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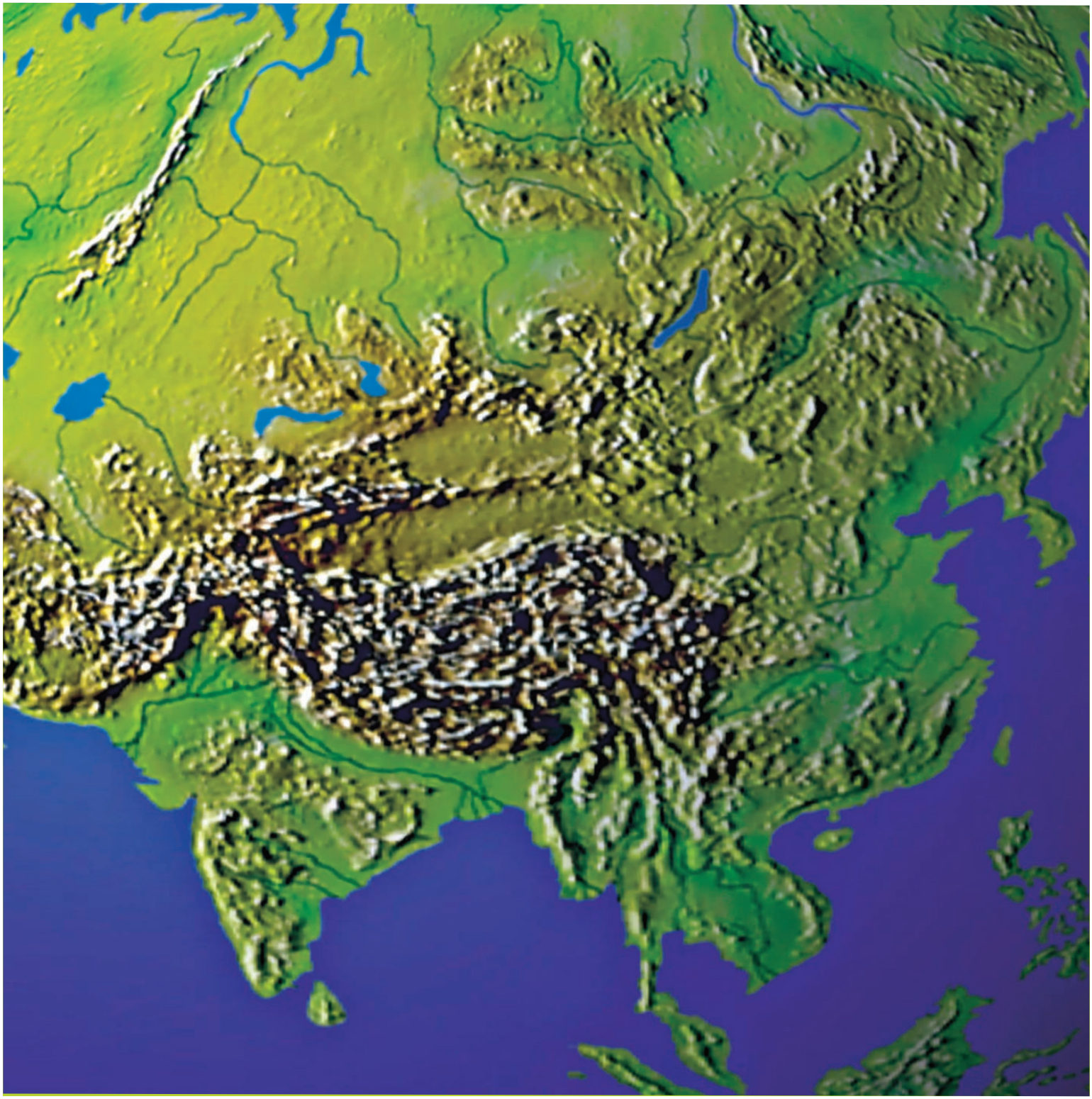

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URBAN CORRIDORS IN INDIA: A STUDY OF THE DELHI-CENTRIC NORTHERN CORRIDOR

Doctoral Dissertation Abstract (2018)

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Urbanization is a process of concentration of population in urban settlements that can be mapped both in space and time. The process occurs as cities grow over time and evolve in their physical limits. It is a movement which initiates from a small town and culminates in a city; in present times they are regarded as mega-city, city-regions or urban corridors.

The contemporary process of urbanization has mainly been influenced by the 'Industrial Revolution'. The new industrial towns were dynamic in nature, remained consistent and continued growing unlike the settlements of the past. Such towns witnessed major changes as a new set of production process started operating at the global and regional levels. These phenomena, together with the development of modern means of transport and communication, gave rise to a new urban system. In this new system, city is everywhere; its footprints are visible even in towns, villages, countryside or its rural hinterland. These are connected by corridors of communication like highways, railway lines, motorways etc. to name a few.

The extended urbanization per se resulted in an urban-scape which was variegated in fabric. It was no more concentrated in few metropolitan cities with confined boundaries; it had spilled over to the hinterland and thus was uneven in nature with high densities across vast stretches of the entire world. The new urbanization is somehow in a state of disarray from the early twentieth century literature which confines urban as a typical settlement with certain boundaries. Over time, these boundaries have loosened as cities now have become much more than mere agglomeration of population, infrastructure and investment.

As the process further starts unfolding, the character of the cities also shows changes; changes in their nature as now the transformations in the labour markets, exchange and trade of commodities, cultural forms have webbed with other territories, places and scales which at some time were not included within the paraphernalia of 'urban'. These include small and medium sized towns, rural hinterland, villages at the periphery, agro-industrial zones, inter-state transport corridors and communication infrastructures. The city has now become a part of complex arrangement of interrelated urban places instead of independent entities. Such urban systems are composed of a number of urban settlements (of varying sizes) that are connected collectively in such a manner that any change in the populace, economy, employment or service provisions in any individual settlement has ramification on other settle-

ments. In other words, in present time, cities have emerged as a system consisting of a network of urban places or settlements as spread linearly and connected through a well-developed and efficient transport and communication network which can be termed as 'urban corridors'.

The development of corridors occurs through five stages which can be described through the processes of original occupance of man at a permanent settlement which was followed by commercialization of the agrarian society. The third and fourth stages involve the invention of railways, motor transport and rapid transit leading to the final stage of metropolitanism. Therefore, linearity and transport network are the two main attributes of urban corridors.

An almost continuous ribbon of 'concrete structures' with humanity and occupation are found stretched nearly for hundreds of kilometers between two cities. Such corridor cities have emerged as one of the prevalent bi-centric urban systems at the regional level. Another important aspect of this concept is that it embraces both scales within its ambient-time and space.

Objectives

Major objectives of the study are:

- To theoretically analyze the concept of corridor development and how it can lead to regional development.
- To examine the pattern of settlement hierarchy and the urban system that exists in the Delhi-Centric Northern Corridor.
- To evaluate the levels of development along different axes of the Delhi-Centric Northern Corridor.
- To investigate the prevalence of urban corridors resulting in the growth and development of the adjoining rural hinterland and the small and medium towns.

Study Area

In this study, urban corridor has been seen from a geographical point of view considering factors like distribution of urban places of various orders, levels of development and land cover changes. The Delhi-Centric Northern Corridor has been taken as the case. It comprises of the following five axes: i) Delhi-Panipat-Chandigarh, ii) Delhi-Gurgaon-Jaipur, iii) Delhi-Mathura-Agra, iv) Delhi-Meerut-Dehradun and v) Delhi-Moradabad-Bareilly.

Database and Methodology

The study is based on secondary data sources. Some of the important data sources that have been used in this study are: Census of India 1991, 2001 and 2011, Registrar General, Government of India; Google Earth and Satellite Imageries.

At the first stage, the settlement hierarchy in the Delhi-Centric Northern Corridor has been analyzed. This has been done studying the urban system that exists in this corridor. The analysis has been done at three levels - at the first level, the analysis has been done at the district level. The process of urbanization has been studied by looking into the levels of urbanization, zones of urban concentration, growth rate of urbanization and proportional city growth in the corridor. To study the proportional city growth, scatter plot has been plotted taking the size of the city and the decadal growth rate into consideration. Rank size rule and development of primacy has also been looked into at the second level. Zipf's method of Rank size rule has been used; for further interpretation. The Index of Primacy (Three City Index of Primacy) has been computed. Rank stability and relative dominance of the largest city has also been investi-

gated for the corridor as a whole and the five axes within the corridor. The third level inspects the settlement hierarchy in the corridor and to achieve this, class-wise distribution of towns (district-level) in the Delhi-Centric Northern Corridor has also been done.

At the second stage, the impact of urbanization has been analyzed for the rural settlements situated along the five axes of the corridor. This has been done at the two levels. At the first level, the rural transformation has been examined for the corridor as a whole for three Census years 1991, 2001 and 2011. It has been achieved with the help of composite indices computed for demographic parameters, workforce participation and infrastructural facilities. At the second level, the data on the three parameters have been collected for all the villages along the five axes of the Delhi-Centric Northern Corridor for Census years 1991, 2001 and 2011. The purpose is to analyze their characteristics and changes that have occurred in the last three decades. Apart from these three indices, an index has also been computed to find out the levels of development which examines the transformations that the villages have undergone over the last three decades.

In the third stage, land cover mapping has been applied for the corridor for 1996 and 2017. The satellite imageries (LISS III) has been used and the maps for land cover (1996 and 2017) in the corridor have been prepared through ArcGIS, QGIS and ERDAS Imagine softwares.

Major Observations

The study attempts to understand the process of urbanization and rural transformation in the Delhi-Centric Northern Corridor and comes to an understanding that in such a setting, the development of urban corridors is not possible. On the basis of the analysis, the following conclusions were drawn.

In India, the root of hierarchy of urban settlements lies in its colonial legacy. The economy was commodity driven which resulted in the flow of population towards port or administrative cities; weakening their hinterlands. The dominance of colonial primate cities has limited the growth of corridors to an extent. A proper integrated approach based on the philosophy of decentralization by infusing growth impulses in the second-tier cities can bring balanced regional development in India. In recent years, a large number of initiatives have been taken up to promote corridor development at macro and meso levels with the basic philosophy of decentralized regional development.

In the Delhi-Centric Northern Corridor, at the district level, it is observed that the districts nearer to the capital city had faster growth rates of urbanization than others. But there are exceptions also like the districts of Palwal, Jyotibaphule Nagar and Alwar. Though these districts are not far away from Delhi, yet they had comparatively lower rates of urban growth. The reason for this is attributed to lack of the process of active town formation in these districts due to which the conversion of villages into towns has been slower. For districts which are far away from Delhi and have achieved higher urban growth rates the reasons are more specific. Dehradun, experienced higher rates after the creatin of new state of Uttarakhand and Dehradun city was made the capital. Similarly, Jaipur had higher rates because of the initiation of government projects under the Delhi-Mumbai Industrial Corridor. The continuing concentration of economic activities in Delhi has made this city a centre of attraction, pulling large number of migrants from all over the country. The burden of this ever adding population is visible on these towns as in 2001 itself, the cities of Faridabad and Ghaziabad attained the status of Million plus cities.

In this Delhi-Centric Northern Corridor, the growth rates depend on city sizes. This clearly means that the city size distribution follows the Zipf's rule. The above statement stands true because the city size distribution in the Delhi-Centric Northern Corridor very closely fit to the theoretical rank size rule as this distribution produces a near straight line with the slope with values of R square near 1. The nearly straight lines further state that the urban settlements are in equilibrium or steady state as the growth rate of each size category is somewhat similar. Moreover, this kind of steeper slope suggests that larger cities are growing at a faster rate than the smaller ones; an arrangement leading to primacy. If Delhi is included in the analysis; it clearly emerges as a primate city. If it is excluded, then Jaipur emerges as the primate city. This conclusion complies with the theory that primate cities are either orthogenetic, political and administrative capitals or heterogenetic capitals of the emerging nations or empire capitals.

Another significant feature of urbanization in the Delhi-Centric Northern Corridor is that the cities have maintained rank stability, which means that, larger proportion of urban population has been concentrated in the same cities over a period of time. Thus, the largest cities have maintained their relative dominance over other cities and towns. An analysis of the distribution of urban population across different class-size of urban settlements in this corridor clearly indicates that, like elsewhere in the country, population is concentrated in class I towns or million plus cities. This pattern of urbanization can be called as top-heavy or urbanization oriented towards large cities in the study region. Most of the urban growth is a result of natural increase; only a fraction of settlements transformed from villages to towns.

The Delhi-Centric Northern Corridor has its own urban system which consists of all classes of towns. But Delhi to some extent has over shadowed the development of this region. Although, the corridor is considered as one of the developed regions of the country, disparity and imbalances do exist within the corridor and need to be investigated at micro level. The process of rural transformation has been experienced in the entire corridor. In all the five axes, some villages have been transformed into urban centers from 1991 to 2011. The only difference is in the numbers.

The performance of demographic and workforce participation indicators is synchronized with these findings. The rural settlements along the National Highway 1 (NH 1) and NH 58 have shown better development prospects than those located along NH 2, NH 8 and NH 24. In the case of infrastructural facilities, the results are different as infrastructure is directly linked with the process of urbanization. Since, all the villages are located on National Highways they show same sort of growth. Moreover, there have been a number of schemes of the government to provide basic amenities in the villages. Proximity to Delhi has favoured these rural settlements in gaining better infrastructural facilities. The study reveals that, in 2011, most of the villages had educational and medical institutions as well as drinking water. However, availability of post office was not common.

Thus, the analysis clearly brings out the relationship between urbanization and rural transformation. It would be right to point out that rural transformation is much more than a demographic phenomenon. The changes are even socially and culturally expressed through occupational differentiation and participation of females in the labour market. It can be said that in Delhi-Centric urban corridor ribbons of smaller stretch of 50-75 kms can be developed as a number of such have already emerged in each axis of the corridor. Large urban corridor

centered at Delhi is a far possibility as the settlement system in this corridor is variegated.

The pattern of modifications of urban system and the process of development show that in the study region, the development of corridor is not possible, only ribbons can be developed if two large cities are at a distance of 50-75 kilometers. Examples can be cited of Kundli-Panipat (66 km) and Ambala-Chandigarh (45 km) on NH 1; Mathura-Agra (75 km) on NH 2; Manesar-Neemrana (74 km) on NH 8; Hapur-Garhmukteshwar (31 km) on NH 24 and Ghaziabad-Meerut (46 km) and Roorkee-Haridwar (30 km) on NH 58. In the study area what seems possible is 'Beaded Urbanization'. Such urbanization will depict development of a number of urban centers of varying sizes. These centers will be of regional importance and will act as 'beads of growth'. Such beads will have the potential of infusing growth and development in their neighbouring rural hinterland.

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