

Emerging Megalopolis

Bangalore, From 'Boiled Beans' Town to Advanced IT City

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Historically, Bangalore's growth and physical spread had been dictated by the location decisions of certain important industrial, institutional and residential activities, rather than as an outcome of any city planning exercise or planned vision of its development. Such an ad-hoc growth pattern was affordable to Bangalore then, as the city had neither population nor land pressure. However, the replication of this historical pattern of urban spread is certainly not feasible in the current context of sharply intensifying land and population pressure.

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Rapid urbanization, a global phenomenon projected specially for developing countries in the coming centuries, appears attractive for its much-expected benefits of overall development and human welfare. However, developing countries are likely to face serious problems rather than rosy prospects for the simple fact that they are not prepared for such a sudden shock on account of acute financial constraints, poor infrastructure, lack of appropriate technology and inefficient institutional structure to promote and monitor the process of rapid urbanization.

In fact, recent trends of urbanization have reflected these problems. In the rapid urbanization process, mega cities are the most affected urban centres as they have been experiencing inefficient planning with absolutely no planned vision for their future development. In addition, both national and state development policies have been invariably encouraging rapid growth of large cities as 'islands of development' without considering even their immediate neighborhoods, thus imposing the problem of rural-urban dichotomy. Such a process, has in turn, been leading to more serious issues affecting the environment and development in the peri-urban areas of large cities for lack of planning of various urban functions and services like: landuse, housing, transportation, water and sanitation, solid waste management, and other infrastructure and services. This is in addition to innumerable infrastructure, services and environmental problems posed to main cities on account of rapid urbanization. Bangalore, one such 'emerging global city' has been facing several critical urban management issues.

Historical Development

Bangalore, a globally known Information Technology (IT) and Bio-technology (BT) center, but without corresponding global exceptions in terms of infrastructure and services has been passing through unhealthy process of unplanned growth and development, and associated infrastructure and service deficiencies needed for its efficient management. Such a disturbing growth process is in spite of a well developed planning institutions like the Bangalore Development Authority (BDA) and Bangalore Metropolitan Regional Development Authority (BMRDA) established by specific acts of legislation by the state to promote planned growth of the city and its region. On the other hand, such unplanned development may imply that the city might have inherited the development process from its past experiences of development. What has been the process and pattern of historical development of the city of Bangalore?

Historically, the Fort near the current City Market and the Barracks near the Halsoor tank were the main foundations of the city built in 1537 and 1809, respectively. These historical foundations were gradually developed with unique specificity. The Fort neighborhood was developed on the basis of the philosophy of a city by temple builders, agriculturist turned warriors who patronaged wholesale and retail traders, highly skilled artisans, and others. The Fort neighborhood was developed as a typical native town with traditional characteristics of bazaar, temples and residential neighborhoods, etc. The barracks neighborhood, on the other hand, was developed to cater to the needs of the British troops and officers who were relocated from Srirangapatnam, near Mysore. Halsoor neighborhood was developed as a 'spot of England in India' with artillery and cavalry, barracks, parade ground, the mall, fine and spacious bungalows, classical gothic, public houses, bars, taverns, and night clubs. Hence, the city was developed on an east - west zonation with the east having a high concentration of churches and mosques thus encouraging, by and large, the western civilization, and west with temples characterizing the traditional city [Rao and Tewari, 1979]. However, gradually as the city developed, a finely tuned of inter-mixing of two cultures has been evident..

Process of Urban Spread

For the said historical reason, Bangalore was developed with dual characteristics since its foundation. As a result, the city has been attracting various categories of people from different regions, and more interestingly, the tradition has been maintained even to this day, but with a changed importance. Formerly, the attraction was based on its importance as a specialized center for trade, commerce and industry, and currently of course, on the basis of its global importance as an IT and BT center.

Since beginning, the city has been identified as a migrant dominant city, but with a thorough adoption of migrants to the local culture and activities. This fine blending of migrants with the locals has been very evident since inception in the core areas of the city neighboring the Fort area like Cotton pet, Akki pet, Ragi pet which denote the concentration of trading activities in these commodities, like cotton, rice and ragi followed by the concentration of people associated with these trading activities in the immediate neighborhoods. A similar concentration of flower and vegetable selling communities is also found in the neighborhoods of City Market and Sri Dharmaraya Swamy temple. Gradually, the city grew as an important trade and industrial center for the entire southern India in the following centuries. As a result, the city had started expanding according to the needs and convenience of trading and industrial activities.

To begin with, the physical spread of the city was in the form of residential leapfrogging and residential infilling along the ribbon shopping and commercial activities within an accessible distance range of about two to four miles in the neighborhoods of the two nuclei. As characterised about the pattern of physical spread, Bangalore has almost followed the pattern of leapfrogging and infilling process for its physical spread with institutional leapfrogging of the Indian Institute of Science, popularly known as TaTa institute, as the earliest process, and the gradual infilling of residential neighborhoods like Malleswarma, Srirampuram, Vyalikaval and Sheshadripuram and Sadashivanagar. The second type of urban spread was identified with the leapfrogging of large-scale industries like Hindustan Aeronautics (HAL), Hindustan Machine Tools (HMT), Indian Telephone Industries (ITI), and Bharath Electronics (BEL) about eight miles from the city market. This was later followed by gradual infilling of residential areas along the major transport route and

near the industries and interstitial areas like industrial townships. Similarly, the third type of spread was also evident in the form of institutional leapfrogging of Agricultural University at Hebbal, Bangalore University at Nagarabhai, and new industrial extensions [Rao and Tewari, 1979]. Hence, historically, Bangalore growth and physical spread had been more due to the location decisions of certain important industrial, institutional and residential activities, rather than, as an outcome of any city planning exercise or planned vision of its development.

Of course, infilling was guided by some form of planning exercises by the planning institutions. As a result, urban spread was gradual with the formation of various residential layouts formed by both BDA and several private housing co-operative societies. However, the residential layouts formed in the earlier stages of development were more citizen-friendly as compared to the so called modern layouts in terms of landuse planning and its utility. In the old residential layouts, provision was made for more efficient use of the available land according to the changing landuse requirements to meet the emerging needs. This has been demonstrated with efficient use of then planned service roads in solving the current major emerging issues of vehicular parking space in the context of rapidly increasing vehicular ownership and movement. Such an ad-hoc growth pattern was affordable to Bangalore then, as the city had neither population nor land pressure. However, the recent experience sends a very strong message that replication of such historical pattern of urban spread is certainly not feasible in the current context for the simple reason of rapid population growth and high land pressure to accommodate the growing population and associated activities.

Interestingly, the process of urban sprawl of the city has taken almost the same historical pattern of leapfrogging and infilling in the recent decades as well; now in the form of software and other industrial complexes, and infrastructure project. The leapfrogging of huge software industrial complexes towards the east, near Whitefield and the south, at the electronic city near Hosur and also Sajjapur, border towns of Tamil Nadu; Bidadi industrial area to the west, and the international airport to the north are the new city limits established on account of the location decisions of the industrial and infrastructural projects. This seems to be the widest leapfrogging that the city has ever experienced in its history. Hence, on similar historical lines, infilling of residential and commercial, and maybe some industrial activities are likely to take place in the coming years. Since, tough competition prevails for land by various activities, infilling process needs to be promoted with utmost care by the

planning authorities to ensure planned development of the city. The BDA and BMRDA have to work in coordination to ensure overall development of the city and its region, though their jurisdictions differ in terms of their planning areas.

Like the well recognized leapfrogging and infilling processes followed by the city for its physical spread, a similar historical fact prevails for the delimitation of the city limits as well. It is interesting to note that the name 'Bangalore' was derived historically from *Benda kalooru* (town of boiled beans) by an anecdote. If we look back to the historical development of the city, interestingly, the city's boundary limits were specified as early as in 1537 by the founder of the city, Kempegowda II, probably with the intention that Bangalore should remain a small and compact town. However, regional and national importance that the city had acquired for its trade, commerce and industries in the beginning and now, the global importance on account of its IT and BT specialization have forced the extension of the city limits frequently according to emerging requirements. Of course, the four city limits then established by the founder of the city are being maintained as historical monuments even to this day, and some of them have been converted into tourist spots. In fact, the boundary limiting marks established as 'Mantapa with a Tower' is the emblem of the Bangalore Mahanagara Palike (Bangalore Metropolitan Council).

The re-established current city limits is in spite of well developed city planning institutions like the then City Improvement Trust Board (CITB) which is currently known as the Bangalore Development Authority (BDA) and the Bangalore Metropolitan Regional Development Authority (BMRDA). These planning institutions are supposed to impose norms for planned growth of the city, through efficient strategies. However, excepting certain residential layouts like Jayanagar, some parts of JP Nagar, and Sadashivanagar, the remaining areas have seen unplanned growth with a most inefficient land use pattern. This is because the planning authorities have failed to impose contiguous development process on a regular basis with more realistic landuse planning and its strict imposition. As a result, the city lacks well planned access roads to several peripheral residential layout developed by the BDA which can carry the huge traffic generated between the city centre and its so called planned residential layouts. This has ultimately resulted in frequent traffic jams, accidents and in turn led to our traditional curative management approach, such as, conversion of several narrow roads into one-way streets, widening of narrow roads, etc. All these problems are mainly due

to lack of a well-conceived vision plan for the city prepared well in advance to absorb all future rapid urbanization shocks.

In this context, if we recall the Comprehensive Development Plans (CDP) developed by the BDA from time to time to promote planned growth of the city has ended up more of an engineering exercise than a citizen-friendly document depicting the field realities. Even to this day the CDP lacks the social dimension in the planning process.

Greater Bangalore

Now, yet another urban sprawl has been recently proposed by the Government of Karnataka with special initiation of the Chief Minister who has proposed the concept of 'Greater Bangalore'. According to this proposal, Greater Bangalore will be identified as a single administrative unit consisting of the existing Bangalore Mahanagara Palike (226 sq.km), 'seven' city municipal councils (Byatarayanapura; K R Pura; Mahadevapura; Bommanahalli; Yelahanka; Dasarahalli; and Rajarajeswarinagara with total area - 257.97 sq.km), 'one' town municipal council (Kengeri -34.0 sq.km) and 111 villages (223.03 sq.km) adjoining these areas. The 'Greater Bangalore' concept has been proposed with the following four main objectives: i) Improve and coordinate infrastructure development; ii) upgrade the quality of urban civic services; iii) strengthen the administrative capacity for enforcing various rules and regulations; and iv) optimize expenditure on establishment. The total area of the proposed Greater Bangalore administrative unit is 741 sq. km., which is more than three times the current BMP area (226 sq.km). Such a re-establishment of the city limits with a vast area will have massive implications for all aspects of city functions and services--- economic, environmental, infrastructure, planning and political aspects--- as well as on the socio-economic status of consumers, much discussed in recent times.

The current socio-economic fabric of the city has followed four categories: High income, middle income, low income, and slum households that may be to a great extent identified as below poverty line households. These categories have their specific requirements in terms of residential, transport, education, health, water and sanitation, commercial, leisure time and recreation activities. As it is, the city has been experiencing serious problems in serving the people in these sectors according to their requirements. Now, one more category of households, the so called urban or rural households with imposed urban characteristics (rurban) is being added to the existing group whose requirements may differ

significantly from that of the said urban household categories. A set of socio-economic and environmental indicators for the city and its region substantiate the prevailing city-region disparities.

Table1: Percentage Distribution of Household by Socio-economic and Environmental Characteristics

Variable	City	Conurbation	Greenbelt
<u>Education</u>			
Illiterates	13	21	30
Primary	4	5	9
Higher primary	23	25	34
secondary	32	33	19
intermediate	7	6	2
Graduation and post graduation	15	9	6
Professionals	7	1	0
<u>Workers</u>			
Unskilled	12	23	50
Skilled	32	40	12
<u>Monthly Household Income(Rs)</u>			
Less than 2000	10	13	19
2000 - 6000	56	70	68
More than 6000	29	8	7
Piped water supply	73	8	6
Toilet facility	66	47	26
Open defecation	1	35	70
<u>Solid waste disposal</u>			
House collection	34	0	0
Dustbin	53	29	2
Open space	7	64	72

Source: Sastry (2006)

Note: Conurbation: city fringe area; Greenbelt: beyond the city fringe

This addition will add to pressure on the existing infrastructure and resources. While health, education and commercial services, are largely being provided by the private sector, of course, with suitable regulation and some involvement in providing the services by the government. The most affected sectors are transport and housing. With the expansion of the city area to 741 sq. km, it is almost impossible to imagine the transportation problem that the city will face in the future. This is with special reference to the existing road network and available means of transport in the city. Similarly, with the new and uniform label to the entire 741 sq.km area of the city that comes under the administrative set up of the 'Greater Bangalore', land values will definitely shoot up to such a level that middle and specially low income households may not be able to fulfil their life time ambition of owning a 'home-sweet-home' within city limits. This inability may in turn lead to rampant illegal and

unauthorized ownership of land, which will promote unplanned growth. There is already some evidence of such illegal land dealings in the city. Such most unwanted development process would end up Bangalore as a big slum and that will have repercussions on the land use planning and location of various activities of the city. Similarly, the city's economy may shift to a higher share of both middle and low income households with a small share left with the high income group. This has more economic implications in terms of rising of revenue for the city development and instead, the government may have to dole out more subsidies to the low income households as a social welfare measure or as a safety net in managing their urban life. This may be in addition to several on-going programmes on eradication of urban poverty and slum development initiated by both the government of India and the state government.

The environmental condition of the city will be more serious, especially air pollution, water and sanitation, solid waste, open spaces, greenery and water bodies, etc. With the existing road conditions, and additional pressure, air pollution will be a more serious issue on account of greater number of people involving in the travel for work, shopping, religious, and recreational activities. A rough estimate of emission of various pollutants to the city atmosphere by the transport sector is of the order of 2857.6 tonnes per day. A similar situation will arise in the case of water and sanitation. While, sanitation may be provided through well-planned networks with considerable investment, water, the most precious natural resource and a basic necessity for human existence will pose a more serious issue in the context of i) its limited resource; ii) restricted supply even to the current BMP area; iii) high share of unaccounted for water; and iv) inefficient management of the available huge sewage water.

Hence, the prime questions that emerge are: Do we need frequent extensions of the city limits to make the city unmanageable in terms of various infrastructure and services? What is the guarantee that the city limits will not continue to see more extensions in the future. In the current context of the trend towards rapid decentralization, was there any need for the promotion of the centralization concept by putting BMP, eight urban local bodies, and several gram panchayats together for the establishment of the a single administrative unit called the Greater Bangalore? A rough estimate of population of Greater Bangalore by excluding the population of 111 villages as on 2006 is 7.99 million and will cross 8 million

mark by including the population of the left over areas. One can only assume the huge requirements both in terms of infrastructure and services as well as institutional structure required for efficient city management. Though the state government has estimated Rs.100,000 million for the establishment of the Greater Bangalore this may be too meager to promote planned development with adequate infrastructure and services. It is preferable to manage the city as a single administrative unit, and of course with several decentralised planning of various urban services and functions with the development of required infrastructure.

Bangalore and other Metros

Bangalore, the globally known Software city and capital of Karnataka is known for its trade and commerce and industrial development since its inception. As a result, it has become one among the million cities of India as early as 1961 whose growth and development is comparable with the seven 'million' and capital cities of India. As per 2001 census, Bangalore ranks fifth, next to Chennai by population size. Population size trend of Bangalore has been smooth all along and very close to the baseline as compared to other metros in general and Greater Bombay, Calcutta and Delhi in particular (Fig.1). All the seven 'million' cities have revealed the growth trend of bi-model pattern with growth peaks at 1951 and 1981(Fig.2). In particular, the main reason for such high population growth of Bangalore during 1941-51 is large scale industrial development encouraged by both govt. of India and Karnataka, and area expansion. While, 1971-81 growth is also attributed to industrial development especially the IT sector in its formative stage and area expansion (Heitzman, 2004 and Sastry, 1986).

The area of the city has recorded significant increase by 92.1 per cent and the population by 37.8 per cent during 1991-01. As per the projected estimate, the population of Bangalore would reach 9.8 million by 2016. While, IT development has been in progress, the corresponding infrastructure and services required for smooth functioning of IT sector was not geared up. The main victims of such expansion are the peripheral areas of the city as they have experienced uneven development and severe environmental problems with unique 'rurban' characteristics which is quite different from the city. Some of the characteristics are higher concentration of households with large household size, higher illiteracy rate, higher

share of unskilled and primary sector workers, higher share of medical expenses as compared to the city, larger share of kacha or semi-pacca house structure, least water and sanitation facilities and almost no solid waste disposal provision, and a high concentration of slums and uneven city- peripheral transport facility [Sastry, 2006].

Figure 1

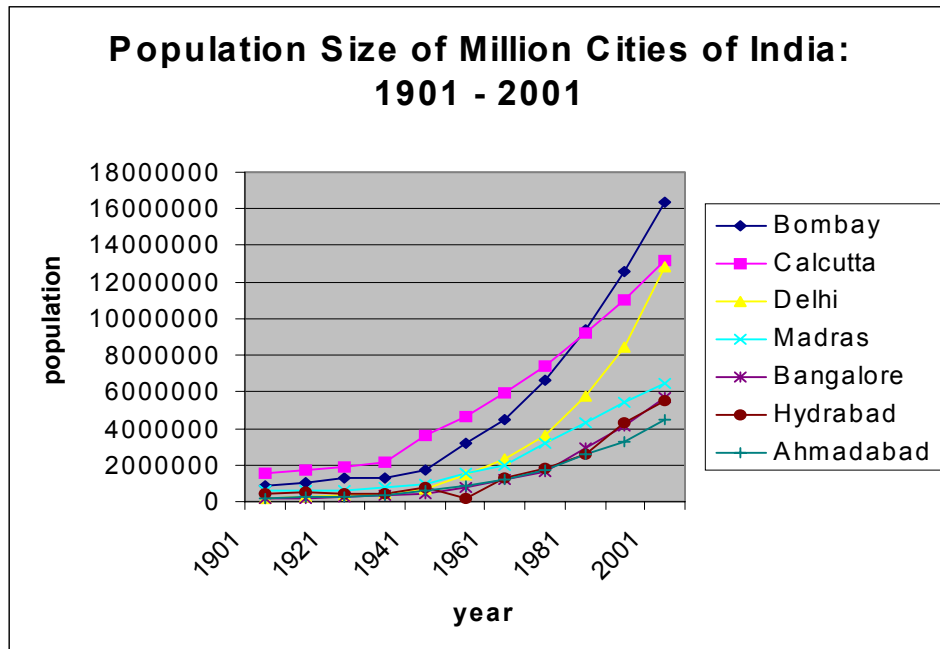
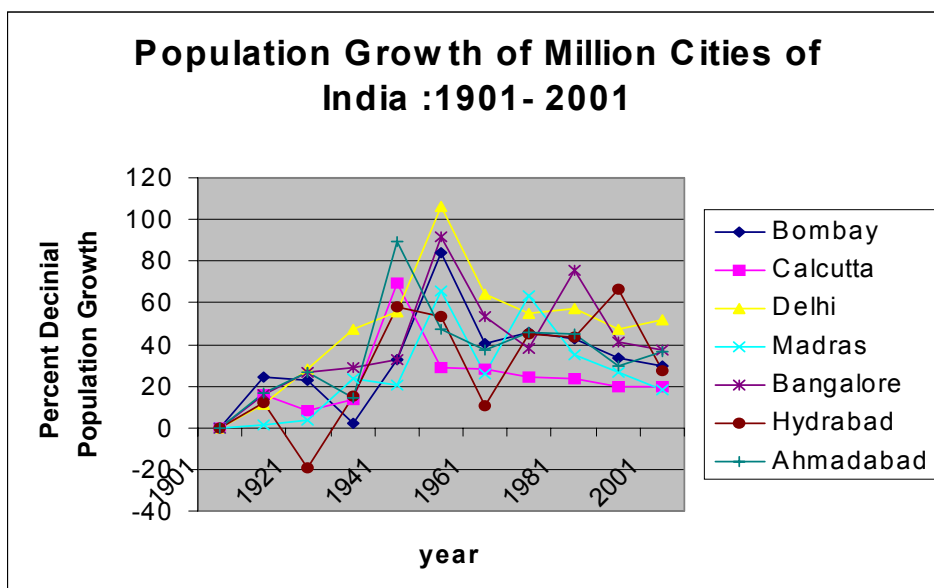


Figure 2



Functional Specialization as Cause and Consequence of Growth

By functional specialization, Bangalore has consistently emerged as a bi-functional city with specialization in manufacturing and service sectors. In addition, trade and commerce for obvious location specificity has acquired greater significance. As a result, almost 97.5 per cent of the total work force were employed in non-primary sector with a major share in the tertiary sector (63.6%) [Census, 1991]. However, since 1984 the main instrument for Bangalore's rapid growth is IT sector with the establishment of a multinational company, the Texas Instruments followed by STPI first earth station and a group of 13 company. Especially, during 1991-99 the number of IT units has increased by 361.5 per cent while, sales in terms of export has recorded an unparalleled increase by 22566.7 per cent. More significantly, growth in export of software in a single year (2000-01) was as high as 73 per cent. For smooth functioning of the IT sector, it has attracted highly skilled IT professionals whose number is estimated as 1.5 lakhs. Hence by 2000, the Bangalore city had 2020 individual software related companies with 765 companies specialized exclusively in software development and service. This has obviously resulted in the multiplier effect to attract resources and population to the city. As a result, the city had started expanding its boundaries on all sides to accommodate IT units and its professionals. Such expansion has been more prominent in the south-east sector of the city (Hosur Road, Koramangala, HAL, Whitefield) which has been proposed as IT corridor running from old Madras Road to New Madras Road (Karnataka, Undated). With rapid population growth, area expansion, functional specialisation and further boost to the city growth and expansion through the formation of the Greater Bangalore, the city development will be a gigantic task, but efforts need to be put forward in order to make the city to develop in a planned way from both planning and environmental point of view.

Some decentralized planning hints for Planned Development of the City

Several interesting suggestions had emerged from the recent discussion on the future growth of Bangalore organized by the *Times of India*. Broadly, they can be classified into i) Institutions - giving union territory status, strengthening with more resources, public-private partnership, single window agency for management; ii) planning - no planning vision, visualize the plan and its implementation, uncontrolled construction work, development of II level cities for location of IT and BT industries; and iii) resource management - more projects but no land, water bodies and open spaces; dual economy of IT and non-IT sector

households, IT and BT credit for Bangalore, solid waste management etc., get more resources for infrastructure development by virtue of its significant IT contribution to the exchequer.

However, the first and the foremost task required for planned growth of the city is to keep a complete account and control of the entire area annexed to the city and development of a realistic landuse plan at least for the areas which are going to be annexed to the city and imposition of the same by the planning authority. This may require some alterations in the existing land use plan of the city as well in a holistic view of the entire city. In a simple sense, this is nothing but better organization of various activities likely to occur in future for better functioning of the city. All probable activities that a city performs may be put into a broad landuse classification as residential, commercial, industrial, transport, and recreational and open spaces. Unlike, previous decades, all the said landuse activities acquire special significance in the current development set up. For instance, recreation and open space, which was just a namesake category in the previous plans, acquires greater importance in the context of environment and health conscious citizens. Similarly, transportation, which was marginal in the previous decades, has acquired special significance due to revolutionisation of both public and private transport systems in urban areas on account of rapidly changing urban activities. As a result, city requires more efficient transportation planning in terms of road network and organization of road traffic in a well-behaved way. This is in the context of rapidly increasing vehicular ownership and usage in urban areas in order to carry on various time bound urban activities. The immediate effects of poor planning are traffic jams, road accidents and higher emission of toxic pollutants to the city atmosphere and associated health problems. As traffic is generated against the organized urban activities like residential, shopping, recreation, work place, education and health etc.; most of the transportation and associated problems may be solved by location of various activities with minimum transportation needs. Of course, the main traffic generator in mega cities is the home to work place travel. If this is planned efficiently with minimum transport dependence, a major part of the urban travel problem is solved. Hence, it is high time that such a planning initiative is promoted in Bangalore on a priority basis. Next to work place, shopping generates significant consumer travel that also needs adequate reorganization in the city. All these planning hints warrant for a thorough decentralization of various urban activities.

Let us take the work-home scenario in the city. In Bangalore, the three major work concentration spots are Vidhana Soudha- Majestic area- City market; KR Puram -White field- HAL; Hossur road- Electronic city; and second level areas are Tumkur road and Mysore road. Except in the city core areas, minimum travel need to be encouraged in the home-work travel. This means re-organization of residential as well as work places to achieve the minimum travel objective. Several residential layouts which are likely to come up in the process of infilling need to be planned in a modern way with lot of open spaces, civic precinct, green lawns and amenities, thus fulfilling both consumer as well as environmental requirements. Similarly, in terms of shopping services, the existing City market and Majestic areas cannot bear the future shopping pressure of the entire city including the proposed annexure. Hence, this pressure need to be reduced substantially by planning several second level civic precinct which should include shopping, recreation and religious facilities may be on the lines of Jayanagar 4th block shopping centre at various strategic residential neighborhoods in the city. Similarly, a replication of M G Road; Brigade Road and Commercial Street shopping activities may be initiated in the emerging planned layouts.

A similar pattern of decentralization of rail and road transport terminals is also essential for the planned growth of the city. Currently, Majestic is the main transport terminal for both rail and road transportation for the entire city. As a result, one will find a huge crowd at all times in a day thus causing inconvenience both to the transportation sector as well as consumers. Like shopping, the Majestic terminal can not bear the pressure of the entire city's transportation. Hence, it is preferable to decentralize transport terminals to such locations, which are convenient for the destination. The KSRTC and BMTC have already taken steps in this direction with the location of two such satellite bus terminals at Santhinagar and Mysore road. Many such satellite terminals would decongest the Majestic bus terminal to a very great extent. On similar lines, railways can also identify a few satellite terminals to reduce the pressure on the city station at Majestic. The potential centres are: KR Puram, Yeshwanthapur, Yelahanka and, Kegeri. The arrival and departure of several trains may be shifted to the said satellite terminals, of course, with good bus connections to the various parts of the city, and thereby reducing the pressure on the city railway station to a very great extent. The railway authorities have already introduced some steps by shifting some origin and destination points to the Yeswanthapur railway terminal.

Image of the Emerging City

Bangalore, a city with almost 500-year old history has several images - garden city, air-conditioned city, city of scientific and technological institutions, and now IT and BT city. Hence, let us not allow Bangalore to become one more 'urban monster' with its on-going rapid urbanization, haphazard growth and poor management which is being experienced in the metros of almost all developing countries. Instead, one should carefully understand and appreciate the city's dynamism and potentialities for its beckoned development path through its changing capabilities (trade, industry, science and technological institutions; and IT and BT) according to the changing scientific and technological advancements for development. Therefore, instead of the crazy idea of conversion of Bangalore into Singapore, the policy makers and urban planners should respect the location specificity and capabilities of the city of Bangalore and promote its growth and development if not as an 'ideal city' which means 'a city without slums, traffic congestion, house and ground congestion, air and water pollution, and with population growth matching the requirements like housing, health, education, and the people living in an attractive urban environment at a cost which a city can bear', but, 'as a city of profound aesthetic and environment culture with a balanced urban ecosystem in terms of land use, infrastructure and human beings belonging to various socio-economic strata'.

Hence, the future city of Bangalore should look like, a city with a balanced vertical and horizontal growth having greenery all around interspersed with well planned self-contained residential neighborhoods, infrastructure and services **with minimum travel needs**. Since, any city for that matter cannot function alone in isolation with its immediate region, Bangalore should be developed along with its region to maintain the city-region symbiosis. In fact, Bangalore is already experiencing this problem more seriously. May be as a component of the city-region development, the government of Karnataka has also proposed to develop a few satellite towns around Bangalore probably with an intention to siphon off the existing as well as future population pressure likely to experience by the city. However, these satellite towns should be planned as self-contained units with a minimum dependence on the city for their occasional specialised commercial, health and administrative services. Hence, for the planned development of the city and its region together, the existing planning institutions like BDA and BMRDA have to work with proper coordination to achieve the sustainable city-region development. Ultimately, such a dream city with a well balanced city-

region system is possible only with the combined efforts of dedicated urban planners, policy makers and more significantly the citizens of Bangalore.

References

- Heitzman J (2004): *Network City: Planning the Information Society in Bangalore*, Oxford University Press: New Delhi
- India Govt. of (2001): *Census of India, Provisional Population Totals*, New Delhi.
- India Govt. of (1991):, *Census of India, Town Directory of Karnataka*, New Delhi.
- Karnataka Govt. of (Undated): Directorate of Information Technology, Government of Karnataka, Bangalore
- Rao, V L S Prakasa and V K Tewari (1979): *The Structure of An Indian Metropolis: A Study of Bangalore*, Bombay: Allied.
- Sastry G S (2006): 'Urbanization in an IT Prominent State of India: Patterns, Issues and Policy ' in Sailabala Debi and V.B.Annigeri(ed) *Sustainable Development and the Indian Economy: Issues and Challenges*; New Delhi: Serials Publications.