



## Analysis of Peri-Urban Areas Under Durg-Bhilai Development Plan Using Satellite Image: Need of Policy & Challenges to Governance: A Review

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### Abstract

Continuous growth of built-up areas results in uncontrolled momentum of urbanization at peri urban areas which results in increment in change in land use / land cover of urban landscapes. This results in creating issues such as loss of agricultural land, unauthorized urban sprawl, high land values etc. which might have both negative and positive impacts. This study focuses the development of Rural-Urban Fringe at various villages of Proposed Development Plan 2031 of Durg district. The objective of the study is to find the possible reasons of development by considering land value factor, land diversion of agriculture lands for spatial distribution in informal manner and development impact at the different neighbor revenues. Secondary analysis- Monitoring urban growth followed by land use change detection at spotted places of city using GIS with help of BHUWAN portal. Primary analysis- Finding reasons of development of various spotted/selected places on villages by public questionnaires/participations. To study development hierarchy at such village this includes analysis of illegal plotting. In most of the previous scheme/policy of government have made attempts to incorporate policy such as land pooling, land acquisition etc. for the full control of land at several million plus cities.

**Key words:** *Peri-Urban development, GIS, Land use / land cover, Urban sprawl.*

### 1. Introduction

Peri-urban area is the region in between urban settlement areas and their nearby rural hinter land. Within an urban agglomeration, towns and villages form a larger Peri urban area. For some area, change of often fast changing with complex pattern of development with change in land use and landscapes in a patchy form between local or regional boundaries are witnessed. There are numerous reasons of development based on different characteristics. Few are listed below:

a. Living costs in cities are very high, so the people who wish to migrate to cities for engaging in economic activity are unable to do. So, the better reasonable option for them is to reside in

such rural areas that are located just outside city limits, or in the fringe within city limits.

b. The peri-urban area is the space around urban areas, which merges into the rural landscape is growing rapidly, is due to the reason that land cost and land taxes is quite low as compare to city and there is lack of strict administration for monitoring of building byelaws.

c. The real estate service providers/developers who provides plots at cheaper cost at such village which near to cities or outside periphery boundary of development plans which results in occurrence of illegal plotting.

There are several influences of such rapid expansion. In many cases, the result is urban sprawl, which increases problems such as urban decline, wasted land, social segregation and dependency on oil for transport. In addition, the chance of increase in pollution of air and water, traffic fatalities, increase harmful effects on human health, loss of agricultural capacity, increased car dependency and loss of natural habitats, wildlife and less open

space is the listed consequence of urban sprawl. However, these could do better with alternatives approaches, opportunities for sustainable green infrastructure, enhanced quality of life, better connectivity between town and countryside with sustainable rural and urban development. There are several issues on peri urban areas which seriously affects different aspects. Few are listed below in Table 1.

**Table 1 Issues in various aspects**

<p><b>PHYSICAL</b></p> <ul style="list-style-type: none"> <li>• Haphazard Development</li> <li>• Development variations</li> <li>• Loss in open spaces</li> <li>• Development occurs on sensitive areas like flood plains, wetlands</li> <li>• Land use conversion to non-agricultural uses.</li> <li>• Poor accessibility, Absence of a rationalized traffic &amp; transportation network.</li> <li>• Irrational / non- conforming land use pattern.</li> </ul>	<p><b>ENVIRONMENT</b></p> <ul style="list-style-type: none"> <li>• Lack of environment sensitive planning of the areas</li> <li>• Fall in ground water table</li> <li>• Urban flooding due to development on wetlands</li> <li>• Increase in the environmental pollution due to increasing industrial development in these areas</li> <li>• Lack of waste management leading to adverse impacts of health of people and the ecosystems.</li> </ul>
<p><b>GOVERNANCE</b></p> <ul style="list-style-type: none"> <li>• Policy formulation specific to the extent and direction of sprawl of the city are not there in cities.</li> <li>• Proper Planning framework and institutional approach is also needed for these areas.</li> <li>• There is a gap between plans and their implementation.</li> <li>• Multiplicity of the authorities and the boundaries with no clear responsibilities.</li> </ul>	<p><b>INFRASTRUTURE</b></p> <ul style="list-style-type: none"> <li>• Inadequate Provision of Infrastructure</li> <li>• Variation in pricing of the resources</li> <li>• Competition with the urban areas for the same resource</li> <li>• Lack solid waste management</li> <li>• Open drains or no drains at all.</li> </ul>

## 1.2 Literature Review

The term ‘Peri-Urban’ has originated from the word ‘peripheral’ [1-2]. The literature

analysis gives identification of peri-urban growth in small and medium towns using GIS and remote sensing technique within a

buffer zone 2.5 km. from the city is a method to analysis of growth of small town. The increment in built-up area around 30% over the period of 28 years span is shown in result. The spatial metrics with the gradient approach showing that beyond the buffer of 7 km from the city centre [3]. Another method of literature provides is to monitor spatio-temporal dynamics of urban and peri-urban landscape of Nagpur city using Object Based Image Analysis (OBIA) technique. The analysis of urban sprawl shows that eastern, southern and southwestern part of Nagpur city witnessed significant growth of urban sprawl [4]. Another method used in GIS is Entropy Method of buffer analysis shows that the urban development in Jabalpur city is haphazard and results in development in an unplanned manner. The extension of Central Business District (CBD) playing serious role to extent the boundary of city [5]. The Peri urban areas in India experience most of unplanned development and needs most urgent attention so as to understand the complexity of urbanization and urban transformation. Policy-makers require to give such areas more civic autonomy and provide basic environmental service [6-7]. Also, Master plans are not been considered in these census towns as it is beyond the limit of planning area. Urban agglomeration plan for the city must include the nearby potential growth areas and their future growth [8]. Provision of Urban Amenities in Rural Areas (PURA) concept was not implemented or tested broadly in the country even though it is a significant conception for rural planning and a superior idea regarding rural-urban interactions. Urban planning requires some redirection towards small and medium towns. Governmental efforts should be given in these towns about amenities

development and investment [9]. The policy practice and planning goes hand in hand so that quality of life in these areas as well as problems of urban infrastructure in future cities can be resolved. [10,11].

This current study with analysis aims to build understanding of the issues and challenges facing peri urban areas in Durg-Bhilai city of Chhattisgarh state of India, and give suggestions for overcoming these. The reviews of existing literature are used to assess the following:

- a. Physical changes and problems occurring in peri urban areas of Durg-Bhilai city and;
- b. Approach of the national, state and local government agencies towards planning and management of peri-urban areas.

Present study focuses the occurrence of development at the different region/village outside the municipal boundary of Durg Municipal Corporation, Bhilai Municipal Corporation & Risali Municipal Corporation. The study is focused to find the possible reasons of development by considering parameters such as land value factor, infrastructure development, and land diversion of agriculture lands for spatial distribution in informal manner.

## 2. Methodology

### Secondary analysis

- a. Monitoring urban growth followed by land use change detection at spotted places near city using GIS with help of **BHUWAN** portal.
- b. The study reviews the proposals of Development plan of District and understanding the reason of

proposal on aspects of infrastructure such as road network, facilities etc.

- c. Effect of '*Bharatmala*' project on development southern part of district.

### Primary analysis

Finding reasons of development of various spotted/selected places on suburban villages by public questionnaires/participations. To study the pattern of development hierarchy at such areas which includes analysis of illegal development.

## 3. Results and discussion

### 3.1 Research Area Selection- About the city

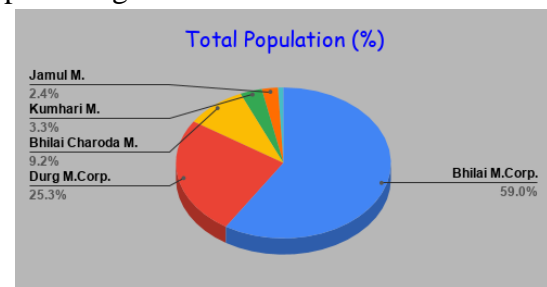
Durg district is situated on the east bank of Shivrath river. It occupies central position in the map of Chhattisgarh State. It is adjoined to Raipur district which is the State headquarters. It lies between 20°54' and 21°32' north latitude & 81°10' and 81°36' east longitude. Height of the district from sea level is 317 meters. Geographical area of the district is 2238.36 sq.kms. as reported by the Surveyor General of India. Bhilai is also known as "Mini India" for industrial development is the twin city of Durg [12,13]. Establishment of Bhilai steel plant in Durg district had created enormous opportunities for industrial progress from one side and from another side Durg district had become centre of many other productive activities. Durg district is situated on the very important and busy route of Indian Railway Network. Durg is a Junction situated on the South-Eastern-Central Railways, on the Howrah-Mumbai route. This route is

considered as one of the important and busiest routes of Indian Railways. Mumbai-Howrah main rail-line passes through the district in which Durg and Bhilai Nagar are main railway stations.

**Selection of study area:** The urban extension of Durg district is very extensive consisting of seven urban bodies namely:

- i. Durg Nagar Palik Nigam
- ii. Bhilai Nagar Palik Nigam
- iii. Risali Nagar Palik Nigam
- iv. Bhilai Charoda Nagar Nigam
- v. Kumhari Nagar Palika Parishad
- vi. Jamul Nagar Palika Parishad
- vii. Utai Nagar Panchayat

Amongst the above urban bodies, extent of Bhilai Municipal Corporation has the highest urban population according to Census 2011 [14]. Figure 1 shows the total population of all the above urban bodies in percentage.



**Fig. 1 Population of various urban bodies in percentage**

Figure 2 shows the category of workers of all the urban bodies on total population. About 96.49% of the total working populations are main workers in the area of Municipal Corporation Bhilai. This is mainly due to development of various small-scale industries in support of Bhilai Steel Plant at the various region of Bhilai such as Engineering Parks at Hathkhoj,

Cement Plant in Jamul, Industrial area at Borai etc.

For the study purpose, the periphery development/developing area from the outside boundary of various municipal boundary is considered for study purpose. (Refer Figure 3) These are based on:

- a. Population density of village situated near to municipal boundary

of city which includes the physical survey for differentiating pattern and classification of such development.

- b. Reviewing uncontrolled / illegal development or diversion of land for plotting using satellite images and physical survey.

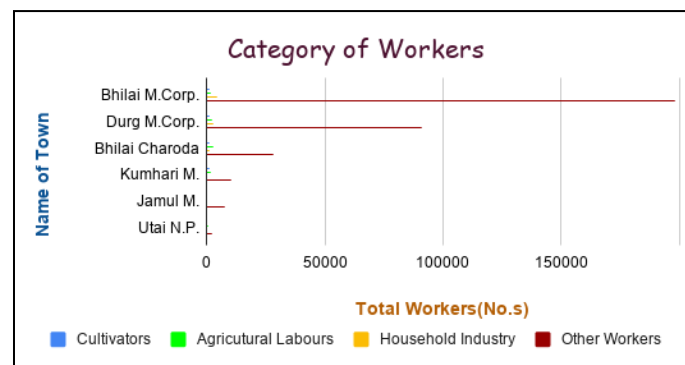


Fig. 2 Population of various urban bodies in percentage

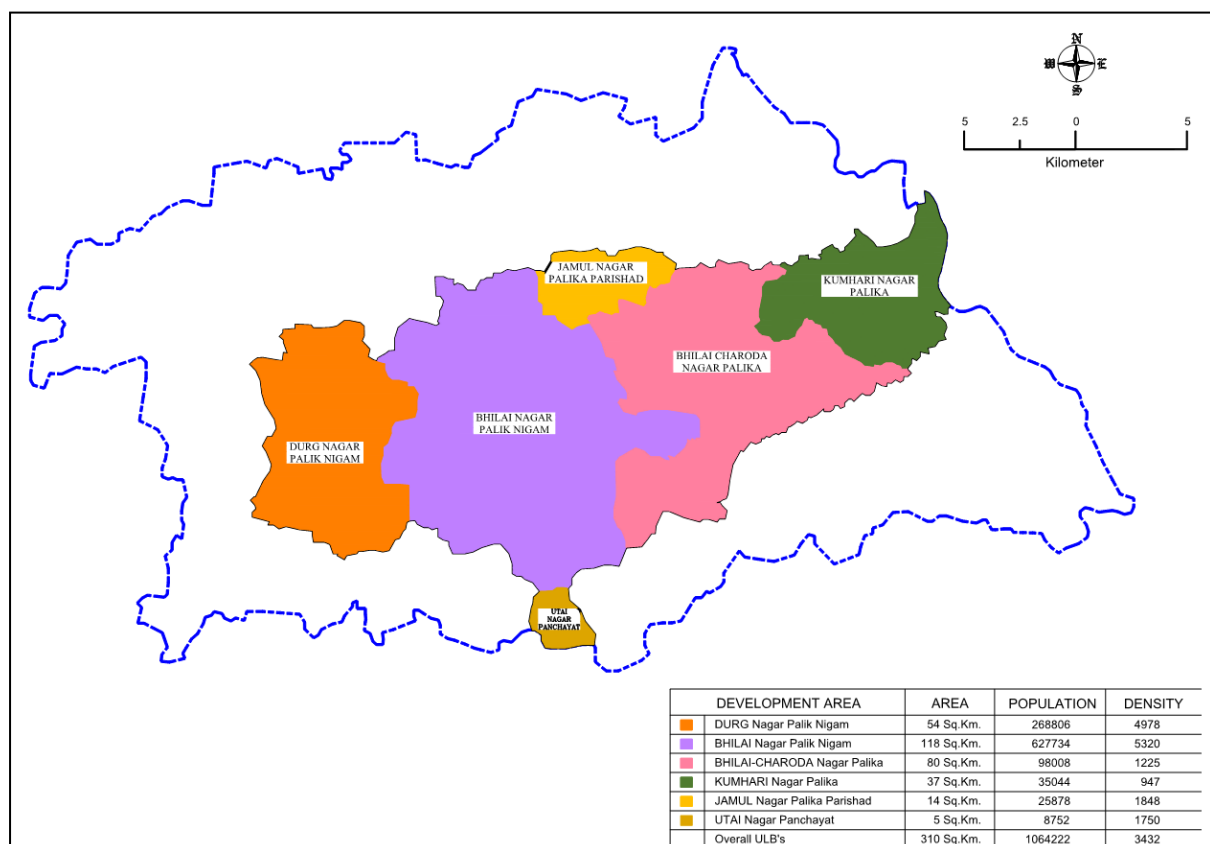


Fig. 3 Map showing various urban bodies within the development boundary.

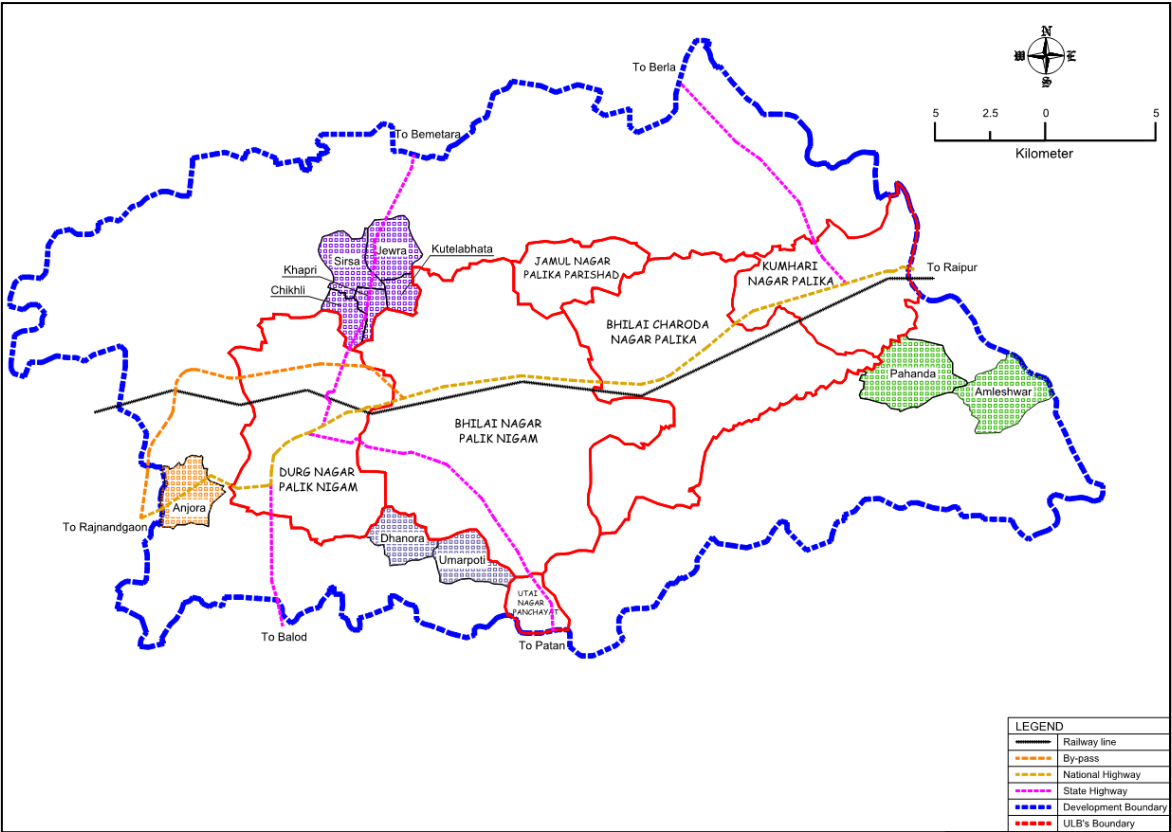


Fig. 4 Map showing various transportation networks

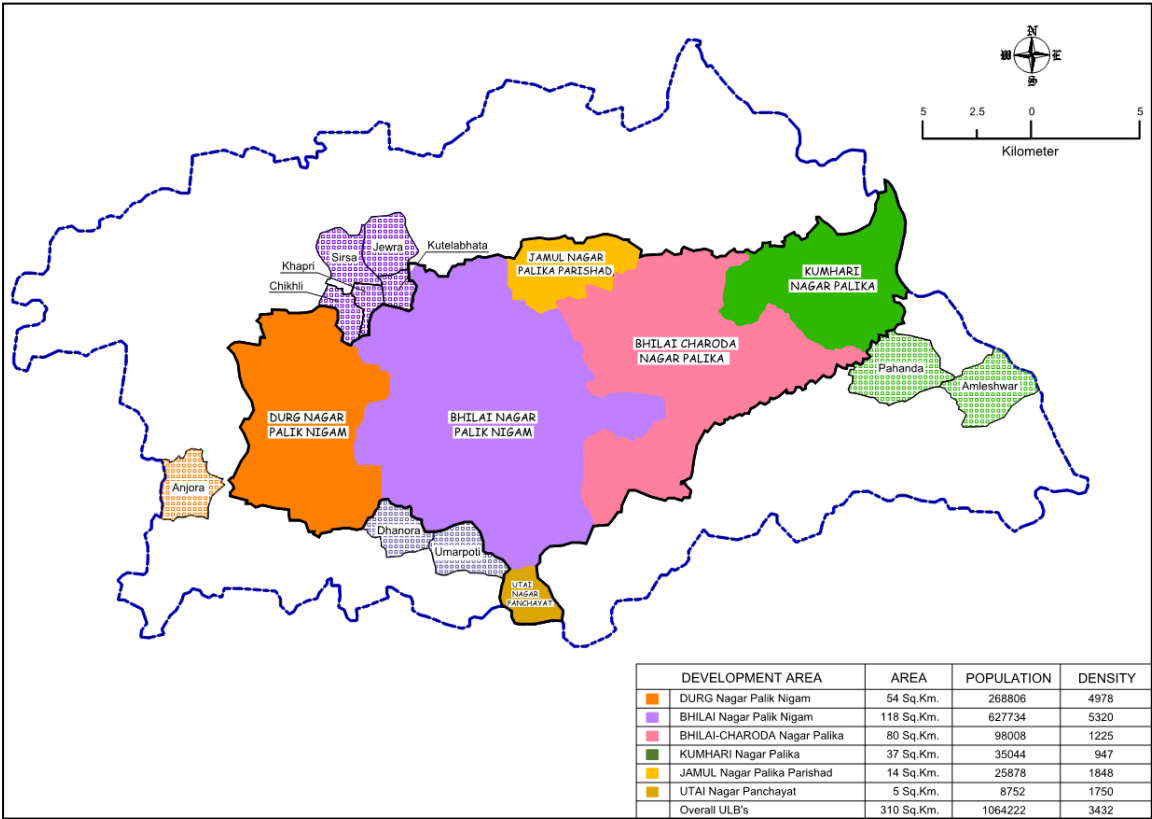


Fig. 5 Map showing various peri urban development within urban bodies.

## Conclusion

In most of the previous scheme/policy of government have attempted to incorporate policy such as land pooling, land acquisition etc. for the full control of land at several million plus cities. As the urban extension of Durg district is very extensive, so the planning and controlling of land by the Planning Committee is a serious challenge. All of seven urban bodies have their own planning/municipal boundaries/limits. There is no control on such development which is occurring beyond their planning limits i.e. Urban village, Gram panchayat etc. which helps in creating peri urban areas. There are many villages within the development boundary where rapid development is occurring in an indiscriminate manner. The Nagar Panchayat/Gram Panchayat is lacking to monitor such ongoing developments on their areas. This creates problem in planning and controlling of land by planning committee. All urban bodies have their own planning boundaries but the developments occurring beyond their planning limits i.e. on Urban village, Gram panchayat etc. is uncontrolled due to various reasons such as lack of planners, old practice of monitoring etc. Villages such as Anjora, Dhanora, Umarpoti, Amleshwar etc. are amongst the most affected cases which is under rapid illegal development.

## Opportunities-

- a. Controlling peri urban development before it becomes urban sprawl in a wide manner.
- b. Urban development can be controlled using GIS monitoring system likewise Pradhan Mantri Awas Yojna (PMAY) scheme on

Nagar Panchayat / Gram Panchayat.

This can monitor various residential and commercial projects by verifying under construction projects from their permissible area.

- c. Land records modernization - Integrated Rural and Urban Records, Municipal Record upgradation, Property ownership card could also be a better approach.

## Conflict of interest

The author declares no conflict of interest.

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