the Son which are mostly shun by settlements) are famous for sitting some overgrown villages (population over 10000). Ghazipur is the only district in the region in which about five percent of the rural population resides in overgrown villages: other important districts are Bhagalpur, Champaran, Saharsa, Munghyr and Darbhanga. One of the notable features of the distribution of rural population has been a significant decrease in the percentage of rural people living in small villages in all the districts except in
Jaunpur, Munghyr, and Bhagalpur showing some increase. The low medium size villages have also last in most of the districts except in most of the Saryupar, Ballia, Jaunpur, Sultanpur, and Varanasi in the eastern plain and the contiguous Shahabad and Gaya areas. This trend implicates the upgrading of the small villages by population gains, and also the fact that new villages are not coming up, perhaps because of the saturation in settlement siting. This is also corroborated by the fact that medium, large and over grown villages also have gained everywhere except in Jaunpur where the medium size villages have not gained.

The rural settlement types and their distribution pattern in the region are intimately related to its alluvial morphology and the predominantly agrarian economy. The complex cities of the various physical factors viz. geology, relief, drainage, climate, soil and natural vegetation have profound impact, both attractive and restrictive, on the selection of sites and morphological plans of villages, while cultural factors such as the nature of the crop grown, population density, nature of transport system and various intangible social customs and traditions and taboos imbibed through millenia of years appear to have guided the orientation
and arrangement of clusters different sizes belonging to different castes and communities.

In the Saryupar, the abundance of water combined with the level and fertile plain has given rise to uniform distributional patterns of settlements, but locally this uniformity is disturbed by the nature of channel shifting and size of the streams and the fork lands in between them, the incidence of forests, swamps, and marshes, fertility differences of soils and as in the tarai, pattern of distribution of lands among the colonizers. Grass and forest infested areas in the tarai have unevenly distributed hamlets with a few large compact villages at suitable sites. The vast area in the Kuwana-Ami and the Rohin-Chilua Doabs are featured by uneven distribution of settlements owing to presence of woodlands, marshes and low lying areas, along the margins of which hamleted villages have grown up. East of the Rapti and south of the Tarai the hamleted settlements are quite uncommon. Almost evenly distributed small and compact settlements with few hamlets are found in the Rapti-Little Gandak interfluve, east of which in the Bhat Soil Region the degree of compactness and evenness of spatial patterning increases.
In the Ganga-Ghaghara Doab the distributional pattern of settlements appear to vary from west to east in general conformity with the diversities of the natural and cultural factors. On the well-drained loam tracts of the eastern part, excepting ill-drained Kachhar lands of the Chhoti Saryu, hamleted settlements are more or less uniformly distributed. Eastward in Ballia district fairly large and compact villages with a few hamlets have grown up. Many villages are quite ancient in origin and they have imbibed certain elements of the historical corridors in their social milieu.

Westward in the vast usar-infested tracts of the patchy (though now intensified) cultivation, unevenly distributed large and small villages, depending on water factor and size of cultivated lands nearby, with several outlying hamlets are the general rule. Ravine lands of the Gomti, the Sai and other rivers are devoid of settlements as are the usar tracts, and only on their edges with better lands villages have sprung up as if in a line on favourable sites. Under the usar reclamation, though on individual scale, hamlets are springing up and even some detached farm houses might be seen, particularly near the Tals and other water points which phase may be accelerated with the consolidation of holdings and irrigational facilities.
through tubewells or pumping sets.

In the Khadar lands, there is a general lack of viable sites, and large out-hill like human congregation are found on the few available dry points levees. But in the Ghaghara Khadar, being subject to more ravaging floods and sand sprawls, has fewer large settlements in comparision to that of the Ganga, and is densely settled with hamlets. The diara lands are mostly temporarily settled for growing rabi and zaid crops, although some of these patches have also large number of small settlements, springing out from the large neighbouring villages: Sitab Diara and Umarpur Diara of Ballia-Shahabad are such examples on the Ganga Diara lands: the later rocked the whole area by the problem of land disputes, a difficult question in the agrarian settlement in such lands of shifting character. The Ganga Khadar is also characterized by uneven distribution of settlements, its high bluffs which are far between have offered sites for some of the largest and oldest villages like Gahmar, Reotipur, Sherpur etc.

The settlement patterns and types are different in North Bihar and South Bihar plains because of the difference in the nature of drainage and other factors. In the sub-montane hills and foothill zone of North Champaran, rural settlements are typically dispersed,
settled as they are in small patchy clearings for cultivation in the woods. The remaining part of North Bihar Plain is characterized by both compact and scattered types as well as their immediate variants: the north eastern plains have mostly dispersed types, those in central doabs are mostly of semi-compact and compact types, while again the Ganga and Ghaghara Diara lands have dispersed settlements as they do in the east U.P. plain.

In the Ganga-Barhi Gandak Doab (away from the Ganga levees) also has developed an island of relatively dispersed settlements characterized by small hamlets and scattered hutments dotting over the isotropic landscape of amazingly uniform fertility of the loamy low land liable to frequent inundation relatively free from marshes and other negative lands.

The Mithila plain shows wide variation in the settlement patterns and types.

The South Bihar plain has more compact settlements than the wet and relatively more riverine North Bihar plain. Consequently, the intervillage distance is greater in the south than in the north.

Thus in the actual distribution of rural settlements, two characteristic types with several
intermediate stages are distinguished, agglomerated or nucleated settlements and dispersed or scattered settlements. Four types are easily discernible:

(i) Compact type

(ii) Semi-compact or hamleted cluster, featured by one main cluster and some hamlets,

(iii) Semi-sprinkled or fragmented or hamleted types i.e. several hamlets spread over the entire mauza and

(iv) Sprinkled and dispersed type i.e. diffused distribution of hamlets.³
Fig. 4. MADHOSINGH, GHOSIA & AURAI
SETTLEMENT PATTERN BETWEEN ALLAHABAD AND VARANASI

Sample Study No. 3:

To find out the general trend of the rural settlement a sample study of rural settlements was done in Uttar Pradesh along the Grand Trunk Road. For this particular study a segment of the Grand Trunk Road was selected from the Topographical Sheet No. 63K/11. The map showing this segment of road extends between 25°15'N to 25°20'N latitude and 82°30'E to 82°35'E longitudes. The general trend of settlement in this segment is compact and semi-compact type. The sample settlements in this segment are Madhosingh, Ghosia and Aurai situated along Grand Trunk Road.

Madhosingh

This rural settlement is situated at 25°16'N latitude and 82°32'E longitude. Semi-compact type of settlement is found well developed on the northern side of the Grand Trunk Road and linear type on the other side of the road. On the northern side of the road there is a development of rectangular pattern. The settlement is well linked by transport lines. One road links it to the north eastern railway line and Grand Trunk Road directly connects it to Allahabad and Varanasi. This
settlement is also connected to another important road leading to Khamaria in the region. Between this road and Grand Trunk Road a triangular space is formed and there is a fair chance of development of settlement in this region. There is a well developed market in this settlement which makes it the place of visit for market purposes for nearby villagers. The settlement is also connected by telephone line with outside world.

Ghosia

This rural settlement is situated at 25°16'N latitude and 82°33'E longitudes. This is a semi-compact type of settlement. Major part of the settlement is situated on the northern side of the Grand Trunk Road and a very small percentage of settlement is on the other side of the road. The settlement represents a somewhat linear pattern of development. The settlement on the northern side of the road shows a rectangular pattern of development. This settlement is connected to a good network of roads on the northern side. Besides, the rectangular stretch of the settlement there is also development of some scattered houses. The settlement has good infrastructural facilities: a post office, telephone services and a bi-weekly market (Tuesday and Friday).
The rectangular shape of this settlement is developed strictly along the Grand Trunk Road and one is tempted to call it a broadened linear settlement. It seems that it was, in the beginning, first developed into linear form and thereafter assumed a rectangular shape.

Aurai

This rural settlement is situated at 25°16'N latitude and 82°34'E longitudes. This is a compact type of settlement situated on a crossroad (chauraha as it is generally called). The core of the settlement is occupied by this chauraha. This intersection of roads is made by Grand Trunk Road and a road cutting it at right angle, connecting the settlement to Bhadohi. The settlement shows a checkerboard pattern. On the southern side of the Grand Trunk Road the left portion is enclosed in a rectangular shape by some small roads and thus produce a peculiar pattern of settlement development. The road which connects Aurai to Bhadohi shows a linear development of settlement throughout its length and looks like a narrow tail of a compact settlement pattern.

The settlement has various civic facilities like veterinary hospital, post office, dispensary etc. In settlement is connected with telephone line.
Fig. 5. GOPIGANJ AND GYANPUR
A sample study of rural settlement has been done in Bhadohi District of Uttar Pradesh. For this particular study a segment of Grand Trunk Road in the above area was selected from Topographical sheet No. 63K/7. The map showing this segment of road extends between 25°15'N to 25°20'N latitudes and 82°25'E to 82°30'E longitudes. The general trend of settlement between this segment of road is compact in nature generally. The most conspicuous settlement in this segment is Gopiganj.

Gopiganj

This settlement is situated at 25°17'N latitude and 82°26'E longitude. It is situated at 70 kms from Varanasi. Previously the settlement was a part of Varanasi district but now it is a part of newly created district of Bhadohi, which was carved out from the adjoining districts of Varanasi, Allahabad, Jaunpur and Mirzapur. Gopiganj is situated only 5 kms away from district Headquarters of Bhadohi. With its fast pace of development it is likely that within few years there will be a continuous development of settlement connecting the settlements of Gopiganj-Gyanpur-Bhadohi chain.
Most of the settlement in this area is situated along the Grand Trunk Road. Gopiganj is well connected by other roads too. It is 40 kms away from Mirzapur by road.

A railway line runs parallel to the Grand Trunk Road in this sector. There is a development of linear pattern of settlement along the connecting roads. The road which connects Gopiganj to district Headquarters of Bhadohi has developed continuous linear pattern all along its length. With its fast pace of development these two separate settlements are likely to be developed in one compact settlement in near future.

One conspicuous feature of this settlement is that the settlement is nearly halfway between Delhi and Calcutta. Actually the point which is considered half way is around 20 kms away from Gopiganj. There are enough reasons to believe that the settlement at the first place started due to Grand Trunk Road. The fact that it is halfway between two premier loading and unloading points added to the process of development of settlement. Initially the site should have worked as a stopover for trucks and other vehicles. Later the carpet industry added and actually piled up the settlement development.
Lower Ganga Plain

The rural settlement generally consists of small groups of houses, dotting the paddy and jute fields. There is wide regional variation in density of population. The Delta proper consists of over forty percent of the rural population of the region. The region as a whole has preponderance of small size rural settlements.

The most distinguishing feature of the rural dwelling in the region is its conical roof. With little variation houses are primarily Kachcha with thatched roof on mud-walls. Pucca houses are very rare. Due to water logging plinth is raised as high as 4 to 6 mts. Highly pitched thatched roofs mostly of palmyre or nipa leaves are very common in the deltaic region, representing environmental adoption; while corrugated iron sheets or tins are frequently popular in Duars and the Tista flood plains. A farmstead in Bengal is not an isolated dwelling of a family like American farmstead but is always an assemblage of several huts, the size of hut depending on the economic status of the inhabitants. Intermingling of the grooves of bamboo, banana and mangoes add to the scenic beauty of the village. Amenities like drainage, sewerage etc. are often absent. Huts up to half a dozen or so cluster around a little court with a tank, often resulting from digging out of the earth for walls, and used for bathing and domestic
water supply. The house is a multipurpose apartment with a cowshed attached. Much of the life of a family is spent in the open air or in the varandah. A great variety of mats and baskets, large storage jars, chests etc. constitute most of the furniture. In areas where the streams are tidal or get overflooded in the rains, nets and other fishing gears are also noticeable.

Caste system has also exercised its influence in village patterning. The upper class communities such as Brahmins, Kayasthas and Vaidyas mostly dominate the village system and often occupy the central portion in the settlement. The schedule castes such as the Begadis are Kus Meteys, the Bauris, the Haris, the Namsudras, the Muchis have usually isolated hamlets away from the central site.

There is a well developed regional variation in the type of settlements. Broadly, the rural settlements are: (a) Compact (b) Semi-compact or hamleted clusters and (c) Linear, emerging as a result of the interplay of both physical and cultural factors. Linear pattern of settlements are most common along the coastal dunes in the Tista plain and the Delta proper, along the old beds of rivers and levees or along roads especially around the industrial concentrations. Scattered and sprinkled
settlements are noticeable in parts of the Rarh plain, newly reclaimed Duars and the Sunderbans. The compact and nucleated settlements are most prevalent in the Ajay-Damodar and Ajay-Brahmai interfluves and the Moribund delta. The dry-point waterfronts are natural site for compact settlements in the Delta proper; in the Rarh plain artificial tanks also provide for such settlements.

Hamleted clusters may be seen in the Bhagirathi-Dwarka interfluve north of Azimganj - Nalhati railway line. The undulating nature of ground as interrupted long stretch of arable lands. The low grounds are left for Aman paddy where as big grounds (Donga) are occupied by hamlets. In addition, some small groups of scheduled tribes, Santhals and Oraons, prefer to live in a small group near the cultivable land where they are mainly engaged as agricultural labrouers. 4

Sample Study No.5: Bardhaman District, West Bengal

To find out the general trend of the settlement a sample study of rural settlements was done in West Bengal along the Grand Trunk Road. The district choosen for this study is Bardhaman. For this particular study, a segment of Grand Trunk Road was selected from the Topographical sheet No. 73M/16. The map showing this segment of road extends from 23°10'N to 23°15'N latitude
Fig. 6. GANGPUR, AMRA AND SHAKTIGARH
and from 87°55'E to 88°0'E longitudes. The general trend of settlement in this region is of compact nature. The three well developed settlements of this region are Gangpur, Amra and Shaktigarh. This region lies in Bardhaman district of West Bengal.

**Gangpur**

This settlement is located at 23°13'N latitude and 87°55'E longitudes. Actually this settlement is a part of a continuous series of settlements including Ban, Banboo and Gangpur. This patch is of compact type and by nature it is of very dense stretch of settlements. This settlement is sandwiched between eastern railway main line and Grand Trunk Road. It can hardly be overlooked that the settlement is placed between two premier life lines of the region and it can be safely assumed that the settlement in the first place originated because of these lines. There is one more factor which played its role in the origin of the settlement i.e. the location of Durgapur industrial complex situated not very far from Gangpur. A fair chunk of population is settled in this settlement due to the proximity of the industrial complex. The settlement is developed on linear pattern but due to continuous broadening now assumes a rectangular shape. Adjacent to this rectangular stretch,
on the southern side of Grand Trunk Road, a triangular pattern of settlement is also developed.

This particular settlement is a very dense one and the process of development is still in continuation.

Amra

Amra is located at 23°12'N latitude and 87°03'E longitude. The settlement is compact in nature and bears a triangular pattern. Almost the whole settlement is located south of the Grand Trunk Road and a very sparse linear development is found on the southern side of the road. The settlement is not very far from Gangpur. The settlement has been connected to neighbouring settlements of Kandarsena and Bembanpara. In fact this settlement could have been considered continuous with neighbouring settlements except for a hollow space of no settlement development between them. It is likely that this hollow space will be filled up in near future and then this settlement will be a part of a longer continuous compact and dense settlement of the area. Industrial development in the Durgapur industrial complex has a profound role in the development of this settlement. Due to the industrial complex in the vicinity the pace of development of settlement is quickened. In fact the complex is the reason for the advance in the development of infrastructural facilities. Due to advanced state of
infrastructural facilities the settlement has further developed into a dense settlement.

Shaktigarh

Shaktigarh is located at 23°12'N latitude and 87°04'E longitude. The settlement is a semi-compact one and has no specific pattern. It can be considered as an amorphous pattern of settlement. This settlement is situated at the confluence of Grand Trunk Road and eastern railway main line. Therefore the different sectors of this settlement have developed separately. The settlement is a well connected one. A road from northern region connects this settlement. Along this road a linear development of settlement may be observed. Another road on the southern side connects it to Barsul, Gopalpur, Kalinagar etc. Along this road also a linear pattern of settlement can be seen. Furthermore, Grand Trunk Road and eastern railway main line connects the settlement to other big settlements. There are other segments of linear pattern along the Grand Trunk Road and eastern railway main line. There is fair chance that the settlement, in future will be developed into a bigger, denser and compact one. The infrastructural facilities available in the settlement are electricity, telephone, post office and a market.
REFERENCES


Chapter IV

Urban Settlements
NEED OF TOWN STUDY:

The outstanding feature of our civilization is the shift towards an urban way of life. Western world is predominantly urban. Americans and Europeans have the biggest cities of the world. These cities have been studied thoroughly by geographers, social scientists and other scientists, and substantial literature is available about them, which due to its immensity, has created difficulties of approach for western civic students. Patric Geddes Complains "Our task is rendered difficult by the immensity of its materials". What is to be said of cities in general where your guidebook to Rome or Paris or London is a crowded and small typed volume. When booksellers' windows are bright with beautifully illustrated volumes, each for a single city, and when each of these is but an introduction to a mass of literature for every city, vast beyond our anticipation.¹

The immensity of introductory information about towns and cities, though a difficulty to the western civic student, is only a prelude of the vast potential knowledge of urban geography. But in India not much work has been done on great cities of India
boasting thousand years of existence like Varanasi, Allahabad, Calcutta and others. Incidentally many of these ancient cities come under the perview of this study.

None can deny the importance of town study. In independent India, when the nation is heading towards speedy development it is proper time to help in making plans and schemes of national reconstruction with a fresh approach. "Cities are the representative of the countries in which they are situated". They are often more important than the countries they are in. Often our only concept of a country or state is centred round one or more large cities.²

Cities play an important role in the political social and economic life of a country. In a country with a large history they undergo vast changes in the course of time. Consequently the towns as we see them today bear marks of their history and act as records not only of past civilisation but also of the changing aspects of human geography.³
The morphology of a city form shape and pattern of the city plan evolves out always influenced by geographical and infrastructural factors the roads specially highways has a predominant place in these infrastructural factors influencing the form, shape and pattern of the city. The cities if they are to be developed and improved on a scientific and planned basis, to make them healthier centres of modern civilized society their morphology should be studied in relation with the geographical and infrastructural factors influencing it.

The approach to the study of a town- an enquiry into the evolution of its morphology - can be made through historical and developmental methods. Many Europian and Indian cities naturally invites us to this method. This method is a useful one for the study of historical cities of India, it gives a deeper insight into the history of the city and reasons and causes of development of present landscape of the city.

INDIAN TOWNS : Some General Characteristics

Although it is true that it is very difficult to see generality in towns because towns in India and in the world are system in themselves but because
G.T. Road which is now known as national highway no. 1 & 2 has long been sort of a life-line to the country some similarities can be seen in the cities situated along it. Besides that in general the towns are so unique individually that even categorising two cities in one single category poses many problems. Nevertheless a pattern emerges in organisation and there are some similarity in characteristics of India towns. A modest attempt has been done here to list some of their characteristics.

In a great majority of cases towns have still very strong agricultural elements within them. The smaller ones are indeed little more than large market villages with the same very local administrative function added; perhaps two or three central streets inadequately paved and lighted give the semblance of an urban formation. Even in so large a city as Agra herds of dairy buffaloes are driven out in the morning, back in the evening 'hour of cow-dust'.

Large number of towns are primarily administrative: they may have been local commercial centres and market villages picked as headquarters of districts or their sub-divisions mainly on account of centrality. For the most part these have a strikingly uniform cast, owing to the alien and hierarchial character of the administration of British India.
Most Indian cities (and large sections of even the greatest of them) have not separated residential and other functions to the same extent as occidental towns.

Yet if the separation of work from residence often hardly exists, there is a very strong tendency (at all levels from village to metropolis) for members of each religious community, caste or race to live together. This is only to be expected in the general social context of India. Notable examples are the pols of Ahmedabad and the Parsee housing estates of Mumbai and where there are very large number of Chinese, has in Calcutta there is a China town - as indeed happens universally.

The British in India as it were fused this communal separatism with their own emphasis on class. Large Indian cities generally consist of two entirely distinct areas: the old Indian city, a squalid but picturesque confusion and the monotonously planned open-developed town of European style bungalows with large gardens along straight, broad roads, aloof and boring in a high degree and absolutely dead in the heat of the day. These two are very often separated by the railway which - in some cases apparently by design - forms a broad barrier with few crossings: the motivation of 'internal
security' is obvious. The 'Civil Lines' contain the official residence of the local bureaucracy and such hangers-on as the more flourishing lawyers; architecture is European. The railway colony is generally on a far less generous scale, but on the mathematically rectilinear lines. The cantonement explain themselves, but they generally had a little Indian enclave, the bazaar to serve the needs, material and some times other, of the troops: this was necessary as for the most obvious reasons the Indian city was strictly out of bounds.

Although this distinction (between the main city and civil line area) is fading fast but to this date most of the cities retain their colonial heritage.⁴

Although this is true for the old cities of India but the newly developed cities which are developed in the post independence period has a character of their own. the tendency now is that of small towns developing into big cities with infrastructural links.
The horizontal expansion of cities occurs due to the developments of roads and highways. Most of the big cities in Uttar Pradesh grew with fort or the temple as the nucleus, but now manifold factors are governing the growth pattern of the city. Roads and highways are important so far as the expansion of the city is concerned. The Grand Trunk Road - one of the important national highways which was built by Shershah Suri, attracted colonies, bazaars and now it almost passes through the busiest and most crowded parts of the different cities that fall en route. Although the city was not originally settled along this road, but now it is an important link connecting two parts of the city: ancient and new. A study of various towns and cities reveals that expansion has generally taken place along the highways and important road links. The example of KAVAL cities of the state may be taken; Agra is expanding along the Agra-Delhi road which is a 'National Highway'. The Agra Corporation has included Sikandra in its limits and the development has taken place in that direction. With the diversion of National Highway-I from Sikandra to bypass the city, the city has expanded in that direction too. Similarly, Allahabad has become crowded on both the sides of the Grand Trunk Road. Later expansion of Allahabad has taken place along the Kanpur road. Lucknow too has expanded along the Sitapur road and Barabanki road.
expansion of Lucknow city along the Kanpur road. In fact, Alambagh, Chandranagar, refugee colony, Sarojininagar, etc. have developed along the Kanpur road. Varanasi, again, has expanded along the Grand Trunk Road. There is also considerable expansion along the Varanasi-Moghal Sarai Road. Kanpur, however, could not expand due to the river on the north and Ganga Canal in the east. The cantonment did develop in the east of Ganga Canal. The gap between old Kanpur (Nawabganj etc.) and Kanpur city has been abridged by new colonies. Later expansion has taken place along the Grand Trunk road, and Kalpi road in the south.¹
VARANASI

The legend of the origin of 'Banaras' is narrated in the 'Kashi Rahasya' a work attributed to 'Veda Vyas', the compiler of the Vedas. It was founded at the request of seven 'Rishis' who approached Lord Vishnu and desired to be shown the certain road to salvation. It is atleast certain that Banaras had already acquired a reputation for secular serelity in Puranic age and consequently its antiquity is beyond dispute.

The description of the city in Sanskrit literature is usually found with the names of Kashi and Varanasi. The name of Kashi remain current and in Varanasi was abandoned, and Banaras was in common use till late. Dr. Sampurnanand The first Chief Minister of Uttar Pradesh renamed it as Varanasi.

Kashi is derived from 'Kash' meaning 'to shine' and construed as 'sole illumination'. The name Varanasi is most probably due to rivers 'Varuna' in the north and 'Assi' in the south of the city.

The first historical reference to this city, however, dates back to the days of 'Buddha'. Sarnath symbolises the site where Buddha made his first converts. In the 5th century A.D. Fahein visited the city of Banaras. Two centuries later, Hieun-Tsang found Banaras densely populated and its inhabitants in
flourishing state.

In Ain-e-Akbari there are references about this city. Earlier Mahmud Ghazni visited Banaras in 1019 and 1022 A.D. We also find a reference of Banaras at the time of Babar. The district Gazetteer refers to the fact that troops of Babar were garrisoned at Banaras under Jalal-ud-din. Later on he was compelled to abandon the place and retired to Chunar.

Akbar also faced great resistance and the area did not fall in the hands of Akbar till the eastern expedition of Khan-i-Zaman in 1559. Banaras flourished immensely under the tolerant rule of Akbar and once again it assumed its ancient position as the religious centre of the Hindu World.

The history of Banaras during the first part of the nineteenth century is mainly a record of administrative development under the British rule. Since the mutiny of 1857 Banaras had remain obscene and unimportant and connected chiefly with the improvement of communication, development of the city and various reforms in administration. Nevertheless in the mean time the city has functioned as a religious centre of the Hindus and a somewhat important centre of Commerce in the Purvanchal although it was not important in the national context.
Although it has been the seat of erst-while Banaras state, it is primarily known as the biggest religious centre of the Hindus. It has also been a big centre of Indian renaissance. Famous writers of the Hindu language Tulsi Das, Baba Harishchandra, Jai Shankar Prasad, Pandit Ram Chandra Shukla and Prem Chandra made this city important with their writings and made the city a cultural and literary one at the time. The city is a big centre of tourist attraction and earns foreign exchange for the country. Later on it has attracted the attention of industrialist and apart from its cottage industries like zari Sarees, wooden toys etc. The complex of heavy industry is fast building in and around the town.

Varanasi is the larger city in the middle ganga plain situated on the left Kankar infested high levee of the Ganga crescent, planned out of not a very good site for expansion on the back; the three cultural nuclei of Kedareshwar, Visheshwar and Onkarshwar are seperated from each other by the Godavari and the Mandakini, the two venerable rivers, one representing the Ganga of the south and other of the north. The city exerted a potent force for national integration through the imperceptible process of cultural assimilation. The confluence of the Saryu of Varanasi with the Ganga provided the burning
ghat, hallowed by the memory of Harishchandra, the king of ancient Awadh and as such, the block to the south came to be known as Awadh. This again means the integration of the Awadh culture of the north with the other cultural currents embedded in Varanasi. These discrete blocks coalesced with each other being joined by the Kedareshwara-Visheshwara lane, the life line of ancient Varanasi, running parallel to the crescentic Ganga through the crest of the levee over a wooden bridge on the Godawari in the present Dasaswamedh area (preserved in the name of a Mohalla 'Dedasi Ka Pul', bridge of Dedasi). The main residential area has developed roughly like a bow the Ganga forming its string. New residential areas have gone up along the outer roads, like the Durgan-Kund, Vidyapith road and the Jagatganj-Civil Court Road. There are a number of planned colonies now and many emerging up in the city which is fast expanding. Having the first bridge in 1882 on the Ganga in the whole of the Middle Ganga Valley, the city had the maximum advantage of growth, and has increased its population manifold. It is the world famous centre for silk fabrics and brass works among many other handicraft products, and true to its cultural history it is the most famous educational centre with three universities. The city has now developed a metropolitan
character. The city, in fact, works as a growth engine for the adjoining Purvanchal region. The city is now also spreading on the road connecting to Allahabad which is G.T. Road. City has functional links with Allahabad city.
ALLAHABAD

The city was formerly known as Prayag. It has been an important pilgrimage centre since the ancient times. According to Manu the place belonged to Brahmriishi, and embraced all the part of the country north of Yamuna and Ganga. Legend has it that Lord Brahma performed the 'Ashwamedha Yajna' here to establish his universal supremacy, but nothing can be said authentically. Description of this place also is found in the great epic Ramayana. During the period of their exile, Rama, Sita and Laxmana visited this place after crossing the Ganga by boat over Ram-Chaura a place few miles away from Allahabad city. There is a vivid description in Ramayana of the visit of Lord Rama, to the famous temples of Prayag, particularly the visit to Bharadwaj Ashram and Akshayavata. Later, Bharat who came in search of Rama, also state with Muni Bharadwaj at his Ashram on the high bank over looking the confluence of Ganga and Yamuna but these are not borne out by history and hence it is difficult to calculate the date of the origin of the city.

In the times of Buddha, Prayag was a part of 'Kosal Kingdom'. The excavation show that 'Kosam' or 'Kaushambi' was situated some thirty miles from Prayag. Kaushambi was the capital, and Prayag was the
holy city. It was one of the principal cities during the period of Lord Buddha, whereas now Kaushambi lies buried underneath and Prayag is lost in the wilderness of urban Allahabad! According to the writings of Hiuen-Tsang, Kaushambi was not so large a city as Prayag and appears to have been in a much declining state. King Harshavardhana used to distribute his accumulated wealth to the poor and needy here, at Prayag. He also held great assembly, once in every five years. The description show that the city had the expansion around the Patalpuri Temple where at present the Allahabad Fort is situated.

Ashoka the Great erected a pillar, now preserved inside the fort compound. On this pillar are inscribed the six edicts of Ashoka. Besides the inscription of Ashoka, the pillar bears long inscription of Samudra Gupta, Jahangir—the Mughal Ruler, and innumerable scribblings done by pilgrims of various dates. The record of the visit of Raja Birbal in 1575 to the Magh Mela is also found inscribed on the pillar.

Akbar visited Prayag in 1575 and laid the foundations of imperial city which he named 'Ilahabas'. Taking into consideration the strategic site of Prayag, Akbar also built a fort. He again visited Prayag in 1584 and spent four months there.
It is apparent that part of the fort had been completed by that time. The city grew rapidly in importance, and before the end of Akbar's reign was a place of considerable size, one of the chief industries being boat building: for it is said that number of far large sea-going vessels were constructed there and taken down the river to coast. Before the completion of the fort the seat of this province, under a chieftain of Moghulswas Jaunpur; and Kara, near Kanpur was an important town. After the completion of the fort Allahabad became capital of the province in place of Jaunpur, and from this time Kara ceases to possess any political significance.

Although Akbar named the city as 'Ilahabas' in place of Prayag the former name nevertheless remains current and popular "but denotes the scene of religious worship rather than the city". The name, Prayag, was perpetuated by the British by christening one of the city railway station as 'Prayag Railway Station' which was originally Allenganj. The name given by Akbar was conveniently changed by popular usage to Allahabad. And onomatopoeic controversy arisen for long and it is yet undecided, "whether this name is merely a Hinduised formed of Ilahabas or whether there was really a town called after 'Allah-á'one of the celebrated Banaphar twin brothers of Hindu story, and renamed by Akbar in the interest of Islam".
While comparing the description of Hiuen-Tsang regarding the expansion of the city which was around the Patalpuri temple, and the present core of the city along the Grand Trunk Road from Muthiganj to Mirganj, there are reasons to believe that the city core has shifted westward leaving its original site with a solitary fort.

In Akbar's time Allahabad became an important arena of political activities. Prince Jahangir after rising in revolt against his father, came to Allahabad and declared himself the King.

The history of the city is obscure after the death of Jahangir, but it did remain an important city of northern India.

Allahabad regained its position and importance during the reign of the British, particularly after the shifting of Government Headquarters of north-west province in 1858, followed by the transfer of high courts in 1868. This resulted into a tremendous increase of population in the city. According to the figures available in 1853 the total population was 72093, but in 1865 it had risen to 105926 people. In 1872, the population was recorded as 143693, while in 1881, the total was 160118 persons.
Later on Lucknow became the capital of United Provinces, but Allahabad still remained the seat of High Court. With the establishment of Muir College, and later the University of Allahabad, it emerged as an important educational and cultural centre of Uttar Pradesh.

Allahabad is known as the city of Judges, Lawyers, Professors and students. Now it has also developed into an important railway centre with a big colony. The industrial complex has also grown in and around Allahabad. The city is fragmented into civil lines, old city, university area, industrial estate and new colonies etc. Lately the city has seen tremendous population explosion.

It could be seen that Allahabad touched the lac-mark in 1865; now it is many times bigger than what it was 100 years ago.

As can be seen from the above description Allahabad is a fragmented rather compartmentalised city having well defined colonies of personnel of different professions as lawyers, judges and other civil personnel. As the city is an important rather most important educational centre of Uttar Pradesh. Educational activity with judicial activity dominates a city life. Students roam the streets and roads of the city.
KANPUR

One of the biggest metropolis of Uttar Pradesh, Kanpur, acquired a place on the map of India only in the modern era after the advent of British rule. The local army of Oudh under the British Command which was stationed at Faizpur, near Bilgram, under the terms of the treaty of 1773, was moved to Kanpur in 1778. The simple reason was that of East India Company realising the advantageous position of Kanpur, wanted to establish commercial firms there, and therefore decided to have the protection of the army for the British traders and their establishments. Henceforth, Kanpur became an army camp, or 'Kampoo' as it was referred to in the colloquical terminology. The presence of large army garrisons gave rise to demand for variety of goods, particularly food-stuffs, clothes and leather articles. Consequently it grew into an industrial metropolis. It had the advantage of growing into an industrial city especially in the period of second world war, as there was ample market for the war material, shoes, saddles etc.

It may be further noted that till 1778 Kanpur was merely a village. With the network of railways laid in 1863, it assumed far greater importance from the point of view of trade and industry. Also, it gained
importance due to its central location in the Indo-Gangetic plains, and presence of river, canal and host of other facilities encouraged the leather and textile industries. The first textile mill was started in 1861. By 1891 it became quite an important industrial centre. Now it is the nodal industrial centre of the state. Jute, leather, textile, defence (aircrafts and ordinance), rolling mills, and host of other industries are developed here.\(^{10}\)

Originally a military cantonment at the border line dividing the then British frontier from the province of Oudh and the territory of the Moghal Kings of Delhi, it has become one of the most important industrial centre of the country. Before the national uprising of 1857, the cantonment covered an area of about 28 Sq. Km. stretching along the river front. The main city was enclosed by the cantonment on three sides and city's expansion was possible in one direction only in the triangular space enclosed by the Ganga Canal in the east and the cantonment boundary in the north and west. This naturally resulted in great congestion in the main city.

After 1857 many industrial concerns were established at Kanpur. The city had already become famous
for tanning and curing of leather and for the production of leather goods, especially of boots and saddlery for the military. The period 1863-1885 witnessed the development of great industrial establishments, i.e. the Government Harness and Seddlery Factory, Coopar Allen & Co., North West Tanneries Ltd. and several cotton mills like Elgin, Muir, Victoria, Kanpur Woolen Mills and Army Cloth Manufacturing Company Ltd. etc.

After the construction of railway line, the railway station and railway colony were developed to the south of then built-up area. With the expansion of the railway yard, it became more advantageous for the factories and small mills to occupy a site in the southern periphery. This led to the chain establishment of ginning presses and mills in the south of the city. Thus the industrial area of Kanpur forms two zones:

(1) in the north of the city proper,
(2) in the south of the city proper.

Lately the city is expanding towards south beyond the railway colony.

The city proper is crowded and some of the old built-up areas have developed into virtual slums
separated by narrow lanes. The Mall is an old market serving the city as well as the cantonment. Nayaganj is the largest grain market. With a view to providing better accommodation, Open market of Collectorganj, now the centre of grain trade lies on the Chowk road which is a narrow lane lined with shops and business houses running west to Collectorganj.

Thus industry dominates all spheres of life in Kanpur. It has become an important centre of advanced education including technical; the IIT has added a new township to the city.
CALCUTTA

Calcutta was established in 1960 born out of a factory built by the East India Company. In 1927, a municipal corporation for Calcutta, headed by a Mayor was established. Between 1774 and 1911, it was officially the capital of British Empire in India. In the later half of the nineteenth century, a filtered water supply, underground drainage, a network of roads, and other improvements were planned and built. Up to independence in 1947, Calcutta was the premier industrial centre and largest port in India. Following independence and the loss of the hinterland that had provided raw materials and workers to its prominent manufacturing industries, Calcutta's relative importance as an industrial base declined.

The population of Calcutta Metropolitan District (CMD) was calculated to be more than 10 million in 1981; that of the Calcutta Metropolitan Corporation (CMC) area was 3.3 million. At that time, the total urban population of India was approximately 160 million, thus some 6% of urban dwellers in India were resident of CMC.

The CMD is the slowest growing metropolis in India, yet it continues to add over 2,00,000 persons
to its population in spite of continuing deficiencies in environment, infrastructure, public services and employment. About 7.8 million people live on the east bank of Hooghly river. This includes the 3.3 million people living in the CMC administrative area. The west bank population is about 2.2 million and is concentrated mainly in the Howrah Municipal Corporation (HMC) and Bally Munacipality opposite the CMC.

Despite its poverty and breakdown of civic amenities, people are increasingly flocking this metropolis. This has turned Calcutta as the most populous of the sub continent. The city has now attained super metropolitan character. More than one third of its population of about 10.2 million is now packed within a highly congested core area of about 104 sq. km. while the west of the population spreads over the CMD area of 1321 sq. km. From its primary function as a port, the city has now acquired multifunctional status covering a variety of functions.12

For the first time mention has been made of Calcutta conurbation in the 1951 census of West Bengal, when the census superintendent, in his pioneering zeal delineated the Calcutta industrial region on the Hooghly side in recognition of a certain demographic, economic,
industrial geographical unity - a fact surmised and hinted at since 1921, but not avowedly expressed by any government agency.

The total area covered by the conurbation is above 400 sq. km. of which the core cities of Calcutta and Howrah occupy around 100 sq. km. and 30 sq. km. of area respectively.

The Calcutta industrial conurbation has expanded tremendously in spatial, demographic and socio-economic dimensions. This has been achieved by a process of (a) accretion of periurban settlement, industrial and residential suburbs gaining urban status due to rapid change in proportion of non-agricultural workers; (b) municipal annexation of urbanised tracts, settled areas etc. lying adjacent to existing urban nodes; (c) constant expansion of transport networks, especially of bus services from the central city and industrial towns into the peripheral areas, bringing large volume of commuters and (d) rapid growth of population and steady rise in density both in urban tracts and adjacent areas due to heavy influx of migrants, industrial labourers and displaced persons from beyond borders of West Bengal the Calcutta Metropolitan District (CMD) has an area of about ...
1040 sq. km. along the Hooghly encompassing two corporations, 33 municipalities and 42 non municipal urban units extending from Baruipur – Budge Budge in the south to Bansbari-Kalyani in the north in addition to 475 densely settled and semi urbanised outlying rural communities around the urbanised zone. This area is little more than one per cent of total area of the state and contains 17 per cent of total population and 75 per cent of urban population of the state.

The region, though endowed with rich alluvial soil, abundant basic raw materials, numerous perennial streams and a sea face which together could attract large number of people is now confronted with certain acute problems, both physical and socio-economic, Calcutta, a typical example of chance-erected and chance-directed city has grown haphazardly not only in its physical plan but also in terms of the provision of economic opportunities commensurate with the needs of a metropolis of its size. The city is plagued with overcrowding, degradation of housing, health hazards, primitive water supply, lack of space for new industries, traffic bottlenecks, power shortages and other problems. The lanes and streets are too narrow to cope with the traffic as only 8 per cent of total area is in
transport use as against 30 per cent as per modern standard.

However, Calcutta as a dynamic metropolis has the essential vitality to meet the challenge of the situation. Various efforts are being made to relieve the metropolis of its ills.

The problems of Calcutta and the Hooghly side call for the development of not only the different sub regions of the Lower Ganga Plain but also need rather more immediately the planned and integrated development of several counter-magnets in its vast hinterland as well as to arrest the Calcutta-ward flow of people and opportunities.

The remodelling of the existing transport links and laying down of the new ones will facilitate the movement of bulky goods like jute, tea, coal, and other minerals along with the fish. The reviving of water-transport may release the extra burden on railways and roads. The swampy chunks in the south east and south west Rarh lack adequate road and railway facilities. The laying down of additional lines will help improving the conditions and in developing agro-industries there. The seasonal roads in Duar hamper the movement of tea. The modernisation and through connection will maintain regular flow of tea. Being a perishable item, tea requires quick transit and adequate warehousing.
How the traditionally graceful and beautiful cities have gradually emerged into 'slums' is the matter of historical perceptions and political attitudes. The present Delhi has evolved through seventeen ancient 'Delhis' during 3500 years of its history. Today two of them Shahjahanabad (old Delhi) and New Delhi are living cities. Old Delhi, the product of Shahjahan who shifted the capital from Agra in 1635 remain one of the most beautiful and graceful cities in the orient, till 1803, when the British arrived in Delhi. The British and the natives lived side by side within the walled city. After the war (so called mutiny) of 1857 the British attitude had been hostile and over one third of the city was razed to ground and its population ejected. Initial plan was to completely blow up the entire city. However, insufficient gunpowder stalled the proposal. The Red Fort was seized by British infantry and buildings upto 500 yards from which were cleared. Delhi municipal committee was setup in 1863 and the city came to be seen as dark, unhealthy and congested. Sections of the walled city and several gates were removed with a view to relieve congestion. Areas of walled city were perceived as a 'useless maze' and its surroundings as heterogeneous patches of dirty
hovels, the approaches to which are 'irregular and wholly unsatisfactory' (Whitehead Report - 1908). Extension plans were formed so that the construction of wide and symmetrical streets is secured by sufficient open space is preserved, while the improvement schemes discussed the need for 'regularisation' of the walled city.

The decision for the transfer of imperial capital from Calcutta to Delhi in 1911 furthered the process of devaluation of the walled city. New Capital's housmannian vistas and imperial scale dwarfed the walled city and brought immediate and direct comparison. During 1920s, the concept of congestion crystallised into 'slums'. In 1936 Hume estimated that there were about 100,000 more people in Shahjahanabad than its capacity.

In 1947 after the partition and independence of India, Delhi witnessed one of the largest immigration of people in the human history. Millions crossed man made borders, out of which an estimated half a million sought shelter in the lap of Delhi. Delhi was not prepared for this doubling of population in just two months. Tents were pitched to house these uprooted people. Through years of improvisation,
adjustment and resettlement, they were moved into 14 permanent rehabilitation townships located towards the fringe of urban Delhi of 1950. However, many families continued to occupy public land adjacent to the old city, because of several reasons main of which had been their links with employment and central location to such squattments.

To improve the situation, in December 1957, the government replaced the Delhi Development (provisional) Authority and the Delhi Improvement Trust. By passing the Delhi Development Act 1957 Delhi Master Plan came into force on 1st September, 1962. The master plan divided the old city into conservation, rehabilitation and development zones.\textsuperscript{14}
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11. Opcit, pp. 150 - 158.


Throughout the course of this study, studying and analysing rural and urban settlements one could feel that a sort of common thread exists between these settlements. It seems that a common set of rules, if we can call them 'rules' in real sense, govern the growth and establishment of these settlements. Although it is an established fact that every settlement is unique and has a personality of its own but studying the different settlements along Grand Trunk Road gives the 'feel' as if these settlements has some common traits and as a a common thread run along them joining them with each other. The fact is not surprising, although an unusual one, because Grand Trunk Road works as a life line for all these settlements.

In the region under study it appears that there has been hardly any proper planning of the rural settlements although in case of urban settlements some planning attempts can be seen at different levels. It is obvious that most of the settlements are rectangular or square and do not appear to differ in essentials. It can be felt that most of these settlements started in the linear form and later, with continuing growth due to many factors, became rectangular or assumed other
forms. Some 'Karwan' towns were also developed in this fashion. The starting point of most small towns was establishment of some tea-shops or dhabas as stopovers for passengers. In the medieval times 'Sarais' were built for passengers at regular intervals by 'Sher Shah Suri' and Mughal Administration. 'Sarais' were resting places for tired passengers journeying through the imperial road. These 'Sarais' in due course of time with their surrounding area developed into small and big towns in many cases.

The traditional settlement pattern in most of rural India, viewed as a system of settlements, consists of a group of semi independent villages weakly interlinked with one or more villages amidst them. In the study area this link is prominent in the form of Grand Trunk Road. There is a need of proper planning taking Grand Trunk Road in the centre. The plan should be such to ensure that social and economic infrastructure are not dispersed randomly over space but are concentrating at certain focal points which serve as points of growth. In other words, the current spatial organization is to be transformed into a desirable spatial organization which will promote focussing of investments at certain growth centres which
are selected in terms of maximizing access to the 
maximum population at a minimum cost.

Grand Trunk Road boast of some very important, 
rather most important cities of the country. The list 
of towns is very impressive one. These prominent cities 
are Delhi, Calcutta, Kanpur, Varanasi and Allahabad 
etc. to cite some of them. In these cities Delhi is the 
capital of India, Calcutta was at a time capital of the 
country and still is the capital of West Bengal and a 
very important commercial centre of the country. Infact, 
Delhi, Calcutta and Kanpur work as growth engines for 
the country. Delhi from the very begining is a very 
important city of India first as the seat of Mughal 
Emperor and now as capital of free India. Varanasi is 
an ancient city and is still an important cultural 
centre of the country. Allahabad can be cited as an 
educational city at par with oxford of United Kingdom. 
In fact, it is often called 'Oxford of the East'. 
Although all of these cities are very important in their 
own right and Grand Trunk Road is not the reason of 
their existence but studying these cities in the course 
of this study it was often felt that Grand Trunk Road 
has a tremendous impact on the development and growth 
of all these cities. Often, in these cities Grand Trunk
Road passes through the heart of the city.

In retrospect, it can be clearly seen on the basis of present study that along the Grand Trunk Road that there are some common elements between the settlements. The common element comes from the fact that Grand Trunk Road works as an all pervasive link for all these settlements, linking them with one another and in some cases even is 'raison d'etre' of these settlements.

In the course of the study, one thing comes time and again that is the lack of proper planning. Notwithstanding the fact whether the settlement is a rural or urban one lack of planning is clear in most cases. The need is to consider the region in its entirety and to prepare planning strategies taking the Grand Trunk Road in the centre as an all pervasive common link.

Following are some of the problems besetting the study area and some measures to address them. There is an urgent need to address the problem of heavy traffic congestion on Grand Trunk Road. Steps should be taken for the decongestion by providing alternate parallel and link roads. A possible approach to do this is to construct bypasses in more congested areas. Lately, attempts are being made to construct Super Highways
which will be four lane speedy highways. Hopefully this will be proved an important step in the direction of decongestioning our highly traffic congested highways. Another problem is that the settlements along and near the Grand Trunk Road are very dense and compact. There is a need to relocate some parts of these settlements in the manner that this compactness is to be reduced. A useful thing to do in this regard is to provide link roads between different settlements so that to facilitate more rational future growth of the settlements. Pollution is another alarming problem in more busy parts of the area. Here more plant cover is necessary to ward off harmful effects of pollution. Decongestion of traffic will also be of help in this regard. Another alarming problem is of fast deterioration of road surfaces due to heavy traffic. This calls for efficient road management and scientific innovativeness. Tonnage on trucks should also be regulated more strictly to reduce extra burden on the road surface.
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