

**Dynamics of Peri-Urban Area: Prospects and Challenges
of Sustainable Development-A case study of Lucknow**



March 2020



**Town and Country Planning Organization
Government of India
Ministry of Housing and Urban Affairs**

PREFACE

The cities are expanding in size and structure. These are becoming increasingly complex, heterogeneous and irregular in shape, due to rapid urbanization and economic development. The development spreads over the peri-urban areas resulting in degradation of natural and rural land over time. The process will continue further and will adversely impact the quality of life of both urban and peri-urban dwellers, if remained unchecked through proper planning measures. Although urban sprawl in a developing country like India cannot be stopped, however; a remedy to this problem lies in a strict zoning regulations based on land suitability and carrying capacity, which shall allow land use to be channelled towards more sustainable uses.

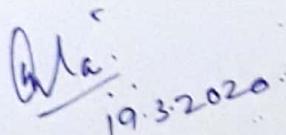
The current Research Project "Dynamics of Peri-Urban Areas :Prospects and Challenges of Sustainable Development - A case study of Lucknow" was undertaken by the Regional Planning Division of Town and Country Planning Organisation (TCPO) in consultation with former Chief Planner and Additional Chief Planner, TCPO. The Objective of the study is to understand the patterns of recent urban expansion and process of land use transformation in urban core and peri-urban areas of Lucknow and to devise suitable strategies for sustainable development of peri-urban areas. This report provides ground situation in the peri-urban areas, data analysis of the existing demographic, socio-economic and urban infrastructure, present peri-urban issues and challenges and the recommendations on measures to tackle the same.

I express my deep gratitude to Town and Country Planning Department, Housing and Urban Planning Department, Directorate of Urban Local Bodies of Uttar Pradesh, Lucknow Development Authority , Lucknow Industrial Development Authority , Lucknow District Administration, Lucknow Municipal Corporation, for providing the necessary data, reports and interacting extensively with the TCPO Team .

I thank Shri K.K.Joadder, former Chief Planner, Shri S. Surendra, Additional Chief Planner for their valuable suggestions in selecting the research study. The report has been completed under the overall supervision and guidance of Town and Country Planner and Divisional Head of RP Division, who was ably assisted by Research Study Team. I, therefore extend a word of appreciation to my Research Study Team, namely Smt. Abha Agarwal, Associate Town and Country Planner; Shri Gajanan Mali, Research Assistant; Smt. Saroj Bala, Planning Assistant for data analysis, draft report design and cover page of the report. Thanks are also due to Sh.Dinesh Chahal and Sh. Om Prakash, Planning Assistants, who were the part of study team for data collection. Sh Neeraj Tiwari, Stenographer, Sh Shashi Ranjan Sinha, Junior Executive Assistant and Sh Uday Vir, MTS extended secretarial assistance.

I hope that this document will be useful for policy makers, administrators, urban managers, researchers and academicians which they may use this document as a ready reference while dealing with pertinent issues of peri-urban areas and its challenges.

New Delhi
March 2020


19.3.2020
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**Dynamics of Peri-Urban Areas: Prospects and Sustainable
Development- A case study of Lucknow**

Research Study Team

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1.1 Introduction

Urbanisation and economic development have caused rapid city expansion in size and structure. The urban structure is becoming increasingly complex, heterogeneous and irregular in shape. The development spreads over to the peri-urban areas resulting in degradation of natural and rural land over time. This process will continue further, if remain unchecked through proper planning measures. This will adversely impact the quality of life of both urban and peri-urban dwellers. Although the urban sprawl in a developing city cannot be stopped, however; a remedy to this issue can be devised through strict zoning regulations based on land suitability and carrying capacity, which allows land use to be channelled towards more sustainable uses. In this context, research study entitled Dynamics of Peri-Urban Areas: Prospects and Challenges of Sustainable Development - A case study of Peri-Urban area of Lucknow is undertaken and peri-urban areas are illustrated at Map 1.

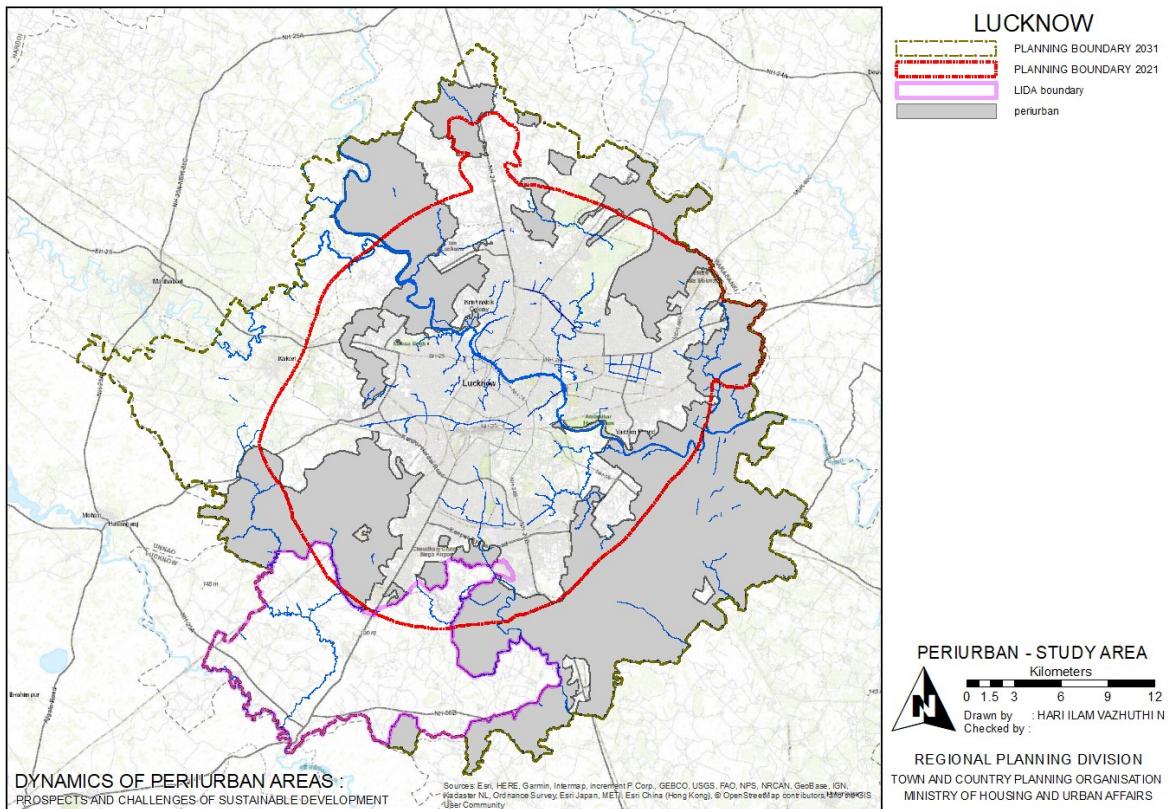


Lucknow has been divided into two parts based on growing urbanisation i.e. old Lucknow and New Lucknow. The peri-urban area denote to a grey area which is neither entirely urban nor purely rural in the traditional sense. Sometimes, Peri-urban area is

Photo 1: A bird's eye view of Central area of Lucknow

described as physically defined transitional area bordering a city, characterised with mix of both rural and urban form and functions. Peri-urban areas are ‘those areas surrounding the cities within a daily commuting reach of the city core. In some parts of Asia, these regions can stretch for up to thirty kilometres away from city core’. The peri-urban is a distinct phenomenon within the larger process of urbanisation. Thus, Peri-urbanisation refers to the process of urban transformation in the urban fringe areas,

which is becoming a significant spatial phenomenon in the current globalised society. This process can be initiated by the expansion of uneven settlements, new towns, industrial estates and other forms of large scale urban development activities in the periphery of large cities. 'Proximity to the city' is not the only criteria to define peri-urban area but rural-urban continuum, uncontrolled urbanization, prevailing socio-cultural and political environment, etc. have direct impact on the formation of such areas.



Map1: Peri-urban Study Area

Development of peri-urban areas may be in the form of urban sprawl, contiguous corridor, cluster development, conurbation, ribbon development, etc. These areas act as transitional zone between the city and its hinterland and the country side. The Peri-urban regions are characterised by intensive flow of natural resources, goods and in and out migration. They also serve as the interface between urban, rural and natural areas with relatively rapid and dynamic growth, mixed land use in its physical and socio-economic attributes. The peri-urban is characterised by high, and often increasing, population

density, rich countryside homes, poor slums, diverse sources of income, pollution, environmental problems, increased resources exploitation, considerable economic dynamism and a severe lack of service provision. Notwithstanding these insights, understanding the peri-urban as a heterogeneous conglomeration of rural-urban features has resulted in an underlying assumption in the literature that the peri-urban is ‘place-based’. It is often described as ‘midway between urban centres and rural spaces’ and as ‘lying between cities and countries’. Halkatti et.al similarly argue that, in India, ‘the constantly expanding periphery around a city constitutes the peri-urban interface’ (2003:149). The impact of economic growth and physical expansion of the urban area are not confined to urban boundaries but they reach into much wider areas surrounding urban centres creating “urban areas” “urban fringe areas” or “peri-urban areas”. The peri-urban area retains the characteristics of the rural area subject to major modifications and changes which take place with respect to physical configuration, economic activities and social relationships.

Due to growing peri-urban area, land is taken over by urban development agency. Competition for land amongst real estate developers and nonurban users, mainly farmers and other agricultural users have increased tremendously in the last decade. For the city to grow spatially, public and private developers bid away additional land from agricultural users in the peri-urban areas. Increased demand for housing and commercial space means that land is worth more in urban use than in agriculture, thus reflecting greater economic benefits in its developed state. According to Brueckner (2000), land conversion in such situations is guided by the economist’s invisible hand, which directs resources to their highest and best use. In this process productive agricultural land is often converted into urban land use. As the value of agriculture output is fully reflected in the amount that agricultural users are willing to pay for the land, a successful bid by public and private developers means that society values the houses and other structures built on the land more than the agriculture output.

As the city’s population grows, it must expand spatially to accommodate more people. In addition, people’s rising incomes and quality of life concerns affect urban growth because residents demand better housing conditions and more living space as

they become richer over time. The greater demand for space forces the city to expand spatially with increase in population. The aspirations of dwellers further leads to buy additional lands for their housing needs in a location where land price is cheap, mainly in the peri-urban areas. Therefore, the spatial expansion due to rising incomes and quality of life concerns, among the residents is strengthened by a price incentive favouring urbanization along the city's periphery. Generally, peri-urban areas are not statutorily declared areas except in certain cases like Chandigarh where they are defined as a belt of 16 Km around the city. The problem of peri-urban areas are due to general changes in land uses to meet urban requirements as well as local needs. Similarly, activities in such areas have a strong interface with the city and complement its needs. These areas may be divided in two parts:

- i) Urban Fringe: Area which is adjacent and touching the municipal boundary having direct impact of urbanization and experiencing rapid pace of transformation.
- ii) Area beyond Urban Fringe: In these areas, setting up of new townships to maximize profit out of periphery by converting the land from agriculture to non-agricultural use is the main concern.

The peri-urban areas can be described as fringe areas of cities or adjoining rural areas, which are intrinsically linked with the city economy, experience constant transformation, and are characterized by a mix of rural and urban activities. The areas could be imagined as intermediary zones overlapping rural and urban jurisdictions and are inhabited by the native population, who are normally engaged in agro-based activities, livestock rearing, and fishing as well as by a migrant population who pursue non-farm interests. These areas are centre of inter-mixing of rural and urban cultures and focal point of socio-cultural, political, religious and environmental turmoil.

Peri-urban areas are characterized by both authorized and unauthorized developments including informal settlements having inadequate provision of services and infrastructure which affects quality of life. There are major conflicts pertaining to the change of land use from agriculture to non-agriculture (urban development). The competition between the real estate developers and farmers is increasing, while the

urban development agency is acquiring the land for the development in the peri-urban area. The land conversion defines in this situation as the productive agricultural land is converted to urban land use and the natural environment is damaged. The agricultural loss of productivity due to constantly increase in buildings and residential blocks in peri-urban areas, also affects rural economy.

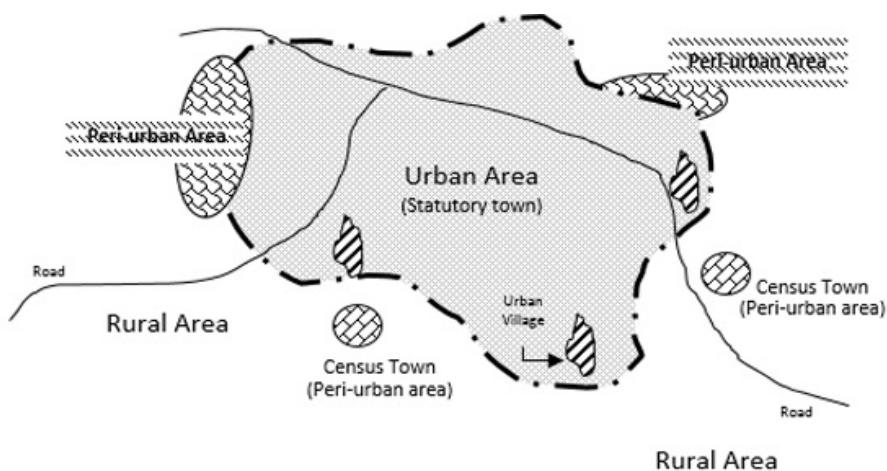
Most of the middle class people prefer low cost housing in the peri-urban areas; even though there is lack of proper infrastructure facilities like transportation, water supply, sewerage etc. Most of them buy land on suburbs on the pretext that the land value will increase tremendously in future due to the development. Thus these peri-urban areas attract huge investment on lands, which leads the spatial growth of the city. Peri-urban people cope with high pollution levels, poor sanitation and drainage system which contribute to environmental deterioration, present a negative picture of the peri-urban ecological features; still there is wide range of positive aspects in this environment. The relatively greener landscape, cost effective housing options, better educational and health care facilities as compared to rural areas, better avenues of employment due to increasing concentration of industrial facilities and manufacturing site, etc. increasingly attract both urban elites and rural migrants to seek a better quality of life. Since these fringe areas are economically vibrant, while being environmentally calm and serene as compared to the crowded city settlements. Thus they promise better prospects for both rural poor and urban elite.

Due to urbanization and rapid economic development, the cities are expanding in size and structure, becoming increasingly complex, heterogeneous and irregular in shape. The development spreads over to the peri-urban areas resulting in degradation of natural and rural land over time. The process will continue regularly, if remain unchecked through proper planning measures, which will adversely impact the quality of life of both urban and peri-urban dwellers. Although urban sprawl in a developing country cannot be stopped, however, a remedy to this problem lies in a strict zoning regulations based on land suitability and carrying capacity, which shall allow land use to be channeled towards more sustainable uses.

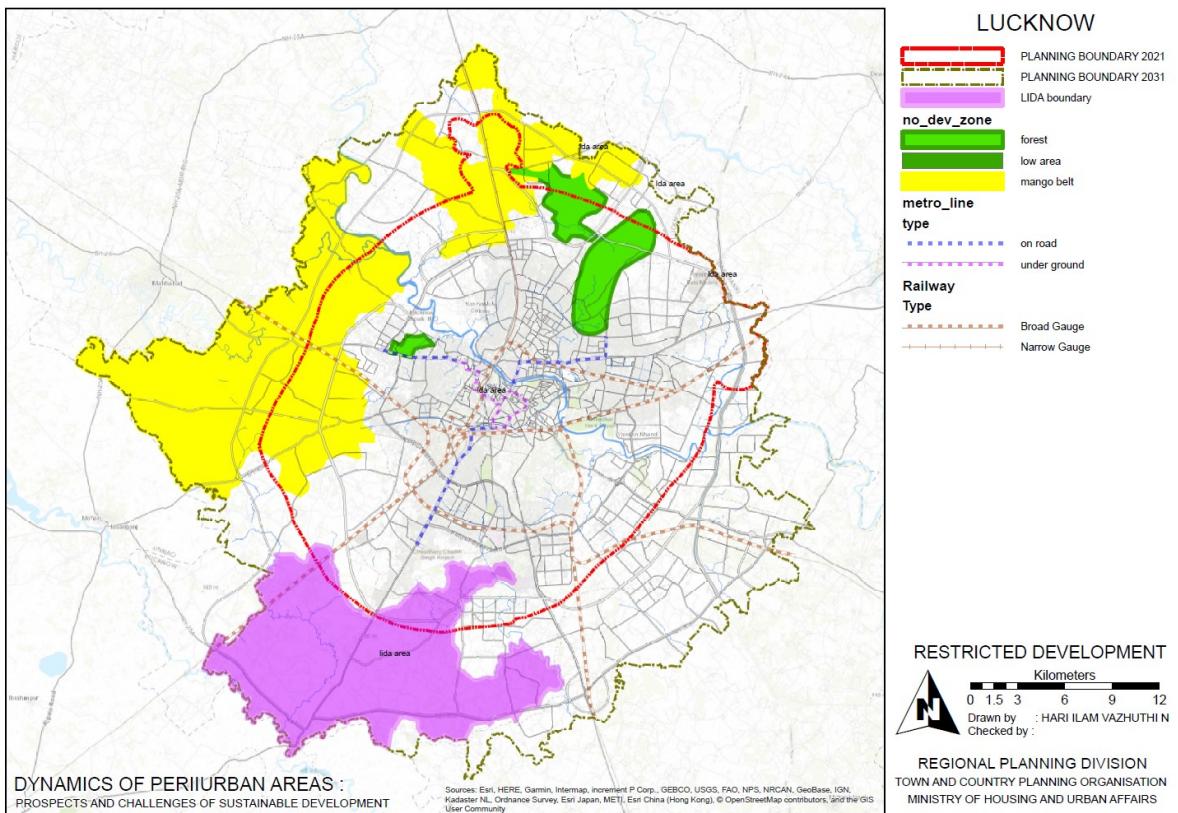
1.2 Need for Peri - Urban Area Planning

The peri-urban area of Lucknow has been taken up as a research project. The Development Area boundary of Proposed Master Plan-2031 has been taken as Urban Area in consultation with Town and Country Planning Department, Government of UP, and the area beyond this boundary are considered as peri-urban area. Therefore, the settlements falling beyond this boundary will be taken as peri-urban settlements. The rapidly growing urban population along with large scale migration, spills into the peri-urban areas and rural areas surrounding the city. A visualization of urban and peri-urban areas is given at Diagram 1. People travel to Lucknow from surrounding areas for employment, social interaction, higher order facilities, etc. but prefer returning back to their respective places, once the purpose is fulfilled. The hypothesis, therefore, is to allow the growth of peri-urban area with proper regulations and systematic distribution, as the land is limited and diminishing rapidly.

Diagram 1: A visualization of urban and peri-urban areas



The restricted development area of Lucknow city and its environs have been depicted in map 2. The study outcome would assist the planners and land developers to evaluate whether the development goals are in consonance with intended Master Planning, and if yes, how the resources can be used to optimize enabling infrastructure and enhance carrying capacity of peri-urban areas.



Map 2 : Lucknow Restricted Development

1.3 Objectives

The study area of Lucknow city will provide adequate opportunities to understand the patterns of recent urban expansion and process of land use transformation in urban core and peri-urban areas.

The objectives of the research study are as follows:

- To assess the magnitude of factors which promote rural-urban movement viz., movement of people, goods and services.
- To understand the process and approach of delimitation of peri-urban areas and associated problems.
- To devise suitable strategies which can provide an impetus for balanced development in terms of infrastructure facilities, employment avenues, health and educational facilities of higher order in rural areas itself, within close vicinity of urban area.

1.4 Scope and Limitations

Demographic, socio-economic and urban statistics pertaining to Lucknow district and its urban areas have been analyzed to flag the key issues, which need focused attention. However, following limitations are flagged.

- The case study is based on the secondary data collected from various sources.
- Due to administrative and technical constraints exhaustive data collection was not feasible.
- Depending on data availability, the study may focus on selected aspects which are easy to implement and monitor regularly in a systematic manner.
- The details at micro level are not highlighted.

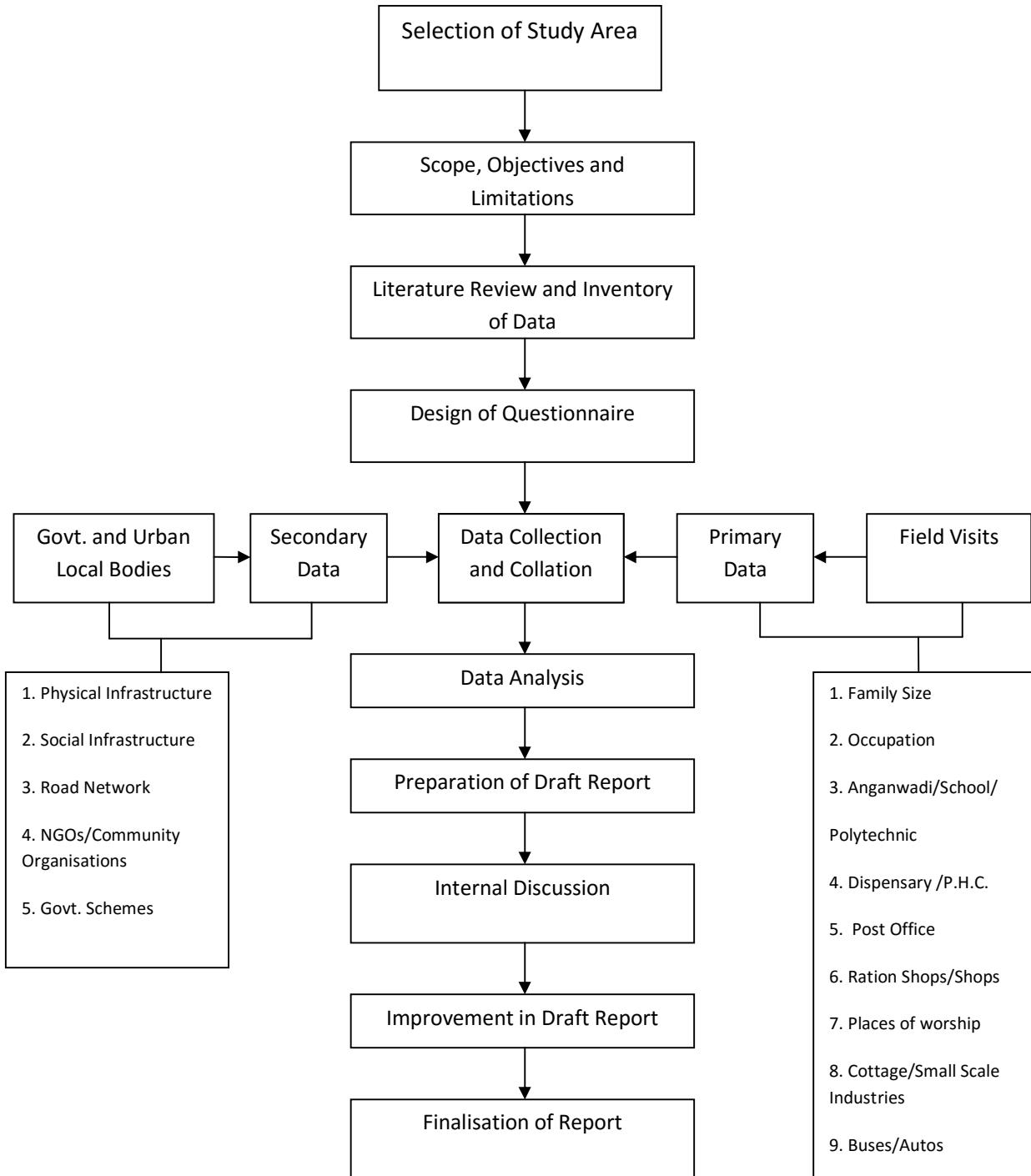
1.5 Methodology

The case study of Lucknow City is undertaken which exhibits an uncontrolled urban sprawl. The rapidly growing urban population in the city along with rapid migration spills into peri-urban and rural areas surrounding to the city. The hypothesis therefore is to allow the growth of peri-urban area with proper regulation and orderly/systematic distribution of land use. Thus, the task becomes more cumbersome; therefore, the focus would be to regulate expanding urban sprawl of the city, frequent transformation of land uses, linkages between urban and peri-urban areas, to make the peri-urban areas sustainable and inclusive. This analysis would help in understanding why and how peri-urban areas are important entity for the large cities. For this study methodology adopted is depicted in the Diagram 2.

1.6 Expected Outcome

The study outcome would help town planners, city managers, researchers, and land developers to evaluate whether development goals are in consonance with intended master planning, and if yes, how the resources shall be used to optimize enabling infrastructure and carrying capacity of peri-urban areas. The study outcome would also provide all the stakeholders an impetus to devise strategies for sustainable and integrated development in the peri-urban areas.

Diagram 2: Methodology



2.1 Geography

Lucknow by virtue of its central location was selected as the capital and seat of administration for Uttar Pradesh—the largest populated state of India. It is located between 26° 30' N and 27° 10' N latitude and 80° 30' E and 81° 31' E longitude, in the middle of Gangetic Plain on the banks of river Gomati. Location Map of Lucknow is given at Map 3. The river meanders through the city and geographically almost bifurcates it into two parts: the Trans-Gomti and CIS-Gomti (sub-city in Lucknow) regions, the first part forming the core of Nawabian and British evolution of the city structure and form, while the second half is urban sprawl of post-independent evolution of the city structure and form.



Map 3 : Location Map of Lucknow

Lucknow is bounded on the north by Sitapur, south east by Rae Bareli, north east by Barabanki, North West by Hardoi and south west by Unnao districts. It falls under seismic Zone III. There are many towns and villages in the surroundings such as Kakori, Malihabad, GosainGanj, MohanlalGanj, Chinhat, etc.

2.2 Administrative Zones and City Corporation

Lucknow city is presently divided into 40 wards with one cantonment having a population of 28.80 lakh person (2011 census) which covers an area of 337.50 sq km. Currently, its

population is more than 3 million. It is classified as metro city which has been developing in all sectors and emerging as new commercial hub of northern India especially in education, services etc. in the 21st century. The city spans an area stretching from Mohanlal Ganj (Lok Sabha Constituency) in the south to Bakshika Talab in the north and Kakori in the east. Lucknow urban Agglomeration (LUA) includes Lucknow Municipal Corporation and Lucknow City. The planning boundary of Lucknow has been shown at Map 4. Morphologically, there are clear demarcations of Central business district, which is a fully built up area, comprising of Hazartganj, Aminabad and Chowk. A middle zone surrounds the inner zone with cemented houses while the outer zone consists of slums.

2.3 Climate and Flora

It has humid and warm subtropical climate with winters which are dry and cool lasting from December to February and summer season from April to June is extremely hot and dry. From mid June to mid September is the rainy season, where average annual rainfall is about 896.2 mm. Fog is usually seen during winters from late December to late January.

Lucknow has only 4.66 % of forest, which is much less than the state average of around 7 %. Shisham, Babul, Neem, Peepal, Ashok, Khajur, Mango and Gular trees are all grown here. Different varieties of mangoes, especially Dasher, are grown in the Malihabad block for export. Many medicinal and herbal plants are also grown here. The city also has a botanical garden, which is a zone of plant diversity.

2.4 Economy

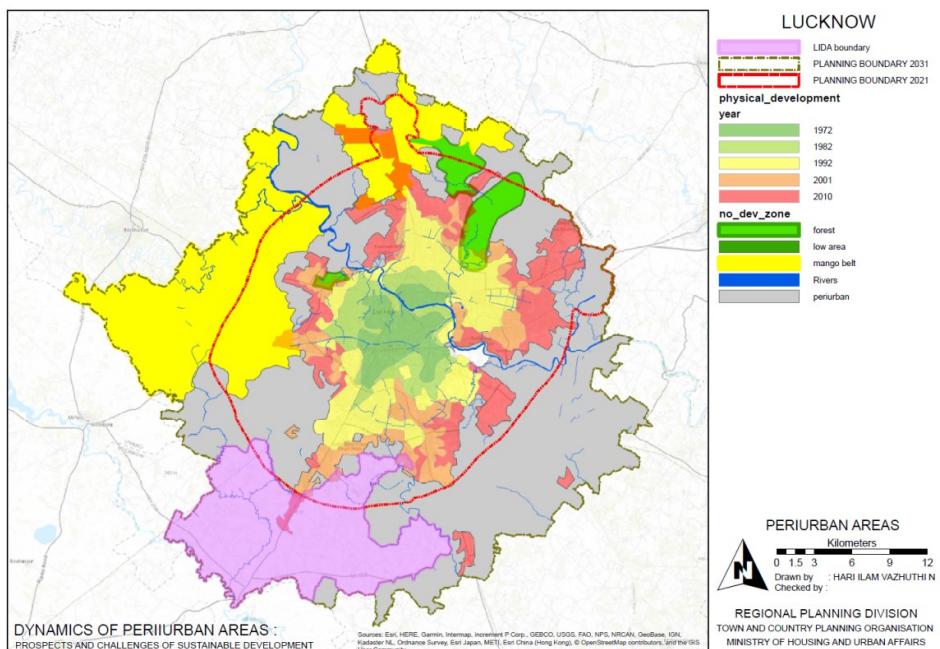
The major industries include aeronautics, machine tools, distillery chemicals, furniture and Chikan embroidery. It is also a major centre for research and development as it is home to prominent R&D centres of National Milk Grid of National Dairy Development Board, Central Institute of Radical and Aromatic Plants, National Handloom Development Corporation and UP Export Corporation. Luckonw ranked sixth in the list of ten fastest growing job-creating cities in India. Its economy was formerly based on tertiary sector and majority of the workforce was employed in government sector. Presently, the economy is growing in the fields of IT, manufacturing, processing

and medical/ bio-technology. Now, it is a growing IT hub since various software and IT companies have been established here.

The city has enormous potential in the handicrafts sector which accounts for 60% of total exports from the state. Major export items are marble products, handicrafts, art pieces, gems, jewellery, textiles, electronics, software products, computers, hardware products, apparel, brass products, silk, leather goods etc. Lucknow has promoted public private partnerships in a major way in electricity supply, roads, expressway and educational ventures sectors.

2.5 History

Lucknow, the capital of Uttar Pradesh, is a fast becoming metro in the heart of India. A city who witnessed the mutiny at Residency, who gave so many leaders to India. A city of culture, a city having lover of kite, pigeons, historical monuments and all above, a city of 'Nawabs' and 'Aadab'.



Map 4 : Lucknow Planning Boundary

Mythically, Lord Lakshmana founded the town, which eventually grew into Lucknow and a mound on the south bank of the river Gomti and in the western part of

the city bears the name, Lakshman Tila. The sheikhs who held Lucknow in the 13th century developed the area between Machhi Bhavan and Lakshman Tila and at the site of Machhi Bhavan, they built a old fort called Quila Lakhna for defence, as it was considered as nucleus of the city. In the early period of growth, the city expanded in the left bank of the river Gomti. Earlier Rajputs, Shiekhhs of Bijnaur and Pathans of Ram Nagar lived in an area between Lakshman Tila to present Residency.

Lucknow, which was in the Awadh region, since 1350 had been under the rule of Delhi Sultanat followed by Mughal Empire. After the Mughal empire broke down, many small kingdoms were formed and then it came under the control of local nawab of Awadh. This was also the place which contributed to the 1857 rebellion. Although the buildings of Lucknow were initiated by Shiekhhs but it got momentum in Nawabi period. It was the capital of Awadh kingdom during the Nawabian period due to its strategic location and was also known as Granary of the country and had strategic location because its fertile land was located between Yamuna and Ganges rivers. The kingdom during those days was very wealthy and therefore it could ward off many attackers such as Marathas, the Pathans and the Britishers.

During the Tughlak and Lodhi period i.e. the end of the 15th century, haphazard development took place around the south of the Quila. The area in and around the Quila received importance during the Moghul period. A monument of this period is the Akbari Darwaza built by the subedar of Awadh, Jawahar Khan. At the same time, Sheikh Rahim developed the area to the east of the Quila and his tomb is known as Nadan Mahal. During the Shahjahan's rule, Mohammed Arif, the Subedar of Awadh, development took place in Ashrafabad to the south of the Quila. Towards the end of the Moghul period, especially in the regime of Aurangajeb, development took place in the present day Alam Nagar to the west of Quila. The buildings of this period are the specimens of Indo-Islamic architecture. During the reign of Gazi-Ud-Din Haider and Nazir-Ud-Din Haider, important monuments were constructed along the banks of Gomti river, namely Chattar Manzil, Moti Mahal. Hazrat Ganj, Hussain Ganj and Kaisar Bagh were developed in the later period by the rulers of Shah Dynasty. Iron Bridge, Kanpur Road, Chhota Imambara and Jama Masjid and Aminabad Market are the other important developmental works

were undertaken by this dynasty. The architecture was unique as they were a distinct blend of Indo-Islamic and European designs.

During the time of the 4th Nawab, Lucknow became prominent as the capital of Awadh, when Asaf-ud-Duala changed his capital from Faizabad in 1774. Gradually, the city acquired the status of a culture capital with the Nawabs leading a lavish lifestyle and patroned art and culture. Lucknow grew at a rapid rate under the patronage of Nawabs. Music dance, architectural buildings flourished under them. The major contribution to the development of Lucknow was made by Nawab Asaf-Ud-Daulah, as significant number of mohallas were added to the western part of the Quila such as Aishbagh, Charbagh, Yahiyaganj, Wazirganj, Fatehganj, Rakabganj, Daulatganj, Begumganj, and the Nakkhas. In 20th century, these muhallas became prominent business places. The Bara Imambara, Romi Darwaza, Bibipur places and the Residency were also built by him.

Till 1719 Awadh was under Mughal empire with Governor SaadatKhan (a Persian adventurer) who was appointed as the Nizam of Awadh in 1772 and the court was established at Faziabad, about 100 km from Lucknow. He developed the area between Dilkusha and Kaisarbagh. Significant number of mohallas in the south as well as western parts of the city viz., Saadatganj, Mohiganj, Moghulganj etc. and prominent monuments like Hyat Bauksh, NurBukh, Beily Guard, TekriKothi, Lal Bara dan, Dilkusha Palace, Khursheed Manzil etc. were developed by him. At present, Aishbagh is known as industrial area of the city while Yahiyaganj, Nakkhas, Wazirganj, Rakabganj, etc. are main centers of traditional industries like Chikan, Itra and Jardoji. The architecture of this period reflects the European influence which was due to Major General Claude Martin who advised the Nawabs on military matters. During the pre-independence war period, rapid development took place especially in the central and western part of the city.

It was during the reign of Shuja-ud-Duala, the 3rd Nawab that there was a fall out with the Britishers after he helped Mir Qasim who was a fugitive. East India Company defeated him in the battle of Buxar and he had to pay penalties and part away with the land. In 1773, the Britishers' put a resident in his place and gradually controlled a major

part of the territory. But the capture didn't happen all at once due to the threat from Marathas and the Mughal Empire.

2.6 Development during the British Era

Brigadier General of the British army, Sir Robert Napier prepared a Master Plan for multiple development and defence of the city after 1857. It was British army plan to opt Machchhi Bhavan as center point from which three roads (150 feet wide) radiated; one leads toward south direction for Talkatora and the other in the west for Mosa Bagh and the last and the most important in south east direction leads for Charbagh. A new era began in Lucknow after the birth of Municipal Board in 1862 which took planned management of metalled and straight roads, new avenues, many gardens, parks and open spaces. In 1866, Nishatganj bridge was constructed on Gomti river near Hazratganj bridge for development of eastern area. Many markets were established in 1867 at Sadatganj, Daliganj, Shahganj, Aminabad, Rakabganj etc. and railway lines and Charbagh Railway station were also constructed. The city had spread over a total of 31.77 sq km in 1870, of which 9.21 sq km of land was fully built up with 57,256 houses. The cantonment was developed in the south-eastern part of Lucknow and the military was shifted from Machchi Bhawan and other areas to this area. Cantonment occupied an area of 27.40 sq km which had well planned roads, buildings, playgrounds and rifle range.

Municipal Board in 1900 invited Patrick Geddes, a Town Planner of Britain, to advise about city's development. In 1916 he presented a report on Urban Planning of Lucknow City in which he emphasized the need to develop basic infrastructure for people like transportation, housing, landscaping, drainage system, etc. It was real phase of planned layout of city's development for urban design and flag in the evolution of urban landscape. Planned markets were developed such as Nazirabad, Ghasiari, Chikmandi, Raniganj, Ganeshganj, etc. The capital functions were shifted from Allahabad to Lucknow in 1928 and it became administrative centre of Uttar Pradesh. Hazratganj became the centre of all important activities (administrative and commercial), due to which all important offices related to administration and big hotels were constructed around this market.

2.7 Lucknow the Capital

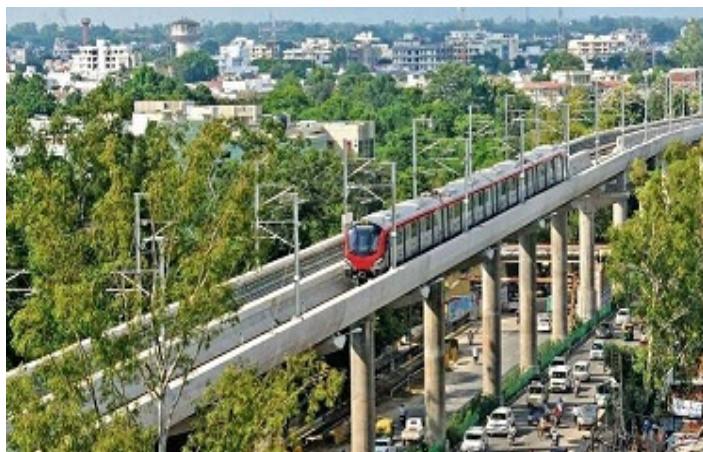
Lucknow was proclaimed as the state capital in 1930 with the efforts of Sir Hercourt Butler, the Governor of the state and several state offices were transferred from Allahabad to Lucknow. They were established towards the north and east of the main city. The new Civil Lines, Mall Avenue, Council House, Residency, Clock Tower etc. were constructed. Aishbagh was developed as an industrial part of the city.



Some small industries such as paper mill and oil mills were established on the north western bank of Gomti river. Thus administrative, commercial, industrial functions became prevalent in the urban growth of Lucknow. The University was established across the river in

Photo 2 : Lucknow Railway Station

Niralanagar in the second decade of the century. The decaying “Machchi Bhawan” was used for establishment of medical college.



After independence, the Development Trust, Municipal Corporation and other statutory bodies also ventured construction of new colonies in a planned manner. Labour colonies have also emerged as a distinct landmark in new pattern of the

Photo 3 : Lucknow Metro

city. Housing schemes for lower and middle income groups further emerged in the development of housing colonies. After 1971, Lucknow was extended towards Niralanagar, Aliganj, Mahanagar, Nishatganj, New Haiderabad, Sitapur road and Faizabad road. Tal Katora road and Aishbagh were declared as a site for heavy

industries. Some planned and organized colonies like Chandranagar, Singarnagar, Ramnagar, Krishnanagar and Vijay Nagar were developed along Kanpur road. Polytechnics, colleges and Amausi Airport were also constructed in the south-eastern part along Kanpur road. Thus, the growth of the city was primarily envisaged only along two accesses viz.Kanpur and Sitapur roads.

In the 1980s several factors viz., nerve center of political, administrative and economic activity, excellent educational and economic hub and very good air and rail connectivity etc, attracted people to Lucknow for commercial and residential settlement. Lucknow bypass and Lucknow-Kanpur Expressway has improved connectivity with major centers like Kanpur, RaiBarely, Faizabad, Sultanpur, Varanasi, Agra, etc.

After 1991, the city swelled along every outgoing roads viz., Raebareli, Sitapur, Hardoi and Faizabad roads which have provided an access to the city to sprawl along the transport network. This accessibility prompted the movement of commodities and people not only in the intra-urban space but also in the inter-urban space in the regional economy. A number of new colonies developed such as HAL, Ram Sagar Mishra Colony, Sarojini Nagar, Gomti Nagar colony, etc. In the south of Lucknow, Telibagh and Kharika residential areas have been established along with Sanjay Gandhi Post Graduate Institute of Medical Sciences. The intermittent filling of residential areas between major roads led to the development of spatial structure by evolving layout, form and shape of the city. The city developed in the north of Gomti river has planned colonies like Mahanagar, Aliganj, Niranjan Nagar, Vikasnagar, Indiranagar, etc.

The city has witnessed swift urbanization in recent years, leading to multi-fold increase in employment opportunities, but a rapid degradation of basic natural resources like land and water. Once dominated by agriculture, the region is fast converting into a mosaic of interspersed rural-urban landscape with depleting natural land cover and increasing paved surfaces of urban land use. Rural-urban fringes in India may be defined as an area of mixed rural and urban population and land use, which is really an extension of the city itself, actually and potentially. As any other fast growing developing Indian mega city, Lucknow faces an uncontrolled urban sprawl. The rapidly growing

urban population in the city and high rate of migration spills into the peri-urban and rural areas surrounding the city. Lucknow is growing at unprecedented rate creating extensive urban landscapes. Many of the agriculture and horticulture fields, wetlands, and forests that formed part of Awadh's capital in 1900 have been transformed during the past 100 years into human settlements.

Today built-up area in Lucknow has reached to Kathauta Jhil after crossing Chinhat area, newly constructed Sports College along the Kursi road and several other educational institutions are also developing towards north that is Aliganj, Vikas Nagar, Jankipuram and Jankipuram Extension. The expansion of Lucknow is also growing towards south-west that is Rajajipuram, Krishna Nagar, Indralok, Shivnagar, etc. The built-up area of the city is now approaching towards Amausi Airport along the Lucknow-Kanpur Highway, towards south-east of Lucknow Rae-bareily road and Lucknow Hardoi Road.

3.1 Demographic Profile

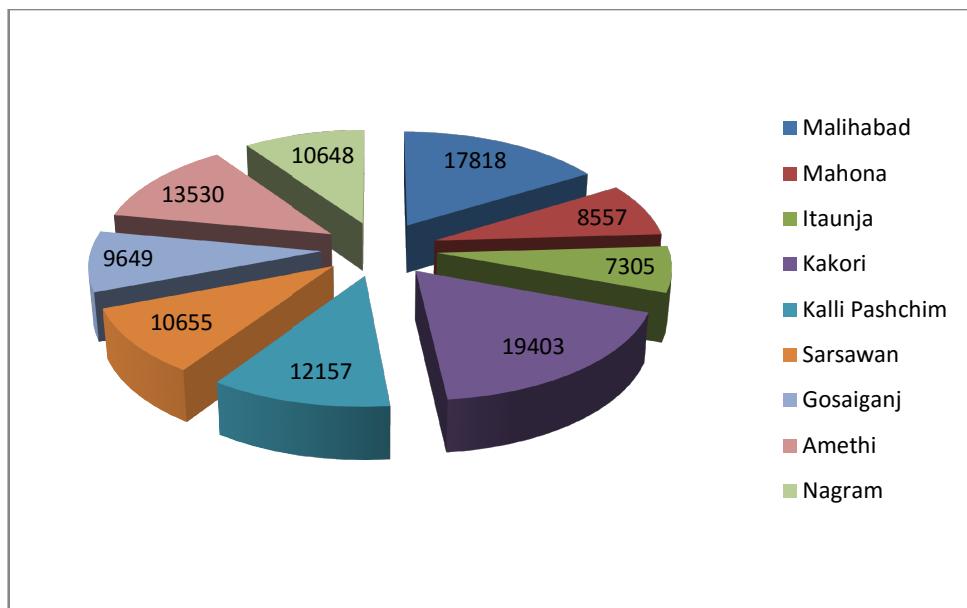
The basic elements to be considered while planning for a peri-urban area are population growth, density of population, literacy, sex-ratio, socio-economic and occupational structure pattern, etc. The other aspects to be consider for peri-urban area planning are, land use pattern, circulation pattern and its access to the region, allocation of different facilities such as schools, hospitals, parks, play grounds and shopping complexes, etc. The Urban Agglomeration (U.A.) consists of Lucknow Municipal Corporation and Lucknow Cantonment. As per Census 2011, Lucknow city's total population is 28.17 lakh. The population in the last six decades has risen tremendously by almost six times (from 5 lakh to 28 lakh in 2011). The city's decadal population growth rate is 28.87% during 2001-2011, which is less than the country urban population growth rate (31.80%) but is higher than state urban population growth rate (28.75%). Lucknow city is expected to have population of 4.5 million in 2021. The male population increased from 1199273 in 2001 to 1460970 in 2011 (21.8%) and the female population rose from 1067660 to 1356135 (27.02%) in the respective year.

Lucknow has changed from small, isolated population center in early 1990s to large, interconnected urban agglomeration today having diverse economic, physical, and environmental features. The temporal and spatial dimensions of the land use have changed significantly. The city has experienced a steady increase in population arising from natural growth, large-scale migration and addition of peri-urban areas.

3.2 Population Characteristics

The population of Lucknow Urban Agglomeration (UA) has increased from 2.5 lakh in 1901 to 28.17 lakh in 2011. The population of Lucknow UA is depicted at Graph 1. It is observed that till 1911-1921, the growth rate was almost negligible with some rise till 1931. The population growth from 1931 to 1941 is increased by more than 40% in Lucknow Municipal Corporation as well as in Lucknow U.A (Table 1). However, the

population percentage has declined proportionately from 1961 till 1981. The decadal growth trend in both the Nagar Nigam and the Lucknow UA is almost similar till 1981. In 1981-1991, it showed a rapid spurt of 70 % in UA and more than 60% in the Nagar Nigam area. The rapid growth rate during this decade was due to change in the municipal boundary area. Prior to 1987, area under municipal limits was 118 sq. km which increased to 348.80 sq. Km in 2011. Hence, the nearby settlements and villages also became part of the municipal limit resulting in high population growth for the decade. The growth rate of Lucknow UA declined to large extent (34.53%) in 1991-2001. But the growth rate of population declined further as it registered an increase of only 28.26% in 2001-2011 decade. The reasons for declining growth rate can be stabilization in birth rate and large migration from Lucknow city to metro cities like Delhi Mumbai and other metropolitan cities.



Graph 1 : Total Population 2011

The average household size of the urban centres in Lucknow peri-urban area is 5.7, which signifies proportionately higher population in the listed urban centre (Table 2). Malihabad and Kakori had highest population with largest number of households (17818 population with 3032 households and 19403 population with 3409 households respectively), Itunja and Mahona had lowest population with less number of households

(Population 7305 households 1246 and 8557 population with 1455 households)
 Population and household growth trend in these urban centres is given at Graph 2.

Table 1: Population growth in Lucknow Urban Agglomeration (1901-2011)

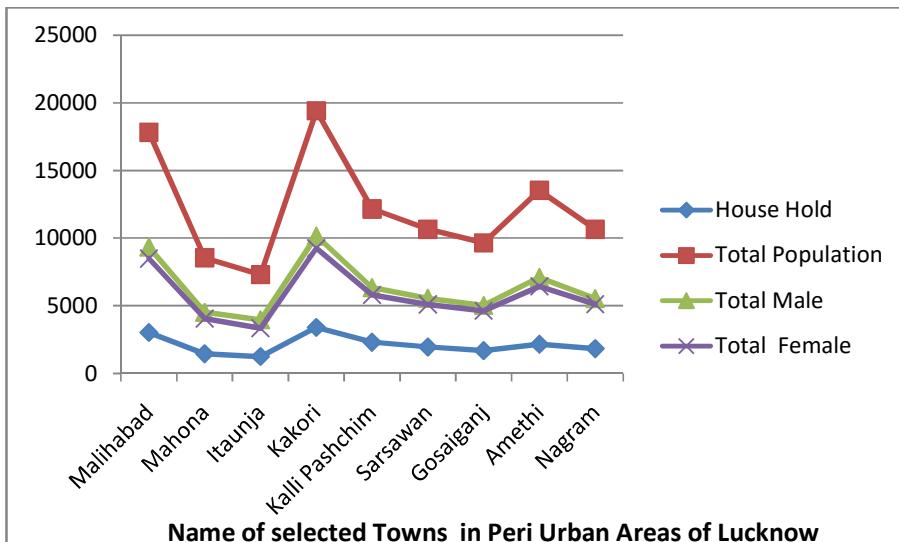
Year	Lucknow UA		Lucknow MC	
	Population	Growth Rate %	Population	Growth Rate%
1901	256238	-	256239	-
1911	252114	-1.61	252114	-1.61
1921	240566	-4.58	240566	-4.58
1931	274659	14.17	251057	4.38
1941	387177	40.97	361294	43.89
1951	496861	28.33	459484	27.18
1961	655673	31.96	615523	33.96
1971	813982	24.14	774644	25.85
1981	1007604	23.79	947990	22.38
1991	1669204	65.66	1619116	70.79
2001	2245509	34.53	2185927	35.00
2011	2880108	28.26	2817105	28.87

Source : Census Handbook

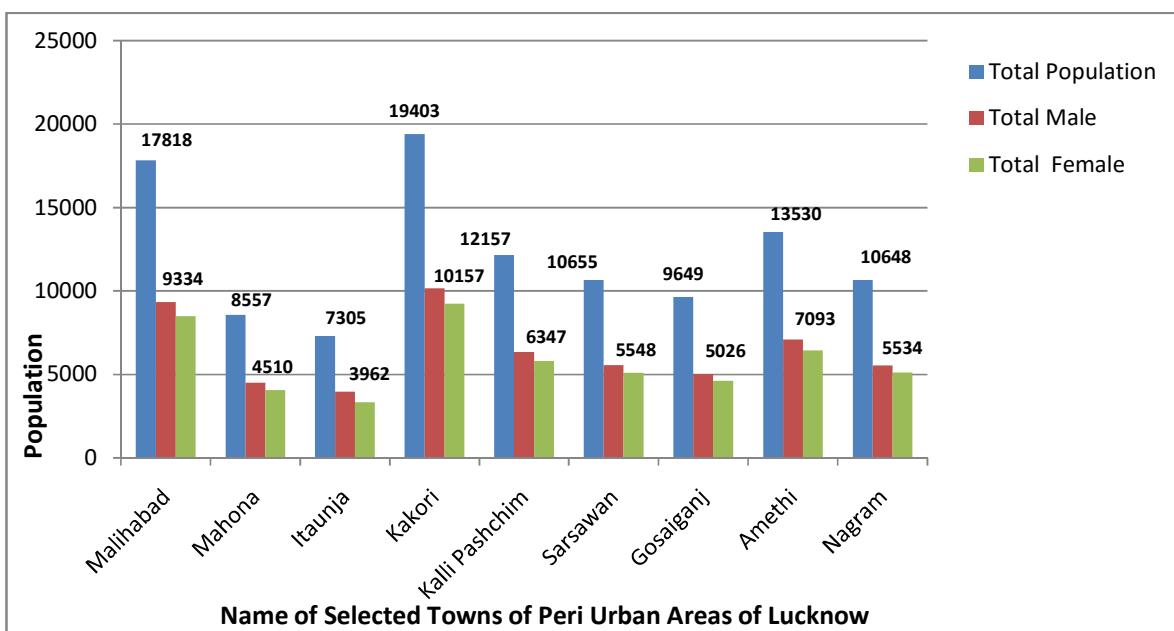
Table 2 : Population Composition 2011

Names of Nagar Parishad and Census Towns	House Hold	Total Population	Total Male	%	Total Female	%
Malihabad	3032	17818	9334	52.39	8484	47.61
Mahona	1455	8557	4510	52.71	4047	47.29
Itaunja	1246	7305	3962	54.24	3343	45.76
Kakori	3409	19403	10157	52.35	9246	47.65
Kalli Pashchim (CT)	2307	12157	6347	52.21	5810	47.79
Sarsawan (CT)	1951	10655	5548	52.07	5107	47.93
Gosaiganj	1685	9649	5026	52.09	4623	47.91
Amethi	2158	13530	7093	52.42	6437	47.58
Nagram	1831	10648	5534	51.97	5114	48.03
Total	19074	109722	57511	52.41	52211	47.58

Source: Census 2011



Graph 2 : Peri-urban areas - Population and House Holds



Graph 3 : Peri-urban areas and Population

3.2.1 Density of Population

The density of population was 6717 persons per sq km which increased to 9474 persons per Sq Km thereby registering a growth of 41.04 % from during 2001-2011. There is corresponding increase in area from 337.5 sq km in 2001 to 348.80 sq km in 2011. Lucknow was once dominated by agriculture, but now the region is fast converting into a mosaic of

interspersed rural-urban landscape with depleting natural land covers and increasing paved surfaces of urban land use.

3.2.2 Sex Ratio

Sex ratio reflects the socio-economic and demographic characteristics of the population. Higher sex ratio denotes higher out-migration of male population and lower sex ratio is the sign of immigration of single male population. Better economic opportunities have dominant impact on in-migration and vice versa.

Table 3 : Sex ratio of Lucknow District 1901-2011

Year	LUCKNOW		
	Total	Rural	Urban
1901	912	923	893
1911	856	809	886
1921	845	879	788
1931	819	872	739
1941	819	881	746
1951	842	890	789
1961	839	889	790
1971	841	854	829
1981	847	862	834
1991	866	857	871
2001	888	887	888
2011	917	906	923

The sex ratio for Lucknow Urban Agglomeration (UA) was 917 women per 1000 men in 2011 which was lower in 2001 (888 women per 1000 men). It has been showing been a rising trend as in 1981 it was 832 women per 1000 men which rose to 871 women per 1000 men in 1991. There has been a significant increase in sex ratio since 1981 due to the urbanisation, increase in audio visual aids to raise awareness among citizens for preservation of female baby, family planning etc. The lowest sex ratio of 819 females per 1,000 males was recorded during 1931 and 1941 respectively (Table 3).

The sex-ratio in rural areas of the district is 906 females per 1,000 males, as a whole.

3.2.3 Literacy

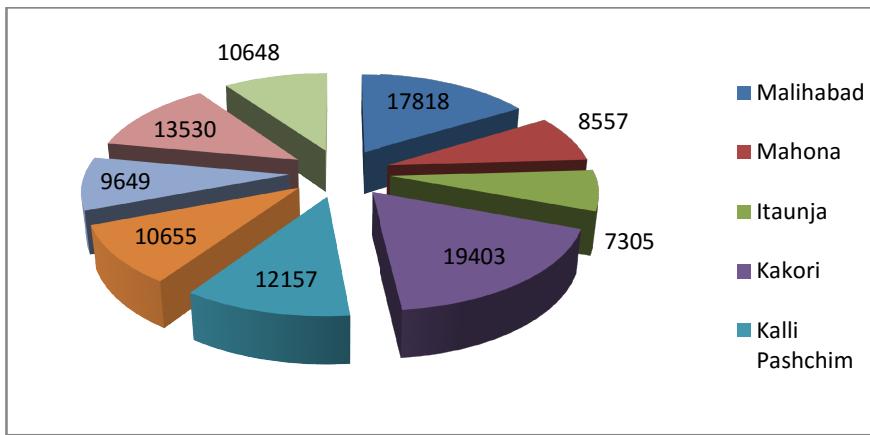
Literacy rate reflects the socio-economic development of any region. Factors such as location, proximity to urban centres, caste composition, level of social and economic development, attitude of villagers towards literacy and female education, availability of schools and teachers etc affect the literacy rate. Lucknow city has the highest literacy (82.50%) when compared to the urban district (81.91%), urban state (77.01%) and urban India literacy rate (80.73%) as it is one of the leading centers of higher education in the state.

Table 4 : Literacy Rate, Lucknow

Description	2001 Census		2011 Census	
Total Literates	14,74,733	77.11%	20,81,727	82.50%
Male Literates	8,27,793	81.72%	11,24,261	86.04%
Female Literates	6,46,940	71.91%	9,57,466	78.70%

Source: Census of India, 2011

The literacy rate of Lucknow city has increased from 77.11% in 2001 to 82.50% in 2011. Males have a higher literacy rate at 86.04% compared to 78.70% for females. However, the gap between literacy rate for males and females has narrowed, compared to that in 2001. The literacy rate for Lucknow Urban Agglomeration has been increasing significantly from 57.54% in 1981 to 71.43% in 2011. It rose from 60.27% in 1991 to 67.60% in 2001, which may be attributed to increase in good quality educational institutions, cosmopolitan culture, increase in the awareness level of the people (Table 4)



Graph 4 Literate Population Distribution 2011

Table 5 : Distribution of Literate Population 2011

Names of Towns	Total popln.	%	Total Literate		Male Literate		Female Literate	
			No	%	No	%	No	%
Malihabad	17818	0.60	10854	72.33	6037	55.62	4817	44.38
Mahona	8557	0.29	4596	53.71	2650	57.66	1946	42.34
Itaunja	7305	0.24	4546	62.23	2600	57.19	1946	42.81
Kakori	19403	0.65	10983	56.60	6093	55.48	4890	44.52
Kalli Pashchim	12157	0.41	7462	61.38	4269	57.21	3193	42.79
Sarsawan	10655	0.36	7504	70.42	4194	55.89	3310	44.11
Gosaiganj	9649	0.32	6066	62.86	3365	55.47	2701	44.53
Amethi	13530	0.45	6915	51.10	3944	57.04	2971	42.96
Nagram	10648	0.36	5671	53.25	3312	58.40	2359	41.60
Sub-total	109722	3.67	64597	58.87	36464	56.45	28133	43.55
Lucknow MC	817105	94.22	2081727	73.90	112426	54.01	957466	45.99
Lucknow Cantt	63003	2.11	48786	79.02	29955	61.40	18831	38.60
Grand Total	2989830	100	2195110	73.42	1190680	54.24	1004430	45.76

Source: Census 2011

The distribution of literate population in 2011 from the table 5 indicates that there is almost proportional distribution between males and females. More than 58 % of the population was literate. More than 70 % of the population was literate in Malihabad and Sarsawan and around 50 % in Amethi, Nagran and Mahona. There seems a healthy proportion of males and female literates in all the blocks viz., in Nagram, Amethi and Mahonaand Kallli Pashchim it was more than 57 % for males which was above average (58.87 %)and it was same in the case of female literates which was above the average (43.55 %) in Kakori, Sarsawan, Gosaiganj and Malihabad.

3.3 Migration

The main reasons for movement of family from rural to urban areas are related to socio-economic factors such as employment, education, business, health, etc. Higher level of migration of educated, skilled and semi-skilled workers from rural areas to the urban areas has been observed in Lucknow city (Table 6). As per data available from study “Counter Magnet areas to Delhi and NCR” by National Capital Region Planning Board, total in-migrants in Lucknow city for 1991-2011 decade was 2,36,788, while out migration was 75,486. Lucknow attracts maximum number of migrants followed by Kanpur and Meerut City.

Table 6 : In and Out Migration Pattern -Major Towns of Uttar Pradesh

Cities	In Migration	Out Migration
Lucknow	2,36,788	75,486
Meerut	1,15,870	1,37,589
Agra	84,025	1,07,301
Kanpur	1,78,397	45,052
Allahabad	76,191	89,092
Bareli	86,352	1,00,634
Varanasi	68,324	85,724

Source: Study - Counter Magnet Areas to Delhi and NCR by National Capital Region Planning Board

4.1 Introduction

Lucknow enjoys a central position in the State. Understanding the economic base of the city is a pre-requisite to understand the future demands of the city. The economic base of the city comprises of goods and services, on which it operates. Analysis of economic base consists of forecasts of population trends and housing needs, assessment of real estate markets, appraisal of land values, prediction of tax revenues and many other issues, etc. Lucknow always had a mixture of activities i.e. administrative, institutional, commercial, manufacturing, etc. Apart from this, Lucknow caters to the needs of the entire region and substantial part of the State for specialized health and educational services.

4.2 Occupational Structure

The occupational structure determines the socio-economic status of the city. The major occupations like trade, commerce, transportation, industries, private and public offices, white collar jobs are interwoven in such a way that it exhibits an organised system. Economic development of city can be assessed in terms of participation of people in different economic activities viz, primary, secondary and tertiary sectors. The decadal distribution of workers for Lucknow U.A (2001-2011) is given at table 7.

Table 7: Decadal distribution of workers - Lucknow U.A 2001-2011

S. No.	Category	2001		2011	
		Total Workers	%	Total Workers	%
1.	Primary	12783	2.10	16016	1.65
2.	Secondary	111180	18.00	178113	18.35
3	Tertiary	493701	79.90	776515	80.00
	Total	617664	100.00	970644	100.00

Source : Census Hand Book

As per Census of India – 2001, the participation of work force in primary sector was 2.1% in Lucknow U.A. which has decreased to 1.65% in 2011. The reduction of participation of work force in primary sector indicates symptom of Urbanisation. There was shift in secondary sector from 18% (2001) to 18.35% (2011). The territory sector almost remained constant i.e. 79.9% in 2001 and 80.0% in 2011.

The scenario of work force participation rate in urban India, Lucknow distirct urban and Lucknow Municipal Corporation is almost equal as far as its percentage is concerned. However, the absolute number differs (table 8).

Table 8 : Workforce Participation Rate LMC, India and UP2011

S. No	Total Workers	Male Workers	Female Workers	WFPR%
Urban India	92,278,654	76,175,323	16,103,331	32.25%
Lucknow District Urban	10,20,646	8,20,238	2,00,408	33.58%
LMC	9,44,295	7,55,085	1,89,210	33.52%

Source : Census 2011

The work force participation rate in Lucknow UA increased from 27.51% in 2001 to 33.70% in 2011 (Table 9).

Table 9: Work Force Participation in Lucknow U.A.

S.No	Category	2001		2011	
		Number	Percentage	Number	Percentage
1	Total Population	2245509	100.00	2880108	100.00
2	Main workers	617664	27.51	970644	33.70
3	Non - workers	1627845	72.49	1909464	66.30

Source: Census of India.

4.3 Distribution of workers

The total workers in nine urban centers of Lucknow district accounted for 31.97% of total population and 68.03% of non-workers in 2011 (Table 10). Persons engaged in household duties, students, dependents, retired persons, beggars etc are some of the categories grouped as non-workers.

Table 10: Distribution of Workers Lucknow District - 2011

Total Population	Total Workers	% of Workers	Total Non Workers		% of Non Workers	
109722	35078	31.97	74644		68.03	

Source: Census 2011

The male workers share accounted for 84.08% and rest 15.92% as female workers to the total workers. Very less participation of females are due to social taboo and cultural environment prevailing in the region.

Table 11: Distribution of Workers in Lucknow Urban Centres

Name of Towns	Total Popln.	Total Workers		Total Male Workers		Total Female Workers		Total Non-Workers	
		No.	%	No	%	No.	%	No	%
Malihabad	17818	5886	33.03	5066	86.07	820	13.93	11932	66.97
Mahona	8557	2861	33.43	2335	81.61	526	18.39	5696	66.57
Itaunja	7305	2342	32.06	1960	83.69	382	16.31	4963	67.94
Kakori	19403	6596	33.99	5484	83.14	1112	16.86	12807	66.01
Kalli Pashchim	12157	3794	31.21	3133	82.58	661	17.42	8363	68.79
Sarsawan	10655	3066	28.78	2569	83.79	497	16.21	7589	71.22
Gosaiganj	9649	2991	31.00	2498	83.52	493	16.48	6658	69.00
Amethi	13530	4361	32.23	3638	83.42	723	16.58	9169	67.77
Nagram	10648	3181	29.87	2809	88.31	372	11.69	7467	70.13
Total	109722	35078	31.97	29492	84.08	5586	15.92	74644	68.03
Lucknow MC	2817105	944295	33.52	755085	79.96	189210	20.04	1872810	66.48
Lucknow Cantt.	63003	26349	41.82	23108	87.70	3241	12.30	36654	58.18

Source: T&CP Deptt. Lucknow/Census 2011

In Itunja, Nagram and Malihabad, the percentage of male workers was far above the average percentage, whereas it was minimum in Mahona and Kalli Pashchim. In Nagram and Malihabad, the percentage of female workers was less than average (15.92%) whereas it was above the average in Mahona and Kalli Pashchim. The details of male/female wise percentage share of workers are given at Table 11.

4.3.1 Main Workers Sex Wise

It can be observed from table 12 that in 2011, out of the total population, 23.55% of the population in nine urban centres comprised of main workers, of which 86.38% were male workers and females formed a very small proportion 13.62% of the work force. The proportion of male main workers was 86.38 % in all the blocks. Data analysis indicates that the participation of female workers in the work force is almost minimal.

Table 12 : Distribution of Main Workers (Male and Female) 2011

	Total Population	Total Main Workers	% of Main worker	Total Male Main Workers	% of Male workers to Total Main workers	Total Female Main Workers	% of Female Workers to Total Main Workers
Total	109722	25836	23.55	22318	86.38	3518	13.62

Source: Census 2011

The percentage of marginal workers to the total workers accounted for 26.35% and rest 73.65% comprised of main workers (Table 13). The main other workers constitute 18250 whereas marginal other workers share is 5505.

4.3.2 Marginal Workers Sex Wise

It can be observed from the table 14 that in 2011, out of the total population of 109722, the proportion of marginal workers to total population (9 towns) was 8.42%, of which 77.62% were male marginal workers and females formed a small proportion 22.38% of the marginal work force. Data analysis indicates that the participation of marginal female workers in the work force is minimal. Distribution of Marginal Workers is shown at Graph 5.

Table 13 : Distribution of Workers in Urban Centres of Lucknow

Name of Towns	Total Workers	Main Workers		Marginal Workers		Main Other Workers		Marginal Other Workers	
		No.	No	%	No	%	No	%	No
Malihabad	5886	4042	68.67	1844	31.33	2974	73.58	1005	54.50
Mahona	2861	1784	62.36	1077	37.64	926	51.90	456	42.33
Itaunja	2342	1314	56.11	1028	43.89	982	74.73	651	63.32
Kakori	6596	5873	89.04	723	10.96	3605	61.38	414	57.26
Kalli Pashchim	3794	2242	59.09	1552	40.91	1569	69.98	906	58.37
Sarsawan	3066	2072	67.58	994	32.42	1900	91.69	839	84.40
Gosaiganj	2991	2088	69.81	903	30.19	1466	70.21	674	74.64
Amethi	4361	3956	90.71	405	9.29	3248	82.10	337	83.20
Nagram	3181	2465	77.49	716	22.51	1580	69.09	221	30.86
Total of 9 Towns	35078	25836	73.65	9242	26.35	18250	70.63	5505	59.56
Lucknow MC	944295	756483	80.11	187812	19.89	686289	90.72	159439	84.88
Lucknow Cantt.	26349	23528	89.29	2821	10.71	22731	96.61	2130	0.08

Source: T&CP Deptt. Lucknow/Census 2011

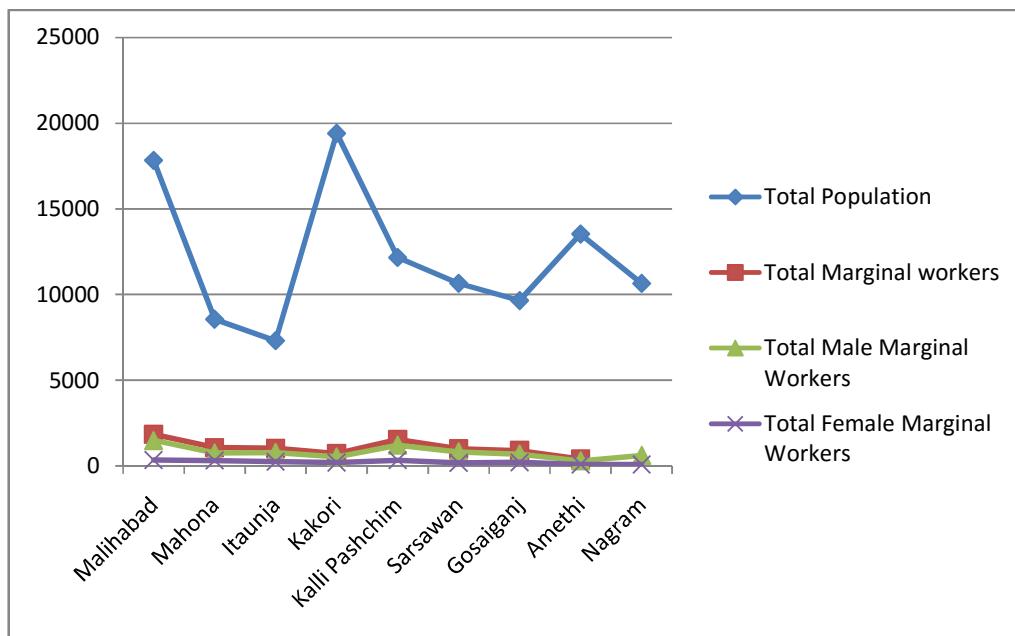
Table 14: Distribution of Marginal Workers (Male and Female) 2011

	Total Population	Total Marginal workers	% of Marginal workers	Total Male Marginal Workers	% of Male Marginal workers	Total Female Marginal Workers	% of female Marginal workers
Total	109722	9242	8.42	7174	77.62	2068	22.38

Source: Census 2011

4.3.3 Other Main Workers (Sex Wise)

It can be observed from the table15 that in 2011, other main workers in urban centres constituted 16.63 percent of the total population which comprised of predominantly males i.e. 86.50 percent and females formed a very small proportion of 13.50 percent.



Graph 5: Distribution of Marginal Workers

4.3.4 Distribution of Other Marginal Workers

It can be observed from the table15 that proportion of other total marginal workers to total marginal workers was 59.56 percent in 2011. With proper planning and generating employment avenues, many marginal workers can be brought into main work force stream.

Table 15: Distribution of Other Main Workers (Male and Female) 2011

	Total Other Main Workers	% of Total Other Main Workers	Total Other Main Male Workers	% of Male Other Workers	Total Other Main Female Workers	% of female Other Workers
Total	18250	16.63	15785	86.50	2465	13.50

Source: Census 2011

Table 16 : Distribution of Other Marginal Workers (Male and Female) 2011

	Total Marginal workers	Marginal Other Workers	% of Marginal other workers	Marginal Male Workers	% of marginal other Male workers	Marginal Other Females	% of Marginal Other Females
Total	9242	5505	59.56	4223	45.69	1270	13.74

Source: Census 2011

4.3.5 Occupational distribution

It can be observed from the table 17 that in 2011 the %age of cultivators to the main workers was insignificant (5.76 %), whereas agricultural labourers (12.71 %) and household workers accounted for a relatively large %age (10.96 %).

Table 17: Distribution of Main Workers Category-wise 2011

	Total Main Workers	Main Cultivators	%	Main Agri Labourors	%	Main workers (hh)pop	%
Total	25836	1489	5.76	3286	12.71	2831	10.96

Source: Census 2011

It can be observed from the table that in 2011 relatively large proportion of main workers was employed as agricultural labourers and household workers. The occupational distribution of workers on the basis of sex indicated that %age of females in the work force was very less in proportion to males whereby more than 91.67 % males were engaged in cultivation and rest were working as agricultural labourers and in household industries (Table 18). More than 20 % of females were employed in household industries and very low %age was working as cultivators. Data analysis shows that the female participation in the work force in the urban centres is very low.

Table19 shows that marginal workers were largely employed as agricultural labourers (26.25%) followed by household industries (10.96%) and cultivators (3.29 %) in 2011. The nature of agriculture are seasonal where there is no employment throughout the year. Thus, out of the total population of 1.09 lakh, marginal workers 9242 (8.40

percent) constituted a small proportion of total work force unlike main workers 25836 (23.50 percent).

Table 18: Distribution of Main workers in Urban Centres of Lucknow - Occupation Wise 2011

Sl. No.	Category wise Main Workers	No & (%)	Sl. No.	Category wise Main Workers	Main No & (%)
1	Main Cultivators	1489	9	Main Agricultural labour Female	415
2	Main Cultivators Male	1365	10	%	14.60
3	%	91.67	11	Main Household industries Population	2831
4	Main cultivators Female	124	12	Main Household industries Population Male	2317
5	%	8.33	13	%	81.84
6	Main Agricultural Labourers	3266	14	Main Household industries Population Female	514
7	Main Agricultural labour male	2841	15	%	22.18
8	%	86.98	16	Total Main Workers	25836

Source: T&CP Deptt. Lucknow/Census 2011

Table 19: Occupational Distribution of Marginal Workers- 2011

Block	Total Main Workers	Total Marginal workers	Marginal Cultivators	%	Marginal agricultural	%	Main House Hold industries	%
Total	25836	9242	304	3.29	2426	26.25	2831	10.96

Source: Census 2011

Table 20 indicates that proportion of marginal cultivators to the total marginal workers in 2011 was very low and they were largely employed as agricultural labourers.

There seems almost equitable distribution of cultivators between males and females but large % ages of males were employed as agricultural labourers with less proportion of females. It can be clearly observed that large %age of males were engaged as agricultural labourers 76.81% and 56.38% were cultivators whereas 43.58% females were employed as cultivators and agricultural labourers were considerably less. There seems to be almost proportionate distribution of agricultural labourers among male and female workers which shows that in agriculture sector, the women share equal responsibility with their counterparts.

**Table 20: Distribution of Marginal Workers in Urban Centres of Lucknow–
Occupation Wise 2011**

Sl. No.	Marginal Workers (Occupation Wise)	No & (%)	Sl. No.	Marginal Workers (Occupation Wise)	No & (%)
1	Total Marginal Workers	9242	7	Marginal Agricultural Labourers Population	2426
2	Marginal Cultivators Population	304	8	Marginal male agricultural labour	1298
3	Marginal Cultivators Male	243	9	% of Male agricultural labour	76.81
4	% of Marginal Male Cultivators	56.38	10	Marginal Female agricultural labour	498
5	Marginal Female cultivators	243	11	% of Female agricultural labour	23.19
6	% of Marginal Female Cultivators	43.58			

Source: T&CP Deptt. Lucknow/Census 2011

4.4 Distribution of Non-Workers

The population of workers has risen from 27 % in 2001 to 33.70 %in 2011 in Lucknow U.A., which is quite remarkable. Inversely the proportion of non-working population was very high 72.79 %. The %age of non working population declined to around 66.00 % in 2011 which may be attributed to economic development.

It can be observed from the table 21 that the %age of non workers to the total population was 68.03% in 2011. The sex wise distribution of non workers depicted a disproportionate picture whereby females were in large %age (62%) as non workers in the total non worker population unlike males due to socio-economic and cultural environment (table 21). The male non workers were comparatively less as they are the bread earner of the family, educated and responsible as per societal norms. The %age of male non workers was around one third. Thus, it can be surmised that there exists indirect relationship between the %age of non workers and total workers in terms of sex, since large proportion of non workers comprised of females who were not allowed to step out of their houses due to socio-cultural environment, family issues etc.

Table 21 : Distribution of Working Population/ Non Working Population 2011

	Total Worker Population	%	Total Non Worker	%	Total Worker Male	Total Non Worker Male	Total Female Worker	Total Non Worker Female
Total	35078	31.97	74644	68.03	29492	28019	5586	46625

Source: Census 2011

Out of the total population, 23.55% are main workers, while 8.42% per cent are marginal workers and more than 68.03% comprises of non-working population. Out of the total worker population, 33.46% are non worker population. The total male and female non worker population constitutes the share of 37.54 % and 62.46% respectively. (Table 22).

Table 22: Distribution of Non Worker Population 2011

Total Worker Population	Total Non Worker Population	%	Non Worker Male	%	Non Worker Female	%
35078	74644	33.46	28019	37.54	46625	62.46

Source: Census 2011

4.5 Dependency Ratio

Table 21 reveals that in 2011 out of a population of 1.09 Lakh, there was low %age of working population i.e. 31.97% and very high dependent population. It can be surmised that there is indirect relationship between the %age of workers and non workers, especially females which may be due to socio-cultural, environment etc. issues. From analysis of above data it is observed that the city is unable to cope up the demand generated by the growing population. A total of 176 villages have been included in the boundary of Lucknow Metropolitan Area, but this did not necessarily change the occupational pattern. The economy of those new villages remained mostly rural. This weak point also emerged because of very less %age of participation of female workers. The female workers equal participation is needed for all round development of Metropolitan City of Lucknow.

5.1 Distribution of Land

The land use classification is an important parameter to understand the distribution of land over urban area under different categories. It is defined by different factors viz., topography, population distribution, land availability and its potential for growth in a certain time period.

Lucknow has witnessed huge urban expansion. The urban area was spread into 9170 Ha (1987) which increased to 16270 Ha (2004-05), thus registering growth of 1.8 times during 17 years (Table 23).

Table 23 : Existing land use of Lucknow UA (1987 and 2004-05)

S. No.	Category of Land use	1987		2004-05	
		Area (ha)	(%)	Area (ha)	(%)
1.	Residential	4485.98	48.90	8945.00	55.00
2.	Commercial	223.77	2.40	360.00	2.20
3.	Institutional	474.69	5.20	560.00	3.40
4.	Industrial	596.22	6.50	990.00	6.10
5.	Entertainment (Parks/Play grounds)	346.48	3.80	435.00	2.70
6.	Community Facilities	902.02	9.80	1410.00	8.70
7.	Transport	952.00	10.40	1240.00	7.60
8.	River/Tanks/Reserves	193.66	2.10	310.00	1.90
9.	Open Areas	996.14	10.90	2020.00	12.40
	Total	9170.00	100.00	16270.00	100

Source: Lucknow Development Authority, Lucknow Master Plan -2031

Further, the total area under different land use categories increased from 16270 Ha (2004-05) to 24481.57 Ha (2010-11). Such huge increase of land under different categories is due to inclusion of 176 rural villages under Lucknow Master Plan 2021.

5.2 Description of land use

It may be inferred from that land use under residential categories has major share of 55% (2004-05). The land under commercial use has increased from 2.40% to 2.55% during 2004-05 to 2010-11. On contrary to this, percentage of industrial category has gone down from 6.1% to 3.84% in the corresponding period.

Table 24: Existing Land Use of LDA 2010-11 (Area in Ha)

S. No.	Land use	LDA excluding LIDA	LDA Area (Urban Area)	%
1.	Residential	10271.68	10278.68	41.99
2.	Commercial	623.14	623.14	2.55
3.	Industrial	940.57	940.57	3.84
4.	Institutional	888.76	888.76	3.63
5.	Community Facilities/Amenities/Utilities	2137.26	2137.26	8.72
6.	Recreational (Parks/Play grounds)	14672.75	997.71	4.08
7.	Transport	7842.74	7842.74	32.04
8.	River/Tanks/Drains	2255.32	578.64	2.36
9.	Others	194.07	194.07	0.79
10	Agriculture/Orchids/Shrubs	76379.06	-	
11	Undefined land	2595.09	-	
Total		105125.40	24481.57	100

Source: Lucknow Development Authority, Lucknow Master Plan -2031

The Table 24 depicts that due to inclusion of agricultural and undefined land to the tune of 78974.09 Ha, the total area of LDA (excluding LIDA) has gone upto 105125.40 ha. The significant increase in residential sector is due to addition of residential colonies developed by Lucknow Development Authority, Uttar Pradesh Housing and Development Board and colonies developed by Private Sector. Apart from this, Telecom Sector has emerged as major user of the space in the city. MG Road, BFSI sector offices, Gomti Nagar Zone, Faizabad Road, Mahanagar and Ali Ganj have witnessed commercial activity. In newly developed area, the commercial activities are growing at slower pace and unplanned growth of commercial activities in new residential area is the concern of the Authority.

5.2.1 Residential – The total area under residential land use was 8945 ha in 2004-05 in the city. Due to inclusion of 176 villages in the Lucknow Development Area, the residential land use rose to 10278.68 ha in 2010-11 which is 41.99% of urban developed area. It has been increasing rapidly for past 15 years due to development of planned colonies which are concentrated in Aliganj, Indiranagar, Gomtinagar, Hussainganj, Maqboolganj, Nirala Nagar and C.B. Guptanagar wards. The residential houses in old parts of the city are mixed and unplanned which are old, dilapidated and unventilated with unhygienic conditions. In old part of the city compact houses can be seen along the narrow streets and lanes which are over congested. The residential areas, therefore, have a varied character from congested areas of Kashmiri Mohalla, Asharfabad, Chowk, Aminabad, Kaisarbagh, Hussainganj, Bashiratganj, etc. to the spacious and newly planned colonies of Mahanagar, Indiranagar, Gomtinagar.

5.2.2. Commercial – In 2004-05 total area under commercial use was 360 ha, which increased to 623.14 ha in 2010-11 constituting 2.55% of urban developed area. Hazratganj, M.G.Road, Aminabad are the significant old commercial streets of the city. The wholesale market areas include Fatehganj, Sathdatganj etc. The most planned commercial hub was created along the Hazratganj road during the British period as a fashionable and spacious shopping complex. However, Chowk-Hazratganj, Aminabad area is considered as Central Commercial Area (CCA) of Lucknow metropolis. Other commercial areas include Nazirabad, Kaisarbagh, Maulviganj, Dar, Nishatganj, Alambagh, Daliganj, Shriram road, Faizabad road etc. The newly developed shopping

complexes have emerged in the various planned colonies, such as Kapurthala market, Nishatganj market, Janpath market, Lekhraj market as well as markets along Gautam Buddha Marg, Ganga Prasad Verma road, Nandan Mahal road etc. Due to slow development of commercial centres in the newly developed areas, unorganised commercial activities have sprung up in the residential areas at a faster rate.

5.2.3 Institutional—In 2004-05, total area under institutions was 560 ha, which increased to 888.76 ha (2010-11), thus constituting 3.40% of urban area. The institutional areas are largely situated in Kaiser Bagh and Vidhan Sabha Marg. Many institutions have come up in the commercial areas of newly developed areas. Many office complexes have been established in the residential areas as well, which adversely affects peace and security. Vidhan Sabha and many offices/departments like PWD, Irrigation, Directorate of Medical and Health, Town and Country Planning, Post and Telegraph Office, Bharat Sanchar Nigam Ltd, Municipal Corporation, Electric Supply Office, Road Transport Offices, Railways, etc are located along Rani Laxmibai Marg, Vidhan Sabha Marg, Kalidas Marg and Ashok Marg. Many of them are situated in Hazrat Ganj Ward. Other offices are located in various residential colonies, Aliganj Extension and in newly developed commercial complexes in the peripheral area of Metropolis.

5.2.4 Industrial - In 1987 total area under industrial land use was 596.22 ha (6.50 percent) which increased to 990 ha (6.08 percent) in 2004-05. The increase in area under industrial use during 2004-05 was mainly due to inclusion of industrial area along Deva road in LDA. The small cottage industries are concentrated in the Chowk, Aminabad, Bashiratganj wards. The industries have been established along Kanpur Road, Amuasi, Sarojini Nagar and interior parts of the city in Aishbagh, Nishatganj, Daliganj, Hindnagar, Yahiaganj and Deva Marg. The light industrial area of Aishbagh has the precision instrument factory, cycle parts factories, agricultural implements, general engineering factories, electrical, hardware, chemicals, pharmaceutical, etc.

5.2.5 Recreational/Parks and Open Spaces : The area under recreational land use accounts for 435 ha (2.70%) of the total developed area in 2004-05, which increased to 14672.75 ha (8.72 %) in 2010-11 after including 176 villages under the Lucknow

Development Area (Table 24). The monument buildings with parks/playgrounds are scattered in the metropolis. Rama Bai Park, Ambedkar Park, Kanshiram Park, Begham Hazrat Mahal Park, Kunwar Jia Lal Park, Sarojini Naidu Park, Buddha Park, Janeshwar Mishra Park etc. are the important parks in the Lucknow. The other most popular parks are Jhandewala Park, Aminabad Park, Ladies Park, Gange Nawab Park, Victoria Park, etc. Along the bank of river Gomati there are number of parks namely Shahid Park Surajkund Park, Hathi Park and Neebu Park have been developed by Lucknow Development Authority. Important stadiums and playgrounds include K.D. Singh Babu Stadium, Railway Playgrounds etc.

5.2.6 Community Facilities: These comprise of public and semi-public uses such as education, administration, recreation, health, transport, communication, water supply, and other public uses. In 2004–05, the total area under community facilities land use was 1410 ha which was 8.70 % of total developed area, which increased to 2137.26 ha in 2010 (8.72%) of urban developed area. There are many higher educational institutions, universities and colleges in the city which include Baba Bhimrao Ambedkar University, Lucknow University, K.G. Medical College, Chhatrapati Sahuji Maharaj Medical College, Engineering Colleges, Isabels Thornburn College, Colvin College, and Sanjay Gandhi Post Graduate Institute of Medical Sciences. Besides these, there are numerous research institutes of central as well as state Government related in the fields of science and technology, medicines, agriculture sugarcane, seeds and horticulture. The pre-secondary and secondary schools are also widely scattered all over the metropolis. Health facilities are also well developed being capital city of the state. There are very highly specialised medical hospitals in the city such as Civil Hospital (Hazratganj), Balrampur Hospital and Duffern Hospital on the Hospital road, Gandhi Memorial Hospital on Shah Mina road and Vivekanand Hospital. Besides these there are more than hundred small clinics and dispensaries owned by either government or private medical practitioners. There are Rajendranagar T.B. Clinic and Thakurganj T.B. Hospital which provide special treatment to the T.B. patients.

5.2.7 Transport – This sector plays an important role in the development of the town. The area under transportation was 1240 ha in 2004-05 which increased to 7842.70 ha

during 2010-11, thus registering 6 fold increase in 6 years. The traffic and transport land use registered the growth of 32% during 2004-05 to 2010-11, which was the second highest growth of the land use sector after residential sector (42%). The urban growth has witnessed uncontrolled and haphazard growth mostly in ribbon form along the the transport corridors leading to urban fringe areas. The city's radial expansion has given way to new corridor especially connecting Kanpur, Raibareli, Hardoi, Sitapur, Faizabad and Sultanpur. The supporting urban infrastructure facilities needed to be strengthened in newly developed areas.

5.2.8 Water Bodies and Open Spaces: The other urban land uses occupy 2330 hectare (14.33%), which includes open land (12.42 per cent) and water bodies (3.91 per cent). These vacant lands are lying in the middle and outer zones of the city which have potential use for future urban development. A significant land parcel is also being used in agricultural and allied activities.

TRANSPORT AND PHYSICAL INFRASTRUCTURE

6

6.1 Existing Transport Facilities

Transport system is an integral part of land use and development. During the last decade, the urban sprawl in Indian cities has extended far beyond the existing territorial jurisdiction of the city administration resulting in high usage of private modes. Despite substantial efforts, cities are facing difficulty in coping with increase of private vehicles along with improving personal mobility and goods distribution.

Table 25: No of Registered Vehicles in Lucknow (March 2007)

S.No	Type of Vehicle	Number of Registered Vehciles				% increase
		2005-06 (No)	%	2006-07 (No)	%	
1	Multi Axial	917	0.11	1365	0.15	48.85
2	Medium and Heavy weight vehicles	8014	0.97	8232	0.91	2.72
3	LCV (Three Wheelers)	2930	0.36	3362	0.37	14.74
4	LCV (Four Wheelers)	5365	0.65	6217	0.69	15.88
5	Buses	3978	0.48	4198	0.46	5.53
6	Taxi	5979	0.73	8012	0.89	34.00
7	Three Wheelers and Auto Rickshaw	12502	1.52	15154	1.67	21.21
8	Two Wheelers	660093	80.11	720378	79.61	9.13
9	Car	94222	11.43	105674	11.68	12.15
10	Jeep	12428	1.51	13000	1.44	4.60
11	Tractor	13385	1.62	13923	1.54	4.02
12	Trailers	991	0.12	1062	0.12	7.16
13	Others	3199	0.39	4254	0.47	32.97
	Total	8,24,003		9,04,831		9.81

Source: RTO, Lucknow

Lucknow is known for its cultural and intellectual traditions. The rapid growth of the city and associated urban sprawl has accentuated the demand supply mismatch amidst the constraint, transport infrastructure resulting in economic and social externalities. The inadequate commuter transportation system in Lucknow is overwhelmed by upsurge in private automobiles, which constitute 90% of total registered vehicles in the city.

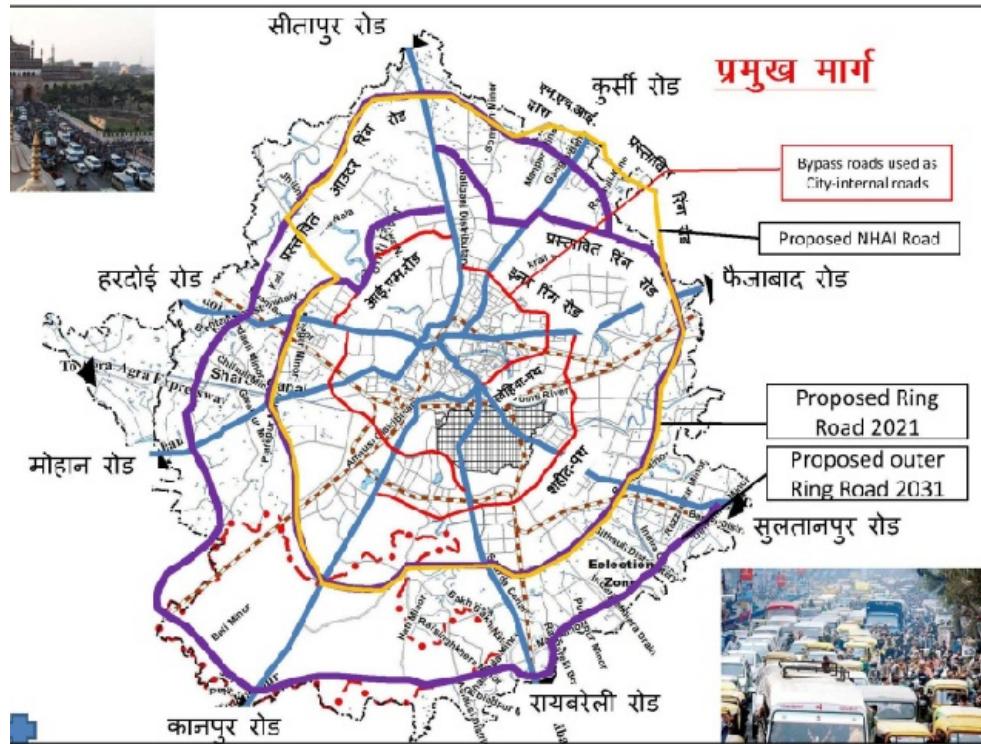
6.1.1 Vehicular Population: Total Vehicles in the Lucknow city was 8,24,003 during 2005-2006 which increased to 9,04,831 during 2006-07, thus registered a growth of 9.8% during 2005-2007. The number of registered vehicles with RTO Lucknow in different categories with their percentage breakup for year 2005-06 and 2006-07 is given at Table 25. The percentage share of two wheeler among all the vehicles alone constitute 80.11% and 79.61% in 2005-06 and 2006-07. The buses, two wheelers, three wheelers and cars constitute 93.54% and 93.42% in respective years (table 25). To cater to the auto-mobiles in the city, there are 108 petrol pumps.

Lucknow is connected with important metro cities by Amausi airport and linked in the north, east, south and west by rail and road network. It is well connected with a network comprising of both state and national highways which are primarily of radial nature (Map 6). The city is strategically located at the junction of the National Highways. It has good railway connectivity with both northern and north eastern railway zones (Map 7). Keeping in view the growing travel demands in this area Lucknow Metro Rail Corporation (LMRC) commissioned by LDA has prepared DPR for Mass Rapid Transit System for Lucknow City. A large number of passengers/ commuters and goods move across the state of Uttar Pradesh and the country use these modes daily to and from Lucknow, and thereby creates an impact on city's transport infrastructure.

6.1.2 Road Network (National Highways/State Highways)

Lucknow is located at a junction of three National Highways and other five State Highways (table 26).

Map 5 : Major Road Network



Source: Town and Country Planning Deptt. Lucknow Master Plan-2031

Map 6 : Lucknow Transportation Facilities

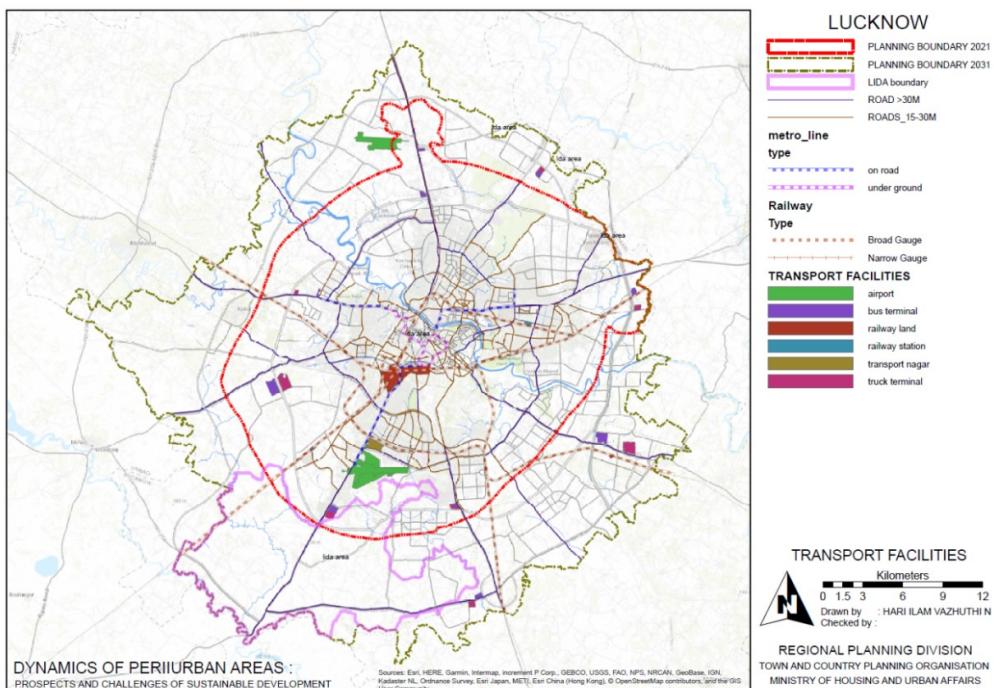
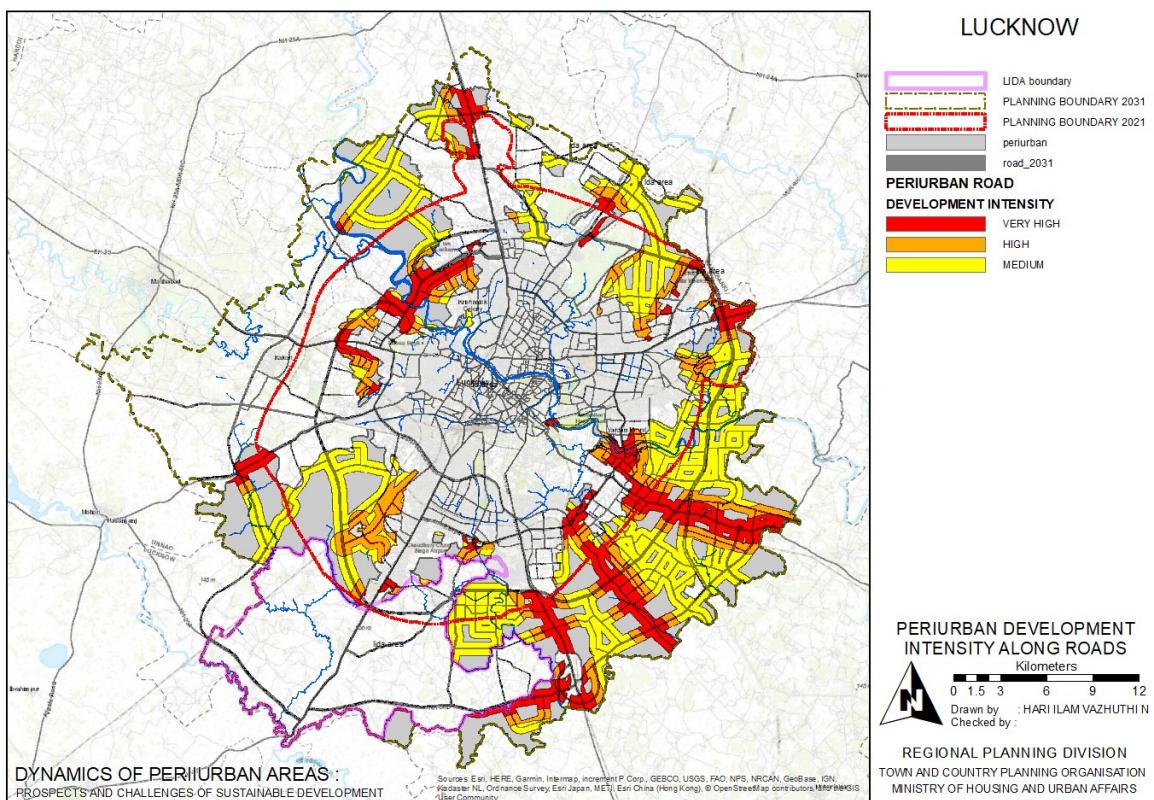


Table 26 : Connectivity of the city

No.	National Highways	No.	State Highways
NH-24	Leading toward Delhi in the north	SH-40	Leading towards Etawah
NH-24S	Leading towards Raibareli	SH-25	Leading towards Hardoi
NH-25	Leading towards west and south via Jhansi in UP and Shivpuri in M.P.		
NH28	Leading towards Baruni in Bihar		
NH56	Leading towards Varanasi		

6.1.3 Local Roads - There is a good network of highways that are radiating outwards from the city, however, absence of a proper circular ring road leads to an inconsistent urban growth in the fringe areas of the city.

Map 7 : Lucknow Peri-Urban Development - Intensity Along Roads



Of late, the State has taken a step to connect the Lucknow airport to Gomti Nagar by Shaheed Path which is part of east west corridor, thus reducing the travel time to airport. The intensity of the roads is given at Map 8. Unprecedented growth of vehicles and composition of mixed vehicles on the roads and inadequate width of the road with severe encroachment on road network are peculiar reasons for increasing the congestion on the roads especially in old city. However, presence of heavy mix of slow and fast moving traffic, presence of at-grade railway crossings, parking alongside roads and encroachment of roads, etc. are specific features that also cause congestion in the city.

With the entry of private developers, like other metropolitan cities of the country, Lucknow is witnessing a real estate boom. The entire city has been dependent upon the core area, which has grown to become the lone Central Business District for Lucknow city. This has lead to a large number of trips attracted from all corners of the city towards the central core.

6.1.4 Railways

Lucknow's main railway station is located at Charbagh, on the southern side of the city along Kanpur road, which on an average handles 60,000 passengers daily. It is connected to different parts of country in north and south corridor like New Delhi, Mumbai, Kolkata and acts as the divisional headquarters of Northern Railway Division. Its neighbouring and second major long-distance railway station is Lucknow Junction operated by North Eastern Railway. It is a major junction which links to all major cities of the state and country through Kanpur, Hardoi, Sitapur, Barabanki and Raebareli. Lucknow city has further thirteen more railway stations, viz. Alampur, Malhaur, Utretia, Transport Nagar, Dilkhusha, Gomti Nagar, Badshahnagar, Manak Nagar, Amausi, Aishbagh junction, Lucknow City, Daliganj and Mohibullapur. Other suburban stations include Bakshi Ka Talab and Kakori.

6.1.5 Bus services

Lucknow city's bus service is operated by Uttar Pradesh State Road Transport Corporation (UPSRTC), a public sector road transport headquartered in MG road. The UPSRTC operate intrastate and interstate bus services, with 12429 buses. It has the

highest fleet of buses in North India. Lucknow city has around 300 CNG buses operating in the city. The buses consist of low floor buses, semi-low floor buses and mini-buses. Similarly, the Interstate Bus Terminal (ISBT) located at Alambagh, run by UPSRTC, provides for adequate services to outgoing and incoming passengers in the city. Lucknow city has one Transport Nagar at Alambagh along Kanpur road that attracts approximately 4800 trucks daily and plays a significant role in terms of freight movement in the city. Apart from this Lucknow City Transport Service Ltd., a city based service under JnNURM scheme of Government of India also operates its buses primarily in the city of Lucknow. It covers the entire city and provide services to the daily commuters. It has 15 A/c, 30 Non A/c low Floor Marcopolo Buses, 90 Tata Buses and 125 Mazda Buses, totaling 260 (as per its official website data).

It is headquartered at Nagar Nigam, Triloki Nath Marg Hazratganj Lucknow and Camp office Charbagh Bus Station, Charbagh Lucknow and has 2 depots. Bus depots are at Vibhuti khand Gomtinagar and Dubagga. These buses are running on different routes of Chinhat-Nadarganj (BlueBus), Tedi Pulia (Indira Nagar)-Charbagh(Red Bus), Rajajipuram-PGI (Cantt-Eldeco Udyan Tele Bagh) (Green Bus) Gomtinagar-Dubagga (Aishbagh-OldLucknow) (Yellow bus), LDA Colony-Aashina- Bangla Bazar) Power House Chauraha-Engineering college and Aishbah-Ram Bank Chauraha.

6.1.6 Parking

Presently the city is facing severe parking issues. The existing parking facilities are unable to meet the growing demand of vehicles. Mostly, the residential areas have grown in new area especially in the periphery of the city and the work area remains mostly in central part of Lucknow. Due to narrow width of roads and paucity of earmarked parking areas, the vehicles are parked on the streets resulting into traffic chaos. The poor parking management and policy results in illegal parking, overcrowded footpaths rise in pollution levels and road violence. It is imperative to strongly emphasize on development of adequate parking with smart solutions, supply of parking spaces as per demand and enforcement of parking rules in the city and the outskirts.

6.1.7 Metro Network

There are two metro corridors i.e. 1) North-South Corridor (CSS Airport to Munshi Pulia) and 2) East - West Metro Corridor (Lucknow Railway Station to Vasant Kunj) (Table 27) with a length of 22.82 km and 11.12 km respectively. North - South Corridor is operational and have 22 stations (3 underground and 19 elevated), where as proposed East – West Corridor will have 12 Stations (7 underground and 5 elevated).

Table 27 : Total cost of Lucknow Metro Corridors

Corridor	Estimated Cost* (Rs in Crore)	Completion Cost** (Rs in Crore)
North – South Corridor	4992	6880
East – West Corridor	3723	5494

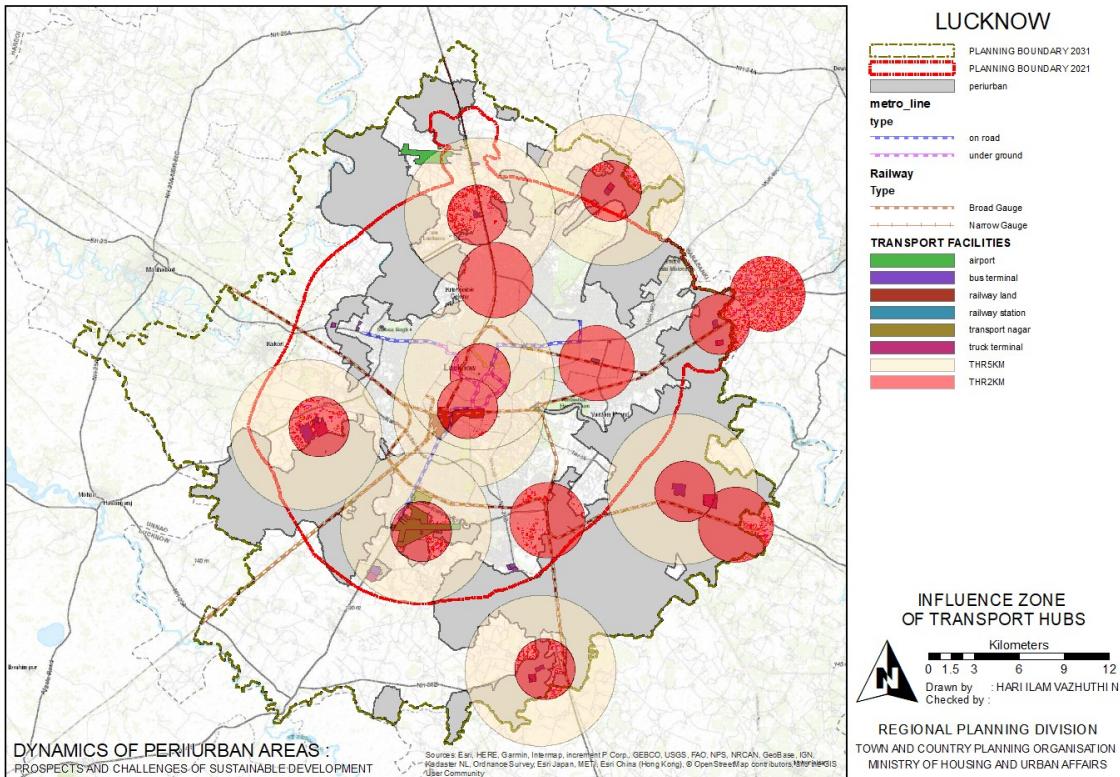
*2013 Prices, ** 2018 – 19 Prices

6.1.8 Others

Chaudhary Charan Singh Airport is located at Amausi, in the southern side of the city along NH-25 (Lucknow - Kanpur road) which handles about 4000 passengers daily, out of which 17% of them have either origin or destination abroad. The airport covers 1,187 acres area, with Terminal 1 for international flights and Terminal 2 for domestic flights, for allowing significant passenger and cargo traffic. The airport provides direct flight to New Delhi, Patna, Kolkata, Mumbai, Bangalore, Ahmedabad, Hyderabad, Chennai, Guwahati and other major cities. The airport has been ranked the second best in the world in small airport category. The airport is able to handle all weather operations and consists of parking facilities up to 50 aircrafts. At present, Air India, Air India Express, Jet Air, GoAir, IndiGo, Saudi Airlines, Fly Dubai, Oman Air and Air Vistara operate domestic and international flights to and from Lucknow.

Freight System - Being a service industry-based city, the development of Lucknow-Unnao- Kanpur Industrial Belt towards Kanpur road will have significant impact on goods movement in Lucknow city. Existing location can support such development only to some extent. The city is in dire need of a freight management strategy and integration of goods mobility with mobility for people.

Map 8 : Lucknow Influence Zone of Transport Hubs



Influence Zone of Lucknow in terms of movement of traffic and other day-to-day business, the city broadly has two influence zones viz., Primary Influence Zone and Secondary Influence Zone. Primary Influence Zone consists of the areas between 25 to 40 km radius from Lucknow city. This includes rural towns and villages like the orchard town of Malihabad, historic Kakori, Mohanlalganj, Gosainganj, Chinhat, Itaunja, etc. Secondary Influence Zone consists of areas ranging from 80 to 130 km radius from Lucknow city. Cities and towns of Kanpur, Unnao, Hardoi, Sitapur, Faizabad, Raebareli, etc. fall under this zone (Map 8).

6.2 Challenges Ahead

- The deteriorated road conditions, insufficient street lights, unorganised traffic movement leading to congestion and absence of traffic management, inadequate traffic personnel and surveillance systems, etc. are the major problems encountered by the city.

- Short-duration on-street parking during peak hours in front of educational institutions, commercial establishments and business areas hampers smooth movement of traffic. Unorganised parking outside commercial places and on road is a common phenomenon in the city. High parking demand has been observed in many areas of the city such as Aminabad, Chowk, Hazaratganj, Charbagh, Kapoorthala, Patrakarpuram etc., which leads to congestion.
- Traffic congestion due to absence of proper traffic management and Traffic Control Mechanism, presence of non functional traffic signals at many places in the city, poor geometrics are another challenging issues. Activities such as retail sales, boarding and alighting of passengers, take place at the intersection control area, which reduces the traffic handling capacity of the intersection significantly. Besides, the bus stops are also located near the junctions, which further reduce the capacity of intersections.
- Lack of Traffic Enforcement - The main arterials of the city are experiencing encroachment by hawkers on the footpaths and on the carriageway by private vehicle users in the form of on-street parking, thus reducing the capacity of the road. Due to absence of proper enforcement mechanism, on-street parking takes places on most of the busy roads, resulting in congestion.
- NMT - The city witnesses significant number of walk trips, and the composition of traffic reveals large number of slow moving vehicles (cycle rickshaws, animal carts, etc.) moving on the road along with motorised vehicles, which leads to fuel consumption, accidents, pollution and slow movement of traffic.

6.3 Changing Expectations: With rising affluence, the needs and expectations of the people have increased. This has necessitated to re-examine the current policies to cater to the higher expectations of the people and those who care for their living environment. Addition of land for roads will not solve the transport problems in a sustainable way in the long run, because the demand for road space is insatiable. Hence, rise in travel demand should be met by public transport rather than by personalized modes.

7.1 Infrastructure Development: It plays a key role in economic growth and development of the region. With progress and development of society, the process of economic development and resulting urbanization get momentum, which in turn creates demand for enhanced urban services and infrastructure facilities. The gap between demand and supply of essential urban services and infrastructure deteriorates the physical environment and quality of life in urban areas. Apart from provision of housing for the poor, the social infrastructure contributes considerably to inclusive development. Educational Institutes, healthcare centers, IT infrastructure and social security are crucial requirements of a city's social infrastructure where real-estate plays a pivotal role in fulfilling these requirements.

7.2 Education

There are many high educational institutions, universities and colleges in the city. The most prominent institutions of higher education are Lucknow University, Baba Bhimrao Ambedkar University, Khwaja Moinuddin Chishti Urdu, Arabi~Farsi University, Engineering Colleges, Isabels Thornburn College, and Colvin Taluqdar College. Degree/Post Graduation Colleges are abundance in Lucknow along with Management Institutes such as IIM Lucknow. The pre-secondary, secondary and higher secondary schools are widely scattered all over the metropolitan area (Table 28). Besides these, there are numerous research institutes of central as well as state Government related in the field of science and technology, medicines, agriculture and horticulture viz., Central Drug Research Institute, Central Institute of Medicinal and Aromatic Plants, Central Institute of Plastics Engineering and Technology, Indian Institute of Toxicology Research (formerly, Industrial Toxicology Research Centre (ITRC), etc.

7.3 Administrative, Technical Institutions

All the important offices such as administrative and commercial institutions are located in the interior parts of the city viz Hazratganj, Aminabad, Kaiserbagh, Chowk, Vidhan Sabha, High Court, Charbagh station Road, etc. which are severely congested and hinder traffic movement. More than 51 percent people are employed in state/central

government offices in Hazratganj alone. Approximately more than 20 percent retail shops are largely located in commercial centres such as Hazratganj, Chawk and Aminabad.

Table 28 : Lucknow City Basic Education Facilities (2004)

S.No	Category	School & College	S.No	Category	School & College
1	Pre primary	45 (pvt) recognized	10	Medical College	3
2	Junior basic	844	11	Management Institute	7
3	Senior basic	442	12	Technical Institute	4
4	Higher secondary	519	13	Training Institute	11
5	Degree & Higher	23	14	Research Institute	10
6	ICSE	43	15	Dance Institute	2
7	CBSE	43	16	Coaching Institute	5
8	Universities	2	17	Other Institute	5
9	Engineering Institute	1			

Source: Nagar Nigam Lucknow , 2004

7.4 Health

Health facilities are well developed in Lucknow. There are 30 government hospitals, 400 private nursing homes and 545 renowned specialised medical hospitals like KGMC, Civil Hospital (Hazratganj), Duffrin Hospital,Gandhi Memorial Hospital (Shah Mina road), Mental Hospital, Vivekanand Hospital and Chhatrapati Sahuji Maharaj Medical Colleges, Sanjay Gandhi Post Graduate Institute. The total bed capacity of government hospitals and private nursing homes (small and big) are approximately 2000-6000 to 500-2000 beds respectively. Besides these, there are more than hundred small clinics and dispensaries owned by either government or private medical practitioners. Such as Rajendranagar T.B. Clinic and Thakurganj T.B. Hospital which provide special treatment to T.B. patients.

Issues

- There is uneven distribution of educational and health facilities which are largely located in the central part of the city, due to which there is large movement of people and vehicles from peri-urban areas and other parts of the city resulting in chaotic situation. The educational and technical coaching institutions are mostly located in the residential and commercial areas which disturb the lives of the residents due to excessive crowd of vehicular traffic. This has lead to high level of noise and unorganised parking of vehicles in unauthorised areas.
- The provision of public healthcare services in peri-urban areas is inadequate and not upgraded as per the requirements of growing population. There is acute shortage of specialized doctors and other skilled healthcare professionals. The majority of population opts for private medical practitioners who charge exorbitant fee for their services. This is due to many factors such as distance, inadequate availability and low quality of health care services provided by the rural public health sector. Sometimes residents receive medical care from quacks which may prove dangerous, since they do not have required qualification and training of medical procedures.

7.5 Recreation

There are many entertainment facilities viz cinema halls like Novelty, Capital Alanka, etc. There are around 25 cinemas and 3 PVRs. There are 400 hotel and restaurants in the city such as Carlton Hotel, Kohinoor Hotel, Gomti Hotel etc., which serve the needs of the tourists and locals. There are 800 sweet shops, and 270 manufacturing food product units. Earlier the city was known as City of Garden, as there were 742 parks and playgrounds under Nagar Nigam, among which, 112 parks are developed and rest are not maintained. Some parks are maintained by LDA and some by Nagar Nigam. There are 7 stadiums namely K.D.S.B Stadium, Chowk Stadium, LDA Stadium, Northern Railway Stadium and Sports College and T.T. Complex. There are 15 clubs viz., Unity club, Don Sports club, Alambagh Cricket Club, etc. There is a polo ground, Race Course and a golf course. Besides, there are six telephone exchange set up for communication, apart from one radio station, one television station and many news agencies like Rashtriya Sahara, Times of India, Danik Jagran, Pioneer, National Herald, etc. The parks and playgrounds cover an area of 14672.75 ha (4.08%). Parks and playgrounds are

scattered throughout the metropolis, such as Rama Bai Park, Ambedkar Park, Kanshiram Park, Begham Hazrat Mahal Park, Kunwar Jia Lal Park, Buddha Park, Janeshwar Mishra Park, etc. Other most popular parks are Jhandewala Park, Aminabad Park, Ladies Park, Victoria Park etc. Lucknow Development Authority have developed parks along the bank of Gomati river namely Shahid Park Surjkund Park, Hathi Park and Neebu Park. Important stadiums and playgrounds include K.D. Singh Babu Stadium, Railway Playgrounds etc.

7.6 Cultural / heritage sites

The community based awareness mechanism about health; hygiene and sanitation are well in place in peri-urban areas. The community based health workers such as ASHA and Anaganbadi are working in local community to spread awareness about health, hygiene, family planning, sanitation etc. Furthermore, periodic health camps in the area by NGO's and government healthcare agencies are held, these camps disseminate information, provide cure and medical consultation on arrange of health, hygiene and sanitation issues to the residents of the area.

7.7 Agricultural Mandis

Lucknow has one of the best market facilities in India like Hazrat Ganj, Aminabad, Nakkas etc. Yahiya Ganj is basically copper and brassware market located near Nakkas. Nishat Ganj is one of the best market places in the city. Gole Darwaza is famous for Chikan work for many of the whole sellers and retail sellers are located there and Chowk is the oldest market and famous commercial centre for chikan work. The main markets are located in old city - Aminabad, Chowk, Kaiserbagh, while modern market centres have evolved in new areas such as Hazratganj, Kapoorthala, Gomati Nagar, Alambagh, Indira Nagar etc. The famous Naza computer market is located in Hazrat Ganj, which is the commercial center of the city. Wholesale mandis are located in old part of the city such as Saudhtganj, Doliganj, Pandyaganj, etc. which are very congested. The shop keepers prefer to work in the busiest central markets of Lucknow, inspite of the fact that new places with sufficient space have been allocated for them. The food grain markets are located in Mohillapur and Gosainganj while fruits and vegetable markets are centred at Balaganj, Kaisherbagh, and Jankipuram. Blak Ganj and Bubaggah located in the

western part of the city, are centres of mandi, vegetables, grains, pulses and fruits. Bio-energy gas plant is also located here which is the peripheral zone of the city.

Issues

The roads leading to the Mandis are overcrowded and blocked for hours with heavy vehicles for long hours due to movement of heavy traffic, loading and unloading of goods etc. In addition to these, as they are located nearby residential colonies, hence; air and noise pollution is a regular phenomenon.

7.8 Informal Sector Activities

The city has significant slum population which are more or less uniformly distributed across the city and is marked by low levels of access to basic infrastructure. There are approximately 2 lakh people employed in informal sector, who work on road side, due to which road width is reduced. The peri-urban areas present a hybrid culture encompassing the attributes of both rural and urban cultures and have greater influence of historical and cultural heritage, socio-cultural value system and folk traditions. The U.P. Government has taken up social development programs and schemes such as NREGA, sanitation, Sarva Shikha Abhiyan, Indira Awas Yojana, etc. Although the city has potential economic contributors, such as its heritage and educational institutions, etc. However; lack of infrastructure and business concerns about the regulatory framework have limited the economic base, employment opportunities and service delivery.

8.1 Introduction

Industrialization plays a vital role in the economic development of underdeveloped countries. The industrialisation transfers the labour from agriculture to industrial sectors in an industrial economy, thereby increasing the income of the community. Industrialization contributes to economic growth of city as it provides for increased employment opportunities in small and large-scale industries, whereby people are drawn to the cities, leading to urbanisation. The impact of manufacturing structural change on employment also has a spatial dimension.

8.2 Distribution of Industries

Lucknow is famous for its small scale and handicrafts/ cottage industries specially for luxury and beauty articles like-gold and silver brocades, chickan and embroidery works and Indian perfumery as specialities. However, it failed to attract light and heavy industries. The city's small and medium-scale industrial units are located in the industrial enclaves of Chinhat, Aishbagh, Talkatora, Amausi and Mohanlalganj. Some industries have also been established along Kanpur Road, Sarojini Nagar and interior parts of the city in Nishatganj, Daliganj, Hindnagar, Yahiaganj and Deva Marg. The area under industries increased tremendously from 1987 and 2004-05 due to the inclusion of industrial area in Deva Marg under Lucknow Development Area, which was not included in the development area of Lucknow in 1987.

As per Master Plan of Lucknow, there is proposal to develop wholesale trade and mandis in different parts of the city. As the wholesale trade centres located in the central part of the city are congested and centralised in the core of the city, which needs to be decentralised. The mandis located on Sitapur Road, Hardoi Road and Kanpur Road needs to be strengthened. Apart from these, the sites for mandis are proposed to be strengthened on Faizabad Road, Sultanpur Road, Bakshi ka Talab and Kanpur Road for which provision of 160 ha of land has been made.

8.3 Traditional Trade

Lucknow is famous for embroidery works including chikankari, zari, zardosi, kamdani and gota making (gold lace weaving). As a sign of recognition, in December 2008, the Indian Geographical Indication Registry (GIR) accorded Geographical Indication (GI) status for Chikankari, recognising Lucknow as the exclusive hub for Chikan manufacture. Chikankari is an embroidery work well known all over India. This 400-year-old art in its present form was developed in Lucknow and it remains the only location where the skill is practiced today. The work is done on caps, urtas, saris, scarfs and other vestments. About 2,500 entrepreneurs are engaged in manufacturing chikan for sale in local, national and international markets with Lucknow being the largest exporter of Chikan embroidered garments. Kite making is existing in present form since Nawab period and considered a small-scale industry.

Traditionally, Lucknow has been a Mandi Town for mangoes, melons, and grains grown in the surrounding areas. Sugarcane-growing plantations and sugar industries also exist in close proximity. This attracted Edward Dyer to set up a unit based on molasses in the city. Dyer Breweries was incorporated in 1855 and was Asia's first commercial brewery. The company's name was changed to Mohan Meakin Brewery in 1967.

Lucknow has also been an industrial producer of tobacco products like 'Kivam', edible fragrances like 'attars' and handicrafts such as pottery, earthen toys, silver and gold foil work and bone carving products. Khadi products of Gandhi Ashram are quite popular among local population.

8. 4 Types of Industries

Ranked sixth in a list of ten fastest growing job-creating cities in India according to a study conducted by ASSOCHAM Placement Pattern, Lucknow's economy was formerly based on the tertiary sector and the majority of the workforce was employed in government sector/public sector undertaking.

The Lucknow city is a major market and trading place in northern India and an emerging hub for producers of goods and services. Large-scale industrial establishments are few compared to other northern Indian state capitals like New Delhi. Liberalization has created many more opportunities in the business and service sector and self-employed professionals are burgeoning in the city due to emerging fields of IT, manufacturing and processing and medical/biotechnology.

The major industries in the Lucknow Urban Agglomeration include aeronautics, machine tools, distillery chemicals, furniture and Chikan embroidery, etc. Lucknow is also a major centre for research and development. It is home to the prominent R and D centres of National Milk Grid of National Dairy Development Board, Central Institute of Medical and Aromatic Plants, National Handloom Development Corporation and U.P. Export Corporation. The small scale/Khadi and Village industries include Cottage Industries, Agro Based Industries and Khadi units.

The large Scale Industries/ Public Sector undertakings in the city include Hindustan Aeronautics Limited, Faizabad Road, Lucknow, Scooter India Ltd. (Govt. of India Undertaking), Sarojini Nagar Industrial Estate, Lucknow, Tata Motors Ltd., Deva Road, Chinhat, Lucknow, Eveready Industries, Omax Auto, etc.

Tata Consultancy Services is one of the major companies with its campus in Gomti Nagar, which also is the second-largest such establishment in Uttar Pradesh. HCL Technologies started its training program with 150 participants in April 2016 at HCL Lucknow campus. It is also home to a number of important national and state level headquarters for companies including Sony Corporation and Reliance Retail. The light industrial area of Aishbagh has the precision instrument factory, cycle parts factories, agricultural implements, general engineering factories, electrical, hardware, chemicals, pharmaceutical, etc.

8.5 Business Headquarter

Business-promoting institutions such as Confederation of Indian Industry (CII) and Entrepreneurship Development Institute of India (EDII) have set up their service

centres in the city. The city is the headquarters of institutions like Small Industries Development Bank of India (SIDBI), Pradeshiya Industrial and Investment Corporation of Uttar Pradesh (PICUP) and Regional office of the Uttar Pradesh State Industries Development Corporation (UPSIDC).

8.6 New Business Ventures

Lucknow, with its excellent education, commercial, banking and legal infrastructure, is witnessing rapid growth in information technology; banking, retailing, construction and other service sectors, apart from Commercial property, SEZs, Business centres, Multiplexes, Clubs, Banks, Food courts ,Entertainment centres and Finance institutions.

8.7 Emerging Issues

Some industrial units which were earlier located on the outskirts of the town such as Paper Mill at Nishatganj, Mohan Meakins at Doliganj, etc. have reached in the city due to city's geographical spread. There are many Saw Mills located in Aish Bagh, Rakabganj and Doliganj areas which are densely populated and prone to air and noise pollution in combination with vehicular traffic. This hinders the peaceful life of the inhabitants, necessitating relocation of these industries to other areas.

The city has potential in the handicrafts sector and accounts for 60 percent of total exports from the state. Major export items are marble products, handicrafts, art pieces, gems, jewellery, textiles, electronics, software products, computers, hardware products, apparel, brass products, silk, leather goods, glass items and chemicals.

8.8 Initiatives for Industrial Development

- Ministry of Communications and Information Technology, Govt. of India has set up Software Technology Parks of India (STPI) in 2001. Biotech park is being set up in Lucknow as it one of the cities selected for the Smart City project of STPI. Biotechnology and information technology are the two focus areas to promote economic development in and around the city under this scheme.

- UP government proposed to establish an Information Technology (IT)/ IT Enabled Services (ITeS) Special Economic Zone (SEZ) to boost the technology sector in Lucknow as it is growing as a hub of IT/ITeS. The companies currently operating in this sector include Tata Consultancy Services (TCS) and HCL Technologies, etc.
- A sprawling 100 acres IT city costing Rupees 15 billion is planned by state government at Chak Ganjaria farms site on Sultanpur road. It has already been approved Special Economic Zone status for the project, which is expected to create thousands of job opportunities in the state.
- Lucknow is among one of the eight cities in India that will have textile business clusters, an objective towards which the government has earmarked US\$ 32.88 million (Rs 200 crore).

9.1 Introduction

Clean air is a primary requirement for the healthy survival of humans. As a consequence of rampant and haphazard development, the air, water and soil gets polluted to such levels that the efforts to restore the ecological balance of the region remain unmatched to the magnitude of disturbance occurred. The problems of loss of vegetation and decline in environmental performance index(air pollution, forest, water quality, water management and climate change etc) can be attributed to rampant and haphazard development, population pressure and growing burden on the existing infrastructure. Many environment-development problems of a city is rooted in the way land use planning is done and governed as intended in the Master Plan. The uncontrolled urbanization pushes too hard in the direction of bigger cities with inadequate enabling infrastructure. Urbanization becomes synonymous with frequent land use changes that often have negative impacts on the environment.

The poorly regulated land governance has led to unscientific urban expansions that do not conform to land suitability and the carrying capacity of the city. Industrial areas are being built upon environmental eco-sensitive areas; some residential areas have come up on lakes and ponds. Population growth, growing construction industry, transportation needs and rapid increase in energy consumption are major driving force of air pollution in large cities, especially in mega cities. Air pollutants emitted from vehicles and industries are responsible for rise in irritation, discomfort and increase in airborne diseases, poor air quality and deterioration of heritage buildings of cultural importance in urban areas. Ambient air contains various gases and substances in substantial quantities, which harm the health of humans and animals and damage the plants.

The higher growth of vehicular population especially the personalized modes of vehicles is a matter of concern. As the system is becoming automobile dependent, it has affected not only the environment but also the economic and social aspect of the people which is barrier to sustainable development of cities. Despite increase in fuel efficient

cars, there is increase in substantial oil consumption as well, which is potential threat to the sustainability of cities as well as countries. The parking problem is another area of concern, which is inadequate in the capital city of U.P.

9.2 Air Pollution

The air pollution and the resultant air quality can be attributed to emissions from transportation, industrial and domestic activities. The air quality has been, therefore, an issue of social concern in the backdrop of various developmental activities. As per data released by Central Pollution Control Board (CPCB), during December 2019, Lucknow has experienced worst air quality index (AQI) and remained fourth most polluted city in India. The peak PM2.5 concentration was 485 in Talkatora, 467 in Gomti Nagar, 466 in Lalbagh and 461 micrograms per cubic metre of air in Aliganj. The concentration of PM2.5 in Lucknow was 7-8 times higher than the permissible limit of 60 micrograms/cubic metre, set by the National Ambient Air Quality Standard.

Air pollution is aggravated because of increasing traffic, growing cities, rapid economic development and changes in weather conditions including temperature and humidity.

The main causes of air pollution in Lucknow are given below:

- The increase in deforestation to build parks, malls and highways which has increased the rate of Carbon dioxide in the atmosphere. Thus, rapid urbanization is occurring at the expense of greenery.
- Vehicular emissions and day-by-day increasing private vehicles, trucks, inter city buses, tempos, two wheelers etc. on the roads.
- Unawareness and apathy of the government and public.
- Industries surrounding the city.
- Burning wood for fuel purposes and also garbage emitting poisonous gases.

The level of air pollution in the peri-urban Lucknow has significantly increased in recent times due to increased building construction activity, vehicular emission, concentration of dust particles and other heavy particles in the atmosphere etc. Furthermore, massive deforestation and unmatched levels of afforestation has resulted in lack of concentration of oxygen in the atmosphere.

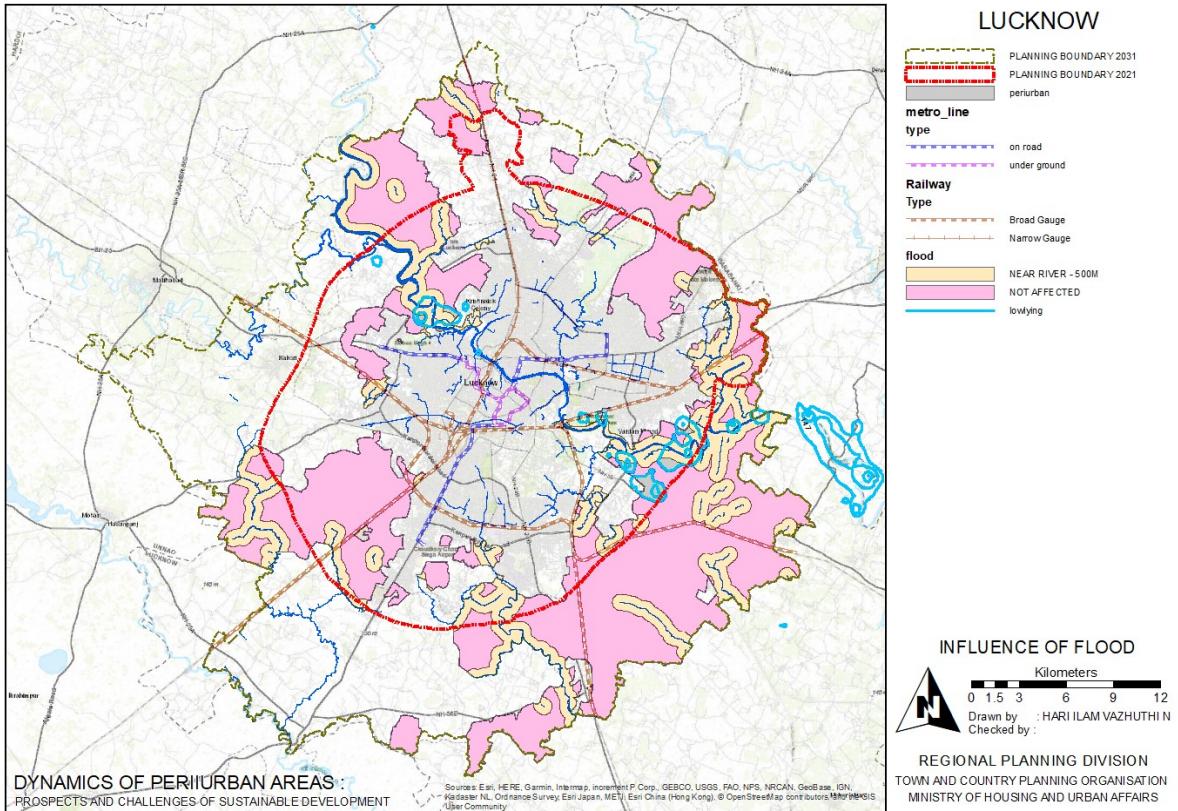
9.2.1 Health hazards of air pollutants: Particulate air pollution is associated with a range of effects on health including effects on the respiratory and cardiovascular systems, asthma and mortality. In addition, constituents of particulate matter, such as acid sulphates, may irritate the upper airway and deep lung, reduce bronchial clearance, and modify the lung's resistance to infection. There is heavy dust load on Lucknow's air. The city is in transition, with a lot of construction activities, metro work, and smoke from brick kilns polluting the air.

9.3 Water Pollution

The rapid growth of urban sprawl has resulted in gradual deterioration of environment. A range of factors are responsible for water pollution in the city includes industrial activities, dense concentration of population and inadequate infrastructure for maintaining fresh sources of water. The pollution levels have been further aggravated by lack of treatment or disposal facilities for solid and liquid wastes. Rapid increase in population coupled with increasing commercial and industrial activity has resulted in rising water pollution in Gomti river and in the ground water sources. Water pollution is also noticeable in the peri-urban area of Lucknow as the quality of ground water used for drinking is alarming.

Pollution of Gomti river is an area of great concern for the residents of the city as it is estimated that 27 drains discharge around 32 million litres of sewerage and household wastes each day into it. The release of industrial effluents along the course of the river has further aggravated the problem and thus water is considered highly unfit for drinking. Increase in population has also led to greater extraction of water from the river and underground aquifers. It is estimated that against a summer demand of 702 MLD of water, the Lucknow Jal Sansthan manages to supply only around 450 MLD (64.10%). The balance demand is met through hand pumps and tube wells. Groundwater levels declined to the extent of 0.5 m to 1.0 m per year in most of the city area due to increased tube well and bore well connections since 2005. Embankments have also interrupted the natural drainage of the city and rainwater, instead of flowing towards the river, inundating the habitations. The dumping of municipal and construction waste on the river banks has also added to the pollution.

Map 9 : Lucknow Influence of Flood



9.4 Riverfront development

The State Government has initiated the project of Riverfront Development spanning to around 17 km with an estimated cost of Rs 1,500 crore during April 2015 to March 2017. It has become a popular recreational spot for its residents. The project has not only obstructed the exchange of water between river and land but also reduced Gomti's capacity to flush out the city's waste. The project has changed hydraulic regimes leading to loss of river processes and ecosystems. The channelization has adversely impacted the river ecology, as Gomti river earlier had eight types of fish habitats but now only two types of habitats can be found in the stretch where riverfront has been developed, which has led to substantial reduction in **fish** catch per unit. This has also affected the livelihoods of the local residents.

Kudiya Ghat, which lies upstream of the riverfront project, has been affected by dredging and construction of an earthen embankment for construction of a new bridge

and laying of embankment walls. All waste stagnates here, though devotees come here to pray and take a dip, what they see is scum all around. The development of this ghat has also reduced the working space for the traditional washers (dhobis) of Lucknow.

9.5 Noise pollution

Noise pollution instantly disturbs an individual's state of physical and mental being. Elevated noise levels have been associated with adverse impact on human health, ranging from minor annoyance to physiological damage. Continuous noise causes an increase in cholesterol level resulting in constriction of blood vessel, cardiac and cardiovascular changes, stress, fatigue, dizziness, lack of concentration etc. The long term effects of sustained exposure to increased noise pollution include serious health conditions which may range from deafness to psychosomatic conditions such as insomnia and frustration etc. This has affected the human existence in the peri-urban region, where alarming level of noise pollution has resulted in several ill effects of noise pollution such as psychosomatic conditions, deafness, insomnia and frustration.

Traffic noise has become a major environmental concern and a source of an ever-increasing level of discomfort particularly in urban areas with high traffic congestion. The sources of noise in the urban settings are primarily vehicular engines; exhaust systems, aerodynamic friction, and tyre-pavement interaction. Traffic noise is affected by factors such as traffic volume and speed, vehicle mix, pavement type, and vehicle conditions. In general, from small vehicles the major part of noise emitted is at the pavement-tyre interface, heavy vehicles emit much of their noise at the engine/exhaust.

The level of noise pollution in silence zones such as hospitals, courts, schools and cantonment in Lucknow is 56 percent higher than the prescribed standard of 50 db. The noise levels are more in residential and commercial areas where main educational institutions, important markets and agricultural mandis are located since long time in the day time whereas during night the noise levels are comparatively less in residential areas except those areas which are very famous markets (Table 29).

Table 29: Noise level dB (A) during Day and Night Time

S.No	Area	Location	Day	Night
1	Residential	Aliganj	73.5	64.1
		Vikas Nagar	71.9	65.8
		Indira Nagar	74.6	71.0
		Gomti Nagar	68.7	61.3
		Hazratganj	76.9	62.8
		Hussainganj	77.7	68.4
2	Commercial	Charbagh	78.9	74.5
		Alambagh	79.5	75.2
		Aminabad	76.9	60.8
3	Industrial	Chowk	73.5	69.5
		Amausi	72.1	68.5
		Talkotra	77.8	70.9

9.6 Vehicular Emissions

Vehicular emissions/Automobile exhaust are significant source of air pollution in the urban area, which directly influences ambient air quality. In recent years, there has been a rapid rise in vehicular density resulting in many urban and environmental problems. The environmental effect of pollutant emissions from motor vehicles include global climate change from green house gases, acidification of soil and surface water, adverse effect on plant and animal species and damage to building structures. Gases emitted from vehicles are carbon monoxide, sulphur dioxides, nitrogen oxide, suspended particulate matters, hydrocarbons, and lead.

Traffic congestion has caused vehicular emissions to increase in transport sector significantly. The air quality in urban area depends on the number of vehicles plying on the road, types of fuel (diesel or gasoline), vehicle speed and, the meteorological condition (wind speed, wind direction, temperature, relative humidity, etc.). The reason for double-digit growth of automobile-population especially the motorcycle and passenger car segments, is that people are gradually becoming attached towards personal modes of transport the cities are becoming automobile dependent. This

automobile dependence creates several environmental problems such as Oil vulnerability, Photochemical smog, High green house gas contribution, increase in the fine and ultra fine particles in the ambient air, urban sprawl etc. Automobiles coupled with D. G. Sets are the other sources of pollution.

9.7 Forestry

Deforestation, coupled with increased industrial activities, vehicular traffic, housing construction etc. has lead to the degradation of environment. The increased activities of men and machines have also lead to an uncomfortable level of pollution. The polluted environment leads to a variety of health hazards for human beings, animals and natural vegetation.

The peri-urban area is facing deforestation problem on a very large scale due to changes in land use pattern, increased industrial activity, transportation activities and migration of people from both urban and rural areas. Adding to this, the increased population density increases demand for fuel which causes massive deforestation.

It was stated by MoEF that if a 50 years old tree is cut its value is 50,000 rupees while if it left standing it will value at Rs 25 lakh. The actual forest cover in Lucknow is about 115 square kilometers i.e. less than 5% of total area of Lucknow (2500 sq km) in 2015. While in 2013-2014 assessment by Envis Centre Uttar Pradesh the forest cover of Lucknow was found to be 321 square kilometers i.e. 12.7% of total geographical area of Lucknow. It has been revealed that to build the Agra-Lucknow Greenfield Express Highways; more than 27,000 trees were axed. There is large scale felling of trees along Raebareli Road to widen the roads and accommodate an increasing number of vehicles.

Lucknow is still a low-density, low-rise city with multi-storeyed construction which is growing rapidly in all directions with a higher rate of growth along Faizabad Road in the Trans-Gomti area. It has a low percentage of area dedicated to roads compared to other similar sized cities leading to traffic congestion.

9.8 Spatial, Environmental and Health Related Issues

Intensification of various developmental activities in earthquake prone areas like rapid urbanization, industrial growth, installation of capital intensive hydel and nuclear power projects etc., have also brought in new challenges. Vulnerability of Uttar Pradesh to Seismic Hazards is very strong. The city lies in Earthquake High Damage Risk Zones III and IV.

Significant numbers of poor people live in slums without access to basic services which are distributed fairly uniformly across the city and peri-urban areas and are dealing with the insurmountable and difficult challenges such as environmental hazards. They are witnessing environmental degradation, pollution, and other problems related to environment such as drainage, availability of drinking water, sanitation and hygiene, etc. Due to environmental degradation, water borne diseases such as jaundice and cholera are increasing whereas pooling of waste water is breeding mosquitoes, resulting in cases of malaria, fyleria and dengue.

The integration of these areas within the larger fabric of the city in a manner that ensures provision of basic services without encouraging further illegal occupation of land and encroachments is a major concern. The urban local governments are already facing problems of delivery of environmental and sanitation services to their city dwellers in the peri-urban areas. There is no proper institutional arrangement for delivery of basic civic services such as drinking water, disposal of waste and waste water, drainage, etc. in the urban villages.

9.9 Disaster Management Plan

Uttar Pradesh is vulnerable to emerging threats of water and climate related disasters and other conflict situations such as floods, cloud burst, heat wave and cold wave, droughts, thunder and lightning. Geological related disasters include earthquakes, dam failures/dam bursts, chemical and industrial disasters, forest fires, urban fires, major building collapse, serial bomb blasts, festival related disasters/stampede, etc.

Disaster is caused due to failure of man-made structures, lack of preparedness and awareness. Components of Mitigation Plan includes the elements like prevention, mitigation and preparedness in pre-disaster phase. The first step towards the direction of disaster preparedness is risk assessment. There is a need to proceed from hazard assessment to vulnerability analysis and ultimately generation of earthquake risk maps/figures.U.P. State Disaster Management Authority aims at developing a safer and disaster resilient state by developing a holistic, pro-active, multi-disaster and technology driven, community based strategy for disaster management through collective efforts of all Government Organizations and Non Government Agencies. UP State Disaster Management Plan 2016-17 has been prepared in pursuant to Section 23 of the National Disaster Management Act, 2005 and as per norms laid down in National Disaster Management Authority guidelines-2007. District Disaster Management Authority Lucknow has prepared a disaster management plan 2017-18 which creates a Disaster Management Strategy and ensure that the local administration, non-governmental organizations and private sector cooperate with the community to train, organize awareness programs and establish disaster management facilities.

9.10 Recommendations for Increasing Green Pollution

Smart City Mission Guidelines which govern the implementation of mission projects in various cities are being considered as a bible by all stakeholders in all the states. In pursuance of these guidelines, the government has adopted a tech-enabled approach, under which various environment sensors shall be deployed across the city, to improve air quality in the city. Environmental sensors have been deployed at Dayanidhan Park, Nishatganj Bridge, Polytechnic Circle and up Dial 100 office on Shahid Park.

- It is recommended that various steps such as restoration of river banks and channel connectivity in a phased manner may be taken up by removal of diaphragm wall and stabilisation of bank vegetation in the long run. Efforts should be made on restoring immediate river corridors such as wetlands and seasonal ditches that can improve base flows to the river.
- A step in controlling pollution needs to be supplemented by effective public participation.
- Public awareness programme for automobile pollution is essential.

- Public mass transport must be strengthened to reduce the use of personal vehicle on the road.
- Encroachments should be removed for smooth flow of traffic.
- Improvement of fuel quality and checking of fuel adulteration.
- Effective measures need to be taken for abatement of noise and air pollution so that the levels do not exceed the prescribed standards.
- Making the use of CNG compulsory for all public vehicles would go a long way to reduce air pollution significantly.
- Solid wastes must be properly handled.
- Key issues dealing with finding ways to provide security of tenure to the urban poor and/or providing alternate land for relocation.
- Immediate measures are needed to check water pollution.

10.1 Lucknow is popular because of its Nawabi Shaan which comprises of breathtaking monuments and edifices which are a product of the city's glorious past. The City of Nawabs is a rich compilation of cultures from around the world and it blends the present day chaos with the calm of a departed time. It plays a very important role in people's lives since it gives them a connection to certain social values, beliefs, traditions, costumes and religions which gives them a feeling of identity with others of similar mindset and backgrounds. The 47 historical, religious and sites of cultural importance have been identified in the city of Lucknow. As development pressure increase in the city more heritage buildings are being re-used.



Photo 4: Saadat Ali Khan Ka Maqbara

Saadat Ali Khan Ka Maqbara is a historical monument with two imposing tombs of Nawab Saadat Ali Khan and his wife Khurshid Zadi, stand near the historical Begum Hazrat Mahal Park . This is perfect picnic destination of tourists with a park surrounding the tomb.

10.2 Dynamic Interaction between Tourism and Cultural Heritage

Tourism continues to be among the foremost vehicles for cultural exchange, providing a personal experience, not only of that which has survived from past, but of the contemporary life and society of others. It is increasingly appreciated as a positive force for natural and cultural heritage conservation. Thus, tourism can capture the economic characteristics of the heritage and utilize these for conservation by generating funding, educating the community and influencing policy. It is an essential part of many national and regional economies and can be an important factor in development, when managed successfully.

Planned promotion of tourism can bring benefits to host communities and provide an important means and motivation for them to care for and maintain their heritage and cultural practices. The participation and understanding between the local and/or indigenous community representatives, conservationists, tourism operators, property owners, policy makers, those preparing national development plans and site managers is necessary to achieve a sustainable tourism industry and enhance the protection of heritage resources for future generations.

10.3 Culture - Lucknow is multicultural and multilingual city. Many of the cultural traits and customs peculiar to this city have become living legends today. The city's



contemporary culture is the result of amalgamation of Hindu and Muslim rulers who ruled the town simultaneously. The credit for this goes to the secular and synergetic traditions of Nawabs of Awadh, who took a keen interest in every walk of life and

Photo 5: Rumi Darwaja (Inner Architecture)

encouraged these traditions to attain a rare degree of sophistication. Modern day Lucknowites are known for their polite and polished way of speaking which is noticed by visitors. It also represents the melting pot of globalization where the legacy of Nawab's

culture continues to be reflected in the traditional vocabulary of Hindi language of the city along with better avenues for modernization present in the city.

Lucknow a multi cultural city is located in Awadh region. It is also popularly known as the city of Nawabs. Courtly manners, beautiful gardens, poetry, music, and fine cuisine patronized by the Persian-loving Shia Nawabs of the city are well known. Under the patron of the Nawabs, the city flourished as a centre of a unique culture known for its exotic cuisine and its very rich language and poetry. From Chowk and Nakhas to Aminabad and Hazratganj, the eighty-odd years preceding 1857 saw the emergence of early modern Lucknow. Governance was the monopoly of Nawabs and Taluqdars, neither entirely modern nor democratic; tends to emerge of new desires and aspiration for new social groups. This formed the emergence of complexity in elements in everyday life in Lucknow. It is known for its rich history and culture – manifest not just in its many magnificent monuments but an intrinsic part of its lifestyle. While the city has archaeological remains dating back to 3000 BC, the first documented reference to Lucknow is from the thirteenth century when Emperor Akbar divided the Mughal Empire into twelve provinces and chose Lucknow as the seat of Government for Awadh - the most prosperous province of the empire.

10.4 Historical Buildings/ Heritage Centers

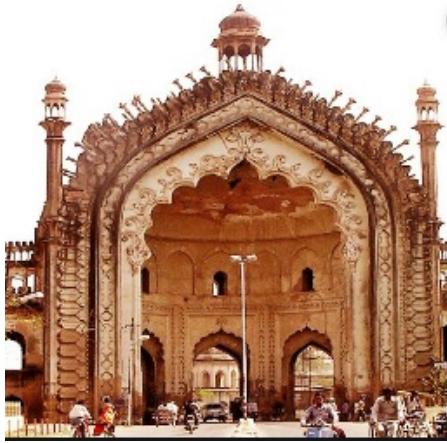
The main tourist attraction centers of Lucknow city are: Bara Imambara, Chota



Imambara, Rumi Darwaza– located on the Northwest of the Bara Imambara and Sikandar Bagh. There are many magnificent monuments symbolising the glorious past of the city, some of them are listed below:

Photo 6: Bara Imambara

a) Bara Imambara: - Nawab Asifudollah built this historic building in 1786, as a famine relief measure to provide employment to the people of the city. The load of the roof is not supported on beams but through an intricate system of arches or the "Bhul Bhuliya". The campus has an imposing mosque on one side and on the other side is a "Babli" or water body connected to the River Gomti.



b) Rumi Gate: - Just adjacent to the Imambara is an imposing gate structure which when seen from the front looks like a gate but in reality is a structure of several storeys. This monument has now become the logo of the city.

c) Imambara: - Beyond Rumi Gate about 30 metres away on the road is located another structure that is famous for its chandeliers and

Photo 7: Rumi Gate

other artefacts. With fountains and a small garden, it is a beautiful structure that attracts tourists.

d) Clock Tower and Picture Gallery: - Located close to the Chota Imambara this structure is adjacent to a picture gallery that is famous for large portraits of the Old Nawabs of Awadh. The novelty of the paintings lies in the fact that they all seem to be looking directly at the viewer from every angle.



e) Kaiserbagh Complex: - This complex depicts the typical architecture of the old Nawabi period and is said to have been the residence of the ladies of the Nawabi harem. The whole area is now declared as a heritage zone and efforts are being made to restore it to its old beautiful surroundings.

Photo 8: Kaiserbagh Complex

f) **Maqbara Asfudoalah:** - This mausoleum is in a beautiful garden that depicts the harmony of Mughal and Hindu architecture.

g) **The Residency:** - This is the British settlement that was established following the annexation of Oudh and was the site of the 1857 Mutiny are maintained by the Archaeological Survey of India.

Lucknow is known for its ghararas. It is a traditional women's outfit that originated from the Nawabs of Awadh. It is a pair of loose trousers with pleats below the knee worn with a kurta (shirt) and a dupatta (veil). It is embroidered with zari and zardozi along withgota (decorative lace on knee area). This dress is made from over 24 metres of fabric, mostly silk, brocade and kamkhwab.

In addition to the buildings listed above, there are entire stretches of the city that have a glorious historical past. These include the 'Chowk' that has the 'rouzas' – replicas of all the Shia shrines in the world; Hazratganj that is in the heart of every resident of the city and is very badly overrun by the growth of the city; La Martiniere with its history; Chhatarmanzil; Dilkhusha – the list goes on.

Parks: - Lucknow was famous for its parks and most of the localities derive their names from parks. Along the southern embankment of the River Gomti there are a number of parks viz. Lakshman Park, Globe Park, Buddha Park, Neebu Park etc. These parks have small water bodies and fountains. Most of these parks have been landscaped and developed in the later years and are places of tourist attraction. There is riverfront development along river Gomti in the city. It is also known for its characteristic cuisine, music, the nature of its residents and its overall ambience – each of these elements together with the more tangible buildings combine to create the heritage experience that is Lucknow.

10.5 Tourism : Key Issues and Challenges

- The well-known monuments are relatively better maintained although the attention seems skewed in favour of the monuments with lesser attention to its surroundings. Most of the heritage sites need maintenance, designated parking places and space for food stalls.

- There are no well maintained hygienic public toilets around the monuments.
- There is lack of proper management at tourism sites like temples, kumbh mela, etc. for tourists, which is overcrowded and results in stampede etc in case of any exigency.
- Deficiency of trained and certified guides for tourists.
- Security of visitors from trespassers like touts, people selling handicraft items etc at the heritage sites.
- There is shortage of tourism infrastructure in the city as it is especially important for long-term tourism growth and the general progress of tourist destinations in providing the required services to tourists. It is also a prerequisite to gain higher tourist numbers as well as tourism receipts.

10.6 Inner City Renewal Challenges

Lucknow, despite of having a glorious past has not been able to showcase itself in the global tourism map. Lucknow was once called by various names like The Constantinople of India, the City of the Nawabs, Shiraz-e-Hind, the Golden City of the East, Choti Kashi. The city still remains undefined, unexplored and mystic. The core area of the city, Chowk offers potential for the enhancement of tourism but has not been explored and the areas are showing signs of rapid mutations which may soon result in losing its heritage value. Some parts of historical and architectural related buildings are being converted into shops, residences and workshops in some areas and irregular and unauthorized activities. These transformations have resulted in rapid change of land use and have deteriorated the face of the town and have changed the built form of original buildings. Thus, these changes are resulting in complete metamorphism in the architectural character, which is a matter for concern.

The old parts of Lucknow city has a number of handicraft ‘factories’ for Zardosi and Chikan work, alongside people from varying socio-economic groups, ranging from wealthy established families to poor people with vulnerable livelihoods. Although a lot of locations need attention but Nadan Mahal and the Ruins of Musa Bagh are the oldest surviving monuments. Most of the monuments and cultural heritage buildings have been encroached upon, defacing its landscape.

- Bada Imambara (residential and commercial) 8 shops and some 6 families reside in the premises. The revenue is collected by Hussainabad Trust.
- Asafi Masjid (residential) Underground cells of the mosque encroached by locals.
- Rauza-e-Kazmain (residential) 30-odd families living inside the premises.
- Shahnajaf Imambara (residential) is occupied by ex-trustees and family members. Primary school is also running at this place.
- Picture Gallery at office of the Hussainabad trust. A school running on the first floor.
- Amjad Ali Shah Tomb-Sibtainabad (residential and commercial) side wings in the premises and first-second gateways allotted by Lucknow Improvement Trust (now LDA) for residential and commercial purpose.
- Kaiserbagh Gate (residential) inhabited by tenants.
- Dargah Hazrat Abbas (residential and commercial) several families residing inside the premises and building portion also houses some shops.
- General Wali Kothi and Office of the Nagrik Suraksha Niyantark
- Other Monuments encroached for residential and commercial purposes
- Cemetery at Kaiserpasand, Qaiserbagh
- Kalan-ki-Lat at Aminabad
- British Cemetery at Sapru Marg
- Two Cemeteries at Lucknow-Faizabad road, miles 4&5.
- Tomb of Janab-e-Aliya, Golaganj
- Jama Masjid, Hussainabad
- Tahsin Ali Masjid
- Neil's Gate
- Karbala Talkatora
- Dianut-Daula Karbala
- Malka Jahan Karbala
- Nasir-ud-din Haider Karbala
- Nagram Mound
- Paharnagar Tikuria Mound
- Sikchawali

10.7 Tourist Infrastructure

Infrastructure is defined as the provision of public safety, transportation services, medical systems, financial systems, education systems, and other services involved in the population, as well as in tourists' demand. The importance of tourism infrastructure is reflected in the fact that it can contribute to increasing the efficiency of production and distribution of tourism services, and, in some cases, such as remote destinations, even increase the supply of tourism services. The development of Infrastructure is a prerequisite to gain higher tourist numbers as well as tourism receipts, and requires the combined effort of the community, tourists and private and public sectors with a regulation and monitoring mechanism in place. Tourism infrastructure is of special importance for long-term tourism growth and the general progress of tourist destinations in providing the required services to tourists.

10.8 Lucknow Tourism

The capital and the largest city of Uttar Pradesh, Lucknow, situated on the banks of river Gomti, welcome the tourists with a heartwarming note of "Muskuraiyein, kyunki aap Lucknow mein hai. A city of kebabs and nawabs, of architecture and history, of literature and culture – that is Lucknow in a nutshell. Known as the 'City of Nawabs', Lucknow has a charm to it that is hard to resist. While the city itself is rich and opulent, the people of Lucknow are known for their courtly manners and endearing 'pehle aap' (you first) culture, which always leaves behind a smile on the faces of its visitors. From a slice of rich colonial history to modernized museums, this artistic hub of Awadh region beautifully brings together the opulence of a glittering past and the simplicity of a modern city. Old Lucknow is well-known for its bustling, vibrant streets, its authentic, mouth-watering kebab and biryani outlets, its lakhnavi chikan market, and its wholesale jewellery stores.

New Lucknow, on the other hand, hosts people of varied cultures and is structurally planned with wide roads, shopping malls and parks built to serve varied entertainment purposes. The most famous among these parks are the Ambedkar Park and the Gomti Riverfront Park, both ideal places for visiting and strolling around with friends and family in the evening. The Marine Drive of Lucknow, situated beside the Ambedkar Park, is a beautiful boulevard devoid of transport, and both locals, as

well as tourists, come here during the mornings and the evenings for casual walk or jog. Hazratganj, a major shopping area located in the heart of the city, is famous for its 'chaat' and 'kulfi' eateries, posh Mughlai restaurants, various shopping complexes and historical buildings, where one can shop for literally anything— starting from inexpensive accessories and trinkets to high-end clothes, shoes and jewellery.

10.9 Future Proposals for intervention

Given the right value for money, people are willing to try out new exotic, distant, ancient or absolutely new locations. So whether at city, state or country level if people from tourism industry just focus on 'PEHLE AAP' courtesy and pertain to changing demands of tourists, the Ancient Indian proverb of VASUDHAIV KUTUMBKUM: world is one home will stand tall and true. It can be concluded that Tourism is not a department to be handled lightly now, in last 4 decades it has become serious business. Bona fide professionals, historians, pilgrims, artisans, cultural intellectuals, artists, globe trotters, students holidaying families, adventure seekers all contribute to its growth. Apart from providing basic infrastructure of travel and accommodation, safety and cleanliness, comfort and luxury are new parameters now. Tourists in this digital age are very well researched and look for value for money.

UP government has adopted tourism policy to attract investment and increase footfalls at various tourism spots. The state government has granted industry status to tourism with the aim is to generate employment as well and also decided to open door to private players to develop tourist spots and provide facilities to the tourists. The focus will be on religious and heritage tourism with fiscal incentives within 20 km radius of all tourist spots and 10 tourism circuits promoted by the state government, including Ramayan circuit, Braj circuit, Buddhist circuit, wildlife and eco-tourism circuit, Bundelkhand circuit, Mahabharata circuit, Shakti Peeth circuit, spiritual circuit, Sufi circuit and Jain circuit. The department has also launched a "Bed and Breakfast" scheme under the new policy.

Under the Smart City Missions of UP Government, along with a thrust on modern technologies, equal emphasis is being given on maintaining the cultural heritage of the various cities. Nurturing the heritage status of Lucknow is the priority for all Smart city

projects being undertaken by the Lucknow administration, under which, many places in Area Based Development (ABD) region are being given a makeover. The work of preserving and utilising the heritage buildings in Chattar Manzil, Roshan Ud Dolah Kothi, Kothi Gulistan-e-eram and Darshan Vilas Kothi and Kaiserbagh area is going on in full swing. It is aimed at transforming the historic city of Lucknow city into a world-class Smart City, along with focusing on developing the city into an International culture and heritage hotspot.”

The other important projects include ongoing development works on an International Culture and Heritage Centre at Chhattar Manzil; a tourist information centre at Sbtainabad Imambara; façade lighting and restoration of Lal Baradari; Archaeological Research and Heritage Centre at Roshan-ud-Daula Kothi; a public library at Kothi Darshan Vilas; Heritage Conservation Institute at Kothi Gulistan-e-eram; a Cultural Club at Rifa-e-Aam Club and restoration of Morris Market near the Qaiserbagh Crossing. Lukcnaw Awadh Walk on Thandi Sadak is being started whereby Awadh Point has been created – which is a centralized recreational space at the Begum Hazrat Mahal Park.

The tourism department, in association with private companies, plans to launch a helicopter service for tourists by October and the department would keep a check on ticket rates. The subsidized service would be a major boost to tourism in the UP capital, by which tourists will be able to see all landmarks in the city from a helicopter in 25 minutes, without worrying about traffic jams and parking problems. They would Lucknow's major tourist attractions include: Imambara, Satkhanda, Roomi Gate, Chattar Manzil, Residency, Ambedkar Memorial, Ikana Staudium, Janeshwar Mishra Park, Lohia Park, Akbari Gate, Dilkusha, Memhmoodabad House gate in Qaiserbagh, Globe Park, Buddha Park, Kudia Ghat, Musabagh, Kakori Shrines, Taikait Rai Ka Talab, Hazratganj, Hanuman Temple at Hanuman Setu among others. The best way to improve the awareness of Cultural Heritage and the ethics of its care is to include it in the Study Curriculum and identify tools that can be developed to help the communities to better understand and conserve their heritage. Heritage education needs to be developed in schools and colleges and through informal education.

ISSUES AND CHALLENGES IN PERI-URBAN AREAS

11

11.1 The cantonment of Lucknow has gradually been engulfed with the radial growth of city. The new housing colonies are being developed in south eastern and eastern part of the city which are connected to newly constructed ring road. The city has witnessed entry of private developers leading to real estate boom. The city has resulted in-migration of people from the surrounding region. Because of high living cost in the city, the inhabitants tend to shift their places of residence to fringe areas of the city. This type of population relocation driven by economic reasons including land speculation have led to people settling in peri-urban areas.

The peri-urban areas are transformed due to in-migration of population and emergence of new activities, as witnessed from changes in land use and occupational patterns, which has resulted in haphazard development and contiguous built structures along the corridor leading to traffic congestion. Peri-urban



problem is not only limited to Lucknow. The other Indian metropolitan cities are facing similar problems throughout the country as well. The existing road patterns in the city have led to its outspread and urban sprawl. In the peripheral area of the city, there are a number of 'rurban centres'.

Photo 9: Traffic Congestion

Due to rapid economic development, the city has expanded in size and structure, becoming increasingly more complex, heterogeneous and irregular in shape. Development has been muddled in peri-urban areas, causing natural degradation of land cover over time and this degradation would continue further if steps are not taken to restrict it. Natural land covers like forest and water bodies are experiencing major deterioration rendering some of the PUI sites as fragile. Each of these impacts is linked

to changes in the extent of urban, agricultural, and forest lands, and (or) transportation, housing and other critical infrastructure systems. This process will continue with time if not checked through proper mitigation and enforce planning measures, which ultimately can adversely impact the quality of life of urban and peri-urban dwellers and will have long-term impacts. Some of the issues and challenges are illustrated at table 30.

Table 30: Pertinent Issues and Challenges in peri - urban areas

Issues	Causes
Uncontrolled growth Unregulated/haphazard development Abysmal services (water, sanitation)	Poor enforcement mechanism, absence of statutory development plans and land monitoring systems
Increase in population density/buildings	Violation of building control norms
Unsafe high-rise built structures, land grabbing	Multiplicity of agencies and non-coordination
Shrinking open spaces Changing land use	Lack of clarity in administrative boundary and areal extent
Forced eviction of unauthorised occupants	Prohibition to apply building bye-laws
Displacement of native population Reduced food grain and vegetable produce; rising food grain prices	Unplanned dispersal of industries and other economic activities from city

Source: Author's own illustration; literature survey.

11.2 Major Issues and Challenges

- There is decline in the quality of living environment especially in the old residential area where commercial activities coexists along with other activities. These areas are extremely crowded as roughly 30% population resides in only 5% area having density of more than 1000 persons per ha. Chaotic traffic conditions and hindrance in smooth vehicular movement are prevalent due to mixed land use and coexistence of administrative/central government offices and retail shops in main commercial centres. Mushrooming of informal sector as unauthorised shops are spread on road pavements which reduce road width and parking and hinder traffic movement on different routes.
- Parking is a very important problem in the busiest residential, commercial and administrative parts of the city.

- Uneven distribution of education and health facilities which are concentrated in central part of the city.
- Mushrooming of educational and coaching institutions in residential areas leading to traffic and noise pollution.
- Encroachment of heritage and cultural areas/historical buildings by shops schools/workshops etc.
- Industrial units which were earlier located in the outskirts, have become closer to the city due to its expansion affecting the already congested residential areas adversely.
- Decline of open spaces as agricultural land is being converted into residential areas and other built up structures.
- Lack of green vegetation and decline in water table has led to extra use of tube well/hand pumps etc.
- Location of old Agriculture Mandis in congested areas has lead to traffic congestion due to loading/unloading by heavy trucks. This has resulted in noise and dust pollution in residential areas.



Photo 10 : A View of Agriculture Mandi

Inadequate planning and governance of peri-urban areas by local governments is resulting in various problems. With rapid increase in urbanisation and scarcity of land, the pressure

on peri-urban areas will grow further. Thus, there is need to prepare India's national policy for planned spatial growth of megacities to ensure the sustainable development of the country's peri-urban areas.

12.1 Development strategies

Peri-urban growth is a process of urbanization where the transition zone is confronted with urban and rural land uses. If this interface is planned and developed in the right direction, it will result in urban-rural continuum, which is desirable and mutually beneficial to both rural and urban areas. Integrated approach adopted by Government, NGO and Public/Private Partnerships, to develop them may increase its sustainable value in an organized manner.

12.2 Peri-urban Planning and Development

The peri-urban areas should be conceived as an area of complementariness, which have both the components viz. opportunities and exclusion. The interdependence between natural resources, agriculture and urban process in peri-urban spaces suggests that complementarities can not exist in isolation. This interdependence creates a climate of competition; for example, antagonisms emerge between poor people's need for housing and general public desire to protect environment features; between the health and sanitation requirements of all residents and the chemical pollutants discharged by industries relocated from cities to the peripheries.

An appraisal of conditions in various peri-urban areas of India reveals a transformation in character and emergence of different kinds of problems due to growth, which affect people's lives and the environment in numerous ways. They are occurring because peri-urban areas have not received proper attention from the administrative agencies, i.e., effective legal mechanisms for planning, management, and governance of peri-urban areas have not been created. Continuous growth of built structures over urban and rural jurisdictions could be an important reason for lack of ownership of peri-urban areas by rural and urban administration. The other major area of concern is the inability of the rural/urban governments to deal with the changing circumstances in peri-urban areas. The absence of laws, rules and mechanisms also creates difficulties for the local and regional authorities to control wrongdoings.

Preparation, implementation, monitoring and revision of spatial and physical plans is unable to keep a pace with the debilitating and unsustainable growth and the resulting chaos is inflicting huge hidden costs to social and economic transformation. The swelling of urban poor and conversion of good agricultural land for urban uses, rehabilitation of displaced farmers, conversion and development of land for malls, SEZs etc. are challenges for planners. Environmental degradation in peri-urban areas may threaten the sustainability of cities in respect of depletion of resources, health and essential life support systems. Hence, spatial planning approach is required to formulate legislation to ensure healthy spatial growth of peri-urban areas and to prevent mushrooming of slums.

12.3 Urban Planning in Uttar Pradesh

To formulate policy that promotes economic growth and sustainable urban development while minimising environmental impacts, decision-makers and planners must understand the factors that drive urban expansion. In Uttar Pradesh, the whole process of plan making is strictly regulated by legal framework, indirectly fulfilling the constitutional as well as social obligations and there is no mention of goals. This may be due to the lack of motivation from the decision makers and insufficient infrastructure to produce more comprehensive plans. After preparation of the plan, public opinion is sought. Draft Master Plan is prepared even though alternatives are worked out at individual proposal or policy level, the plan is considered to be an optimum one. There is no technical evaluation of the proposed draft master plan, after the plan has been prepared. It is modified as per the objections/suggestions by the public and then it is sent for government's approval. No periodic review or monitoring of the plan is carried out after it becomes operational. Therefore, it is very rigid and can't be modified in mid of plan period.

DEVELOPMENT STRATEGIES AND RECOMMENDATIONS

13

13.1 Development strategies

Peri-urban growth is a process of urbanization where the transition zone is confronted with urban and rural land uses. If this interface is planned and developed in the right direction, it will result in urban-rural continuum, which is desirable and mutually beneficial to both rural and urban areas. Integrated approach adopted by Government, NGO and Public Private Partnerships, to develop them may increase its sustainable value in an organized manner.

Peri-urban problem is not only limited to Lucknow, but other Indian metropolitan cities are facing similar problems throughout the country. The existing road patterns in the city have led to its outspread and urban sprawl (an unfortunate type of advancement) around these roads. Urban growth boundaries, one antidote to sprawl, have been defined as a line drawn around a city at a distance sufficient to accommodate expected urban growth. Beyond the boundary, urban development is prohibited.

It is observed that due to rapid economic development, the city has expanded in size and structure, becoming increasingly more complex, heterogeneous and irregular in shape. Development has been muddled in peri-urban areas, causing natural and rural land cover to degrade over time and the trend suggests more such degradation in coming years. The land developers tend to be disconnected from the realities of resource limitations and largely inattentive to the long-term impacts of land use modifications. Natural land covers like forests and water bodies are experiencing major deterioration rendering some of the peri- urban areas as fragile. Each of these impacts is linked to changes in the extent of urban, agricultural, and forest lands, and (or) transportation, housing and other critical infrastructure systems.

Although urban sprawl cannot be stopped in a rapidly developing city, a remedy for this problem lies in strict zoning regulations based on land suitability and its carrying capacity, which allow land use to be channelled toward more sustainable

outcomes. The pace of urbanization will grow up in the future, a significant amount of recoverable land cover presently under transformation can be restored and focus of development can be shifted on underutilized areas within the city development boundary. The older urban areas with dense horizontal urbanization can be considered for urban redevelopment using vertical urbanization methods. Primarily, unplanned and unfocussed urbanization, not considering the suitability of land cover or its environmental impacts/aesthetics should be discouraged in order to promote healthy and liveable cities. Results from urban growth models can be used by land use planners and policy makers to anticipate and plan for future spatial expansion to ensure growth along the lines of city development plans and enabling infrastructure.

New settlements in urban fringe have generated additional travel demand which has been persistently increasing in the city over the past decades. In order to have a control over the urban sprawl, the outer ring road outside the municipal boundary needs to be developed which will counter the traffic issues. As transport planning is major component of urban planning studies, therefore, comprehensive mobility plan needs to be formulated in consonance with Master Plan/Development Plan. Thus, urban development of transportation should go hand in hand to reduce the traffic problem.

There are different strategies to fight sprawl which are as follows:

- Urban sprawl can be controlled by making land use plans at the national, regional and metropolitan levels such as zoning land use policies, transportation etc.
- Transit-oriented development (TOD) aims to design liveable communities that are centred on high volume corridors. The stations within train/metro systems are prominent places of city which are easy to access by walk. It provides maximum access to public transport and reduces dependence on car.
- Create walking neighbourhoods by providing a variety of transportation choices.
- Make development decisions predictable, fair and cost-effective.
- Smart growth based on rehabilitation of existing land-use/ mixed land uses to make it more sensitive and flexible, to address issues such as lack of housing diversity, traffic congestion, environment pollution etc.

- Create housing opportunities for different household types, family size and incomes.

13.2 Recommendations

- Privatization of urban services is an option to improve service levels in peri-urban areas and attract private capital and management skills in provision and maintenance of urban services. However, the local government staff and officials will need to be trained properly for institutional arrangement for delivery of urban services by private sector.
- Innovative strategies are required to be developed by the local bodies to finance peri-urban infrastructure and services. The existing funds available from plan allocation, institutional finance and other sources could be supplemented by private sector as also through accessing the capital market.
- Public Private Partnerships should be promoted in peri-urban areas especially in projects with e-governance, water supply, sanitation, solid waste management etc. Private sector participation should be encouraged. Unbundling of services may improve efficiency of urban local bodies. The regulatory role of urban local bodies should be given to them while other functions may be given to private sector. Private sector may also be encouraged for participation in urban infrastructure projects.
- Government may conduct functional review of service providing agencies in order to examine road blocks in delivery of urban services and improving the coverage and quality of services in peri-urban areas.
- Better coordination mechanism should be created to foster inter agency collaboration for effective implementation of urban reforms and delivery of services as well as implementing of urban infrastructure projects in peri-urban areas.

- Urban local bodies in peri-urban should limit its role to regulation of services, however; private sector participation may be taken for monitoring, direction, auditing and performance evolution of services by Urban Local Bodies.
- Public utilities need to reinvent rather than just reform. A new governance structure for urban services sector needs to be evolved.
- Community participation in delivery of urban services may be augmented through strengthening NGO's, local bodies, public associations and SHG's. However, orientation and training will be required for creating awareness and sensitizing representatives of these associations and organizations.
- Experiences of best practices in the field of water supply, rainwater harvesting, water resources management, solid waste management, sewerage, drainage etc. should be documented and also used in planning and implementation of urban infrastructure projects in peri-urban areas.
- Ground water depletion can be checked by under taking rain water harvesting in all the urban centres. Specific programs, schemes should be initiated for aquifer recharge. These schemes and programs should be based on decentralized approaches of water resources management and water harvesting.
- All the urban local bodies should be made compulsory to impose user charges for urban basic services such as water supply, drainage, solid waste management, parking, street sweeping, sewerage etc. However, the quality of service has to be improved in order to augment financial resources though imposing user charges. Improving cost recovery should be linked with grants or fiscal transfers. Financial incentives may also be given to urban local bodies showing improved cost recovery.
- The urban local bodies are also supported to develop best practices and procedures in areas of accounting, auditing, procurement, tariff rationalization,

customer consultation, and integrating service to disadvantaged groups with maintenance of service delivery.

- The state government should facilitate urban local bodies for preparation of City Development Plan, Detailed Project Reports in peri-urban areas as well as their timely approval in order to avail the benefits of central and state schemes/projects.
- All the properties and holdings in peri-urban areas should be brought into the tax net of urban local bodies. This may be ensured through application of GIS and regular enumeration of houses may be ensured.
- Suitable financing systems with a view to strengthening the basic foundation for peri-urban areas productivity and economic growth be adopted for undertaking sustainable growth of urban infrastructural facilities.
- It is imperative to create an enabling legal institutional framework in peri-urban areas for the planning, financing, management and regulation of urban development with the objectives of sustainable augmentation of housing, infrastructure and urban services to the people ensuring the sustainable urban development.

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