CHAPTER VIII

SUMMARY AND CONCLUSION

The region "Dibrugarh and its environs" constructed for the purpose of urban landscape analysis has been identified to be lying to the southern side of the river Brahmaputra in the Lakhimpur district of Assam. It consists all the police stations of the Dibrugarh sub-division excluding only Sadiya. The cultural landscape of the region including settlements and transport lines has a recent development. Although it is at present one of the most developed areas in whole of Assam yet a hundred years ago it was a very sparsely populated area while the areas all around this region were well inhabited. Dibrugarh itself, established as a small settlement for strategic purpose had its origin in the early part of the sixteenth century and even as late as the beginning of the nineteenth century there was no sign of any notable urban tendency in the entire region. Only a little over one hundred years ago there was not even a single settlement with more than 2000 persons.

The urban landscape of the region "Dibrugarh and its environs" has its origin in the process of advantageous and profitable exploitation of the regional resources. Though the British people initially took interest in the
region more from the point of view of their adventurous curiosity than making any economic gain, the region incidentally and subsequently proved to be economically very much viable. The region which originally had very little population was almost devoid of any significant cultural landscape such as settlements, transport lines or even agricultural fields except only around the town of Dibrugarh and a few administrative centres which were either older nuclei of population concentrations grown out of the necessity for collection of revenue or for housing the old Moamoria rulers and chief-tains for convenience of administration of the neighbouring settlements. The simultaneous growth and development of such industries as tea, coal, petroleum and plywood, in fact, provided real impetus to a number of activities of 'man-land' relationships. Consequently, these urban innovations which brought in the activation of the cultural habitation and processes, including the urban processes, were responsible for the growth and development of a cultural landscape which was almost entirely a novelty to the area before nineteenth century. As late as 1842, Dibrugarh, as also other settlements in the region, saw almost no light of what we now know as modern civilization responsible for development of urbanism and urban landscape. It was in this year that the headquarters of the Lakhimpur district was transferred from the north bank of
the Brahmaputra to Dibrugarh in the south bank. This was as a result of the incorporation of Sadiya and Matak country in the British territory. It was from this time onwards that the once important defence location (i.e. Dibrugarh) gained control of the administration not only of the Lakhimipur district but also of the whole of the tracts lying to the north, northeast, south and southeast of this region and consequently it is from this time onwards that the urban transformation came not only to Dibrugarh itself but also to the region as a whole. By this time the Assam Tea Company which owned the new tea garden at Joypur of the present region established tea processing factories at Dibrugarh. Thus, Dibrugarh controlled the first commercial string of the region and worked as the centre of initial urban activities of the region based on trade and commerce in modern lines.

A few years later, discovery and commercial exploitation of coal in the region provided the next important impetus to urbanization. Subsequently, the third important and most significant item of natural resources of the region—oil—helped in transforming a considerable area of rural landscape of the region into outstanding urban areas besides its being responsible for providing urban impetus to the region as a whole.
A typical Tea Garden in the region.

Itakhooli Tea Estate.
(Mark the beautiful tea garden road maintained by the T.E.).

The Railway line and the tea gardens.
The commercial viability of the natural resources of the region warranted in laying off suitable transport lines. As a result, in 1878 the Assam Railways and Trading Co. built the Bibru-Sadiya railway line connecting important tea gardens in the northeast and also in 1882 another railway line to the coalfields of Ledo near Margherita in the southeast. The latter was from Dibrugarh which had already gained importance and had been connected by river-services to Gauhati and Calcutta. This Company deserves the credit for opening up this area to human habitation and urban civilization not only by constructing railway lines but also by working the coal quarries and drilling the oil wells in this remote corner. By the end of nineteenth century, besides Dibrugarh, half a dozen urban centres had come up in the region mainly due to commercial exploitation of natural resources of the region. Few railway focal points like Tinsukia had also come up. The growing number of tea gardens opened up a number of linking roads to facilitate the transport of tea to the river-port at Dibrugarh which had become a centre of industrial, commercial and administrative activities of the East India Company in this part of India. The urban process got further accelerated as by this time the British transferred most of the important military functions of Sadiya Military Headquarters to Dibrugarh. The tea planters added to the urban landscape by their incentive of
laying off a number of nice roads in a planned way and also providing the region with such urban facilities as medical hospitals, electricity, schooling facilities and recreational units. They also provided incentive for developing plywood industries since they needed plywood tea-chests for exporting their tea which was processed in the tea factories located in the garden areas.

Migration of tea garden, mining and other labour force and also a number of skilled and semi-skilled workers besides the inflow of civil and army officers, upcountry traders and merchants and Chinese tea manufacturers had given a heterogeneous population structure not only to the urban centres but also to the region as a whole. These people with their cosmopolitan outlook, non-agricultural occupation and, above all, their shopping mentality with higher purchasing ability had been responsible to stimulate the urbanization process. Consequently, a number of small urban centres grew up taking the geographical advantage of economy of time and least effort in use of space and distance. The Second World War added further impetus to urbanization in the area through construction and improvement of roads for military purpose and also by opening up of shops and agencies to cater to the needs of people engaged in war.
Ledo-Tikak Coal area.

A typical beautiful road in the region built by owners of tea gardens in the Plantation areas.

Elephant carrying logs of wood, Margherita.

A typical beautiful road in the region built by owners of tea gardens in the Plantation areas.

Timber Industry, Margherita.
After Independence, the democratic set-up of the country provided significant booster for further commercial exploitation of the economic potentiality of this region. It is needless to say that, if a single industry, after Independence, has to be named which helped in significant economic development of the region and also rapid urbanization of the area with establishment and growth of new urban centres in the region, it is the oil industry. This is solely responsible for the birth of the Naharkatiya-Duliajan-Namrup industrial complex with the string of urban-pull still in Dibrugarh since the latter had the control of most essential urban amenities of the whole region besides its administrative control in both civil and private organisations and concerns. The last, but not the least, important urban impulse to the region came from the establishment of the Dibrugarh University. This resulted not only in the offing of a new educational township to the south-west of Dibrugarh, but also establishment of a number of new college campuses in different potential urban centres of the region. This undoubtedly has added to the development of urban landscape of the region.

From the general topographic point of view, the region is a broad plain, but it has some diversified scenes in the southeast owing to the intrusion of the Naga Hills.
Considering the relief and drainage, the region is characterised by three distinct units such as the Dibru River Valley, the Burhi Dihing Valley and the northeastern section of the Disang Valley. The physiographic units are, however, four in number, such as, the Brahmaputra-Dibru Doab, the Dibru-Burhi Dihing Doab, the Burhi Dihing-Disang Doab and the southeastern section in the Upper Dihing Valley. Of these, the Dibru-Burhi Dihing Doab, particularly in its western section, is the major seat of urbanization in the whole region accommodating most of the urban centres. The Upper Dibru-Burhi Dihing Doab is rich in all the three important resources i.e. coal, oil and timber besides large tracts of tea gardens but is less thickly populated than the Lower Dibru-Burhi Dihing Doab which controls the commercial exploitation of the resources of the former owing to its advantageous geographical location for trade, commerce and transport linkage. The area in the close vicinity of the Brahmaputra, with of course, the exception of Dibrugarh proper, particularly in the western Brahmaputra-Dibru Doab, is occupied by gigantic reeds and grasses and also dense jungles and is unsuitable for human habitation. This section is also under the constant fury of annual floods and river erosion. But the eastern section of this unit, particularly the area between the Dangari and the Dibru is consi-
derably free from the danger of floods and is prosperous with rich tea and rice cultivation. There are some important urban centres of the region in this section. The recent discovery of oil at Kusijan near Doom Dooma will undoubtedly add a new dimension to the urban development of this section of the region in near future. The Burhi-Dihing-Disang Doab, however, is thinly populated mainly because of its vast tracts of swamps and beels. This tract is a flat level land and only the relatively raised areas particularly in the east are seats of settlements. This tract has come under urbanization mainly due to its oil and timber resources around Naharkatiya town and coal and forest resources east of Joypur town. The oil fields of Moran in the west and of Naharkatiya in the east, availability of cheap land, nearness to the natural resources of southeast of the region and the proximity to the only railway line of the region, have already put this tract under increasing pressure for urban transformation. This will undoubtedly lead it to an enviable tract of urban landscape in spite of the hazards of the presence of large areas of marshes and swamps. The southeastern section of the region in the Upper Dihing Valley is the only area which is conspicuous in its relief and structure and is very sparsely populated. The few important population clusters of this section are only due to exploitation of such resources as
coal and timber near Margherita and few tea gardens occupying large tracts to the north and northwest of Margherita. This tract is closely linked to the heart of the region through road and railways and has important contribution to the urbanization of the region as a whole.

Using a non-biased sophisticated technique of regreessional analysis,¹ it was observed, on the basis of 1961 population data of major occupational structures, that there are 29 urban centres in the region as against only 6 declared ones. The pattern of these urban centres was studied considering various aspects: (a) the number of urban centres of different size-class and their empirical relationship; (b) the spatial arrangement of the centres over the region; and (c) the inter-central distances showing the mode of intra-regional distribution leading to any of the three distributional patterns, such as, uniform, clustering and random. The views of various authors explaining and suggesting various methods were considered for the region and finally the pattern of urban centres was logically analysed under the two main criteria, (i) size and (ii) spatial location. It was seen that the urban centres of the region fall into an interesting empirical relationship giving a hierarchial order in geometric progression of 2°:

2. What has clearly been understood in analysing the pattern of the urban centres in the region is that neither an empirical rank-size relationship nor any fixed 'K' value of hierarchial order of settlement exists in the region but it has more of a compromise to the empirical rank-size relationship than to any order as suggested by Christaller\(^2\) and his followers. But even the rank-size relationship is not sufficiently satisfied as evidenced from the development of an 'S-shaped' logarithmic distribution\(^3\) of the centres when their size is plotted against their rank. It is obviously due to the break in rank-size relationship from 'sub-towns' to 'town' and 'town' to 'major towns'. The absence of urban centres in the second size class which usually should help in balanced regional development through their transitional role for releasing the pressure on the higher order town(s), is an important indication in the lack of a perfect urban hierarchy and harmony in the region suggesting a draw-back in the ideal urban pattern. This naturally should draw the attention of the authorities of planning and execution to elevate the

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The spatial arrangement of the urban centres is outlined showing the linear array of 6 distinct spatial urban sub-systems spreading along the main communication arteries of the region, i.e. along the roads. This naturally indicates the existence of large areas away from the influence of urban centres. The cause of this linear array has been explained which is due, on one hand, to an influx of urban tendencies through introduction of various urban innovations listed earlier and the 'physical barrier effect' on the other.

The areal distribution of the urban centres has been considered to understand the nature of spread of urban landscape in the region. The study based on 'nearest neighbour analysis' as expounded by Sharma and the present author, suggesting a maximum and minimum limit to recognise randomness or otherwise of the points of concentration of urban landscape of the region, shows that the pattern of distribution of the urban nuclei is rather random. But the $R_n$ value denoting "nearest neighbour statistic" is very close to the upper limit of the scale for the aggregated pattern (0.34). This

further endorses the non-existence of a hexagonal pattern or even a rectangular or triangular lattice of urban centres in the region. But the tendency of the centres to divert from the aggregated pattern and step upward in the ladder of the suggested variant scale is an indication of decentralization of urban activities through the distributed urban centres. It is desirable that the planning authorities take note of this aspect so that the tendency be accelerated by creating facilities of higher service activities in potential centres for a balanced regional development through decentralized urban activities leading to an equalization of the forces of unification and diversification in the region.

Considering the economic space relationship of the major urban centres of the region it is observed that here as anywhere else the urban landscape has developed by the sprawl of townscape over it through the main communication arteries as a response to the growing needs of the immediate environs of the initial concentration points. The nature of the relationship of non-local and local demands of the concentration points or urban centres outlined as 'basic and non-basic' indicate the nature of their further existence and growth. In the present region it is observed that the three major urban centres are very well supported by non-local demands, and every centre, big or small, has within it or in its tri-

butary region some sort of industrial activity mainly to export their respective produce to the areas outside their own. The 'basic and non-basic' relationship expressed in percentage ratio, known as B/N ratio, for the three major centres of the region reveals that Tinsukia with B/N ratio 100:60 contributes the most for the region providing a better economic base to the existence and growth of urban landscape. Dibrugarh with B/N ratio, 100:78, though seems to be of less importance as regards contributing to the economic base of the region, has in fact significant share in the basic employment, over 12,000 as against about 7,000 in each of Tinsukia and Digboi. The lower order in B/N ratio is due to its having a considerably large population to cater to the local needs, and it is due to the educational, cultural and social nucleus of the region that the occupational need for Dibrugarh proportional to the total population is greater than the same for Tinsukia and Digboi. Thus it will be a mistaken attitude of any urban planner to consider this aspect as a tendency of declining in the urban processes of the town and attach higher order urban importance to the towns of Tinsukia and Digboi than Dibrugarh. The nature of the economic space relationship of the said three major urban centres of the region "Dibrugarh and its environs" would work as an indicator for the planner in assessing the intensity of urbanization in the area since these three centres are primarily responsible for diffusion
of the urban innovations and urban tendencies in the entire region. The inter-urban pull (IUP) of the urban centres in the region, expressed in terms of urban interaction, and the development of integrated urban tributary sub-systems clearly testify the above statement pushing the said three urban centres higher up in the ladder of IUP per unit urban demographic mass in the region.

One of the most interesting finding in the analysis of inter-urban pull in the region is that of the potential IUP ranking of the various urban centres. Tinsukia, which is at present second in order of actual demographic mass as well as urban population potential has a much greater 'Inter-urban pull' per unit point over the region occupying the first rank in potential IUP. This centre will undoubtedly be the most important nucleus of high degree of urban concentration in near future. Digboi, which is third in urban population potential as well as in actual demographic mass has been pushed down to the seventh position. This, however, may be taken note of as a tendency in the decentralising urbanization process, in near future, of the area in and around Digboi. The greater potential IUP values of such smaller centres as Dikam, Bordubi, Duliajan, Nahartali and even Lahowal indicate the points and areas of future urban concentrations. The areas which indicate a very slow rate in the urbanization process are around Khowang, Kakapathar, Lado-
Tikak and Moran as evidenced from their lower urban population potentials as well as lower IUP values probably warranted by their peripheral geographic situations. These are some of the important aspects to be considered for future planning in this region, since the behaviour of the urban centres points out the symptoms of regional needs due to their being the "centres of gravity and crystallization of humans and human activities" of the region.

The present work suggests that in future urban planning and development of this region, as also for any other region, the research workers associated with or engaged in urban planning and researches might find out a better and suitable indicator in outlining a practicable and scientific planning if they look into the intra-regional and inter-central relationships expressed in terms of potential demographic energy instead of depending on the apparent demographic mass of the urban centres.

It is needless to say that this work has only treated a few of the many aspects of urban processes responsible for development of the regional urban landscape and that this might lead to analysing a host of other aspects associated with the urban landscape, such as (a) the measuring of the intensity of urbanization and the extent of inter-regional urban contact, (b) the search for evidences of a systematic
order of urban centres, or otherwise, based on the essential features of the 'horizontal' arrangement of urban settlements which might be a further development and improvement over the analysis undertaken in chapter V of the present work, (c) the correlation between urban population and temporal landuse adjustments, (d) the classification of urban centres based on order of services performed and the micro-regional urban systems based thereon, and (e) the nature of movement as related to the number and characteristics of regular trips and patterns of travel in time and space in the urban areas.

It is hoped that the various aspects of urban landscape as analysed in the present work can be more integrally seen for use in future urban planning and development of the region "Dibrugarh and its environs" if further steps are taken to analyse the above suggested aspects of urbanization processes and urban landscape, which however, are too much for one researcher to tackle up.