

Determination of Factors for Identification & Spatial Delineation of Peri-Urban Areas of 2nd Tier Cities in India: Case Study of Bhopal and Varanasi

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Abstract—Owing to the increased stagnancy of the metropolitan cities, the focus of growth in India has shifted to the 2nd tier cities whose city borders are expanding at breakneck speeds. Such uncontrolled urbanization has been a continuous and challenging issue for consecutive Governments. It leads to a two-pronged problem of difficulty in identifying of these peripheral zones (also termed as peri-urban areas) having characteristics of both urban and rural spaces as well managing the unrestrained city sprawl. Often disregarded in the planning process, India's peri-urban areas are crucial in creating a balanced urbanization structure and achieving an equitable distribution of resources. Without proper governance structure, policy framework & spatial planning, peri-urban areas suffer from illegal encroachments, land speculation, escalating immigration and lack of basic urban utility & services. The paper attempts to first define the concept of peri-urban areas in the Indian context and then proceeds to determine and analyze the various identifiable traits including spatial, demographic, institutional, socio-economic factors and the consequent issues plaguing such areas. The paper ultimately aims to identify a method of spatially delineating the physical spread of such peri-urban areas and propose specific recommendations through the case study of two Indian cities – Varanasi, Uttar Pradesh and Bhopal, Madhya Pradesh. A concrete method of identification and delineation of such areas will help Governments and Urban Local Bodies to better plan and strategize their development and in turn regulate the growth of a city, both spatially and sectorally.

1. INTRODUCTION

According to the Census of India, 2011, an urban area can be of two types:

- **Statutory Towns:** All places with a municipality, corporation, cantonment board, notified town area committee, etc. as notified under law by the concerned State/ Union Territory Government irrespective of their demographic characteristics as reckoned on 31st December 2009.
- **Census Town:** All other places with i) A minimum population of 5,000; ii) At least 75 per cent of the male main working population engaged in non-agricultural

pursuits; and iii) A density of population of at least 400 persons per sq. km.

A cursory glance at the Census data (2001 and 2011) will reveal that while the growth of statutory towns have been a mere 6.37% (from 3799 in 2001 to 4041 in 2011), the growth in Census Towns has been a massive 186% (from 1362 in 2001 to 3894 in 2011) [1]. Further over the decade (2001 to 2011), the average urban settlement size has decreased by 14.3% (from 55,439 to 47,524) [2] indicating the overall urbanization of India over the past decade has been fueled by the growth of smaller peripheral towns around bigger cities, thus extending urbanization beyond the city borders, engulfing villages.

The suburbs and peripheries are gaining industry, while metropolitan cores are deindustrializing [3]. While this mirrors the normal trend of urbanization in a rapidly developing nation like India, the uncontrolled sprawl and the unrestrained urbanization has given rise various challenges for Governments as well. Such areas are often loosely termed as peri-urban areas and can showcase various identifiable traits.

2. AIM & OBJECTIVES

Aim of this study is to identify the technique of peri-urban area delineation to regulate the growth of a city, both spatially and sectorally. This will be achieved through the following objectives: (1) to understand the process of formation of peri-urban areas and defining their characteristics; (2) Identification and examination of the issues plaguing peri-urban areas; (3) Identification, finalization and validation of delineation process; and (4) Recommendations and policy proposals for mitigation of the issues.

3. LIMITATIONS

This study will majorly focus on the process of delineation of peri-urban areas through identification of various identifiable

traits. The process will exclude (i) Metropolitan cities or large urban agglomerations like the National Capital Region (NCR) since their peri-urban areas are large-spread and their delineation will require a more exhaustive and elaborate process than the one detailed in this paper; (ii) Hilly regions or other such natural or man-made topography which may physically hamper the growth of a city; (ii) Politically unstable areas and conflict areas; (iii) Availability of primary sources of data may cause limitation in research.

4. IDENTIFICATION OF PERI-URBAN AREAS

Though the expression 'peri-urban' is used commonly, an unambiguous definition is unavailable. The most appropriate definition of peri-urban can be a specific and non-neutral transition or interaction zone where urban and rural activities are juxtaposed and landscape features are subject to rapid modifications by human activities. [4] Many of the census towns are urban outgrowths and though they are organically a part of neighboring cities or large towns, they are not governed by municipal administration. Thus, a large part of the peri-urban fringe of cities in India is not governed by municipal administration but by rural bodies.

5. FORMATION OF PERI-URBAN AREAS

Rapidly burgeoning urban centers face huge shortfall in urban services forcing development to the periphery of the cities, creating a rural-urban interface. Sometimes easy availability of transportation corridors further fuel this expansion. To tackle this, Master Plans and Development Plans encompass a larger extent of area beyond the city limit (often termed in India as the Planning Area, under the jurisdiction of the Development Authorities).

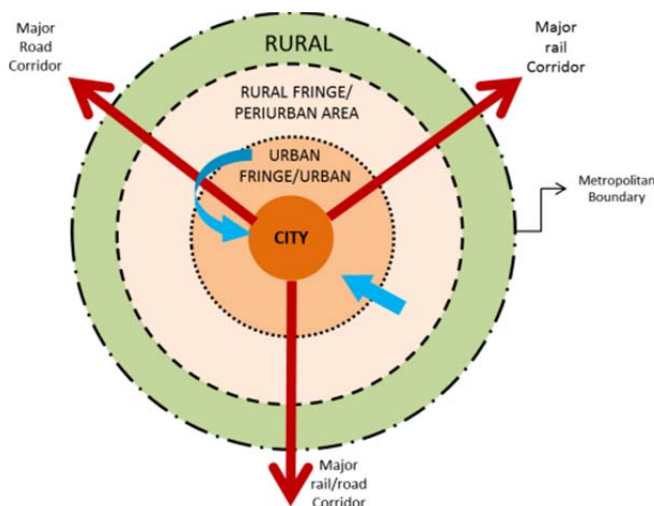


Fig. 1: Formation of Peri-Urban Areas

The underlying principle for such inclusion is the strong influence exercised by the city over its peripheral areas and their dependence on the city for services and livelihood. Thus

during the process of urbanization in the area beyond the city, the peri-urban area is assumed to exist, before it reaches rural areas. The process continues and the rural areas get converted into urban area passing through the peri-urban stage.

6. CHARACTERISTICS & ISSUES OF PERI-URBAN AREAS



Administratively, peri-urban areas contain census towns or rural areas and may or may not be part of the planning area. However, socio-economically, they can be vastly different and not necessarily homogenous.

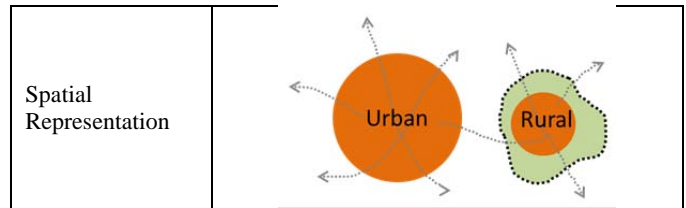
- **Absence of a robust institutional structure [5]** for proper governance and development of peri-urban area leads to weak infrastructure. They mostly fall under the jurisdiction of the Gram Panchayats or Rural Local Bodies which are ineffective in catering to the need for urban utilities and services of the regions. Overlapping functions of various levels and agencies of the Government (including Nagar Panchayats, Panchayats, Town & country planning department of State Government, District administration, District Planning Committees, Development authorities) further complicate the situation.
- **Vastly different land-uses within the region** with some parts being completely industrial while others being residential, commercial and agriculture. Ensuring compliance to the land uses stipulated in the development plans are often difficult owing to the lack of a transparent system to convert land use [6] and cases of illegal conversions and encroachments are rampant.
- **Economic dichotomy** with generally a mixture of primary, secondary and often tertiary sectors. SEZs and service sector zones like IT parks are common. Simultaneously, some of the population in the region engage in agriculture, farming or related occupations creating a dichotomy in the workforce.
- **Differential infrastructure & municipal services** with some areas enjoying good connectivity, transport channels, basic services and utilities while others areas lacking them completely. Often peri-urban areas are governed by rural bodies which do not have the requisite resources to cater to increasing demand for urban utilities like piped water supply, drainage & sewerage system, robust public transport etc. Real estate conglomerates however keep constructing houses further inflating the land prices and creating islands of super-developed, ultra-modern colonies in the midst of rural habitations and consequently fuel the continuous process of gentrification.
- **Increased vulnerability to environmental degradation** because of their proximity to the city. The cities often exploit the peripheral areas by engulfing their land and water resources as well as to dump solid and liquid wastes or spill overs. Increased population and non-compliance

to environmental regulations by large companies, public institutions, townships and upper income groups further strain the environmental carrying capacity of these areas.

All of this leads to difficulty in standardized planning techniques due to the vastly different and varied nature of peri-urban areas.

Table 1: Comparative Analysis: Urban, Peri-urban & Rural areas

Urban Area	
Definition	As defined in Section 1
Synonyms	Nagar, Town, City, Neighborhood, Polis
Population Range	More than or equal to 5000
Growth Rate	Increasing
Economic character	Majorly secondary and tertiary sector
Spatial Representation	
Peri-urban Area	
Definition	As defined in Section 3
Synonyms	Fringe area, Rurban area, urban-rural Continuum, Periphery area, sub urban area
Population Range	Not defined
Growth Rate	Increasing growth trend in census towns, urban agglomerations and out growth.
Economic character	Mixture of primary and secondary sectors
Spatial Representation	
Rural Area	
Definition	All area other than urban is rural. The basic unit for rural areas is the revenue village. [7]
Synonyms	Gram, Gramin Kshetra, village
Population Range	Less than 5000
Growth Rate	Declining
Economic character	Majorly primary sector



7. CASE STUDY AREAS: BHOPAL & VARANASI

Both Bhopal, Madhya Pradesh and Varanasi, Uttar Pradesh are fall under the **Census classification Class ‘P’** (Population ranging from 1-10 lakhs) and under the **HRA Classification – ‘X’** (based on Rates of House Rent Allowance As a percentage of (Basic pay +Net Practicing allowances (NPA)). Both cities are similar in the geographical and economic setting, have similar population ranges and physical extent, as elucidated in Table 2. [8, 9]

Table 2: Comparative Study- Bhopal & Varanasi

Indicators	Varanasi	Bhopal
District Population (2011) - Total	3,676,841	2,371,061
District Population (2011) - Urban	1,597,051	1,917,051
City Population (2011)	1,198,491	1,795,648
Total Area of District (sq. km)	1,535	2,772
No. of Statutory Towns in district	5	3
No. of Census Towns in district	34	0
No. of Villages	1,295	519
Related policies & Legislations	UP Building Bye Laws, 2008; Cantonment Admin Rules, 1937; UP Urban Planning & Development Act 1973; Zoning Regulation Varanasi; Master Plan, 2041; Development Plan, 2031	CDP Bhopal 2005; Draft SFCPoA for BMC under RAY; Bhopal Master Plan 2005; MP Bhumi Vikas Rules, 1984 MP Housing & Habitat Policy, 2007
UP- Uttar Pradesh; MP- Madhya Pradesh; SFCPoA- Slum Free City Plan of Action; RAY- Rajiv Awas Yojana; BMC- Bhopal Municipal Corporation; CDP- City Development Plan		

8. INDICATORS OF PERI-URBAN AREAS

While identifying peri-urban areas, it would perhaps be futile to demarcate a certain distance beyond the main city since the boundaries of cities keep changing geographically; what is a village today may be reclassified as a town tomorrow and then as a city. Therefore locations should be selected for study on

account of the presence of certain characteristics, rather than their distance from the nearest towns or cities. This is an indicative list and there can be many others indicators which require to be detailed and analysed.

Table 2: Indicators for identification of peri-urban areas

Urban population growth	Growth High urbanization level, urban sprawl and increase in urban agglomerations, population density
Social conditions	Literacy, Social exclusion, gender biasness, community level issues
Economic conditions	Per capita income, ability to pay for services, willingness to pay for services, workforce pattern, non-agricultural activities
Status of basic infrastructure level	Access to services, connection level, service delivery mechanism, concerning body
Government interventions and initiatives	Ongoing policies, jurisdiction areas

9. DELINEATION OF PERI-URBAN AREAS

A rapid proximity analysis, for both Varanasi and Bhopal revealed that the existing Municipal Corporation boundaries were at a radius of 10 km from city geographical center. Within next 10-15 km of radius from the center, the areas possess the characteristics of urban localities including population size, workforce pattern, presence of infrastructure, access to amenities etc. However they are not part of the official city administration boundaries and mostly remain without the services provided by the municipal corporations.

In case of Bhopal, the hilly terrain, existing slopes within the city and presence of water bodies restrict the growth of the city in western part of the tehsil, growing instead towards the southern and eastern parts. "Kolar" was the transition area near the Bhopal municipal boundary having characteristics of peri-urban area including presence of cheaper land, some amenities and transportation links. After the uncontrolled growth of the region, Kolar was notified as separate urban Municipality. However, Kolar is still mainly dependent on Bhopal for employment opportunities, education, and transportation. Apart from Kolar and Bhopal, the rest of the tehsil is notified as rural area.

In case of Varanasi, the river Ganga and the flood plains on the eastern part are restricting the growth in eastern part of the tehsil, instead growing towards the northern and western parts. This growth can be easily observed in the map within 10-15 km of radius from the city center. The regions are beyond the urban boundaries, yet display various characteristics with respect to workforce pattern, population sizes, land uses etc. Unlike Bhopal, in Varanasi, there are 34 census towns which are identified as urban areas. As per proposed "Varanasi Master Plan 2031" some peri-urban areas around Varanasi

municipal areas have been identified as "urban sub units" under development area.

From both the areas, there are urban and rural areas distinctly divided, with the rural areas being notified and categorized into "revenue villages". Peri-urban regions are not specifically identified. The new residential colonies, industries and educational campuses having urban characters are coming up in at the periphery of the villages, mostly having very little interaction with the village excepting availing people for domestic help, farming etc. creating a dichotomy in demography, services and economy.

The following process can adopted to delineate the peri-urban regions in 2nd tier cities like Bhopal and Varanasi: (i) Map the area between 10-20 km from the geographical centers of the cities. As the proximity analysis has shown, the city municipal boundaries tend to end at the 10 km radius; (ii) Map all the revenue villages and census towns in the area. In case of Bhopal, since there are no census towns identified in the 2011 Census data, some areas may be expected to be notified in 2021 Census; (iii) Analyze the economic and social conditions of the revenue villages and based on the measurement of the mentioned indicators, a range can be created for categorization between urban rural and peri urban areas. For example; if more than 75 percent of the male population is engaged in non-agricultural services then the area will be categorized as urban. If the values are in the range of 35 to 75 percent then the area is peri-urban. And if the value is less than 35 percent then the area is rural. This type of identification will provide realistic picture of city function and development planning will be far more realistic. This will resolve the issues of proper planning and effective issues for Peri-urban areas.

The Control area boundary/ development area boundary for Varanasi demarcated on the basis of Uttar Pradesh Development Act 1973 by taking 8 kilometer offset from municipal limit in 1991 which consist of 136 revenue villages. This resulted in the increase of urban agglomeration area in Varanasi.

There is an urgent need to build upon and complement previous and ongoing research initiatives that seek to understand the dynamism of the peri-urban interface, vis-a-vis the preparation of Master Plans and / or Development Plans; the institutional and governance framework; and service delivery regimes. This will help initiate a dialogue around these issues among various stakeholders in the management of services in such areas.

Some interesting initiatives in this field include efforts by the Chennai Metropolitan Area. *The Structure Plan, which is a policy document on Urban Development for Chennai Metropolitan Area identifies three distinct areas within the Chennai Metropolitan area namely (i) Rural areas (ii) Rural Fringe and (iii) Urban Fringe based on services and utilities.*

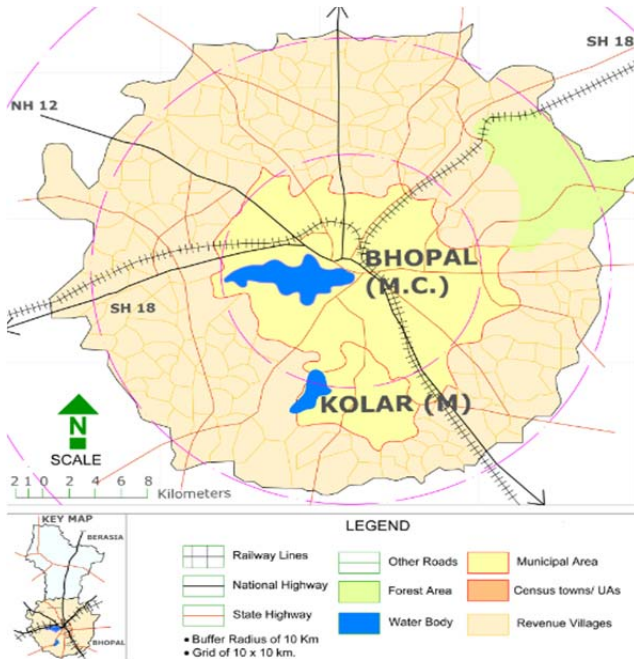


Fig. 2: Bhopal Tehsil

10. RECOMMENDATIONS AND POLICY PROPOSALS

To mitigate the issues discussed, and the consequent analyses conducted, a set of recommendations are proposed. These recommendations will be subsequent to the process of identification and delineation of the peri-urban areas, as elaborated earlier. Peri-urban regions have special needs and require distinct planning processes to regulate their development, sustainably and inclusively.

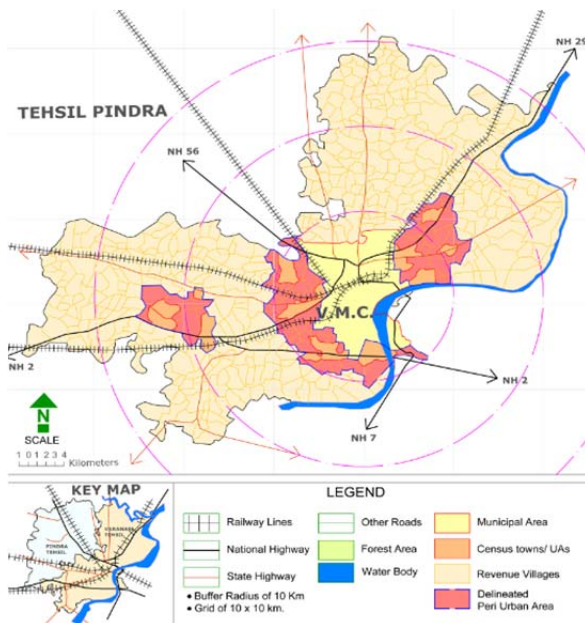


Fig. 3: Varanasi Tehsil

- **Physical Planning** – As detailed in this paper, identification and delineation of peri-urban areas is the first and most important step towards their development. Current Master Plans often tend to focus more on the main city rather than the fringe areas. Specific plans, policies and proposals should be formulated for the delineated areas to ensure a roadmap and vision for its planned development over a period of 20 to 25 years. Since these regions by definition are transitional zones, these plans need to be revised every 5 to 10 years. This regular temporal up-dation of plans will lead to city expansion in planned and regulated manner, which will solve many issues related to land grabbing and rate speculations.
- **Compliance to stipulated land uses** – through strict regulations with identification of Government agencies or departments that will be responsible for ensuring compliance. Although, the town and country planning department and the development authorities are at present responsible for these activities, penalty for non-compliance to the stipulations are hugely inadequate.
- **Transport Corridors** – Urban sprawl, in most cases is fueled by transport corridors, which is why it is vital to plan for them. Major industrial corridors like the DMRC and golden quadrilateral are instrumental to the development of the regions through which these corridors run. Specific guidelines should be formulated for sprawl along highways and land corridors for development of SEZs, IT parks, industries, institutions and residential colonies.
- **Surveys** – In India, one of the major bottlenecks to planning for development of peri-urban areas is the lack of exact data for these regions. Since these regions do not have proper delineation it results into uncategorized data for these area. Through proper demarcation of boundaries and classification the data collection will be done more effectively and in systematic manner. This will be helpful in projections and speculation as per policy and plans. Few Surveys and component for profiling these areas can be – (i) Legal status of the peri-urban areas in the state and the legislations that govern their management, including as reflected in relevant Acts (ii) Social and demographic profile (iii) Nature of overall economic, administrative and institutional linkages (iv) Existing policies, programs, norms and guidelines, etc.
- **Funding Pattern** – The present funding pattern and flow of money as per our administrative system does not recognize these areas and are mostly channelized through either or urban or local bodies resulting in neglecting the most important pre-requisite for growth i.e. funding & resource mobilization. A proper funding mechanism and clear channel for the flow of money for these areas will result into holistic approach of development.

- **Government interventions and policies** – many states in India are noticing the issues and the growth potential of these peri urban areas, and are incorporating those in policies and under jurisdictions.
For example - World Bank has proposed a project named as “*Scoping study on Challenges of Delivering Water Supply and Sanitation Services in Peri-Urban Areas of Maharashtra*”; these initiatives can be replicated in other states too depending upon the requirement.
- **Encouragement to Green field development** – recently Government of India has initiated many mission, schemes and policies for urban and rural development such as AMRUT, SMART City, HRIDAY etc. these missions emphasis more on the retrofitting and brown field development. At this state of alarming urbanization; the equal focus should be paid on green field development. Peri urban areas are the best suited cases for green field development concept, as these will be the cities of future.
- **Land valuation and Records** – The revenue departments should have specific mechanism to maintain a record of land valuation for these areas which will ensure easy access and availability of the information for the public.

Peri-urban regions are vital to the holistic development of India. The recommendations offer a concrete roadmap to strategize their development and in turn regulate the growth of a city.

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