



Impact of Urban Sprawl on Provision of Public Services: Ludhiana

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Abstract: Every year millions of people are attracted towards cities which act as the major economy generating forces. Cities are spatially expanding with this increase in migration. This progress towards the urban areas lead to urban sprawl, where new infrastructure is urbanized around these boundaries and changing the farmland. In today's scenario people want better and safe environment, proper and adequate comfortable spaces which is available in the new suburban area far away from the city. These new suburban areas require new set of major utilities and facilities such as transportation network, medical facilities, educational facilities, commercials and other infrastructure facilities. Hence, there is a dire need to study, understand and quantify the urban sprawl with various parameters.

This research is based on the relation between the increasing urban sprawl and provision of public services in Ludhiana city. Initially the urban sprawl of the city is quantified by various methods and using satellite images of different years. After it the urban growth, growth direction and patterns are also identified across the city and boundaries with the help of Google earth historical images and mapping is done.

Further in these areas public services are being analysed based on various parameters. Also change in land use and land cover trends are also analysed and its impact on the growth pattern and various other public services are studied and issues are identified.

Various surveys has been conducted from Stakeholders such residents, government officials and bureaucrats from various areas to understand the growth reasons and about the existing city region structure. Some other primary, secondary data and maps has been collected to analyses the factors based on it.

Different factors are being categorized such as socio-economic, proximity, geographic etc. Based on all these analysis, variables and factors of urban sprawl and public services various conclusions and results are further carried out and research possibilities are discussed explaining the research gaps from the analysis.

Keywords: *Urban Sprawl, Public services, Infrastructure, Transportation, Growth pattern, Ludhiana, Suburban, Land cover and Land use.*

Abbreviations: MC, Municipal Corporation,

I.INTRODUCTION

In India urban sprawl act as one of the majorly increasing feature of the built environment. Urban sprawl has an adverse effects on public services and the environment, various policy frameworks that are designed for sprawl act as controversial thing somewhere, which face challenges and difficulties in implementation.

Urban sprawl basically expansion and outgrowth of areas outside the city's core, covering many villages around it. This leads to many economic, institutional and social challenges. Services like water supply, sanitation, solid waste management, electricity supply, roads and transportation facilities and other basic infrastructure are generally absent here in these areas. The ecosystem of the region is also threatened by change of Land use from agricultural land to residential, commercial or industrial etc. Due to this transformation people living in peri-urban areas are facing many problems and dangerous situation.

These conditions of rapid population growth in cities hampers the provision of public services and lowers the quality of urban life. The sprawl results in the engulfing of villages into peri-urban areas, peri-urban areas to towns and towns into cities. In this situation to provide basic infrastructure, regional planning is required to understand the sprawl dynamics. Nevertheless, mostly there is probability of uncontrolled growth in the cities. So due to lack of prior planning, non-coordinated decision-making and visualization of the outgrowths, there are lack of basic amenities like water supply, electricity supply, sanitation, solid waste management, transportation etc. and also results in inefficient and drastic change in land use and land cover affecting the provision of public services in the region.

Good urban quality of life requires availability and quality of basic public services. Since rapid population growth and other constraints can be seen in many cities which results in failure of urban governments to meet up with increasing demand for these services. Therefore it is important to provide provision of those services fulfil local demand.

Various public services such as Transportation, Education, Healthcare, Recreational services, Water supply, Drainage, Sanitation, Solid waste management, electricity, Housing etc and other infrastructure needs to be provided and upgraded time to time by addressing the various issues and need.

II. STUDY AREA

Ludhiana is located on National Highway 100 km north west of Chandigarh, the capital of Punjab and Haryana, 310 Kms from New Delhi and 150 km from Amritsar, has emerge as the most vibrant and important business center of Punjab. Positioned at 30 56' N and 75 52' E, Ludhiana is located about 10 km south of the Sutlej, one of the five major rivers of pre-independent Punjab. Ludhiana city is spread over an area of 159.37 Sq. km with 16.24 lacks population (census 2011) while Ludhiana district is spread over an area of 3767 Sq. km with 34.99 lacks population (census 2011). Population projection of Ludhiana city in 2031 is expected to be 30.69 lacks (Geometric progression) & 31 lacks (Graphical method) (city development plan). Ludhiana has highest population density in state with 10,127 persons per Sq. km.

III. URBAN SPRAWL

Spread of urban developments and built up area around Ludhiana city is analyzed from the year 2000 to year 2020 using spatial data analysis. Land Sat-7 satellite image is used to collect the data of year 2000 and sentinel 2 B satellite image is used to collect data of year 2020. Hybrid image classification has been carried out for reduction of changes and change matrix of year 2000-2020 is calculated with 5 km buffer zone from Ludhiana Municipal Corporation boundary.

Huge expansion can be seen in the urban sprawl through built up pattern in 20 years. City is generally expanding on all the sides outside MC limits but mostly expanding towards south, south east and south west direction. Tree cover and agricultural land is being converted into built up area. Non-uniformly increasing urban sprawl is putting more pressure on infrastructure, utilities and services. Since people from neighbouring towns are also dependent on Ludhiana city this leads to one of the major factor for increasing urban sprawl.

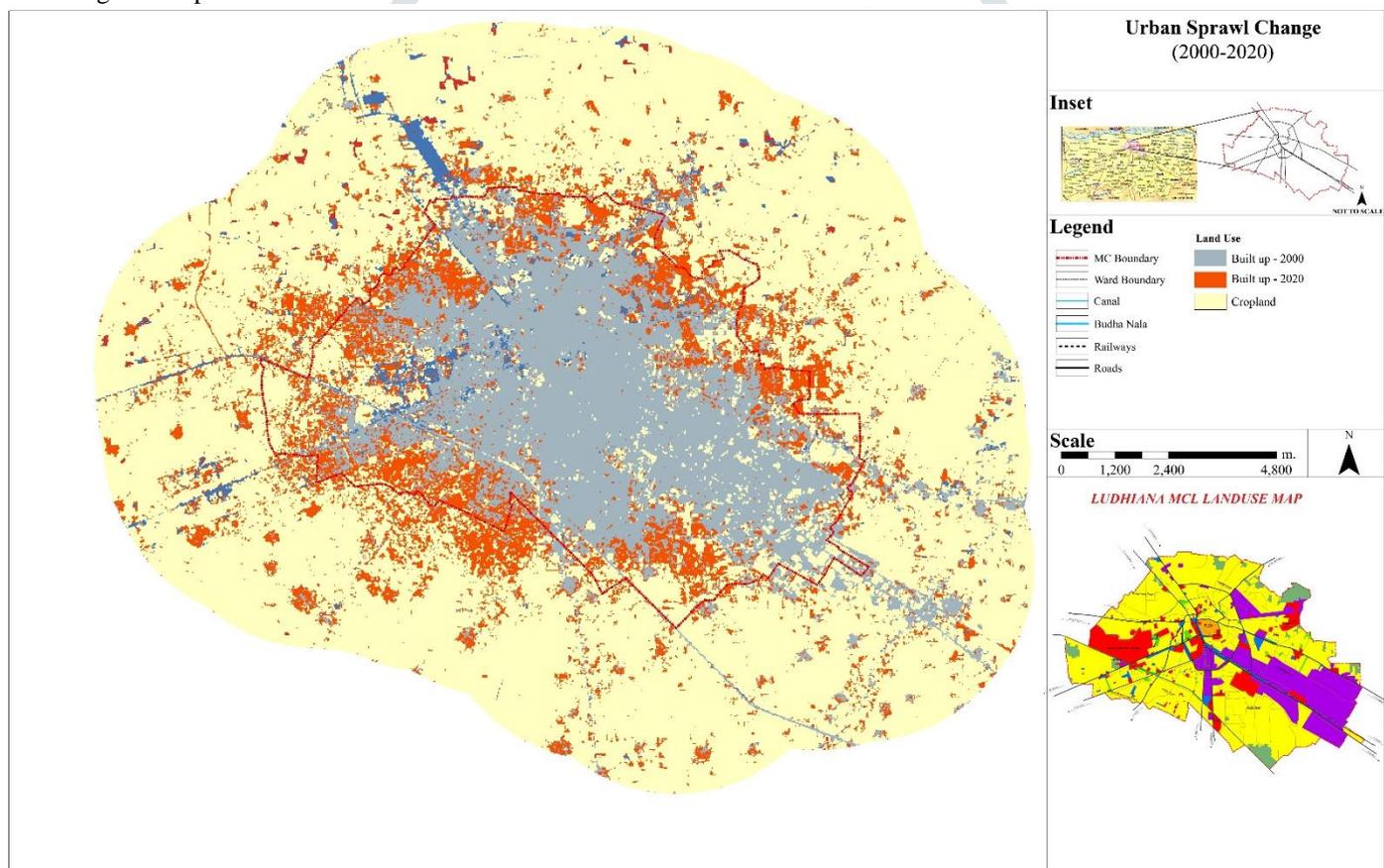


Figure 1 urban sprawl change 2000-2020: Ludhiana

On comparison with the land use map various Residential areas seems to be expanding towards south direction and Urban Rural fringe boundary seems to be broken at various points in buffer zone outside MC limits. With growth of industrial area is the growth of non-uniform housing/slum sector. Due to increase in built up area and urban sprawl various utilities and services issues can be seen in daily life scenarios. Non uniform and unplanned development leads to major issues of the city. Unplanned development lead to change in land use further causing more problems in the society.

IV. PUBLIC SERVICES & INFRASTRUCTURE

Since Ludhiana is one of the biggest city in Punjab both in terms of population and area and hence require adequate amount of public services and infrastructure facilities as per the existing pressure. Yet Ludhiana is expanding and experiencing huge increase in its urban sprawl but there is lack of proper public services inside the city itself in some areas.

Spatial analysis of these services such as healthcare facilities, educational facilities, recreational facilities, parks and open spaces, transportation facilities and other social and Physical infrastructure is done to analyze the load of these services in city and increasing urban sprawl outside MC limits with respect to land use and land cover of the area.

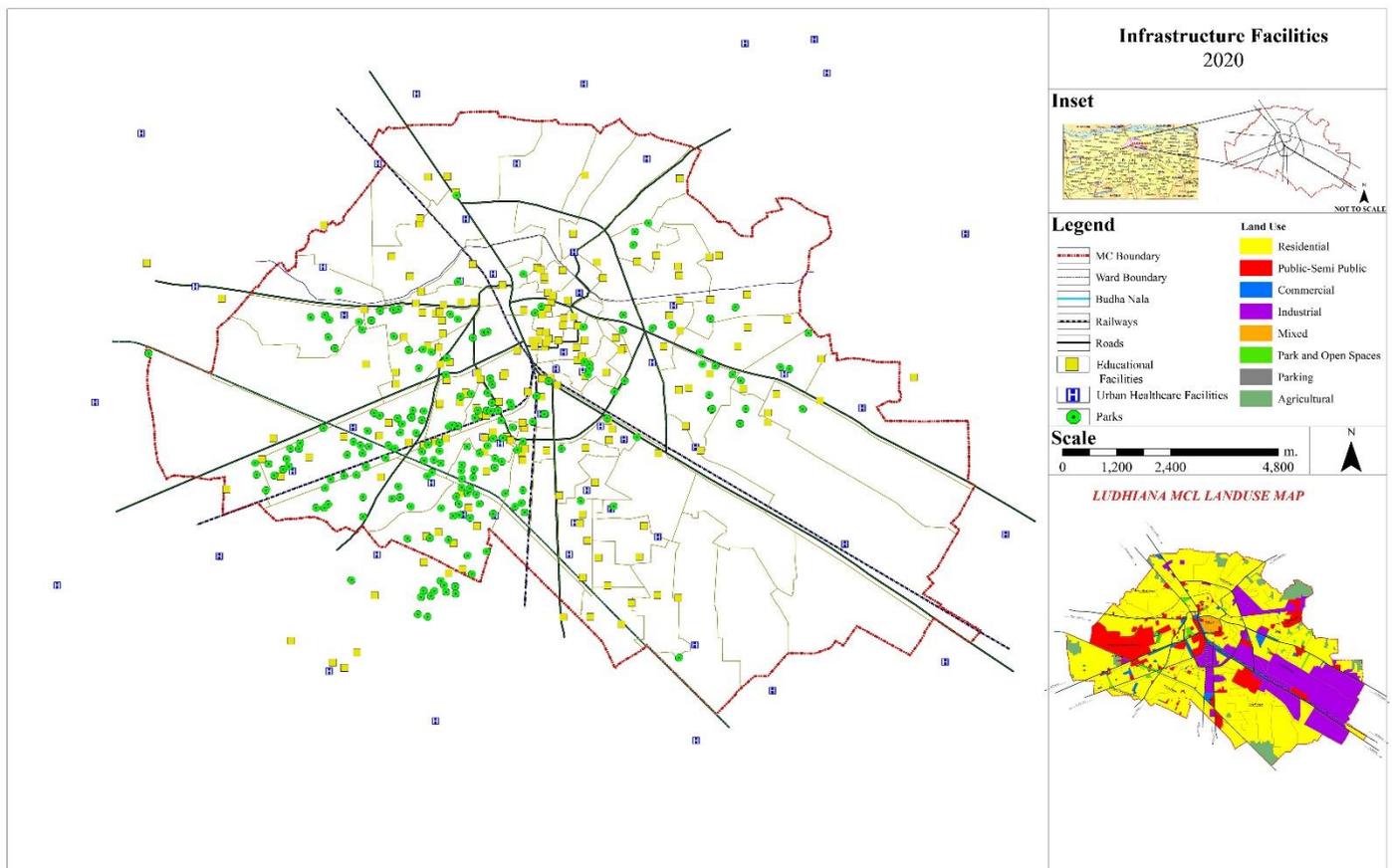


Figure 2 infrastructure facilities: Ludhiana

V.RESULTS, DISCUSSIONS & PROPOSALS

Ludhiana growth pattern can be seen expanding from all sides outside MC limits and is also getting more linked with neighbouring towns/cities and can be seen in regional context also. Various concepts and policies needs to be followed such as Decentralization, urban extensions, hierarchy of urban development and redevelopment of existing urban areas. New urban centres along peri-urban boundary to be made with specific area and population projection as satellite centres to the one main nuclei urban area i.e. Ludhiana city. These new planned urban centres will be formed to boost the satellite town, will help to generate new economic proflitment opportunities, New transportation networks and nodes will be formed which will help to cater the urban sprawl and public services in the range from Ludhiana city to satellite towns in regional context in the whole district helping the Ludhiana city and district both for better growth and solving existing issues.

VI.CONCLUSION

After doing various analysis it is observed that there is huge expansion in the urban sprawl of the city and various services are also affected by this as due to non-uniform distribution of growth pattern and without following the land use characteristics of the place. This will further lead to more problems just like the existing situation of Ludhiana city in some areas where there are lack of public services and infrastructure which is caused due to lack of planning and not following the proper land use plans and policies.

Because of these existing problems in Ludhiana city people are moving towards the suburban area to get better quality of life and new residential and industrial areas are being formed. Yet some of the areas are well planned and have proper infrastructure and public services but some of them are not planned accordingly which will again be a challenge in the upcoming years.

Various internal and external factors are also being analyzed in this research which cause these problems and further become major issues in the city. All these factors are interlinked and dependent on each other which needs to be resolved by given proposals and other ways in the coming time to avoid further impact of urban sprawl on public services.

VII.FUTURE SCOPE

This research will help architects and urban planners to understand the connection between urban sprawl & public services and other factors for the major issues in the urban areas. Many urban areas in India are facing similar problems which can be understood studying from these kind of examples.

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