Chapter 9

Urban Development and Population Redistribution in Delhi: Implications for Categorizing Population

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Metropolitan areas in India are undergoing major transformations. This chapter focuses on the case of Delhi and highlights recent developments in urban forms and processes with a view to assessing the adequacy of local definitions and categorization of human settlements. The dynamics of the metropolitan area of Delhi will be analyzed from two interrelated perspectives:

- evolving urban form, focusing on the processes of periurbanisation and 'rurbanization', including expansion of suburbs, formation of new residential quarters in surrounding rural areas and the creation of satellite towns;
- population redistribution within the metropolitan area.

Firstly the demographic and spatial dimensions of Delhi's metropolitan dynamics in terms of population growth, distribution (and redistribution) and spatial expansion are analyzed. Then the factors contributing to urban deconcentration and outward expansion are examined. Some implications are drawn regarding categorizing population for further demographic analysis (reflecting upon the inadequacy of a simple rural/urban dichotomy), defining relevant limits for measuring urban growth and delimiting zones for the purpose of town and country planning.

This analysis is based on two main sources of data: decennial population censuses (the most recent conducted in 2001), and a survey on population mobility conducted in 1995 complemented by indepth interviews and field visits (Dupont and Prakash, 1999). The survey included five peripheral zones that illustrate the

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dynamics of urban expansion, and covered a sample of 1249 households or 5981 usual residents.

Delhi's Metropolitan Dynamics: Rapid Population Growth and Outward Expansion

Demographic and Spatial Growth of Delhi Urban Agglomeration

The development of Delhi and its metropolitan area bears witness to a major tendency in the urbanization process in India: an increasing concentration of the urban population in metropolises of a million or more inhabitants.[2] Yet, the domination of the Indian urban scene by the bigger cities takes place within the context of a country which is predominantly rural and is likely to remain so in the medium term (in 1991 only 26 per cent of the population lived in urban areas, and 28 per cent in 2001).[3]

The demographic evolution of Delhi during the 20th century is deeply marked by the country's turbulent history. Following the promotion of Delhi as the capital of the British Indian Empire in 1911, the population of the city expanded from 238,000 in 1911 to 696,000 in 1947, while quadrupling in area extent (Table 9.1). After Independence in 1947 Delhi became the capital of the newly formed Indian Union and had to face a massive transfer of population following the partition into India and Pakistan. The 1941-51 period thus recorded the most rapid population growth in the history of the capital-city, from almost 700,000 inhabitants in 1941 to 1.4 million in 1951, corresponding to an annual growth rate of 7.5 per cent. Nevertheless, in the postindependence period, the population growth of Delhi has been remarkably rapid for an urban agglomeration of this size, oscillating between

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[2] In 1951, there were only 5 cities or urban agglomerations (see next note) with one million or more inhabitants, accounting for 19 per cent of the total urban population of the country; in 2001 there were 35, accounting for 38 per cent of the total urban population.

[3] The definition of an 'urban unit' or town that has been applied since the 1961 Census of India is as follows:

a) All places which answer to certain administrative criteria, such as the presence of a municipality, a corporation, a cantonment board, a notified town area committee, etc. These are called the statutory towns.

b) All other places which satisfy the following three criteria: i) a minimum population of 5,000 inhabitants; ii) at least 75 per cent of the male working population engaged in non-agricultural pursuits; iii) and a population density of at least 400 persons per sq. km. These are called the census towns.

In addition, the concept of urban agglomeration was introduced at the time of the 1971 Census and remained unchanged in the 1981 and 1991 Censuses: 'An urban agglomeration is a continuous urban spread constituting a town and its adjoining urban outgrowths, or two or more contiguous towns together and any adjoining urban outgrowths of such towns.' For the census of 2001, two other conditions were added: 'the core town or at least one of the constituent towns of an urban agglomeration should necessary be a statutory town and the total population of all constituents should not be less than 20,000 (as per 1991 Census).'

4 per cent and 5 per cent per year, to reach 12.8 millions in 2001. Since 1961 Delhi has been the third largest Indian urban agglomeration, overshadowed only by Mumbai and Kolkata.

Table 9.1 Population, area and density of Delhi Urban Agglomeration* from 1901 to 2001

Year	Population			Area		Density
	Number	Decennial growth rate %	Annual growth rate %	Square km	Decennial growth rate %	Pop/ hectare
1901	214,115			n.a.		
1911	237,944	11.3	1.06	43.25		55
1921	304,420	27.94	2.49	168.09	288.64	18
1931	447,442	46.98	3.93	169.44	0.80	26
1941	695,686	55.48	4.51	174.31	2.87	40
1951	1,437,134	106.58	7.52	201.36	15.52	71
1961	2,359,408	64.17	5.08	326.55	62.07	72
1971	3,647,023	54.57	4.45	446.26	36.76	82
1981	5,729,283	57.09	4.62	540.78	21.17	106
1991	8,419,084	46.94	3.92	624.28	15.44	135
2001**	12,791,458	51.93	4.27	791.92	26.85	162

* In addition to the urban area circumscribed within the statutory boundaries of the city (the three statutory towns corresponding to the Municipal Corporation of Delhi, the New Delhi Municipal Council and the Cantonment Board), the urban agglomeration of Delhi comprises contiguous urban entities and extensions falling beyond these statutory boundaries. The limits of the urban agglomeration are redefined at each census in order to take into account the most recent urban extensions.

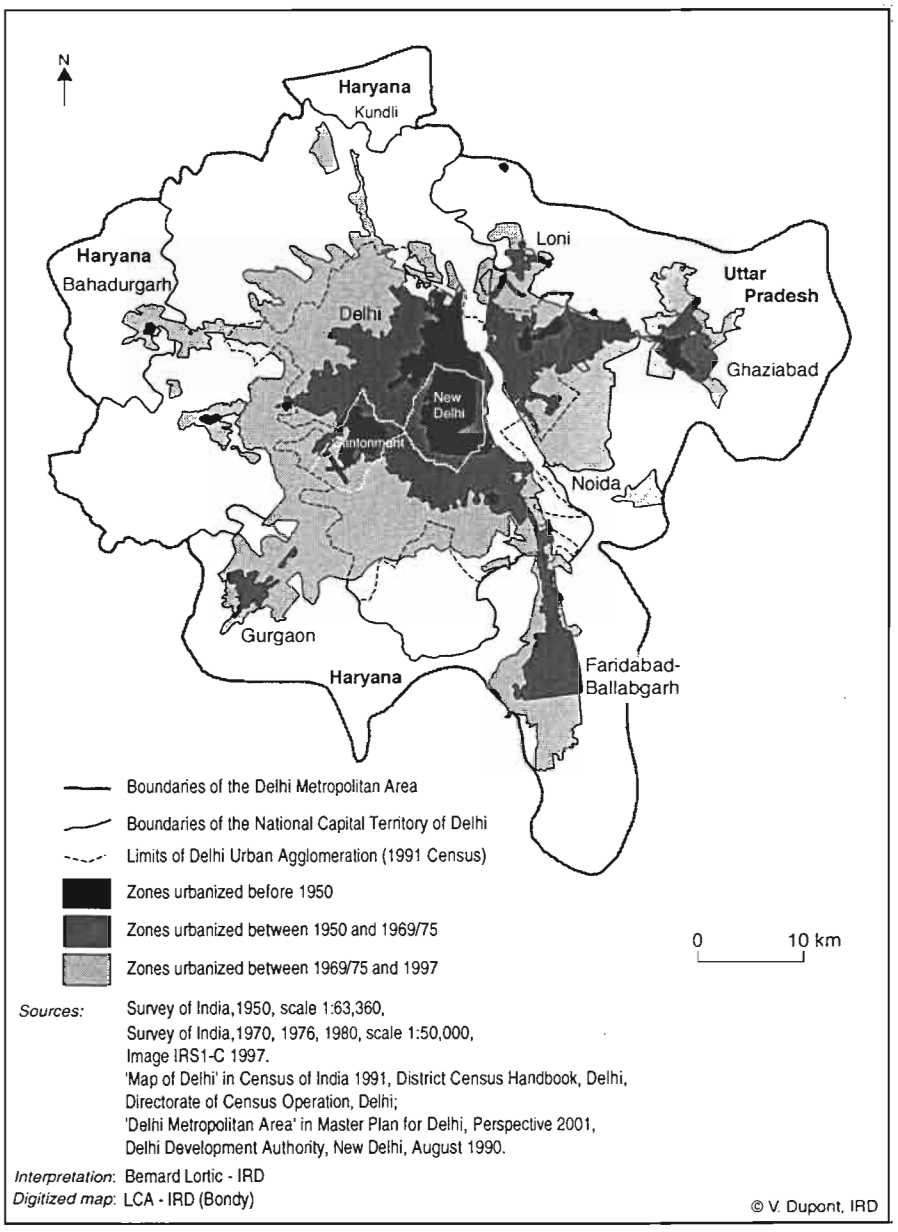
**Provisional results for population figures; area was estimated on the basis of the published census maps.

Source: Census of India, Delhi, 1951, 1961, 1971, 1981, 1991 and 2001

The population growth was concurrent with a spatial expansion in all directions, including to the east of the Yamuna river. The official area of the urban agglomeration was almost multiplied by four between 1951 and 2001 (Table 9.1); and its share in the total area of the National Capital Territory of Delhi[4] (covering 1483 sq. km) increased from 14 per cent to 53 per cent. Delhi's geographic situation, in the Gangetic plain, and more particularly the absence of any real physical barrier to urban progression (the Aravalli Hills - the Delhi Ridge - to the west and south do not constitute an effective obstacle), have favored the multidirectional spreading of the urbanized area (Figure 9.1).

[4] The National Capital Territory of Delhi is an administrative and political entity: a Territory of the federal Union of India, identified by the Constitution of 1949; its boundaries are fixed (Figure 9.1) and correspond to the ancient Province of Delhi under the British rule in India.

Figure 9.1 Spatial expansion of urbanized zones in the Delhi metropolitan area from 1950 to 1997



Contribution of Migration to the Population Growth of Delhi

Migration has played a major role in the demographic evolution of the capital. Following the partition of the country, Delhi whose population was about 900,000 in 1947, had to receive 495,000 refugees from Pakistan, while 329,000 Muslims left the capital.[5] In the postindependence era, migration continued to have a significant contribution to urban growth although it slowed down in the eighties. Migrants with less than 10 years of residence accounted for 62 per cent of the population of the National Capital Territory of Delhi in 1971, 60 per cent in 1981, and it declined to 50 per cent in 1991.[6]

Although the majority of migrants in Delhi come from rural areas, as many as 44 per cent of the total migrants residing in the Territory of Delhi in 1991 were from urban areas: this underlines the specific pull effect of a big metropolis in a predominantly rural country. Over two thirds of all migrants living in Delhi in 1991 were from neighboring states in North India: Haryana, the Punjab, Rajasthan and Uttar Pradesh (Dupont, 2000b).

An estimation of the respective share of the three components of urban growth (natural increase, net inmigration and reclassification of the urban/rural population due to changes in the spatial delimitation of the urban area) in the Territory of Delhi was attempted for the 1971-81 intercensal period by the National Institute of Urban Affairs (NIUA, 1988). It was estimated that: natural increase contributed for 35 per cent to the total urban population growth, net inmigration for 41 per cent and reclassification of population for 25 per cent. However, as the data are not available to estimate the three components of growth in recent years estimates are made based on the following assumptions. Since the population of the National Capital Territory is mostly concentrated in the urban agglomeration of Delhi (90 per cent in 1971 and 93 per cent in 2001), and the area of the Territory constant, an estimation of the two components of population growth (natural increase and net migration) for the entire Territory provides a good approximate of the population dynamics of the urban agglomeration. We attempted this exercise for the last three decades: the average annual rate of natural growth for each intercensal period was computed on the basis of estimated rates provided by the Sample Registration System, and the contribution of net migration deducted as the residual from the total growth rate (Table 9.2). The estimated results not only confirm the crucial contribution of migration to the population growth of the National Capital Territory, but also suggest that this contribution did not slow down during the last decade (1991-2001).

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[5] Source: Ministry of Rehabilitation, Annual Report on Evacuation, Relief and Rehabilitation of Refugees, 1954-55 (quoted in Datta, 1986).

[6] Since the 1971 Census, migrants are those who had resided in a place outside the place of enumeration.

Table 9.2 Contribution of natural growth and net migration to the total population growth of the National Capital Territory of Delhi, 1971-2001

Intercensal period	Average annual rate of growth (%)	Average annual rate of natural growth (%)	Average annual rate of net migration (%)
1971-81	4.34	2.11	2.23
1981-91	4.24	2.13	2.11
1991-2001*	3.88	1.70	2.18

* Provisional results

Source: Census of India and Sample Registration System

Differentials in Population Growth and Densities Within the Territory of Delhi

Differentials within the urban agglomeration The overall demographic change in Delhi urban agglomeration conceals differences within the urban area. Between 1981 and 1991, *the pattern of growth* in Delhi was 'clearly centrifugal' (Dupont and Mitra, 1995), continuing the trend highlighted by Brush (1986) for the 1961-71 decade. Absolute decrease in population, indicating important net outwards moves, has occurred in the historical city core known as Old Delhi and the population has also declined in some parts of New Delhi (the area corresponding to the new capital built by the British). On the other hand, the highest growth rates above 10 per cent were recorded in neighborhoods of the outskirts (Figure 9.2).

During the 1991-2001 decade, these trends persisted. The depopulation of the old city area continued (-1.91 per cent in ten years). Population growth has also been very low in New Delhi district (only +2.47 per cent in ten years), whereas the districts including the peripheral zones of the urban agglomeration have recorded higher decadal growth (for example: +62.52 per cent in the North East district, +61.29 per cent in the South-West district, and +60.12 per cent in the North-West district).

In 1991, the highest population densities were registered in the historical city core: 616 persons per hectare on an average (740 in 1961) in the Walled City of Shajahanabad, established by the Mughals in the 17th century and covering an area of almost 600 hectares. The old city also has a high concentration of commercial and small-scale industrial activities with a mixed land use pattern typical of traditional Indian cities. On the other hand, New Delhi, the area planned in the 1910s and 1920s according to a garden city model, had an average density of only 70 persons per hectare. The Delhi Cantonment, which includes military land and the international Airport, recorded an even lower density of 22 persons per hectare. The average population density in the urban agglomeration was 135 persons per hectare. The classical model of population density gradients, characterized by high densities in the urban core, and a sharp decline towards the periphery, and whose

'original causes (...) can be summed up in three words: protection, prestige, and proximity' (Brush, 1962, p. 65), had largely survived in Delhi until 1991.

Notable changes in the distribution of population densities have taken place over the 1991-2001 period. For the first time, the highest residential densities are not recorded in the old city core, but in two northeastern *teshils* (administrative divisions below the district level): Shahdara (422 persons per hectare) and Seemapuri (402 persons per hectare), while in Old Delhi and its adjoining neighborhoods densities are now lower than 350 persons per hectare. The lowest density is recorded in a *teshil* of New Delhi district (32 persons per hectare in Chanakyapuri, a high status residential area where many embassies' quarters are also located).

A more refined analysis of the pattern of population growth and changes in density during the last decade was not permitted by the data available until now (mid 2002). Furthermore, 15 out of the 27 new *teshils* constituting the Territory of Delhi in 2001 include both rural and urban areas; it is thus not possible at present to test whether the official limits of the urban agglomeration are relevant in terms of rural/urban differentials in the sociodemographic and economic characteristics of the concerned populations. Even after the forthcoming publication of the results of the 2001 census at the ward level, the comparison between 1991 and 2001 at the level of a fine spatial division will not be possible for ordinary census data's users, due to some changes in boundaries of spatial divisions and the lack of published information about the correspondence between the former and the new classification. This difficulty that we already encountered for the previous censuses is compounded by the absence of published maps showing the basic spatial divisions. There is a lack of concordance allowing accurate intercensal comparisons of settlement classification.

Two distinct migration processes are contributing to the rapid population growth in peripheral areas of Asia's megacities. One involves new inmigrants to the city and the other natives of Delhi or migrants of longer standing living previously in inner zones of the urban agglomeration, and who moved to new residential sites. The 1995 survey of population mobility in the Delhi metropolitan area allows us to evaluate the respective contribution of the two types of moves. We will focus here on three peripheral neighborhoods, which illustrate the dynamics of settlement in zones that have recorded a rapid population growth and include various types of housing estates and different income groups. These are:

- *Tigri*, a working class neighborhood, with high residential density located in the southern periphery.
- *Badli-Rohini*, an extensive zone located in the west-northern periphery, including an industrial area, and housing low and middle income groups; its population density in 1991 was still low.
- *Mayur Vihar-Trilokpuri*, a residential zone located in the eastern periphery, including a large variety of housing estates, corresponding to a range of income groups; the population densities of the zone in 1991 varied from middle to very high.

In the three peripheral areas, Table 9.3 shows that most household heads were migrant (i.e. born outside Delhi). Most have moved from elsewhere in Delhi urban agglomeration to the periphery, although newcomers are a significant group.

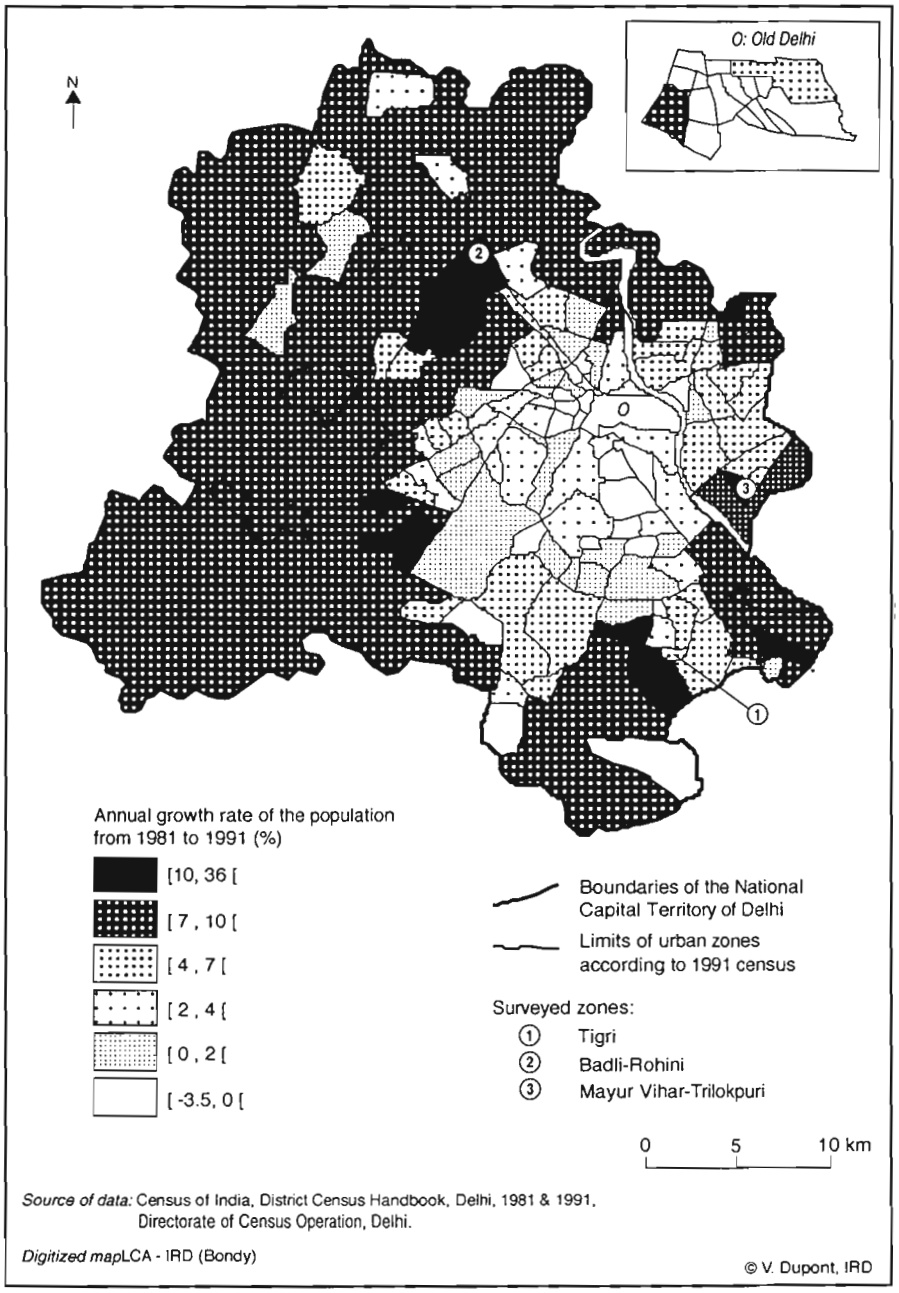
Table 9.3: Delhi sample survey of peripheral neighborhoods: migration status and place of last dwelling of household heads

Place of last residence	Tigri (South)	Badli-Rohini (North-West)	Mayur Vihar-Trilokpuri (East)
Same dwelling since birth	0.6	21.6	4.2
Other Delhi urban agglomeration	72.5	67.7	77.7
Outside Delhi urban agglomeration	26.9	10.8	18.1
Total	100.0	100.0	100.0
Number of cases	171	167	337
Per cent migrant (born outside Delhi)	90.8	68.3	82.8
Per cent of all household members migrant	62.6	57.2	43.5

Source: ORSTOM-IEG Mobility survey, 1995

Differentials between the urban agglomeration and the rural hinterland The centrifugal pattern of population dynamics extended beyond the city limits, Figure 9.2 shows that population growth from 1981 to 1991 was faster in the 'rural' periurban fringe of the National Capital Territory of Delhi than in its urbanized area – 9.6 per cent per year as against 3.8 per cent respectively. These figures can be compared to the natural growth rates during the same period, that is 2.5 per cent annually in rural areas and 2.1 per cent in urban areas (in the urban/rural limits as defined by the 1991 census), thus underscoring the contribution of net inmigration. However, the rural zones accommodated only 10 per cent of the total population of the Territory of Delhi in 1991 and the population densities remain significantly lower in the rural zones than in the urban agglomeration (12 inhabitants per hectare, as against 135 in 1991). Nevertheless, these movements reflect the real attraction exerted by the rural hinterland of the capital on new migrants or residents of Delhi who have left the inner city in search of less congested and financially more affordable localities in which to settle.

Figure 9.2 **Annual growth rate of the population from 1981 to 1991 in the National Capital Territory of Delhi, by census divisions**



This process of periurbanisation around the capital is also expressed in economic terms, insofar as the composition of the working population residing in the rural zones of the Territory of Delhi is closer to that of the national urban population than the rural population. Thus, in 2001, only 11 per cent of the working population were employed in agriculture, as compared with 73 per cent in Indian rural areas and 8 per cent in the urban.

Although the administrative limits of the Delhi urban agglomeration have been extended several times (Table 9.1), the rapid growth of the rural population in the National Capital Territory as well as changes in its economic characteristics underline the discrepancy between the administrative demarcation of urban Delhi and the real pattern of urban development. This points towards the development of a transitional periurban type of area around the Indian capital, as observed in other megacities of Asia (Ginsburg, Koppel and Mc Gee, 1991). Yet, the dichotomous classification of human settlements in India does not recognize this development.

The Rapid Development of Peripheral Towns

The slowing down of the population growth rate in the urban agglomeration of Delhi during the eighties as compared to the previous decades was not the result of a decline in the rate of natural increase.[7] There was deliberate planning from the 1960s onward to develop towns on the periphery of Delhi to accommodate population growth; eventually these areas grew faster than the central agglomeration of Delhi (Table 9.4). The urban sprawl has followed the main roads and railway lines, hence connecting the builtup area of the core city - Delhi - with that of the peripheral towns, leading to the development of a multinodal urban area (Figure 9.1). The inappropriateness of current definitions of urban agglomeration is shown by the fact that the continuous urban spread of Delhi overlaps State borders. The presently contiguous ring towns of Delhi are located in other states (Uttar Pradesh and Haryana) and are not considered as being part of the Delhi urban agglomeration whose actual population size is thus underestimated by more than two millions (Table 9.4).

[7] According to estimates from the Sample Registration System, the average natural rate of increase in the urban areas of Delhi was 2.0 per cent per year from 1971 to 1980, and 2.1 per cent from 1981 to 1990.

Table 9.4 Population growth of cities, towns and villages in Delhi metropolitan area* from 1951 to 2001

Towns/zones	Population					
	1951	1961	1971	1981	1991	2001
Delhi NCT	1,744,072	2,658,612	4,065,698	6,220,406	9,420,644	13,782,976
i) Delhi U.A	1,437,134	2,359,408	3,647,023	5,729,283	8,419,084	12,791,458
ii) other census towns	-	-	-	38,917	52,541	28,303
iii) rural Delhi	306,938	299,204	418,675	452,206	949,019	963,215
Ring towns						
Ghaziabad U A	43,745	70,438	137,033	287,170	511,759	968,521
Loni	3,622	5,564	8,427	10,259	36,561	120,659
Noida	-	-	-	35,541	146,514	293,908
Faridabad CA	37,393	59,039	122,817	330,864	617,717	1 054,981
i) Faridabad	31,466	50,709	105,406	-	-	-
ii) Ballabgarh	5,927	8,330	17,411	-	-	-
Gurgaon UA	18,613	3,868	57,151	100,877	135,884	229,243
Bahadurgarh UA	11,170	14,982	25,812	37,488	57,235	119,839
Total ring towns	114,543	187,981	351,240	802,199	1,505,670	2,787,151

Towns/zones	Annual growth rate (%)				
	1951-61	1961-71	1971-81	1981-91	1991-01
Delhi NCT	4.31	4.34	4.34	4.24	3.88
i) Delhi U.A	**5.08**	**4.45**	**4.62**	**3.92**	**4.27**
ii) other census towns	-	-	-	3.05	-6.00
iii) rural Delhi	-0.25	3.42	0.77	7.69	0.15
Ring towns					
Ghaziabad U A	4.88	6.88	7.68	5.95	6.59
Loni	4.39	4.24	1.99	13.55	12.68
Noida	-	-	-	13.31	7.21
Faridabad CA	4.67	7.60	10.42	6.44	5.50
i) Faridabad	4.89	7.59	-	-	-
ii) Ballabgarh	3.46	7.65	-	-	-
Gurgaon UA	7.36	4.20	5.85	3 02	5.37
Bahadurgarh UA	2.98	5.59	3.80	4.32	7.67
Total ring towns	**5.07**	**6.46**	**8.6**	**6.5**	**6.35**

NCT: Delhi National Capital Territory; UA: Urban Agglomeration; CA: Complex Administration.

* The Delhi metropolitan area identified by the planners consists of the National Capital Territory of Delhi and the first ring of towns around the capital as listed in this table -plus their rural hinterland (Figure 9.1). In addition, the village of Kundli was proposed for enhancement and included in the metropolitan area.

Source: Census of India, 1951, 1961, 1971, 1981, 1991 and 2001 (provisional results)

An example: the new town of Noida The case of Noida provides an illustration of the population dynamics in a new town of the metropolitan area. It is situated at the southeastern border of the Territory of Delhi, in the State of Uttar Pradesh, at fifteen kilometers from the center of the capital. Noida (the acronym for New Okhla Industrial Development Authority) is a new industrial center, founded in 1976, a product of the town and country planning policy. It was created from the clustering together of around twenty villages. The population of Noida underwent

very rapid growth during the 1980s and the 1990s, to reach 294,000 in 2001 (Table 9.4).

According to the 1995 Mobility survey, in the town as a whole (including the original villages, the planned areas and the slums), 69 per cent of the households were headed by a migrant, this figure rises to 89 per cent in the new planned sectors and 99 per cent in the slums. A majority of all migrants (56 per cent) had arrived directly from outside the Delhi-Noida conurbation. Among the households not having always lived in the same dwelling, 33 per cent were living earlier outside the Delhi-Noida conurbation, 39 per cent in Delhi itself (56 per cent among households in the new planned sectors) and 27 per cent in a different dwelling in Noida. The acquisition of a house or of an apartment was the reason for 44 per cent of the last changes of residence from Delhi or a different dwelling in Noida (66 per cent for the households of the planned sectors), and better or cheaper housing conditions for 41 per cent of them. These figures show to what extent the power of attraction of the new industrial center extends beyond the metropolitan area of Delhi, and they also testify to a manifest influx of population from the capital, arising out of considerations related to housing.

Consequently, about one fourth of Noida's working inhabitants commute daily to work outside their town of residence, this proportion undergoing large variations according to the sector of housing (1995 Mobility survey; Dupont, 2001a). Almost all workers living in the slums (98 per cent) work in Noida. It is the attraction of employment opportunities offered by this new industrial center that has made them migrate. But among those residing in the planned sectors, only 52 per cent work in Noida, the rest commuting to Delhi. Thus, for a notable section of its population, Noida is merely a satellite town of the capital, playing the role of a dormitory.

Processes of Outward Expansion: Contributing Factors and Variety of Urban Forms

The pattern of population distribution and growth is related to a number of factors: patterns of landuse, the availability and price of land or residential property, and the accessibility of employment opportunities and urban services. If this last factor helps explain the centripetal force of the past, the actual centrifugal tendency is certainly associated with the scarcity of land for new residential constructions and its consequent appreciating value in central areas. The less congested peripheral zones provide more affordable housing possibilities, as well as more accessible sites for squatting. The expansion of the urban periphery is the outcome of the interactions between planning attempts and private initiatives and responses.

The Planned Development of Peripheral Zones: The Role of the Delhi Development Authority and of Regional Planning

The evolution of Delhi and its region have been strongly influenced by a town and country planning policy initiated in the late fifties, and that was prompted by the desire to control the growth of the capital and to curb inmigration flows by

reorienting them towards other towns in the region. Within the capital itself, this interventionist policy was given concrete shape by means of a master plan, the first of its kind in India, implemented in 1962. Particularly restrictive land control measures were taken, housing programs were launched, while some old central quarters and slums were destroyed and their inhabitants resettled in peripheral areas. However, these measures did not prevent a high level of speculation in land and proliferation of informal - considered as 'illegal' - quarters (the 'squatter settlements' and 'unauthorized colonies').

The Delhi Development Authority (DDA), the central administration created in 1957, responsible for the elaboration and the execution of the Master Plan, has played a direct role in the urban spread of the capital. The DDA set aside large land reserves, primarily through the acquisition of agricultural lands geared towards the implementation of various land development and housing programs:

- the construction of blocks of flats for sale to private households of different income groups;
- the development of land and the allotment of plots on a 99 year leasehold basis to private households and cooperative group housing societies;
- the servicing and allotment of land for the resettlement of slum dwellers and squatters evicted from central areas of the city. This policy which resorted to coercive measures was pursued most actively during the 'Emergency' (1975-77) during which time about 700,000 persons were forcibly displaced to 'resettlement colonies' located on the urban outskirts (Ali, 1990, 1995; Tarlo, 2000).

In some cases, these schemes were part of large-scale projects aimed at developing new peripheral zones and leading to the creation of satellite townships (Rohini, Dwarka-Papankala, and more recently Narela subcity) planned to receive up to one million inhabitants or more (Jain, 1990, Chapter 7).

The 1995 Mobility survey indicated that the housing and plot allotments schemes of the DDA benefited mostly households which were already settled in Delhi. For instance, in Mayur Vihar, 85 per cent of the households surveyed in the DDA flats moved from another dwelling located in Delhi as did 97 per cent among those surveyed in blocks of flats built by cooperative group housing societies. In Rohini, 92 per cent of the households surveyed in the planned sector had followed a similar residential trajectory. Thus, these public urban development programs have contributed more to the redistribution of the population within the urban agglomeration, than to the direct attraction of new migrants, in spite of the emergence of a significant private rental sector among this segment of the housing stock.[8]

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[8] In the sample of dwellings surveyed in Mayur Vihar, 19 per cent of the DDA flats were rented (including accommodation provided by the employer) as were 49 per cent among the apartments of the co-operative sector; in Rohini, 16 per cent of the dwellings surveyed in the planned sector were occupied by renters.

At the regional level, planning policy laid emphasis on the promotion of peripheral towns through the strengthening of their economic base, including the creation of the new industrial town of Noida. The first Master Plan of Delhi (1962) introduced the concept of metropolitan area, that encompassed the Territory of Delhi and the towns located within a radius of 35 kilometers around the capital and whose demographic and economic development was interdependent with that of Delhi and involved large-scale commuting. The development of the metropolitan area was further integrated within the larger planning framework of the National Capital Region, a region covering around 30,000 sq. km., and provided with a planning board since 1985 (NCR Planning Board, 1988). However, the initial stress put on the promotion of the first ring of towns eventually strengthened the attraction of the whole metropolitan area and intensified commuting within it (NIUA, 1988). Due to their proximity to the capital, these ring towns did not emerge as autonomous, alternative growth centers, and most of them can be considered satellite towns, alleviating housing problems in the capital, but exerting a heightened pressure on its amenities.

In the late 1980s, however, a new strategy of regional planning aimed at promoting regional urban centers situated beyond the metropolitan area, at a distance large enough to discourage daily interactions with the capital. It is proposed to develop beyond the borders of the National Capital Region, five regional metropolises as countermagnets to intercept future migratory inflows towards the metropolitan region (NCR Planning Board, 1988, 1996).

Informal Urbanization of the Periphery: A Classic Pattern Among the Poor in Metropolises of Developing Countries

Public housing policies have failed to meet the needs of large sections of the urban population, in particular the lower-middle classes and the poorer who have had to resort to the informal housing sector.

Unauthorized colonies on agricultural land The proliferation of unauthorized colonies has contributed in a decisive way to the urbanization of the rural fringes of Delhi. These estates involve agricultural land not meant for urbanization, bought from farmers by unscrupulous real estate developers who indulge in illegal subdivisioning and selling of unserviced plots. In 1983, 736 unauthorized colonies were enumerated, housing an estimated population of 1.2 million, that is almost 20 per cent of the population of the capital (Billand, 1990, pp.2-7); in 1995, their official number had reached 1300 (Government of NCT of Delhi, 1996, p.11), and their total population in 1998 was estimated at about 3 millions.[9]

These housing estates are not recognized by the municipality and therefore do not have the benefit of its services. Authorities have repeatedly introduced regularization procedures to legalize these unauthorized colonies. However, it

[9] Estimation provided by *Common Cause*, a citizens' association that took the matter of unauthorised colonies to the Delhi High Court, against their regularisation.

seems that this policy has had the perverse effect of indirectly encouraging the development of new unauthorized colonies, since prospective buyers hope their settlement would obtain regular status in the future, thereby guaranteeing the long-term economic profitability of their investments.

Initially, these colonies appealed to lower to middle income groups, people whose limited resources meant that they could not rent or buy in the legal housing market and were prepared to accept limited utilities and resources. In order to make their investment profitable the new house owners often rent out one or several rooms, or one story, in their house, hence contributing to the increasing residential densities of these colonies.

The unauthorized colonies surveyed in Mayur Vihar were almost all occupied by migrant households[10] (they represent 92 per cent of households according to the 1995 Mobility survey). Among the migrants, 44 per cent arrived directly from a town or village situated outside the capital, and 56 per cent lived previously in another locality (or several) within the Delhi urban agglomeration. Three quarters had occupied another dwelling in Delhi before settling in the present one. In spite of a significant rental sector (37 per cent of the households surveyed in this type of quarters are tenants), the unauthorized colonies of Mayur Vihar are mainly a place of resettlement within the urban agglomeration, rather than a place of initial reception for new migrants.

Squatter settlements on vacant land The poorer sections of the urban population live in squatter settlements (locally called *jhuggi-jhonpri*), which have continued to proliferate despite the 'slum clearance' policy (Ali and Singh, 1998; Majumdar, 1983; Suri, 1994). In 1999, about 600,000 families lived in a thousand of *jhuggi-jhonpri* clusters which varied in size from a dozen dwelling units to 12,000; these squatter settlements altogether housed about 3 million persons or 20 to 25 per cent of the total population of Delhi.[11] Though squatter settlements are found throughout of the capital, insinuating themselves into all the interstices of the urban fabric wherever there is vacant land and where surveillance by the legal authorities is limited,[12] the two biggest clusters are located on the periphery, on what was still the urban-rural fringe at the initial time of their occupation. The population density in squatter camps can be very high owing to the cramming together of families in one-room huts and very narrow lanes. In many squatter settlements, the structures are reinforced and further extended by the frequent addition of a story to respond to families' expansion, but also for rental purposes. A process of increasing residential density is at work in quarters already crowded and lacking basic infrastructure and access to services.

Delhi's squatter settlements shelter mostly migrant households attracted by the employment opportunities provided by the city. Yet, all the migrants have not

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[10] By 'migrant household' we mean household whose head is a migrant.

[11] Slum and Jhuggi Jhonpri Department, Municipal Corporation of Delhi.

[12] Numerous evictions of squatter settlements in 2000-2001 are however likely to have altered this spatial pattern.

settled directly in their present squatter settlement upon their arrival in the capital. A significant proportion among them – that vary from one slum to the other, depending on its specific history – have stayed previously in another place in Delhi (this was the case for 38 per cent of the migrants surveyed in the Tigri *jhuggi-jhonpri* camp, and 70 per cent of those surveyed in the *jhuggi-jhonpri* clusters of Badli-Rohini - according to the 1995 Mobility survey). Often, the residential trajectory of the slum dwellers is marked by eviction from one place, squat in another one, until they are evicted again and eventually sent to a resettlement colony. They may also move on their own to a better location, in the vicinity of employment sources (adjoining for instance an industrial area, like in Badli-Rohini).

Deconcentration of the Rich to the Rural Fringe

Residential strategies aimed at gaining access to more space and a better environment outside the city proper have seen many move to Delhi's periphery and the processes of periurbanisation and rurbanization have proceeded apace.[13] Given the lack of a mass transit system in the capital and its metropolitan area, it is the tremendous increase in private means of transportation that has allowed the emergence of residential estates in distant rural fringes suitable only for those who can afford the price of commuting daily by car, or who compensate for the increased transport cost by the cheaper housing costs. Two resulting types of urban form have developed in the rural fringes: 'farmhouses', and large-scale housing schemes.

The farm houses The deconcentration of upper-class families to the rural fringes has created competition for land use, in particular in the southern agricultural belt where numerous 'farm houses' have been built (Soni, 2000). As they were initially genuine farms within agricultural lands, such zones are governed by planning regulations applying to farmlands, seeking to limit the builtup area in relation to the natural green and cultivated spaces. The agricultural nature of such lands is, however, often distorted. Luxurious, sprawling villas, surrounded by large parks and protected by high walls have become the fashion instead. Usually, 'farm house' owners are people from the top income bracket who have been able to build havens of tranquility on the outskirts of one of the most polluted capitals of the world.

Large-scale housing schemes The direct control exercised by the Delhi administration on land suitable for urbanization has induced some private real estate developers to implement large-scale housing schemes outside the limits of

[13] Rurbanisation is understood here as 'the fixation in peri-urban countryside of residences of city dwellers, the interweaving of rural and urban spaces', that is, 'one of the forms of peri-urbanisation', without 'continuity between the town and the rurbanised countryside' (George, 1993, p.411).

the National Capital Territory of Delhi, often well beyond the perimeter of its urban agglomeration. The informal urbanization of the fringes of the capital has also prompted planners in the bordering states to intervene according to a different strategy, allowing private building societies to acquire large tracts of land in the framework of their master plans. These residential projects are designed for well-to-do city dwellers, looking for a better quality of life. Thus, some property developers make use of the very outlying character of these new residential areas to emphasize the rustic 'green' nature of the fringe areas to attract high income settlers from central Delhi (Dupont, 2001b).

The 1995 Mobility survey conducted in the largest residential complex of this type, DLF Qutab Enclave, located 23 kms away from the center of Delhi near the southern ring town of Gurgaon provides insight into the population dynamics associated with this mode of periurbanisation. The peopling of this residential neighborhood beginning in the 1980s resulted mainly from a deconcentration movement within the capital. Thus, 65 per cent of the inhabitants had lived previously in Delhi itself, only 9 per cent in the town of Gurgaon or its surroundings, and 26 per cent outside of the metropolitan area of Delhi (although some of them had already familial or professional links with the capital).[14] The high status of the area is reflected in the fact that nearly three quarters of the households own their house or flat. Financial considerations are also involved here: the cost of plots or dwellings being more affordable here than in neighbourhoods of comparable standing in the capital. Nevertheless, the environmental considerations are also important in the choice of residential location by settlers in the area (Dupont, 2001b).

The indispensable condition for having access to real estate outside the capital and to a better environment, is the possession of a personal vehicle to make possible daily journeys to distant workplaces, to realize certain types of shopping and to maintain one's social network through visiting. About half of the gainfully employed inhabitants surveyed in DLF Qutab Enclave worked in Delhi proper, while half of the students attended a school or university in Delhi; yet, at the same time, bus services, either public or chartered by the developers, were still limited.

The construction of business and commercial centers has supplemented the development of residential complexes in this decentralized area, and the spatial expansion of the builtup area over largely spread zones is now combined with clusters of high-rise buildings in a similar way to the edge cities (Garreau, 1991) of the United States. The scale of the development schemes and the rapidity of transformation of this peripheral zone of Delhi has seen its rural components quickly shrink (Dupont, 1997). In the early years of the development, the discontinuity of builtup area between the city and these residential quarters in the rural fringes was much more pronounced than today, and the countryside more

[14] To compute these percentages, we have excluded the persons who have lived in the same dwelling since their birth (i.e. the children born after their family moved to DLF Qutab Enclave), representing 2.5 per cent of the residents (out of a total sample of 566 residents).

present. The extension of the urban fabric and the increasing density of construction has altered the panorama, contracted the rural space while encircling the village cores, and in the years to come these housing estates will be progressively transformed into a continuous suburb. This illustrates the difficulty in 'demarcating urban and rural spaces' and in 'distinguishing what is continuous suburb and discontinuous periurban' in a context of rapid urban growth common to numerous metropolises in the developing countries (Steinberg, 1993, pp. 10-11).

Increasing Density and Transformation of the 'Urban' Villages

The process of urban expansion involves the annexation of agricultural land and the absorption of the surrounding villages in the urban agglomeration. Over the 1901-91 period, 185 new villages were incorporated within the limits of Delhi urban agglomeration (Diwakar and Qureshi, 1993), and 17 others during the 1991-2001 decade (Census of India, 2001). Many of these urbanized villages (designated 'urban villages' by the planners) appear like spontaneously developed enclaves within highly planned areas. They are subject to very great pressures on land and important transformations of their economic functions, morphology and population (Sundaram, 1978, p.115; Lewis and Lewis, 1997, pp. 26-7, 30-1; Tarlo, 1996, Chapter 9; Bentick, 2000). The habitat is transformed in response to the housing needs of numerous migrants with low incomes who find in the urban villages rent levels which are less than in the other planned areas of the capital. These urban villages enjoy a special status, and remain outside the purview of most town planning rules, the objective being to preserve the original identity of village life and its traditional values. There is thus no restriction on the type of construction erected nor on the type of activity conducted in these zones. Paradoxically, this special status has accelerated the transformation of the original village nucleii. It has encouraged their commercialization and the proliferation of small industrial workshops, by offering to entrepreneurs working space at rents lower than in the recognized commercial or industrial zones, while at the same time avoiding the controls of the municipality. The manifold increase of economic activities has also attracted a working class of laborers who live if possible in the villages, thus contributing to an increased density of population and of housing.

The case of Harola, a village enclosed in the new industrial town of Noida is examined in detail elsewhere (Dupont, 2001a). This urbanized village exemplifies in a spectacular way the radical transformations that may occur in the context of disruptions in sources of livelihood and in the local labor market, combined to a high demand for rental lodging, in the absence of restriction on constructions. Although the town authorities have deployed an active housing policy in Noida, we see borne out there a situation that is classic to cities in developing countries. This is the lack of any central measure in the rental sector, which is left entirely to uncontrolled private initiative.

The population dynamics in urban villages are exemplified in the 1995 Mobility survey in the peripheral zones of Mayur Vihar-Trilokpuri and Badli-Rohini, as well as in the new town of Noida. In these areas the urban villages are the only type of settlement where one can find household heads who have been

living in the same dwelling since their birth. Yet, there are still significant percentages of migrant households in the urban villages (22 per cent in Badli-Rohini, 28 per cent in Noida, and 67 per cent in Mayur Vihar) indicating that newcomers contribute to the current dynamics at work .

Implications for Categorizing Population

The processes that underlie urban development in the metropolitan area of Delhi contribute to an interweaving of urbanized zones and countryside, as well as to a blurring of the distinction between rural and urban population categories. This is especially evident at the fringes of megacities like Delhi. The continuous geographical expansion of the urban agglomeration of Delhi entails, first of all, a physical integration of urban and rural spaces through the incorporation of villages in the urbanized zone. The process of periurbanisation and rurbanization around Delhi is also expressed by a functional integration of the metropolis and new residential neighbourhoods established in the rural fringes, without (necessarily) continuity of builtup space (at least during the initial phase of emergence of these outlying clusters). The daily commuting of the new dwellers in the rural-urban fringe between their decentralized housing estates and the centers of employment in the capital reflects the link of economic dependency between the different spaces.

However, the functional integration of urban and rural spaces is also at work in the central urban agglomeration of Delhi due to the continuous inmovement of considerable flows of migrants, mainly from rural origins. Although we have not elaborated on this aspect here, these migrants usually maintain relations of a diverse nature (economic, social, emotional, etc.) with their native place (Banerjee, 1986; Basu, Basu and Ray, 1987; Dupont, 2000a); their life space transcends the urban/rural borders, exceeding the limits of the city to incorporate their home villages. Thus, the integration of urban and rural spaces extends beyond the geographic continuum through circular movements of individuals (commuters as well as migrants) between the different places with which they have relations (Dupont and Dureau, 1994).

The integration of urban and rural spaces, physical and functional, also induces a crossing, a certain symbiosis, of urban and rural characters of populations and the emergence of composite identities. Many inhabitants of metropolitan areas (like that of Delhi) appear to be neither exclusively urban, nor exclusively rural, whether it be a matter of populations in the rural fringes in the process of urbanization, of commuters from rural hinterland, of city dwellers who have shifted their residences into the surrounding rural zones or, of migrants still linked to their native villages.[15]

[15] The fact that many individuals, by virtue of their multipolar residential and work spaces, and the effect of circulation, are neither exclusively urban nor exclusively rural, has been

The process of Delhi's metropolization must be viewed as a system of reciprocal influences: on the one hand the urbanization of peripheral zones and of surrounding rural populations, as well as the introduction of urban goods, information, ideas, social and cultural values and behavioral patterns in faraway villages through circulating or returning migrants. On the other hand, a certain ruralization of the metropolis and of its inhabitants is occurring, through rural migrants importing their original values and behavioral patterns, and retaining them to some extent in the city. This influences demographic behavior, like patterns of nuptiality and fertility. Thus, constructing population categories that would be based on the criterion of a single place of residence at the time of observation proves to be too reducing for apprehending the spatial distribution pattern of populations and for further demographic analysis.

In order to analyze pluri-polar residential spaces, some authors have introduced the notion of intensity or density of residence (Poulain, 1985; Dureau, 1987) and tried to apprehend the residential space understood as a system of residence, a spatiotemporal configuration defined in relation to the various places of stay and the density of residence in each one of them (Barbary and Dureau, 1993). Yet, in the context of populations exposed to intense commuting, the geographical and social environment of the workplace may exert an influence as significant as – or even more significant than – the place(s) of residence of the individuals to explain some demographic behaviors.

A longitudinal approach proves also to be necessary in order to understand a pattern of behavior at a given time. Rather than the place of residence, or even the system of residence, of an individual at the time of observation, what matters more to explain his/her demographic behavior, is the duration of stay in successive places and the successive modifications of his/her system of residence. Some of these issues have been tackled by life history surveys and event history analysis in demography (GRAB, 1999).

One should also be able not only to characterize the settlement pattern prevailing in the residential space of reference at each step of the individual life course, but also to take into account the transformations undergone by these spaces. In this perspective, one specific difficulty for demographic analysis in the context of many metropolises of developing countries, as in the case of Delhi, is the speed of urban spread and transformations, especially in the urban-rural fringes.

This is also a difficulty for urban and regional planning: the evolution of the Indian capital and of the towns on its periphery shows some growing discrepancies between the objectives of the planners and the actual development of the metropolitan area.

The rapidity of the urbanization process in the 'rural' hinterland also invalidates the pertinence for demographic analysis of the administrative limits of the Delhi urban agglomeration, despite their periodic redefinition. The rise of a transitional periurban type of area around the Indian capital further underscores the

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acknowledged for a long time by several authors. In the Asian and Pacific context, see, among others: Goldstein, 1978; Hugo, 1982; Chapman and Prothero, 1983.

inadequacy of the dichotomous classification of human settlements in India and the need for the recognition of an intermediary category between rural and urban.

At the level of the National Capital Region, the distinction made between three planning zones (the Territory of Delhi, the ring towns in the metropolitan area, and the zone beyond the metropolitan area), runs the risk of becoming an obsolete theoretical distinction, overtaken by the rate at which the actual dynamics at work are evolving. In particular, the development of a multinodal quasi-continuous urban area calls for a revision of the limits of the Delhi urban agglomeration, in order to encompass the contiguous towns located beyond the National Capital Territory borders.

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New Forms of Urbanization: Beyond the Urban-Rural Dichotomy

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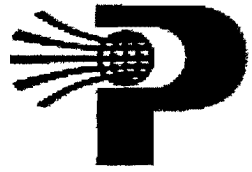

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