INTRODUCTION

Urban India is in the midst of transformation. In an era of economic reforms, liberalization, and globalization, towns and cities are growing very fast. It has been estimated that by 2025, more than 50 per cent of India’s population will live in towns and cities. The cities of India need to be prepared for playing an important role for hosting rapid growth and providing basic infrastructural facilities for an inclusive society, for this propose not only improvement in infrastructural facilities is needed. The following will have a direct bearing on urban development:

i) a socio-economic environment should be created for innovation and investment,

ii) effective delivery of public services of specified standards should be assured for all the people including the poor for whom it should be affordable and accessible

This would require more public financial resources and more public goods, bringing delivery of services to attain standard norms for all, greater willingness on the part of citizens and businesses to pay taxes and user charges for services, and a process of complementary urban-rural development.

India has been slow to urbanize. About 30 per cent of India’s population in 2010 conservatively classified as ‘urban’. This is much lower in comparison to other developing countries, e.g. 45 per cent in China, 54 per cent in Indonesia, 78 per cent in Mexico, and 87 per cent in Brazil. All these countries have much higher per capita income, but there are differences in definition of ‘urban’ characteristics.

Urban population in India formed 10 per cent of total population in 1911, moderately increased to 14 per cent up to 1941. The share of urban population in 1991 was 25.7 per cent, which increased to 27.8 per cent in 2001 (Census 2001). With the industrial development and opportunities for employment in towns and cities migration of people from rural to urban areas has taken place at a very fast rate.

The process of urbanization is directly associated with the socio-economic development. In fact, any shift of population from rural to urban area is an important indicator of development. Development of urban area depends on the provision of infrastructure facilities and amenities which draws migrants even from far off areas.
The term infrastructure has been defined as the physical framework of facilities in which goods and services are provided to people. Availability of adequate infrastructure facilities is of utmost importance for socio-economic and cultural development of a country. The infrastructure sector can be divided into two distinct categories as:

i) Social infrastructural facilities: human development and social security, poverty and poverty alleviation programmes, health care and family welfare programmes, education and training, labour employment and welfare, and women empowerment.

ii) Economic infrastructural facilities: Energy, transport, telecommunication, water supply, sewage, drainage and roads,

Infrastructural facilities contribute to economic growth by increasing economic productivity and providing amenities to bring improvements in social well-being. The concept of development does not include only economic attainments but also the social well-being, which is measured in terms of social equality. It is not only the capital which social groups require for better living conditions, but there are host of factors and dimensions which determine overall quality of life. Among these determinants infrastructural facilities are most important and essential for the social well-being. An increased urban growth has led the creation of complex problems like inadequacy in basic urban services. About 21 per cent of urban population in India is living in squatter –settlements, where the access to basic services is very poor and of substandard nature. Nearly 80 per cent of population living in urban areas although has an access to safe drinking water, but there are severe deficiencies with regard to its equitable distribution. About 46 per cent of households are seen inflicted with water overflow toilets, and only 36 per cent are connected with public sewerage system. Almost half of the solid waste generated in towns and cities remains uncollected. Number of roads in towns are inadequate to carry the growing traffic flow, where on them is seen frequent traffic congestion. Inadequacy of minimum basic services in urban areas have resulted in deterioration of quality of life. The present infrastructure facilities could not keep pace with the rate of urbanization. The Urban Local Bodies (ULB) and Municipal Corporations (MC) are primarily responsible for providing minimum basic services to the urban dwellers. The ULBs/MC in many respects are unable to cope up with
increasing demand of quality urban services in towns and cities due to lack of funds. From time to time Government of India provide central assistance through a number of centrally sponsored schemes like Accelerated Urban Water Supply Programme, Low Cost Sanitation Programme, and Mega City Scheme.

Many cities in India are generally characterized with the problems of bad quality of roads, problems of sanitation, inappropriate solid waste management, inequality and poor access to health and education, and socio-economic deprivations. There are incidences of negligence in governance and even more significant is the ignorance of people about the basic services leading to intra-city disparities.

Geographer’s perception of development is not confined to the limits of either social or economic development. An overall development refers to an integrated development of an area to cover economic progress, social advancement, political development and environmental preservation. For proper planning of an urban area, infrastructural development assumes a greater significance.

Though some improvements have been brought in recent years, still the infrastructure sector is less developed and needs more attention. There are two major problems related to this. Firstly, there is not only inadequacy in infrastructure but it is of poor quality. Secondly, there has been a huge gap between demand and supply of a number of facilities. It is important to find out problems and causes of disparities in the development of infrastructural facilities and social well-being in Aligarh city for the effective planning.

The Thirteenth Central Finance Commission and the Ministry of Urban Development, Government of India have framed a number of norms and standards with regard to providing urban infrastructure services (Table 1). They have adopted certain principles for upholding same standards for all citizens of a town/city without making any distinction among the affluent, urban poor, and slum dwellers.
Table 1. Norms and Standards of Urban Infrastructure in India

<table>
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<tr>
<th>SUMMARY OF URBAN SERVICES</th>
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| **Water Supply** | • 100 per cent individual piped water supply for all households including informal settlements for all cities.  
• Continuity of supply: 24x7 water supply for all cities.  
• Per capita consumption norm: 135 lpcd for all cities. |
| **Sewerage** | Underground sewerage system for all cities and 100 per cent collection and treatment of waste water |
| **Solid Waste** | 100 per cent of solid waste collected, transported, and treated for all cities as per Municipal Solid Waste 2000 Rules |

<table>
<thead>
<tr>
<th><strong>Urban Roads</strong></th>
<th><strong>City Size Class</strong></th>
<th><strong>Area under Roads (per cent)</strong></th>
<th><strong>Road Density (km per sq. km)</strong></th>
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<tbody>
<tr>
<td><strong>Class IA</strong></td>
<td>11</td>
<td>12.25</td>
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<tr>
<td><strong>Class IB</strong></td>
<td>11</td>
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<tr>
<td><strong>Class IC</strong></td>
<td>11</td>
<td>12.25</td>
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<tr>
<td><strong>Class II-IV+</strong></td>
<td>7</td>
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| **Storm Water Drains** | Drain network covering 100 per cent road length on both sides of the road for all cities. |
| **Urban Transport** | Rail-based and road-based mass rapid transit system (MRTS) for Class IA and IB cities and city bus service for other city classes. |
| **Traffic Support Infrastructure** | Intelligent transport systems and area traffic control  
Vehicular and pedestrian underpasses  
Parking systems  
Terminals  
Depots  
For Class IA cities  
For Class I cities  
For Class I cities  
For Class I and II cities  
For Class I, II, and III cities |

| **Street Lighting** | • Illuminance: 35 Lux (35 lumens per sq. km) for all road categories in all cities.  
• Spacing between street lights: 40 m for major roads, 45 m for collector roads, and 50 m for access road spaces. |

*Source: MoUD, Government of India (2008b and 2009a) and CFC Committee estimates*

Social well-being of people within the city depends on protection of environment. Fast deterioration in environmental and ecological balance in urban areas
has become a matter of great concern. Population, urbanization and industrialization are the main causes of these imbalances. Both sanitation and solid waste management are vital for protecting the environment, health and quality of life of people.

There is a pressing need to undertake an in-depth study and evolve a strategy that can address the problems in terms of stipulation of infrastructural services. Large investments on buildings as a part of urban infrastructure, roads, rails, power, sanitation, sewerages and telecommunications are required to accelerate the growth of economy and upliftment of social welfare of people.

Main aim of the present research is to take an stock of the provisions of infrastructural services and their impact on social wellbeing of people of Aligarh city in spatial perspectives. It has been attempted to make a comparative assessment of level of infrastructural facilities in different wards of Aligarh city.

Aligarh city is visibly deficient in the quality of infrastructural services to the existing population. Considering the current service level, it is too low to relative needs of urban households. They are also low relative to what will be required to sustain the economic productivity in the city. The pattern of use of urban services has changed significantly over time as a result of increase in income and technological advances. Rising aspirations in a rapidly growing economy also call for a new look at the norms for public service delivery systems.

Disparities in the provision of infrastructural services have created pockets of deprivation and satisfaction within the city. Another aspect of is to examine the mismanagement of urban planning. Assessment of level of infrastructural facilities helps understand the nature and quality of life of the people in different parts of the city.

The Study Area

Aligarh is a medium size city, which spreads over an area of 36.70 sq km and forms a part of the Ganga–Yamuna Doab of the state of Uttar Pradesh (U.P.) (Fig.1). It is located in between 27.53’N latitude and 78.04’ longitude, and lies at a distance of 130 km southeast from New Delhi. Out of the total built up area of the city, 49.1 per cent is used for residential purposes, 28.1 per cent under roads, 9.4 per cent for industrial and commercial purposes, 7 per cent for public utility, 2.1 per cent under parks and
Location Map of Aligarh City

Source: Municipal Corporation (Nagar Nigam), Aligarh

Fig. 1
open spaces, and a fraction of 0.4 per cent for recreational purposes. The city contains a population of little over 0.7 million. For administrative purposes the Municipal Corporation of Aligarh has divided the city into 70 municipal wards. (Fig. 1).

**Objectives of the Study**

The research work presented in the thesis has the following objectives:

1. To examine the distribution of present infrastructural facilities like roads, sanitation, sewers, solid waste management, installed street lights, health care, and education facilities in different localities of 70 respective wards of Aligarh city.

2. To examine the role of Municipal Corporation in providing civic amenities in different parts of the city.

3. To examine the provision of infrastructural facilities and disparities in different wards of the city.

4. To examine the social characteristics of population like, literacy rate, employment status, and income levels of selected households in wards to ascertain their social status.

5. To compare and contrast the social status of households on the basis of selected indicators as: literacy, employment, income, housing conditions and luxury goods in possession of households in wards of the city, and

7. To establish a relationship between an overall infrastructural development and social well-being of households in the city.

**Data Base and Methodology**

Statistical information pertaining to infrastructural facilities and social well-being for the city were collected from primary and secondary sources. The study is mainly based on primary source of data, which were collected through a questionnaire-based field surveys. Two types of surveys were carried out during the period which extended from the months of December 2009 to April 2010.

i) **City survey:** Initially all of 70 wards of Aligarh city were visited for the reconnaissance survey for overall assessment of infrastructural facilities, like roads, drains, solid waste, health care and educational facilities, and
ii) **Wardwise Household Survey**: At least 30 households from each ward of the city were selected for taking a detailed information from individuals of the households, and it was further attempted to evaluate the status of social well-being of the households.

Secondary information were obtained from the concerned government offices located in the city itself, and a number of official publication of records consulted are as under:

- *Sankhyaki Patrika* (Hindi), (Various issues for the period of 1971 to 2009), District Statistical Office, Yojana Bhawan, Aligarh.
- *Office of the National Informatics Centre (NIC)*, District Collectorate Road, Aligarh.
- *Office of the Aligarh Municipal Corporation* (Nagar Nigam), Aligarh
- *Office of the Aligarh Development Authority* (ADA), Aligarh.
- *Office of the District Urban Development Authority* (DUDA), Aligarh.
- *Office of the Chief Medical Officer* (CMO), Aligarh
- *Office of the Basic Shiksha Adhikari* (BSA), Aligarh

For conducting household surveys, stratified random sampling method was adopted and income of households was taken as one of the main criteria. At least 30 households were selected from each ward who belonged to a certain income group. A total of 2100 sampled households were contacted in the entire study. The questionnaire prepared for conducting survey and obtaining information is given in (Appendix 3).

In order to examine disparities in the levels of infrastructural facilities and social well-being development in wards of the city some variables were considered and analyzed by using Z-score technique, and indices for comparison of an overall infrastructural development and social well-being development were computed. Z-score technique measures the departure of individual observations expressed in the form of an equation:
\[ Z_i = (X_i - X) / \alpha \]

Values of Z-score are added up and averaged to compute the composite mean Z-score, that will indicate an index of development. This can be expressed as:

\[ CS = \sum Z_{ij} / N \]

Simple percentages from data were obtained to show disparities among households and wards with respect to social well-being to draw a picture of social structure of the city, with reference to literacy, employment, occupational status, and monthly income and per capita income of the households.

An attempt has also been made to establish a relationship between some selected dependent and some independent variables related to infrastructural development and social well-being in the wards of the city, and by plotting the linear regression values on a graph. Results plotted on graph show a significant positive correlation among the variables considered.

Cartographic presentation of graphs, diagrams, and preparation of choropleth maps accompanying the thesis were drawn by using GIS software Arc view 3.2 version.