

Evaluating the Planning Strategies for Urban Land Use: A Study on Bengaluru City, India

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Abstract

Urbanization process emerges out of nonurban areas where the urban centres are created; basic services reach the villages and rural fringes. Here the land and inhabitants become urban and urbanization is well measured and expressed chiefly in terms of population, as more and more of the landscape becomes townscape, and people come to live in an environment, that is both physically and socially urban. Bengaluru, once called the Pensioners' Paradise, where land was cheaper, and so where the fruits and vegetables. The British setup a cantonment and built beautiful villas to live in the comfort of the Garden City. As the city expanded with the blooming software industries and off shoring activities, it soon captured a firm position in the global map thus enhancing the process of urbanization. The challenge in this context, Bengaluru faces is to restore its livability while accommodating the over spilling population and their rising demand for housing, water supply, sewerage and transport facilities. Once a multisectoral land use, Bengaluru now possesses a concentric land use pattern which however maintains itself towards east and north thus projecting new suburb areas.

Keywords: urban renewal, metropolitan cities, fringe areas, urban agglomeration, central business district, offshore

1. Introduction

Regional Planning involves the physical, economic and social planning of development within regions and sub-regions and has more of land use content (Glasson, 1974). As the rapid and vigorous growth of the urbanized population in developing countries acquires noticeable proportion, the study of urban settlements and its relation to social activities attracts greater scope of analysis for the planners, researchers and governments in general. Following Misra R. P. it can be stated that overconcentration of population in large cities, and the attendant problems in relation to housing, infrastructures and social services, have led many scholars to claim that there is an increasing "trend of over urbanization" in these countries when seen in relation to their levels of economic development. This paper analyses various strategies adopted in one of the new Metropolitan Cities of India; Bengaluru with special emphasis on its changing urban land use. A radial pattern of urban land use and growing transport linkages surrounding it once again establishes the requirement and maintenance of balanced urban characteristics, exclusively coherent to Bengaluru Urban Agglomeration. A rapid urbanization though ensures enhanced availabilities of high quality housing in preferred locations close to countryside or urban fringes but also suffers from rapid loss of green peripheries and their rural inhabitants while 'swallowing up' of villages with sound economic segregation very much prevalent. Migration into the cities of developing economies had in the past been a phenomenon exclusively of rural to urban movements. In Bengaluru, 58% of migrants to the city generally migrate from other urban areas (Badcock Blair: Making Sense of Cities-A Geographical Survey: 2002) that pose a challenge to the city planners in the context of housing and liveability factors. Arther T. Row identified the goals of urban planning while preparing the Comprehensive Plan for Philadelphia in the United States. He considered better transport, better housing, more useful open spaces, more employment, lubrication of the difficult problems of the city. Such concepts can be well implemented in Bengaluru as well given its immense growth potentialities.

2. Area of Study

2.1 Bengaluru: Its Changing Face

Bengaluru, the capital of Karnataka, is the fifth largest metropolitan city in the country in terms of population. It is situated in the south-east of Karnataka, at an average elevation of 920 metres above mean sea level, and is positioned at 12°97'N, 77°56'E. The Bengaluru Metropolitan Region borders with Kolar district in the north-east, Tumkur district in the northwest, Mandya district in the southwest, Chamarajanagar district in the south of Karnataka itself and the neighbouring state of Tamilnadu in the south east. The government of India selects Bengaluru, a new metropolis, as a category A city, for assistance under Jawaharlal Nehru Urban Renewal Mission as a test example. The city in the recent past has been a favoured destination for most high technology industries and has consequently witnessed a significant in-migration. The city development plan exclusively deals with guided and systematic growth of the city, citizen's participation in decision making, reform in governance leading to a well-managed society and clear goals of making Bengaluru a sustainable city. However, rapid in-migration of population from the other parts of the Indian states and Karnataka itself has posed immense challenges on the city's overall carrying capacity as far as land use, transport and other basic amenities are concerned. Holistically it witnesses a noticeable change in its once existing land use that was much of sectoral to a radial well-established land-use pattern. The growth in recent times inclines eastward owing to the availability of open spaces and towards north chiefly due to the coming up of the new International Airport. This study enhances changing land use in the backdrop of urban morphology model (Burgess, 1925) that re-establishes itself with further planning in Bengaluru.

2.2 Bengaluru's Evolution: A Chronological Tour

History of Bengaluru dates back to the Middle Stone Age, when stone implements were found near Jalahalli, Sudasandra, Siddhapura, Jadigenhalli that today demarcates the outskirts of Bengaluru (Census of India: Karnataka, 2001). Merely a village during the Chola Empire in 850 AD, the city of today emerged to be a chief centre of trade in 1537 under Vijayanagara Empire. Later in 1759 Hyder Ali received Bengaluru as Jagir who fortified it and gave it the status of an Army Town. Under direct British rule in the year 1831, Bengaluru became their Administrative Headquarter of the Mysore State. The Town then fast evolved as centre of cultural activities with The Century Club, Race Club coming into existence along with the foundation of Theological College and Society. After Independence, Bengaluru Municipal Corporation came into being in 1949 with the perfect merging of the City proper, civil and Military Centres. Eventually in the latter half of 20th Century Bengaluru became the preferred location for software and hardware industries giving it rightly the status of Silicon Valley of India.

3. Method

As far as materials and methodologies are concerned this study adopts a much more visual approach in spatial parameters that includes changing land use of the new Metropolitan City from what it was just few years after Independence (1951) and what is at present. A rising population and fast urbanization induces the city once adored by Tipu Sultan to expand radially in all directions to accommodate the former. Land Use of Bengaluru was much haphazard in the beginning with sectors of services growing here and there, but later it took a concentric shape along the centripetal transport linkages. Land requires various uses that do evolve through the years that have spatio-temporally accounted for in this paper. Also, the study confirms the change of Bengaluru's position in regard to population in 1881 and 2001-11. Besides several recommendations are suggested while analysing the policies. However, alongside the well documented spatial dispersal of economic activity, planners are seeing the growth of Bengaluru in new forms of decentralization.

4. Findings

4.1 Population in Bengaluru: An Increasing Trend

The growth of Bengaluru Urban Agglomeration during the last 140 years that is from 1871 has been phenomenal. It has been noted that the population of Bengaluru which was about 1.44 lakhs in 1871 has been 57 lakhs in 2001 and 85 lakh population in 2011 (Source: Census of India). The reason for this increase is due to urbanization of rural units around the city that owes much to incorporation of the surroundings in continuous bands with rapid industrialization and employment opportunities. The population growth slightly declined in the decades 1891-1901 which may be due to plague and partly to the absence of troops in 1901 owing to their deployment in South Africa and China. But overall the city recorded a growing population trend that has been a serious concern for the city planners while planning to reduce congestion through de-congestion methods. In the year 1881, Bengaluru exhibited ninth rank with 1.55 lakh population (Figure 1a). However, the two consecutive Census

years (2001 & 2011) reveal that Bengaluru occupies fifth position as far as Indian Agglomerations are concerned (Figure 1b). This owes much to the in-migration of population from other places of India in search of better employment opportunities.

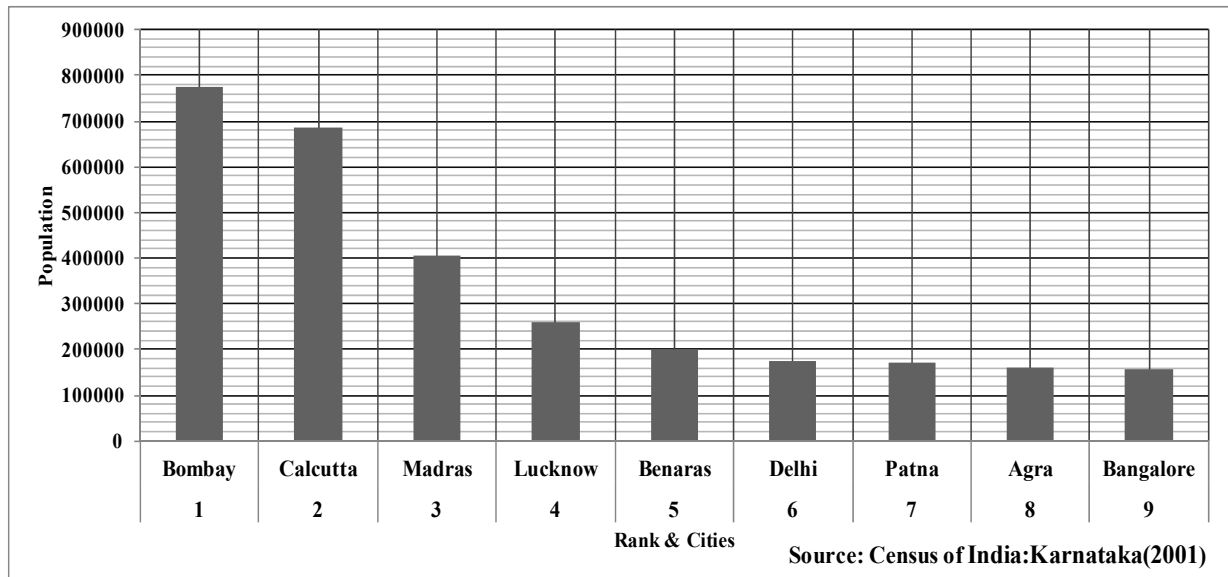


Figure 1a. Distribution of population in Bengaluru and other cities of India (1881)

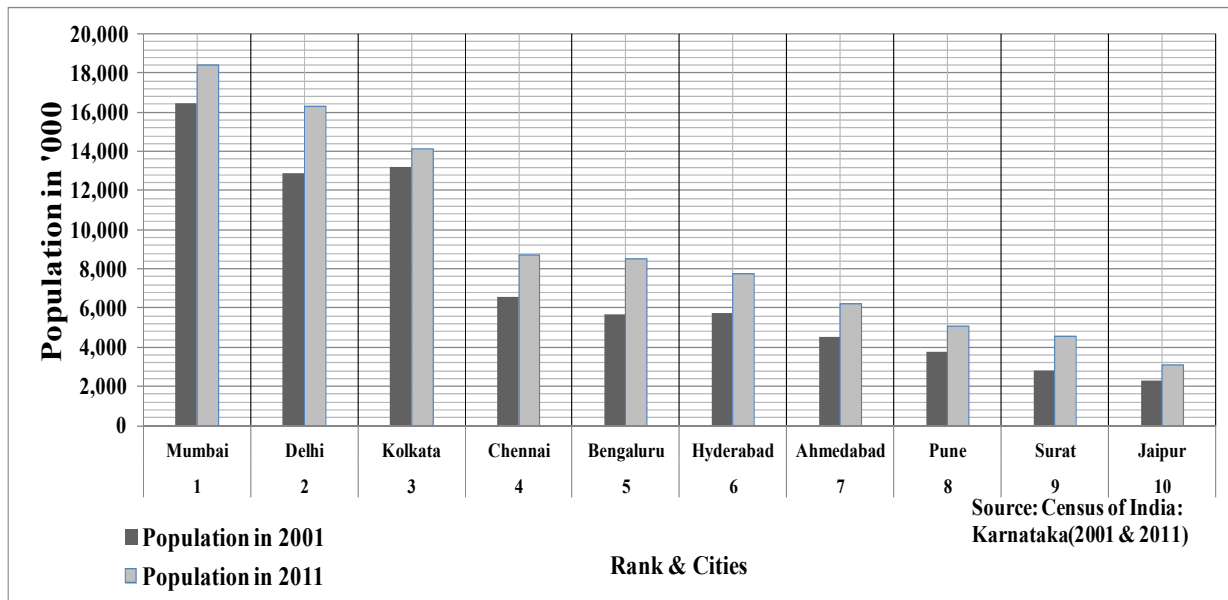


Figure 1b. Distribution of urban population in selected million plus cities of India (2001 & 2011)

4.2 Land Use of Bengaluru: It's Evolution through Ages

Back in 1537, the city Bengaluru consisted of two major parts, the city proper on the western side and the cantonment on the eastern side. The western part was formed by Kempegowda I and the eastern side included the civil and military stations which were established by the British at the beginning of the 19th century when they moved the troops to Bengaluru (which were initially garrisoned at Srirangapatna near Mysore). By 1807, some of the British regiments occupied the barracks which were built near Ulsoor village and people from nearby places settled in Bengaluru for trade and other employment opportunities. With the passage of time, these two separate parts of Bengaluru were assimilated together in the year 1949 to form City Corporation. In 1949,

Bengaluru included 7 wards then called divisions which subsequently enhanced to 50 divisions. Later in the Census years 1971 and 1981, number of wards were increased to 63 and in 1991 it was 87, and for the last two Censuses (2001 & 2011) Bengaluru consists of 100 wards or divisions under Bengaluru Municipal Corporation.

Bengaluru in 1951 however exhibited a land use which was much more sectoral than planned. The central business district area was not a single area but rather scattered at various places near the core. Agricultural zones marked the western and especially in the eastern segment of the city land use. Also towards west, near the Tumkur road the land use included open spaces. Towards east and south west were marked regions for the middle class retired citizens for which Bengaluru was once known as Pensioner’s Paradise. Few were the areas coming under the factory uses in the west. This gives the impression that Bengaluru grew unplanned post-independence that took a much planned and rapid concentration around the core (Figure 2).

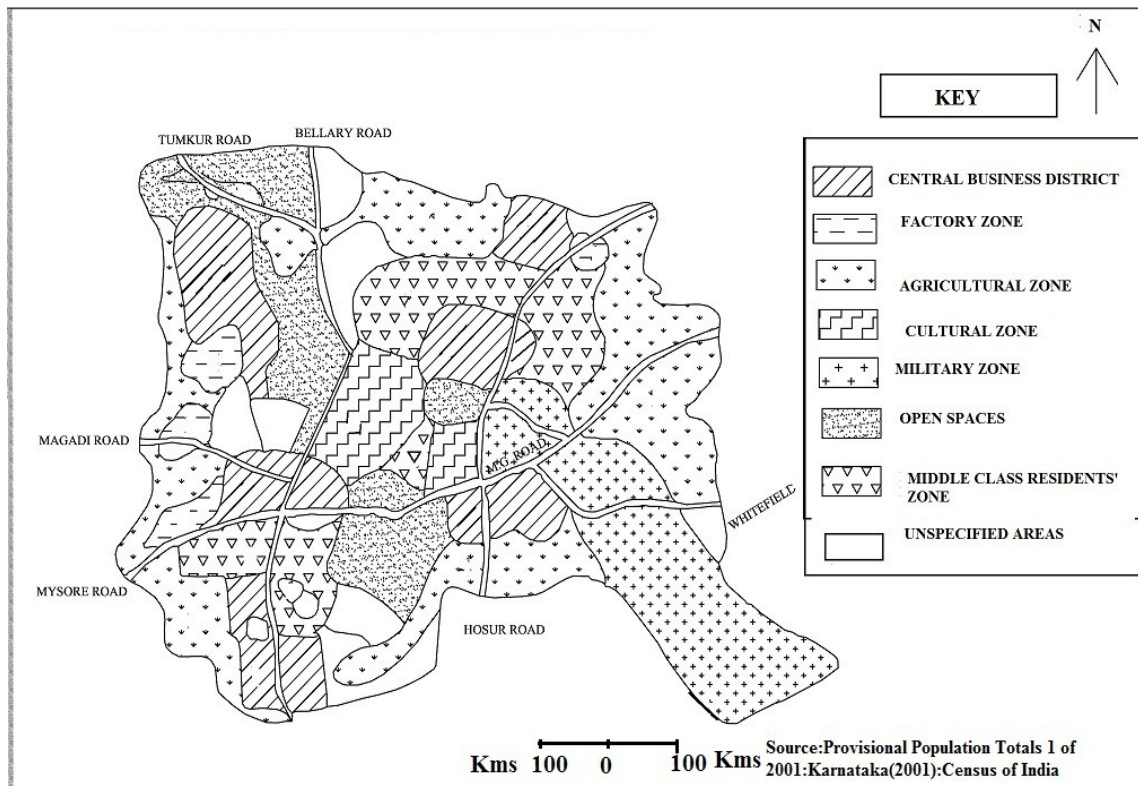


Figure 2. Land use of Bengaluru (1951)

4.3 Bengaluru: A Typical Example of Concentric Pattern of Land Use

It was Burgess who remarked that “an ideal construction of the tendencies of any town or city to expand radially from its central business district...”. Encircling the downtown area there is normally an area of transition which is being invaded by business and light manufacture. A third area includes the area of workers who desire to live within easy access of their work. Beyond this zone remain the residential zones surrounded by the commuters’ zone. Generally, the Bengaluru Urban Agglomeration exhibits a 28% coverage under core areas, 30% under rural fringes and lying in between are the added semi-urban areas or the urban fringes that counts for 42%. (Figure 3) More vividly the sketch of the concentric zone postulated by Burgess can be replicated in Bengaluru Urban land Use.

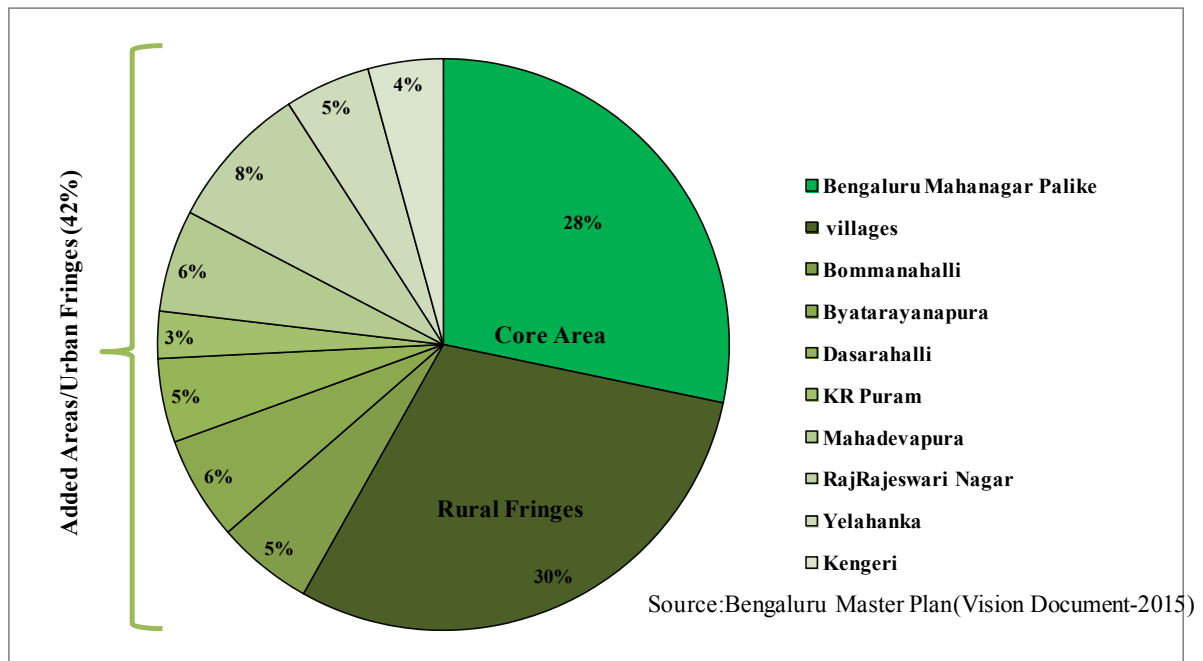


Figure 3. Distribution of Bengaluru urban agglomeration based on core areas and rural and urban fringes

The city of Bengaluru has developed spatially in a concentric manner. A ring-like development of this city induce the regional planners to visualise Bengaluru in accordance to Burgess's zone model with the Central Business District at its core and blue-collared workers and white collared workers clinging to it in a dough-nut pie like manner with the zone of commuters' following next. More specifically speaking the city can be divided into five zones:

- I. Zone-I: The core area consists of the traditional business areas, the administrative centres and the Central Business District. The southern and western parts of it are connected well to the industrial zones of Peenya to Koramangala and exhibits mixed housing and commercial activities.
- II. Zone-II: The pericentral area has older, planned residential areas (like Indiranagar) which has reasonably good infrastructure though exhibiting planned residences with squatter settlement.
- III. Zone-III: The recent extension of the city for the past 10 years flanking both sides of the outer ring road, portions of it are lacking infrastructural facilities, shadowing the second zone, hence termed as the Shadow Zone (Figure 4).
- IV. Zone-IV: This zone encompasses the peripheries of the city, with mixed land uses of settlement and agricultural lands. However a rapid growth of residential layouts here led to an unsystematic and haphazard urbanization. It does include rural fringes and contiguous settlements at places.
- V. Zone-V: This is the green belt of agricultural area of the city's outskirts which has been visualised as the future directives towards urbanization of Bengaluru.

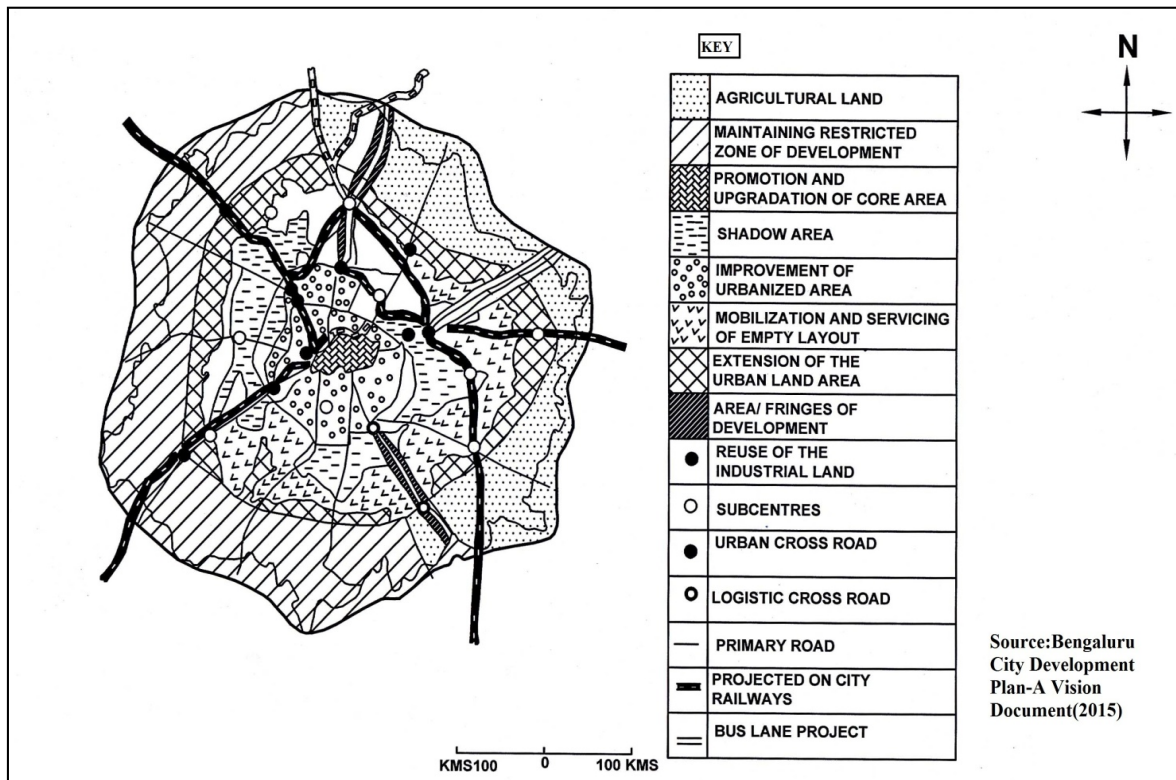


Figure 4. Existing land use of Bengaluru urban agglomeration

Indeed Bengaluru is characterised by radial system of transport axes which converge towards the centre of the city. The region gets well connected by Mysore road with old Madras road from south, south-west, north and north-east fringes of the city. Also, Bellary road and Hosur road connects Bengaluru core to the north and south-east directions. Tumkur road connects Bengaluru wellto the north-west. Infact Magadi road in the west, Kanakapura road and Bannerghatta road in the south and varthur road and Whitefield road in the east mark Bengaluru's connectivity via roadways. The city at present stretches in all directions and along these major road corridors. The growth of urbanization now has taken certain specific directions that once again get determined by the industries while the inhabitants occupy the intermediary areas. Urbanization has taken pace in the southern part of the city which has been determined by service sectors like Electronic city and Bommasandra. On the other hand, there has been a slowdown in the urbanization process in the west near Mysore at the vicinity of Magadi road and traditional heavy industrial zones of Peenya. However the software industries has grown well in the east and north-east which accelerated urbanization processes. While the core area has been the seat of traditional business and economy the markets and trading, the peri-central area has been the place for Public Sector Units. The new technology industries however presently concentrate them in the east and south-east. But for the city planners these patterns particularly are not rigid especially with reference to the new technology parks and industries and services that are light and mobile, and interspersed through the city, including the residential area. However, Bengaluru is shifting from such growth patterns to a much-sided expansion mostly towards eastern side and northern wing towards the newly formed airport.

5. Planning Strategies for Bengaluru

However in order to meet the gap in the service delivery levels several key areas are identified exclusive to this city. These are:

- Repair and maintenance of bulk water supply system
- Rehabilitation or creation of distribution network and piped water supply connections
- Provision of water supply connections to uncovered areas
- Construction and Rehabilitation and expansion of underground drainage system including service connections to all the households

- Aquifer recharging and Rainwater Harvesting
- Billing and Collection activities of water connections and consumption charges
- Development and updating the database and mapping of the system in temporal basis
- Institutional development and public awareness campaigns should be initiated

Provision of adequate water supply to the added areas of Bengaluru and that of the rural fringes clinging to Bengaluru Municipal Corporation has been a challenge. As a step to decongest Bengaluru, water supply forms the most significant criteria for the target beneficiaries. Water supply for 110 villages and sewerage system for 8 Urban Local Bodies includes a service level that has to be provided from zero level. While the main objective, is to provide access to affordable potable water and sanitation facilities which continue to remain outside the access of the urban poor. This includes 100% coverage of water and sewerage systems, individual pipe connections, bulk metering and underground drainage connectivity. These also include sewerage system, road restoration, sewer cleaning equipments, restoration of storm water drains and water reuse. Bangalore Water Supply and Sewerage board also initiated a project for promoting water treatment and recycling (of Vrishabhavati River) that has enhanced the quantum of water supplied to these newly added areas. It has been estimated that the added areas would cater almost 17 lakh population (City Development Plan, 2006) and this would create a bulk water requirement of 1167 million litres per day. This has been sufficed by the treated water generated by the Bengaluru Water Treatment Centres. This also enhances the development of alternative water resources, aquifer recharging, effective management of water by rezoning methods and overall quality monitoring.

The rapid economic growth of Bengaluru in the last decade has resulted in a higher than national average annual growth of 3.25%. Bengaluru has much to contribute as far as country India's economic progress is concerned in respect to the offshore service providing job opportunities. Bengaluru faces problems in relation to the basic amenities provided by it to its dwellers. One of the basic gap remains in the water supply and its demand especially in the newly added areas where the government plans for the dispersal of population to decongest the city proper. There have been provisions made for the restoration of road ways and improvements of the existing sewerage systems in and around Yelahanka, Byatarayanpura, Mahadevpura, K. R. Puram, Bommanahalli, Raj Rajeswari Nagar, Kengeri and Dasarahalli. Also, as far as the urban transport is concerned, Bengaluru city planners give priority to public transport rather than private vehicles. This goes with the understanding that not only does public transport occupy less road space per passenger, but also aggregate and lower the operating cost including environmental impact (as Pollution). The city evidences radial pattern of transport through the core which can be further enhanced by Core Ring Road of about 30 kilometres length which forms the primary by-pass from the periphery to the Bengaluru Central Business District.

6. Recommendations

As stated above the core of Bengaluru's physical strategy has been since 1990, the location of commercial and industrial development along transport corridors radiating outwards from the central area. Further, in order to transform it into a world class Metropolis providing its citizens a high quality of life, and most importantly to sustain it, following recommendations can be implemented.

- In this regard, the corridors are emphasized to develop along not only the major already established routes but also in the vicinity of the fringe areas promoting high speed traffic volumes.
- Inner Lanes have been proposed for slower two-way traffic streets and central lanes to promote alternative bus bays.
- The effective planning and management of urban services should be imperative to overcome the most obvious outcome of over-urbanization that is slums.
- The role of government in the management of urban land use is inescapable. It not only allocates the tangible resources like water supply, roadways and housing but also manages the directives in relation to defining the urban boundaries and land re-adjustments.
- Preservation and promotion of Bengaluru's pre-eminent reputation as the Garden City through restoration of open spaces, green areas, water bodies and valleys, with land use that ensures environmental sustainability.
- Providing focussed development and sustenance of high quality urban services such as water supply, sewerage, municipal solid waste management, sanitation, roads and power supply.
- Finally, providing housing for all sections of the population, with special focus on developing low-cost and budget housing.

7. Conclusion

In order to transform Bengaluru as world-class Metropolitan City providing its dwellers a high quality of life in a sustainable environment, with state of the art infrastructure, service delivery and connectivity supported by an efficient governance framework, is indeed a challenge. The vision remains to develop its economy with balanced economic base of its traditional industry along with hi-tech-industry, research and development and global services. Also, provision of focussed development and sustenance of high-quality urban services such as water supply, sewerage, municipal solid waste management, sanitation, roads and power systems are the top priorities for the city planners. Strong walls do not make a City. Neither the places nor complexes nor all the well tended parks and civil centres in the world can make city thrive. It is the human skill, investment, power, transport, water, living and working space that make a city feel like reaching up to the skies (Mitra, 1963).

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