Trans. Inst. Indian Geographers
ISSN 0970-9851
Indexed in Scopus

The Gurugram-Manesar urban complex: Processes, problems and prospects of de-centralization from Delhi

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Abstract

This paper takes up the Indian case to argue that initially processes of spatial centralization operate which become instrumental in the emergence of an urban core (a capital city), subsequently, concentric zones (semi-peripheries and peripheries) develop and can be delineated around the core, resulting in the emergence of National Capital Regions. In due course of time, corridors may radiate in directions suitable for sustaining the processes and services characteristic of the core, making decentralization dominant. Therefore, this paper's principal objective is to understand this process of peripheralization and corridor formation from an urban core and identify the stages, changes, causes, and consequences for the same taking the National Capital Region of India as a case. Using data from multiple sources, the paper creates an illustrative and evidenced narrative that concludes that peripheralization is a proven reality and is all set to create a gigantic core from Delhi towards Rajasthan, and across Haryana in decades to come.

Keywords: *National Capital Region, decentralization, urban complex, Delhi, Gurugram*

Urban decentralization and emergence of national capital regions

More often than not, an urban center attains the status of the capital of a country owing to processes like industrialization, human migration, implementation of governmental policies, and so on. Globally, over the years, the concentration of urbanization in capital cities like Tokyo (Japan), Manila (Phillippines), and New Delhi (India), among several others have become spaces exhibiting overcrowding and hence call for spatial planning. Decentralization as a planning strategy was adopted in different countries to reduce the population pressure on the country's capital. Congestion in Dhaka, land pressure on Washington D.C., the saturated labour market in India and so on have resulted into processes which can broadly be identified as 'urban decentralization' (Haq, 2014). Urban decentralization is the process that explains the spilling over of people and economic activities from an urban centre into its tributary zones, in other words, redistribution from the cores to the peripheries (Mitra, 2008). This, therefore, leads to the identification and delineation of National Capital 'Regions' (NCRs), moving away from National Capital territories or cities (Nelson, 1971).

National Capital Regions (NCR) become instrumental in relieving the core (the original capital city) by generating spread-out effects from the same. For example, Japan has been

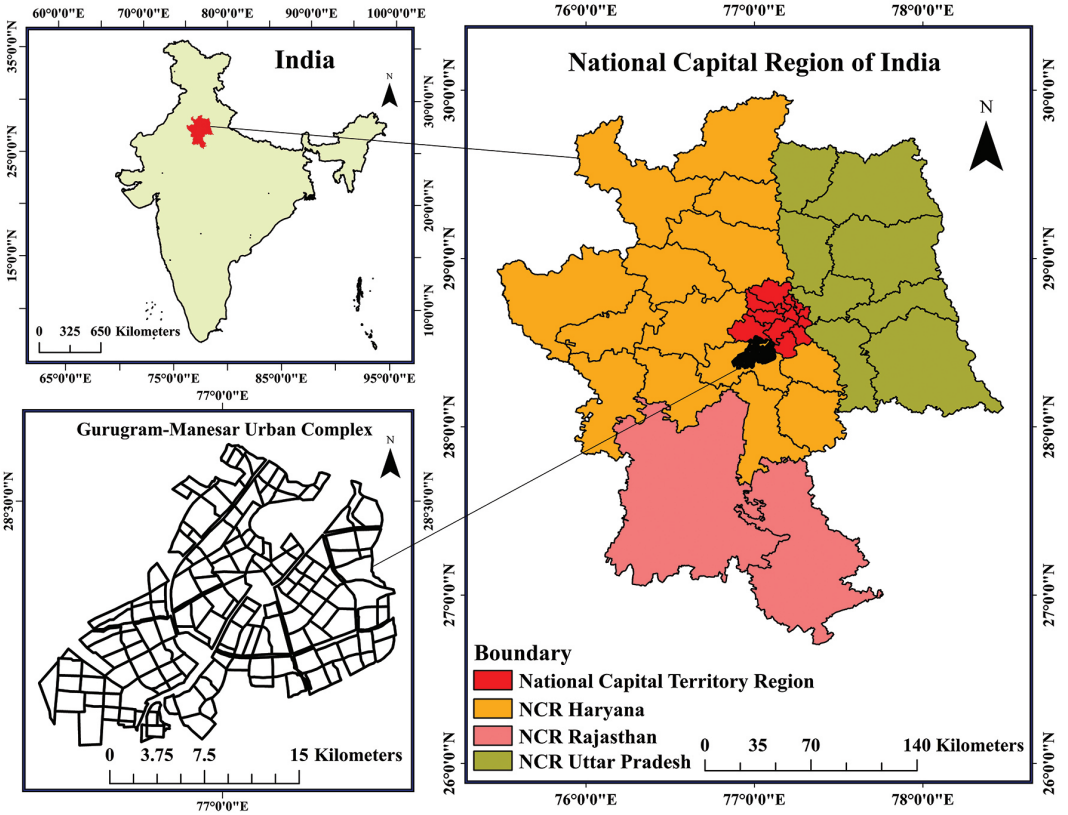

Fig. 1: Location of the Gurugram Manesar urban complex

Source: Prepared by the authors from GMDA and NCRB, 2021

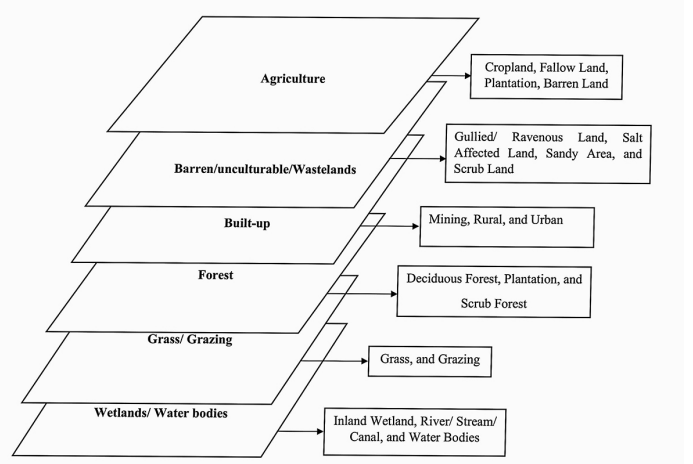

Fig. 2: Classification of land use and land cover in Gurugram-Manesar urban complex

Source: Prepared by the authors from Bhuvan LULC data, 2005-06 to 2015-16

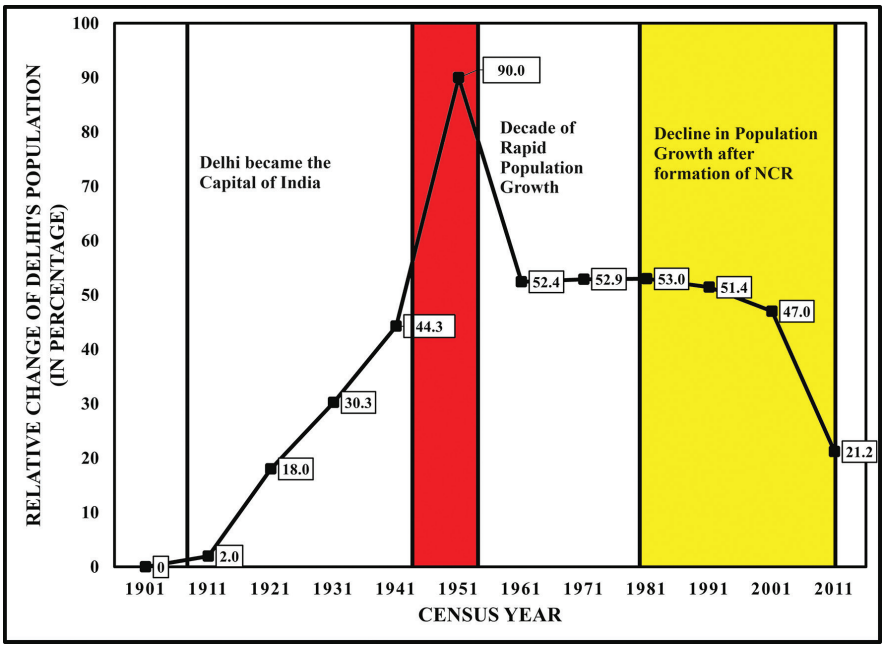

Fig. 3: Relative change in decadal population growth in NCT Delhi (1901 to 2011)

Source: Prepared by authors from Table 07A - 2, NCT Delhi, Census of India, 1901 to 2011

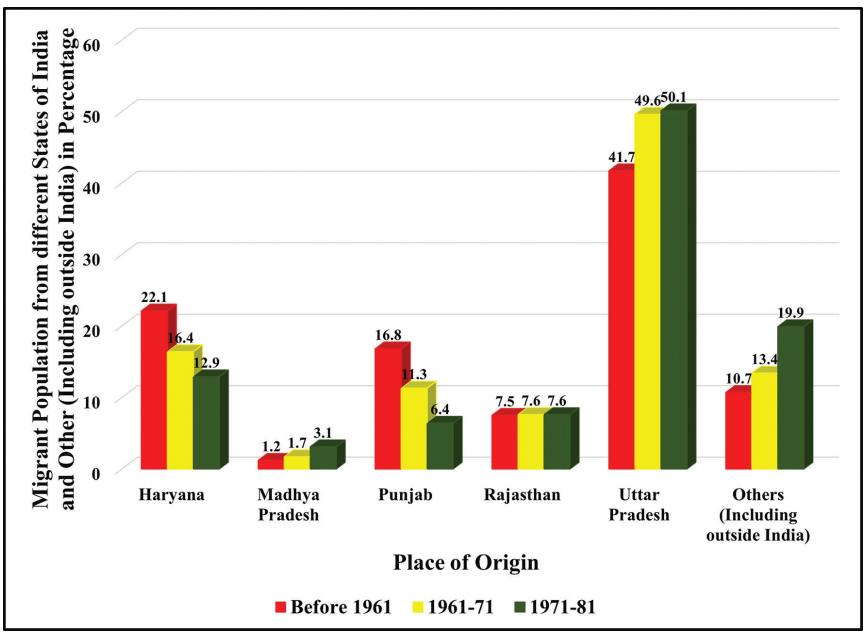

Fig. 4: Major migrant contributors to Delhi (Before 1960 to 1981)

Source: National Capital Planning Board Report, (1990)

successful in halting population growth in Tokyo's inner-city area since the creation of the NCR (White Paper on National Capital Region Development, 2006). In Canada, Ontario, Gatineau, Quebec, and their surrounding municipalities became the national capital region (Harris, 2019). Facilities available in the country's Capital were made accessible in the adjoining areas so that new attractive alternatives could be developed to create intervening opportunities (Walter, 1975).

With time, the NCRs may lead to the creation of new corridors and continuums. This paper takes up the Indian case to argue that initially, processes of centralization operate which become instrumental in the emergence of an urban core; subsequently, concentric zones (semi-peripheries and peripheries) develop and can be delineated around the core. This, in due course of time, causes corridors to radiate in directions suitable for sustaining the processes and services characteristic of the core, making decentralization the dominant force.

Location of the study area

In the 'National Capital Region Plan 2021,' the NCR is divided into four primary zones: the 'National Capital Territory', the 'Central National Capital Region', the 'Highway Corridor Zone', and the rest of the NCR (Regional Plan, 2021). The Central National Capital Region (CNCR) encompasses six urban complexes: 'NOIDA' in 'Gautam Buddha Nagar', 'Ghaziabad-Loni' in 'Ghaziabad', 'Sonipat-Kundli' in 'Sonipat', 'Bahadurgarh' in 'Jhajjar', 'Gurugram-Manesar' in 'Gurugram', and 'Faridabad-Ballabhgarh' in 'Faridabad' district in Haryana (NCR Plan, 2021). Previously, Gurugram was mentioned as part of the Delhi Metropolitan Area in the National Capital Regional Plan 2001 (NCRPB, 1988). This region is geographically located between approximately 28° 4' North latitude and 77° 02' East longitude (Fig. 1).

Objective

The principal objective of this paper is to investigate the process of peripheralization and corridor formation from an urban core and identify the stages, changes, causes, and consequences for the same, taking the NCR of India as a case.

Database and methodology

The concept of urban expansion has been established by analyzing spatio-temporal changes in the concerned region. Peripheralization emerged as a consequence of the same. Consequently, the study imbibed a cause-effect approach to examine the intricate dynamics of urban decentralization and peripheralization in the context of the National Capital Region (NCR).

The study examined government policy documents such as urban development plans and the Haryana State Industrial and Infrastructure Development Corporation Industrial Area Policy to build a foundational understanding of the intentions and strategies behind the decentralization efforts from Delhi towards Gurugram and Manesar. Academic literature and research articles have been reviewed to contextualize the findings within broader theoretical frameworks.

To establish the spatio-temporal changes in population, data from the Census of India for over a century (1901-2011) has been used. Data from Bhuvan, the NRSC, the Land Cover Monitoring Division SRMUG, and the RSAA have been used to analyze the

land use and land cover (LULC) changes. Information on land use and land cover during the 2005-06 season has been collected from multi-temporal Resourcesat-1 LISS III. Land use and land cover data for 2015-16 have been collected using three seasons of Resourcesat-2 ortho-rectified LISS III data. This data enabled this article to examine the relative change in LULC in Gurugram-Manesar Urban Complex (GMUC) from 2005-06 to 2015-16. Only those indicators were selected in which significant changes were found. The LULC data was divided into six major and eighteen subcategories (Fig. 2).

Discussion

The analysis is presented in two parts, the first explaining the various stages of urban expansion along with the processes and prospects for the same and the second discusses the problems.

Stage I: Emergence of Delhi as the national capital

India's national capital shifted from Kolkata to Delhi in 1911, principally owing to a change in the 'intention' of the British Government from 'trade' to 'administration' and Delhi's long popular position as an important administrative seat from where the territory of India could be accessed geo-strategically (Nath, 1993). Since then there has been an unprecedented population growth in Delhi till about 1951, which has been identified as a distinct peak. 1951-81 was also a period of steady population growth (Fig. 3). By then, issues related to housing and other major services had started surfacing (Dupont et.al., 2000). Slums were growing due to the high cost of land and the scarcity of resources. It was also predicted that Delhi's sewage, water supply, and other urban environmental concerns would worsen as the city grew (Biswas, & Gangwar, 2021).

Stage II: Creation of the National Capital Region

In no time, the Government of independent India realized the place value of Delhi and the fact that, with time, the city would grow manifold and attract a large stream of migrants from all across the country. The data analysis reveals that the states bordering Delhi account for a larger portion of the migratory flow (Fig. 4).

It would therefore be difficult to accommodate this migration while maintaining the country's overall growth and stability, which for many years even after independence was primarily centred on Delhi, along with Mumbai, Chennai, and Kolkata, despite target area development strategies in various regions of the nation. The suggestion to create NCR (henceforth NCR refers to the National Capital Region of Delhi) in India was given in the Master Plan of Delhi, 1962. It was created along the lines of the National Capital Region Board Act in 1985 by including the area around Delhi. The formation of this region was the first attempt in South Asia and till date, it is the only one. NCR includes 14 districts of the state of Haryana, 8 districts of Uttar Pradesh, 5 districts of Rajasthan, and the entire area of the National Capital Territory of Delhi (Fig. 5). Presently NCR covers an area of 55,083 km^2.

Stage III: The rise of Gurugram

NCR was created to reduce the population pressure on Delhi's resources, services and environment, and also to regulate the

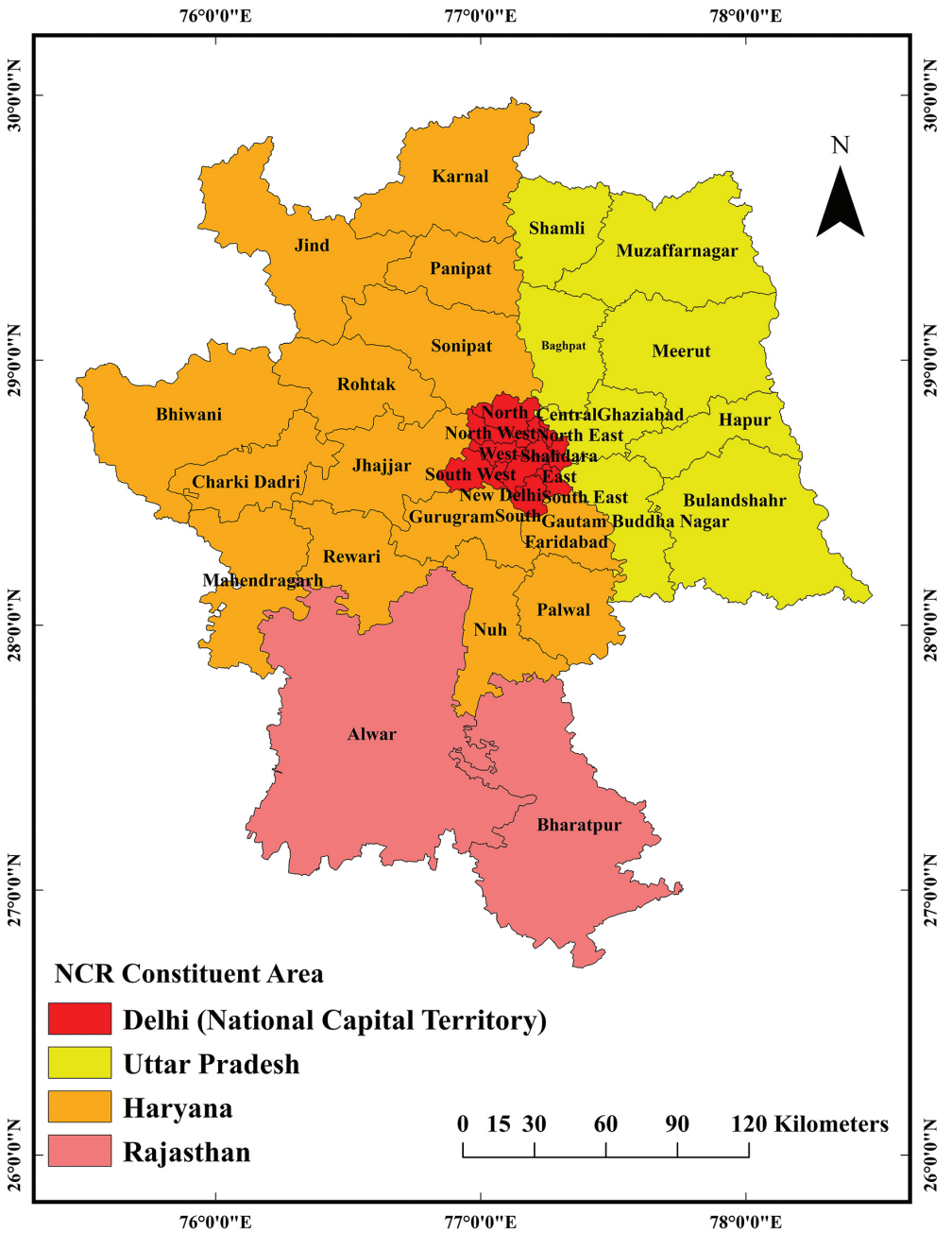

Fig. 5: Location of the constituent area of the National Capital Region.
Source: Recreated by the authors from National Capital Planning Board Report, 2018.

development of the surrounding regions by maintaining both spatial stability and economic growth, which it did for several decades after its creation. The result was the emergence of distinct spread effects towards Noida and Ghaziabad in Uttar Pradesh, Faridabad and of course Gurugram in Haryana.

In contrast to New Delhi, which had a concentration of administrative, professional, and service-based occupations, old Delhi has always had a concentration of industries and trade (Fig. 6). There are six major industrial regions in the western part of Old Delhi alone. Naraina Industrial Area developed into two phases, and other major areas are the Mayapuri Industrial Area Phase I and Phase II, Tilak Nagar Industrial Area, Kirti Nagar Industrial Area, DFL Industrial Area, Moti Nagar, and Najafgarh Road Industrial Area. These provided for an organic industrial expansion towards the west and south-west, into Haryana's Gurugram (Fig. 7).

With the establishment of the Maruti-Suzuki and its supporting factories in 1982, Gurugram started industrializing. Later, various industries started to appear all across Gurugram. The Haryana government granted permits to major developers of real estate, including DLF Group, Unitech, and Ansal Properties, to construct private-sector residential townships. As a result, there was a significant real estate boom in the city, and Gurugram's land market profited as well. The laws also made it simple for businesses in a variety of sectors, including manufacturing, information technology, and infrastructure, to establish themselves in Gurugram along with other areas of Haryana as well.

Stage IV: Formation of the Gurugram-Manesar urban complex

Haryana, a state that shares the longest boundary with Delhi, covers most part of the NCR. The south-western region of Haryana, bordering Delhi developed economically with cities like Gurugram, Manesar, and Dharuhera (Economic Survey of Haryana, 2024). Gurugram became a millennium city and a cyber city in just two decades (2001 to 2020). It became a significant industrial and IT centre by the middle of the 1990s, which paved the way for changes in the city's industrial, residential, and urban environments. The city underwent a significant infrastructural change as well to support the expanding population brought in by the establishment of industries. Manesar, a satellite town of Gurugram, was merged into the city in due course. After the establishment of the Industrial Model Township (IMT), Manesar (1997-98) started getting identified as New Gurugram and subsequently, Dharuhera- a census town located, just 19 km from Rewari city in Rewari district of the state of Haryana emerged. These three cities are representatives of the decentralization process and together they constitute the Gurugram-Manesar urban complex.

The Gurugram-Manesar Urban Complex (GMUC) developed linearly along NH 48. The development of this complex is an outcome of several urban decentralization strategies outlined in master plans like Gurugram-Manesar Urban Complex Master Plan 2031, and Manesar - Bawal Investment Region (MBIR) (2014) The decentralization policies are being further fueled by Haryana State Industrial and Infrastructure Development Corporation (HSIIDC's) major industrial regions, which are developing

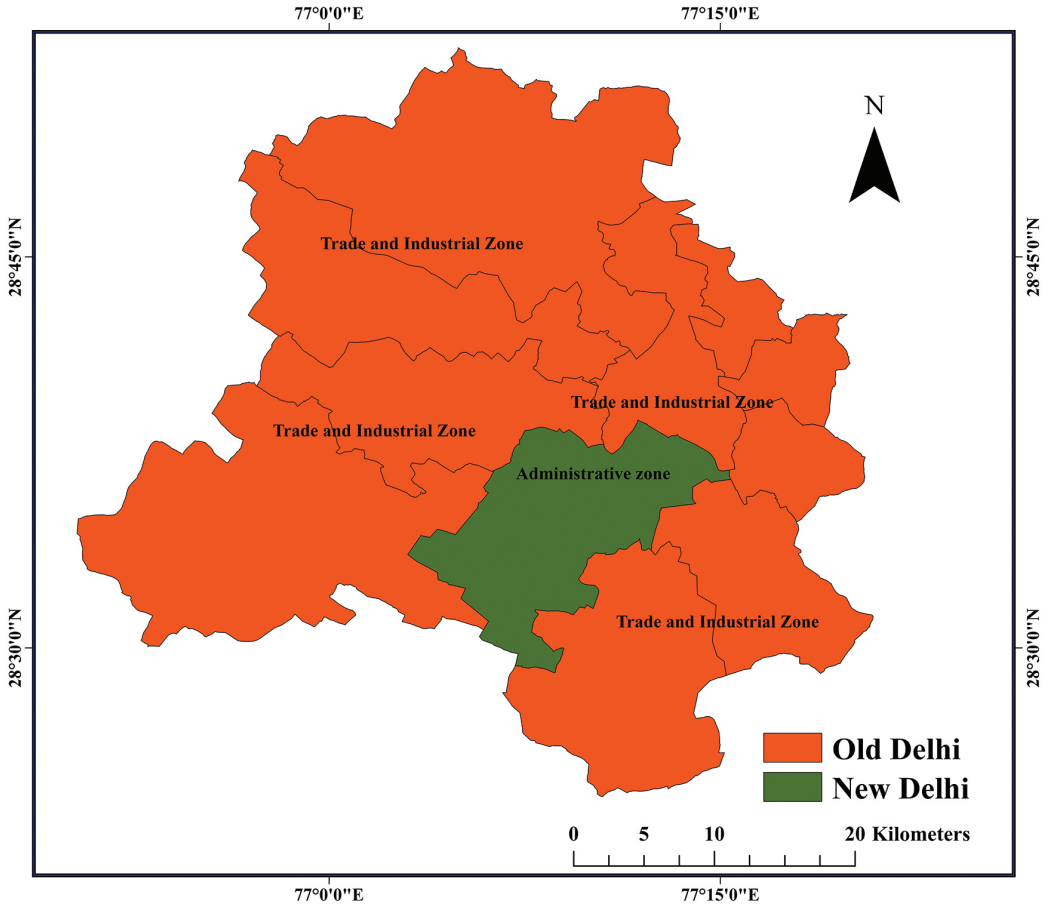

Fig. 6: Functional division of Delhi state

Source: Prepared by the authors from Census of India, 2011.

in this direction, such as IMTs, industrial estates, and industrial parks.

Stage V: Conurbation and corridor development

The transportation system in the Gurugram-Manesar Urban Complex underwent massive developmental changes. Pataudi and Rewari are now connected by a 45-kilometer project that was initiated by the National Highways Authority of India (NHAI). A motorway has been built over the 27.7 kilometer stretch between the Delhi-Gurgaon border and Kherki Dhaula. Both the Delhi Metro and the Rapid Metro networks are important connections.

The rapid integration of the GMUC with the national capital and its peripheries hint that these connectivity-induced urban linkages may become instrumental in developing a corridor of continuums and if the process sustains, Delhi's centralized urbanization, which had concretized across centuries may radiate up to Jaipur in Rajasthan and further

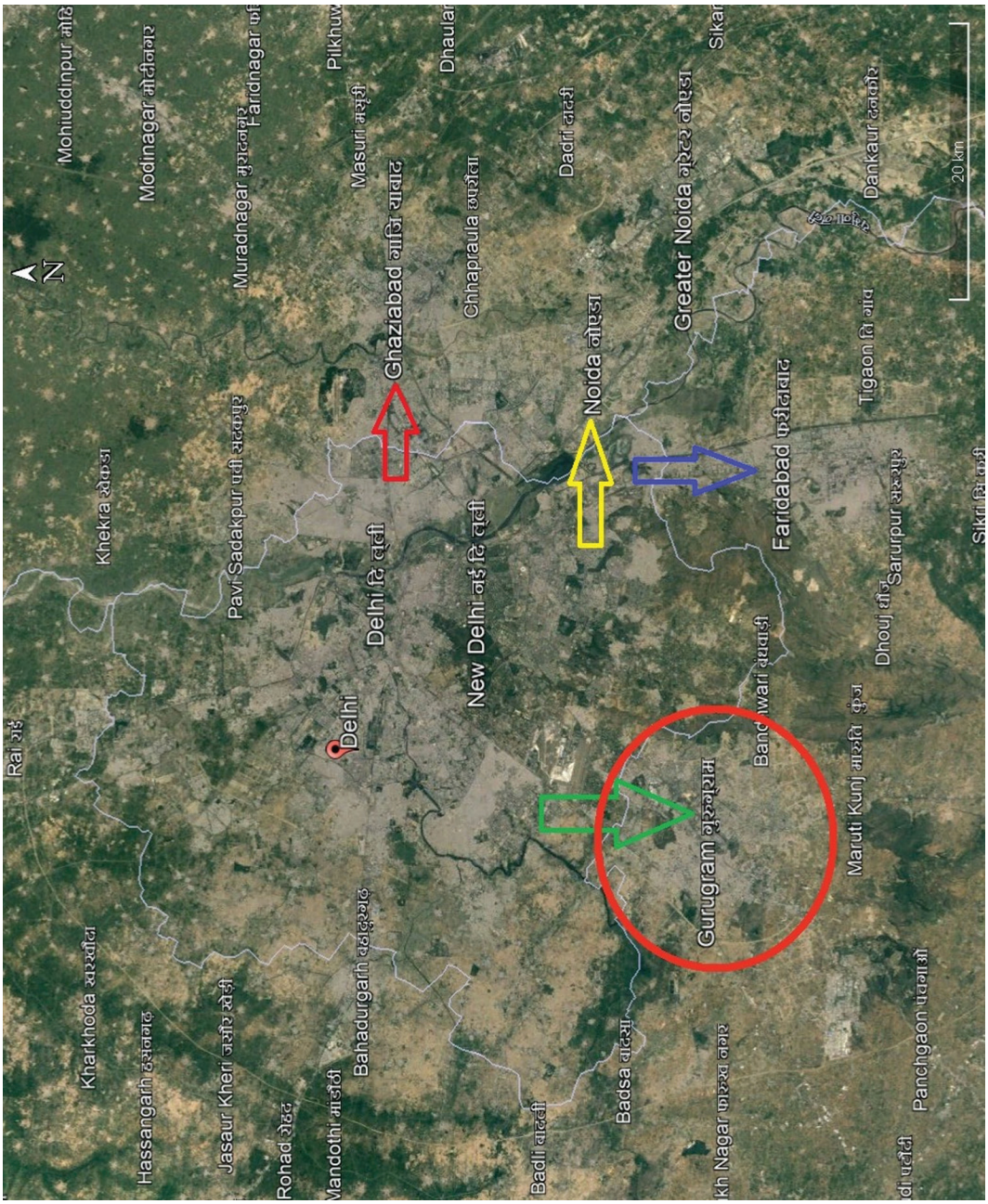

Fig. 7: Decentralisation from National Capital Delhi towards NCR
Source: Prepared by the authors using images from Google Earth, 2024.

Table 1: Acquired land of Gurugram-Manesar urban complex since 1972 to 2021

Year	Location of Land acquisition	Area in Acres
1972	Udyog Vihar Phase I-V & I.E. Plots	
1993	Udyog Vihar Phase V-VI Sheds	
1999	Udyog Vihar Phase VI	774
1999	Udyog Vihar Phase VI	
2021	Udyog Vihar Phase VI	
1999-2021	Manesar Phase I-V	4912

Source: Haryana State Industrial and Infrastructure Development Corporation, 2023

Table 2: Sub-categorywise land and land cover change in GMUC (2005-06 to 2015-16)

LULC	Category of LULC	Area in Percentage		Relative Change
		2005-06	2015-16	
Agriculture	Crop Land	82.38	80.66	-2.09
	Fallow Land	1.21	1.36	12.85
	Plantation	0.24	0.37	52.33
	Barren Rocky	2.08	0.00	-100
Barren/unculturable/ Wastelands	Gullied/ Ravenous Land	0.0043	0.00	-100
	Salt Affected Land	0.31	0.26	-16.35
	Sandy Area	0.0029	0.00	-100.00
	Scrub Land	3.11	4.35	40.01
Built-up	Mining	0.27	0.12	-56.25
	Rural	1.59	1.69	6.45
	Urban	4.37	8.27	89.32
Forest	Deciduous	2.09	0.47	-77.58
	Forest Plantation	0.00	0.05	--
	Scrub Forest	0.76	1.79	135.70
Grass/ Grazing	Grass/ Grazing	0.94	0.10	-89.51
Wetlands/ Water bodies	Inland Wetland	0.14	0.28	105.47
	River/ Stream/ Canal	0.37	0.07	-80.99
	Water Bodies	0.14	0.16	12.96

Source: Calculated by authors from Bhuvan, Land Use Cover Monitoring Division, SRUMG, RSAA, NRSC, Hyderabad, 2005-06 to 2015-16

up to Gujarat, thereby integrating India's west with its northern core (Fig. 8).

Consequences of urban expansion

The process of decentralization from Delhi and the development of its satellites almost at par with itself have been exemplary of the fact that Delhi has been able to spill its developmental processes beyond its boundaries (Joardar, 2006), something that cities like Kolkata and Chennai failed to and Mumbai could achieve only partially (Biswas, et. al. 2019). The emergence of cities like Gurugram has been extremely beneficial in a post-global India. When India pursued liberalization in the 1990s, Gurugram started to set itself apart from other satellite cities of Delhi. By 2008, it had become one of India's top global economic locations, attracting foreign investment and offering high-paying jobs to the middle class (Kalyan, 2017). The Haryana government was a pioneer in the 1980s, enacting laws governing the real estate sector and the involvement of private developers. This allowed Haryana to profit from Gurugram's convenient location near New Delhi and international airports. The liberalization of the real estate sector in 2005-06 made it possible for developers to get institutional finance and undertake large-scale, speculative urban projects in Gurugram with foreign direct investment (Searle, 2016).

The GMUC has increased prospects for employment in rural areas. It has also relieved the overcrowded urban core of Delhi from having to accommodate the in-migrating labor. In addition to lowering the overall demand for housing and urban infrastructure in Delhi, this has also triggered a shift from agricultural to non-agricultural activities; it has minimized disturbances in rural social structures and preserved the rural-urban equilibrium (Sangwan & Kumar, 2023).

One of the major consequences of the urban expansion process has been extensive land use changes. The emergence of the Gurugram-Manesar urban complex has been heavily countered owing to indiscriminate crop-land acquisitions, extensive built-up expansions, unlawful constructions, closing down of water bodies, and cutting down of trees.

A good 61 percent of Gurugram's water bodies have disappeared since 1956. Gurugram had 640 bodies of water in 1956; by 2018, that number had dropped to 251 (Kumar, & Sharma, 2022). Over 5000 acres of land have been acquired in less than three decades (Table 1)

The land use of the region has undergone major changes (Fig. 9). Built-up and barren/ unculturable/wasteland had increased between 2005-06 and 2015-16 at the cost of agricultural land, forest, grazing and water bodies. The sub-categorywise details are presented in Table 2.

Agricultural land in the region shows an overall decrease (Fig. 9). It has been further divided into four major categories, within which cropland shows negative growth between 2005-06 and 2015-16, while fallow land has registered an increase of 12.85 percent. The trend of commercial agriculture is increasing in the region which can be inferred from the 52.33 percent increase in plantation agriculture in 2015-16 as compared to 2005-06; however, this is a small portion of the overall agricultural area. Barren rocky land is mainly used for housing construction and other development activities. In 2005-06,

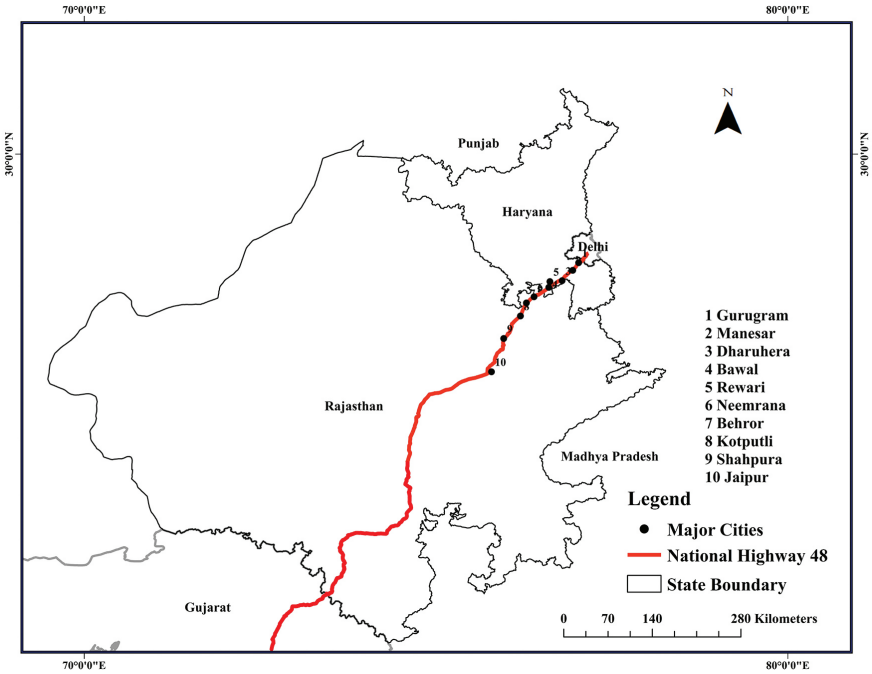

Fig. 8: Expected corridor creation along national highway 48, (Delhi to Gujarat)

Source: Prepared by the authors using images from Google Earth.

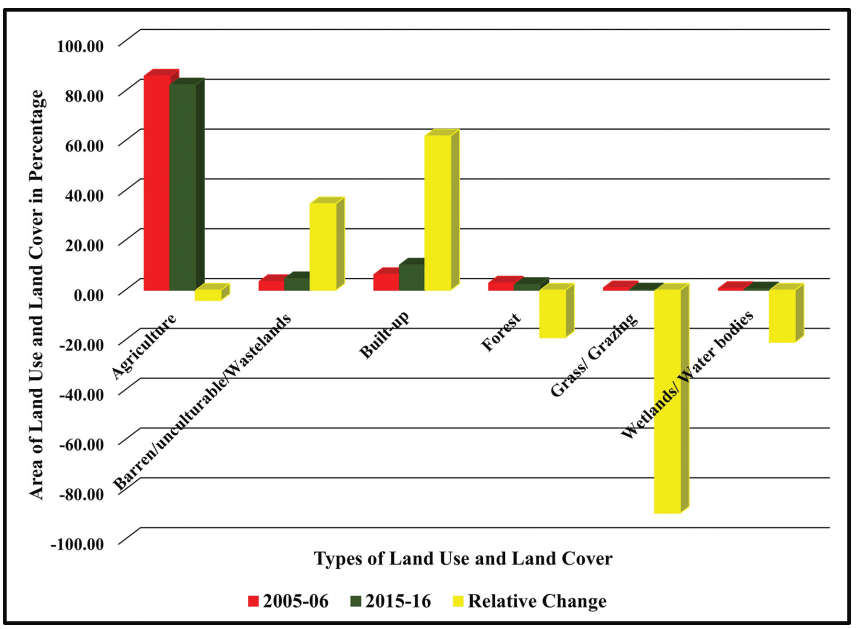

Fig. 9: Land use & land cover change in GMUC (2005-06 to 2015-2016)

Source: Computed by the authors from the Bhuvan, Land Use Cover Monitoring Division, SRUMG, RSAA, NRSC, Hyderabad, 2005-06 to 2015-16

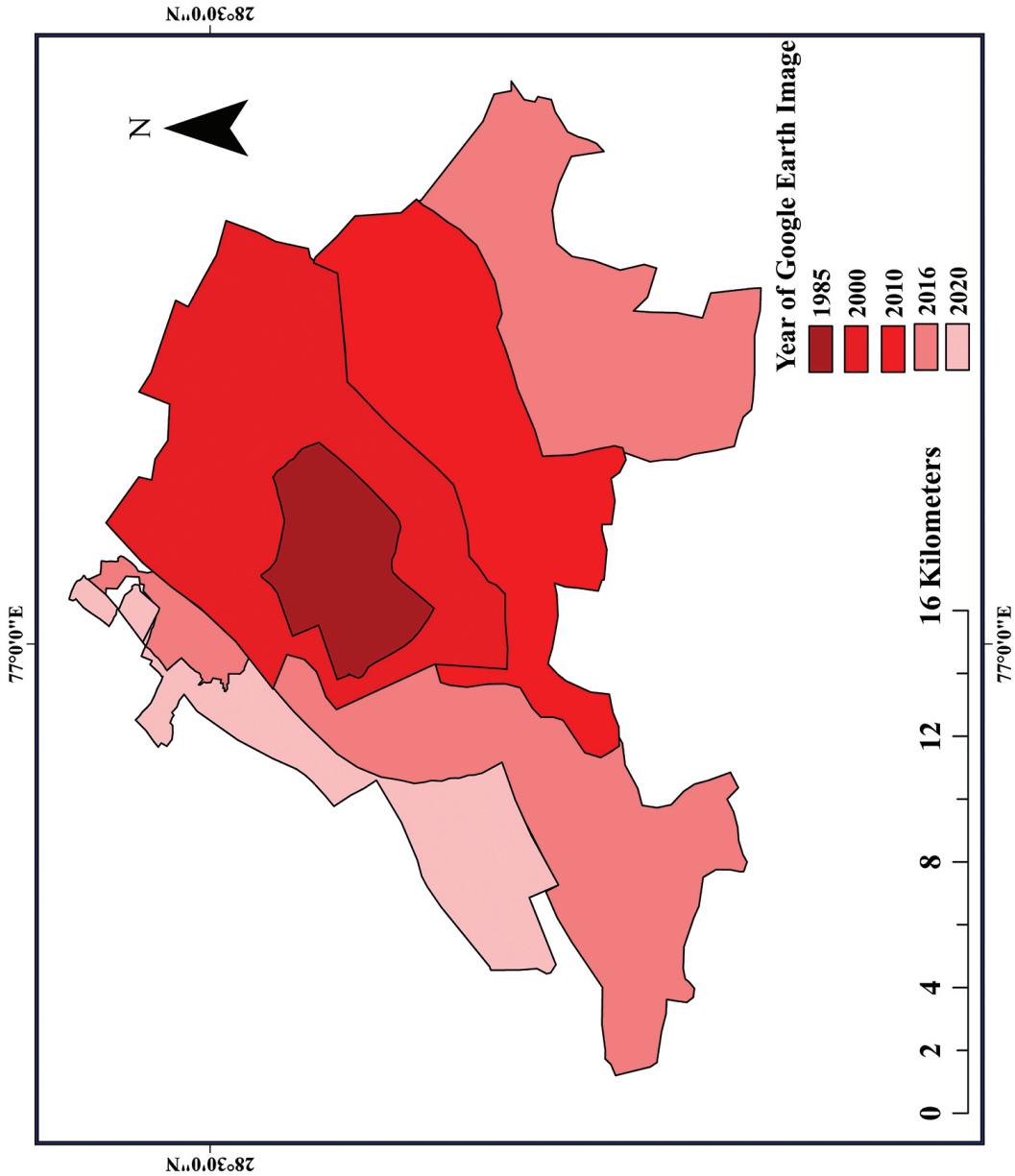

Fig. 10: Expansion of Gurugram Manesar urban complex (1985-2020)

Source: Prepared by the authors using images from Google Earth Temporal Images.

the area was 2.08 percent, which became nil in 2015-16.

One of the main features of this area is that in the year 2015-16, all the gully erosion/ ravenous land, salt-affected land, and sandy land had been treated and made usable, that is, all these problems have been resolved.

The built-up area in GMUC has increased significantly. The mining area fell between 2005-06 and 2015-16. Nonetheless, there has been a rise in built-up areas, 6.45 percent in rural areas and 89.32 percent in urban areas (Table 2), indicating the swift pace of urban development.

GMUC which was once extensively covered by forests has been impacted by increasing urbanization. According to the data, the area covered by deciduous forests represented only 0.47 percent of the total land cover as of 2015-16. The forest cover in this area has declined by 77.58 percent from 2005-06 to 2015-16, which is a serious issue. Forest plantations saw a slight increase from 0.00 to 0.05 percent between 2005-06 and 2015-2016. This demonstrates a positive aspect although at a very small scale. As much as 89.51 percent of the grazing and grassland area has been destroyed in the GMUC by 2015-16.

In terms of wetlands and water bodies, the GMUC presents a precarious situation as evidenced by the fact that 81 percent of the natural streams have been lost by 2015-16. However, efforts have been made to enhance inland wetlands, and the condition of water bodies is also being improved (Table 2).

In terms of built-up area, from 2010 onwards, a notable shift occurred. In 2016, this built-up extended from Kherki Daula in the southwest to Manesar, and from the southeast to Maruti Kunj. This phase marked the consolidation of Gurugram-Manesar as a unified urban complex, harnessing both residential and industrial potentials. By 2020, the built-up expanded further westwards (Fig. 10)

Conclusion

The evolution of the Gurugram-Manesar Urban Complex represents a dynamic interplay of historical, geographical, and economic factors. Originally rooted in its core region, Gurugram's development surged following its integration into the National Capital Region. Gurugram-Manesar has firmly established itself as a Millennium City, symbolizing urban transformation and economic dynamism. Manesar, in particular, emerged as a central industrial hub, attracting investments and driving employment growth across the region.

With strategic planning and sustainable development practices, there is potential for continued economic vitality and enhanced quality of life in this evolving urban landscape. Thus, the journey of Gurugram's early expansion to the creation of a thriving urban complex manifests the significance of 'decentralization' in fostering sustainable growth within and beyond metropolitan areas. Therefore, the development of a National Capital Region from a capital city and further decentralization from the NCR into urban complexes with prospects of linear expansions from them to other states of the country has certainly made this entire region the most important site for urban development and expansion, with negative consequences like environmental degradation and cropland acquisitions.

Competing interest

The corresponding author declares that they have no conflict of interest.

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