

DRAFT REPORT

BANGALORE METROPOLITAN REGION REVISED STRUCTURE PLAN - 2031

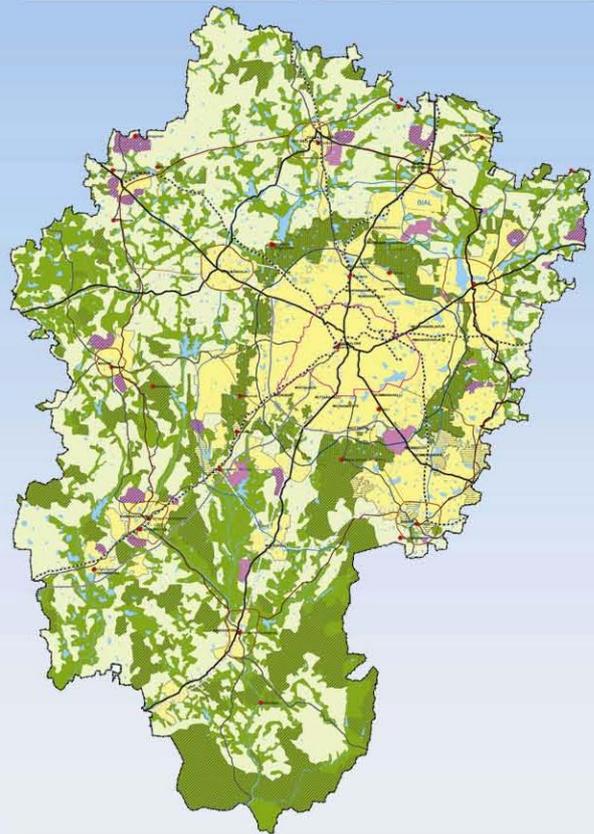
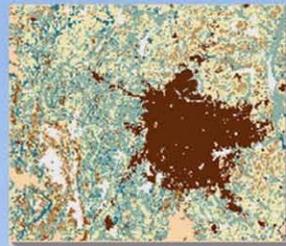
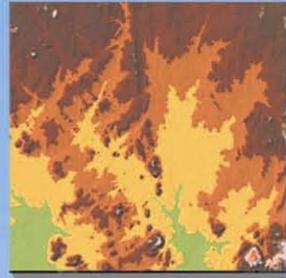


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ACRONYMS

APDRP	Accelerated Power Development and Reform Programme
AL	Agricultural Laborers
APZ	Area Planning Zone
BDA (Act)	Bangalore Development Authority (Act 1976)
BIA	Bangalore International Airport
BIAPAA	Bangalore International Airport Planning Area Authority
BMLTA	Bangalore Metropolitan Land Transport Authority
BMP	Bangalore Mahanagar Palike (now Bruhat Bangalore Mahanagara Palike)
BMPC	Bangalore Metropolitan Planning Committee
BMR	Bangalore Metropolitan Region
BMRCL	Bangalore Metro Rail Corporation Limited
BMRDA	Bangalore Metropolitan Region Development Authority (Act - 1985)
BMR RP	Bangalore Metropolitan Region Structure Plan 2011
BMR RSP	Bangalore Metropolitan Region Revised Structure Plan 2031
BMTC	Bangalore Metropolitan Transport Corporation
BRD	Bangalore Rural District
BRT	Bus Rapid Transit
BSUP	Basic Services to Urban Poor

BTD	Bangalore Telecom District
BUD	Bangalore Urban District
BWSSB	Bangalore Water Supply and Sewerage Board
CBD	Central Business District
CDP	Comprehensive Development Plan
CFS	Container Freight Station
CL	Cultivators
CMC	City Municipal Council
CONCOR	Container Corporation of India
CRR	Core Ring Road
CWC	Central Warehousing Corporation
DPC	District Planning Committee
DULT	Directorate of Urban Land Transport
ESR	Elevated Storage Reservoir
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GL	Ground Level
GoK	Government of Karnataka
GoI	Government of India
GP	Gram Panchayat
GT	Gram Thana
HH	Household Industry Manufacturing, Processing, Servicing and Repairs
HH(s)	Household(s)
HUDCO	Housing and Urban Development Corporation Ltd
ICD	Inland Container Depot
IDSMT	<i>Programme for Integrated Development of Small and Medium Towns</i>
IHSDP	Integrated Housing and Slum Development program
IRR	Intermediate Ring Road
IZ	Interstitial Zone
KHB	Karnataka Housing Board
KIADB	Karnataka Industrial Area Development Board
KPTCL	Karnataka Power Transmission Corporation Limited
KSCB	Karnataka Slum Clearance Board
KSPCB	Karnataka State Pollution Control Board
KSRTC	Karnataka State Road Transport Corporation
KUIDFC	Karnataka Urban Infrastructure Development and Finance Corporation
KUIDP	Karnataka Urban Infrastructure Development Project
KURPD Act	Karnataka Urban & Regional Planning & Development Act 1998
LA Act	Land Acquisition Act 1894
LB	Local Body
LIG	Lower Income Group
LPA	Local Planning Authority (Area)
lpcd	Liters per capita per day
LPG	Liquified Petroleum Gas
MIG	Middle Income Group
MLD	Million Liters per day
MMR	Mumbai Metropolitan Region
MOU	Memorandum of Understanding
MOUD	Ministry of Urban Development, Gol

MPC	Metropolitan Planning Committee
MRTS	Mass Rapid Transit System
NAAI	National Airport Authority of India, Gol
NCMP	National Common Minimum Programme
NGO	Non-Governmental Organisation
NH	National Highway
NICE	Nandi Infrastructure Corridor Enterprise
NUTP	National Urban Transport Policy 2006
O&M	Operation and Maintenance
OOP	Outline Development Plan
ORR	Outer Ring Road
OTH	Other workers
pc	Per capita
PHED	Public Health and Engineering Department, GoK
PPP	Public Private Partnership
PRR	Peripheral Ring Road
RCUDA	Ramanagaram and Channapatna Urban Development Authority
RGVY	Rajiv Gandhi Grameen Vidhyutikaran Yojana
Rs	Rupees (Indian National Rupees)
RSW	Rail Side Warehousing
RTO	Regional Transport Office
SDP	State Domestic Product
SH	State Highway
SKR	South Karnataka Region
SKRCC	South Karnataka Region Coordination Committee
SKRCP	South Karnataka Region Concept Plan
SoI	Survey of India
STP	Sewage Treatment Plant
STPI	Software Technology Parks in India
STRR	Satellite Town Ring Road
SURPB	State Urban and Regional Planning Board
SWAM	Solid Waste Management
TCPO	Town and Country Planning Organisation, Gol
TEU	Twenty Feet Equivalent Unit (20 feet Container)
TMC	Town Municipal Council
ToR	Terms of Reference
TP	Town Panchayats
TPC	Taluk Planning Committee
UBSP	Urban Basic Services for the Poor
UDA	Urban Development Authority
UGD	Underground Drainage
ULB	Urban Local Body
ULCR Act	Urban Land Ceiling & Regulation Act 1976
UMTA	Unified Metropolitan Transport Authority
VVNL	Visvesvaraya Vidyuth Nigama Limited
WF	Work Force
WKR	West Karnataka
WPR	Work Participation Rate
WTO	World Trade Organisation

1 PART I INTRODUCTION

1.1 Preamble: Planning Context in India: Metropolitan/State region and the need for planning

India, the second most populous nation in the world, holds 16% of the world's population and occupies 2% of the world's land mass. Like most other cities in the developing world, it is witness to an unprecedented shift of its substantially rural population to its urban areas. It is emerging as one of the fastest urbanizing countries in the world, and has a staggeringly large urban population of around 285 million. The economic base of the nation through expanding industries, trade, commerce and services has already shifted to the urban centers. Cities have strongly emerged as the prime engines of the Indian economy and generators of national wealth. In this context, urban India faces daunting challenges to cope with the needs of greater numbers alongside coping with managing and administering themselves through a robust institutional mechanism.

Traditionally planning in India has been largely socio economic through the Federal governments. Five Year Plans (trickling down to the state level) with spatial planning restricted to a few larger urban centres in the country. Development in the country is largely socio-economic development through a center-state partnership. The third tier of local Government post independence was largely sidelined and often superceded with the State deciding on a planned agenda for the people. It was in this context that the 73rd and 74th Amendments to the Constitution were made in the year 1992. Known as the decentralisation agenda, the main aim being a gradual governmental change from a Central – State partnership to a local Government – State – Central equation with the Local Bodies (LB's) emerging as units of self governance to be achieved through

- Promoting participatory planning processes; particularly the poor and the socially disadvantaged;
- Decentralising power and strengthening democracy at local level through providing political, functional and fiscal empowerment;
- Establishment of a 3 tier planning structure.

Recognize the need for integrated regional planning; incorporating infrastructure, environment and investment needs and concerns. As part of the functional devolution (refer Annexure 1, section 1.1) the LB's are now expected to perform, amongst others the following functions intrinsically related to planning and development

entry 1 :Urban Planning including town planning;

entry 2 :Regulation of land use and construction of buildings;

entry 3 :Planning for economic and social development;

entry 9:Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded;

entry 10 :Slum improvement and up gradation;

entry 11 :Urban Poverty alleviation.

In the process promoting a bottom up approach with the people vis a vis the top down approach for the people as hitherto.

The Context: State and the Region

A structure plan is a regional level perspective plan supporting a long term vision for development and related spatial perspective for integrated development in the area without compromising on its ecology and natural environment. While providing this framework for development which encompasses the economic, social and environmental opportunities and constraints of the area, a structure plan in today's context, provides for the dovetailing of the bottom - up and top – down planning tools through a series of implementable plans prepared in a participatory manner.

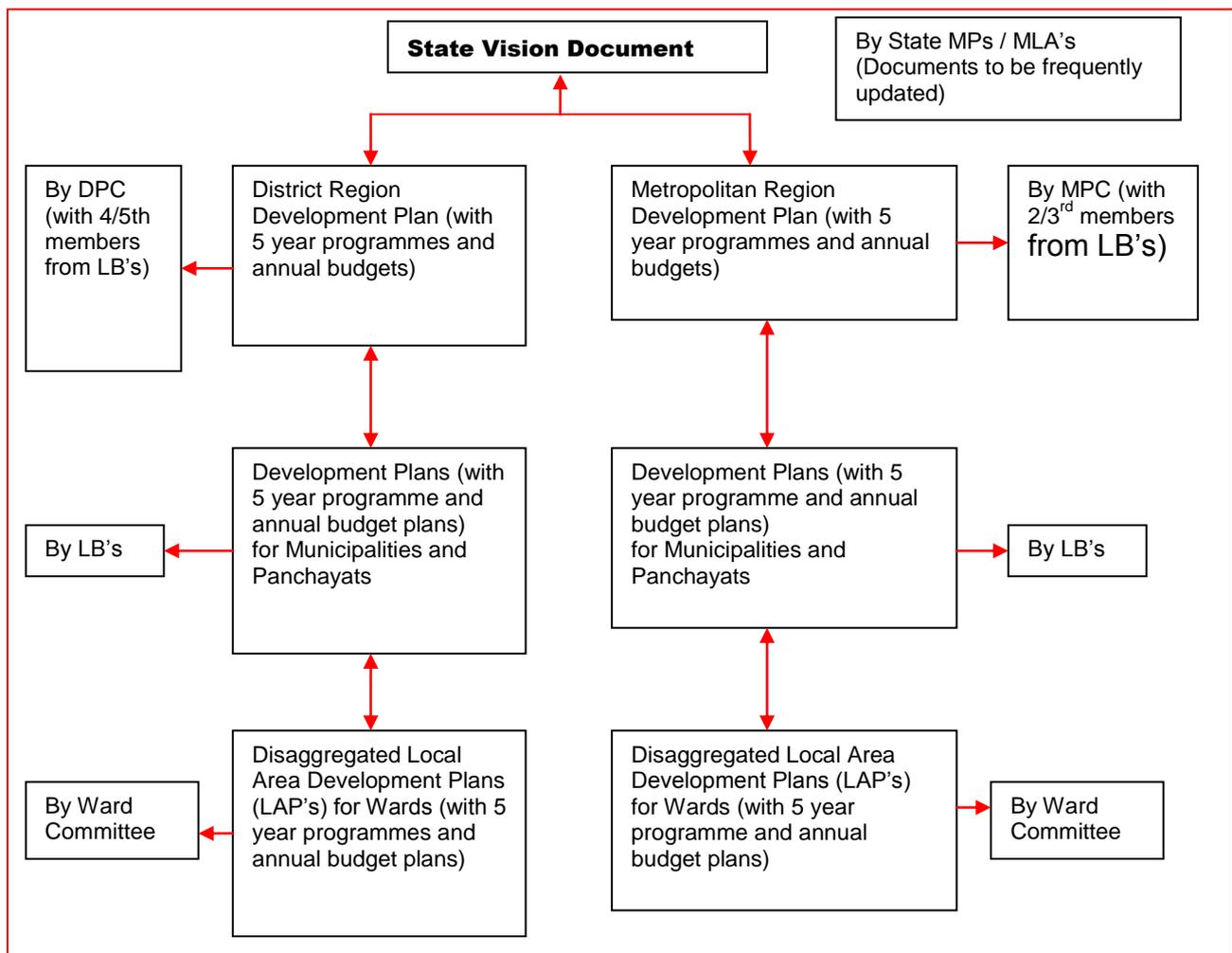
The 73rd and the 74th CAA provide for a spatial framework for integrated development and this assumes significance in the current effort of revision of the Structure plan for the Bangalore Metropolitan Region for the horizon year 2031. This framework advocates a synergy between sectoral socio-economic planning (generally through 5 year programmes and plans) and spatial planning which is currently being land use based, to now evolve as spatially integrated environment and investment planning with inclusiveness as the main focus (refer Figure1) While the decentralization agenda is not fully implemented and with the centre and the state continuing to dominate the planning and development processes in the country¹, this agenda emerges even more relevant today. Essentially it translates into a

'a governance based spatial canvas for integrated development whereby the Centre and the States provide the top-down policy and vision that channelize state level investments and basic infrastructure and the urban and rural LB's provide the down-top participatory and mapped settlement level environmentally regulated developments through 3rd tier electoral constituencies. The Districts coalesce the 2nd tier strategic spatial developmental investments structure and the 3rd tier participatory development plans, through District Planning Committees (DPC) and Metropolitan Planning Committees (MPC)² and it is in this context that the revision of the current structure plan will be attempted. Thus an LSG – State down-top partnership in shaping the built environment is a major aim to be infused in (and not in lieu of) the current top-down Centre-State dispensation³.

¹ The most recent example being that of the Special Economic Zones (SEZ) Act of 2006 which is essentially a central laws on the state subject of land. This essentially has translated into the marginalisation of the LB (for whom land is resource) on one hand while increasing the total available land without any reference to the land use planning within the area in question. At the same time the efforts of the centre to implement the CAA through the JNNURM which calls for reforms in urban governance and planning by linking it to sanctioned funds from the centre though a contradictory signal to the SEZ Act is the right move and may eventually one hopes achieve the mandates of the decentralisation agenda.

² DPC 's and MPC's are part of the institutional restructuring recommended by the 73rd and the 74th CAA to facilitate on one hand the governance structure and the planning process and the plans on the other.

³ Ribeiro E. F. (2009) The District Region Development Plan, 57th National Town and Country Planners' Congress, Institute of Town Planners, India, January 23-25, 2009, Tiswadi, Goa

Figure 1: Planning hierarchies⁴

Scoping down to Karnataka, the fourth most urbanized state in the country faces all the above challenges related to urbanisation while attempting to address the same through the emerging planning and governance framework. Karnataka has only one metropolitan region namely the Bangalore Metropolitan Region with Bangalore being the only megacity in the state. Bangalore and its hinterland have evolved and transformed over the years subject to influences of various factors affecting the city-region dynamics. Regional planning has long been accepted as a tool to address regional disparities. The new millennium is increasingly referred to in India as one of an urban-rural continuum. By 2051, it is expected that nearly 800 million people out of 1700 million at that time would live in municipal areas in less than 2 per cent of the nation's land. Thus, the interplay between the region (Metropolitan or District) and its human settlements (urban and rural local bodies) would largely govern State level spatio-economic development and this emerges as an imperative in the overall framework for revision of the structure plan 2031 for the BMR.

⁴ Ribeiro E. F. (2009) The District Region Development Plan, 57th National Town and Country Planners' Congress, Institute of Town Planners, India, January 23-25, 2009, Tiswadi, Goa.

In 1985, the Govt. of Karnataka constituted the Bangalore Metropolitan Region Development Authority under BMRDA Act and a statutory limit named 'Bangalore Metropolitan Region (BMR)' with an area of 8005 sqkm came into existence. It was only by 1997 that through a regional approach the 'Preparation of Bangalore Structure Plan 2011' was initiated. The plan set out its vision and targets for the horizon year 2011. Prepared in 1998, the plan got statutory approval only in 2005. During this time, the context of the region along with the city of Bangalore had modified to a great extent as a result of various factors including several plans and policies. Furthermore, the region has been disaggregated into six local planning areas (LPA's) for which the Intermediate Master Plans (IMP's) have been prepared for the horizon year 2021. This is over and above the RMP 2015 for the Bangalore Metropolitan area and the CDP for the BBMP under the JNNURM. What needs to be kept in mind here is that the IMP's are transcending municipal jurisdictions, in the process overriding the main dispensation of the decentralisation agenda of the LB's emerging as units of self governance responsible for their jurisdictions and accountable to their electorates.

As a result what emerges today in the region is multiple plans with multiple horizons for multiple jurisdictions against the three tier governance and planning system advocated by the decentralisation agenda. Needless to say, there are multiple institutions and their respective policy and legal framework dictating and defining development in the region. The need of the hour is dovetailing these plans, providing an integrated planning and policy framework for an integrated jurisdiction. It would be pertinent to mention here the GoK has already articulated this in its Vision Document – Govern Bengaluru while recognising that the 'Governance structure is fragmented, too many plans and no integration of plans and jurisdictions. No structure that allows integrated planning. No single blueprint to manage the cities growth and its services' makes a strong call for the implementation of the decentralisation agenda and governance restructuring to enable spatially integrated plans. Thus streamlined governance structures emerge as the first imperative of the BMR RSP 2031.

It is a well established fact that the Bangalore region is one of the most sensitive regions with respect to water resources. One of a handful of urban agglomerations in the world to be situated above the 1000 metre mark, the city is sited on a plateau with catchments in all directions draining away from the city. With no perennial sources of water, the city's development has been totally driven by a reliance on the nearest perennial source, River Cauvery, situated at a distance of 108 KM and more crucially, at the lower elevation of 450 metre. The scenario has become increasingly critical with the uncontrolled over-exploitation of ground water resources. The RSP 2031 recognises the criticality of water as a resource and assesses the availability of this resource from the point of view of the level and extent of growth and development the region can sustain. Recognising the criticality of water, the RSP 2031 aims to analyse this issue at the local level i.e. it localises the problem and also the solution in contrast to escalating the problem and its solution to the larger scale, thereby reducing the externalising of the associated costs. The topography of the region is identified as a positive constraint which is conducive to using the mini watershed as the lowest possible planning unit. All future growth and development, therefore should necessarily take cognizance of the watershed unit. In a nutshell the RSP 2031 recommends the recognition and respect of the water shed, the

associated catchments, valley systems, water bodies and other natural systems as solution for water resource, management, Natural resource cognition and management emerges as the second imperative in the region.

Finally, the acknowledgement of the fact that while Bangalore city (the core) enjoys a position of primacy in the region, there are a host of other human settlements in the 8005 sq kms positing similar requirements as the primate. These settlements, though much smaller in terms of their economy, spatial extent and the corresponding demographics are vibrant components of the region and therefore need to be addressed in terms of not just their growth potentials vis a vis Bangalore but also as independent settlements in terms of their requirements of sustainable growth. Intra as well as inter settlement economic integration and inclusiveness emerges as a priority, specifically in view of the fact that Bangalore while being a primate in the region also requires its expanding activities to be accommodated elsewhere. The strong radial road network focusing on the city offers one, an opportunity in terms of locating population and employment out into the region and two, to develop as the commuter hinterland through the development of an economically integrated region performing a variety of high level metropolitan, national and international functions from the various settlements in the region and not simply the core. To put this in perspective, the BMR RSP 2031 recommends a balanced growth in the region through concerted action to bring about a strong economic interdependence across the region while avoiding an over centralisation which seems to accompany economic development. In this context the plan recognises that economic integration is not possible without ensuring social convergence. Therefore there is a need for, one, balanced population and employment distribution supported by a strong public transport network, two an enhanced emphasis on social convergence through qualitative improvement of health and education services and three, adequate provision of physical infrastructure. In a nutshell BMR RSP 2031 advocates a balanced and integrated economy coupled with enhanced liveability factors across the region (addressed through inclusiveness) as the third imperative for the region.

Within the context of these emerging imperatives, the BMR RSP 2031 develops a vision, strategy for growth and policy guidelines towards managing urban growth and addressing the imperative of sustaining this growth. The plans recommends a balanced growth perspective of the region without compromising on its ecological parameters while ensuring economic integration and enhanced liveability within the array of settlements in the region.

1.2 Introduction to the BMR

1.2.1 BMR in the context of the SKR plan

In 1997, the Govt of Karnataka through Karnataka Urban Infrastructure Development and Finance Corporation Limited (KUIDFC) initiated 'Preparation of Bangalore Structure Plan 2011'. While considering the BMR, this plan focuses on the immediate environs of the region and located the BMR with its area of 8005 sq kms within the South Karnataka Region (SKR)⁵ which is proposed to be co-terminus with the state divisional administrative boundaries.

The BMR Structure Plan 2011 visualized the BMR and the SKR as strategically and spatially a seamless continuum through the preparation of the integrated BMR and SKR Development Strategy. In the later stages the integrated BMR & SKR Development Strategy Report was split into two separate but strategically inter-locking plans. It was that the SKR Concept Plan was essentially a strategic guidance plan to which local governments would be encouraged to comply with when formulating their respective district structure plans. In that respect, the planning process for any district within SKR has to be within the framework of SKR Spatial Concept Plan, prepared simultaneously with the previous structure plan. This in turn demands the structure plan of BMR to be in line with the SKR Concept Plan which will avoid policy contradictions within the same region. Though not a statutory plan, the SKR acts as a guide for statutory District Structure Plans in the region.

1.2.2 Description of the spatial / geographical context of the BMR (in the SKR)

As described above any planning initiative within BMR will have to be validated in the context of South Karnataka Region (SKR). The SKR is comprised of 7 districts around Bangalore. These are Bangalore, Kolar, Tumkur, Hassan, Mandya, Mysore and Chamrajnagar. The area of this region is 50,555 sqkm and population in 1991 was 174.14 lakhs. As per 2001 census, the population has increased to 206.31 lakhs.

⁵ The BMR SP 2011 envisions that the districts of the state be grouped into five regions (South, West, Central, North-East and North-West). However, all the state regions including SKR do not have a statutory status and have remained as conceptual entities

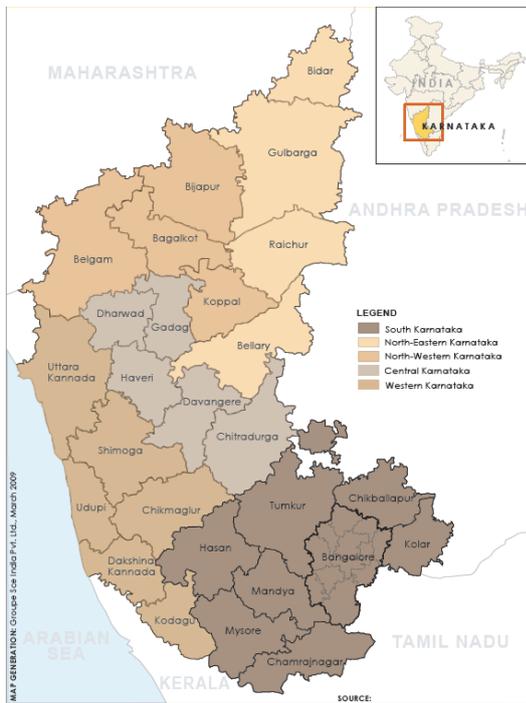


Figure 2 South Karnataka Region indicating the BMR (Left)

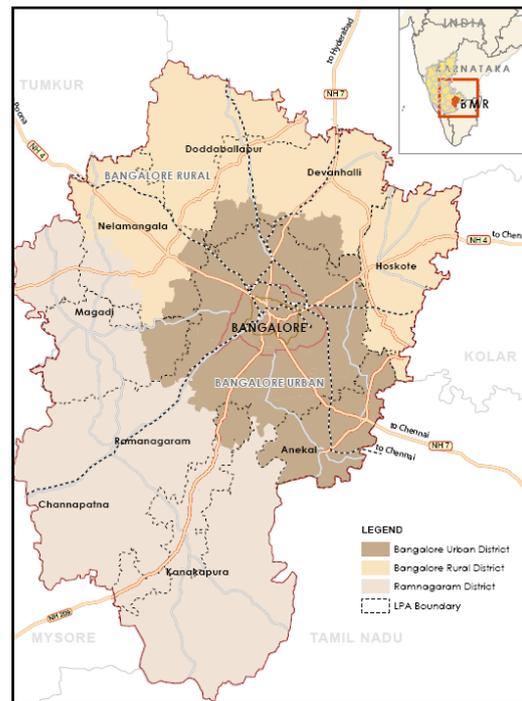


Figure 3 Blow up of the Bangalore Metropolitan Region indicating its three districts (Right)

The Bangalore Metropolitan Region (BMR) covers an area of 8005 sq.kms and houses a population of approximately 8.4 million according to 2001 census. The whole BMR is constituted by three districts namely Bangalore Urban, Bangalore Rural and Ramanagaram (Ramanagaram is a newly created district carved out from Bangalore Rural district that includes Ramanagaram, Channapatna, Magadi and Kanakapura taluks).

Topographically, the Bangalore region is an ecologically sensitive region with respect to water resources. It is one of a handful of urban agglomerations in the world to be situated above the 1000 meter mark; the city is sited on a plateau with catchments in all directions draining away from the city. With no perennial sources of water, the city’s development has been totally driven by a reliance on the nearest perennial source, River Cauvery, situated at a distance of 108 KM and more crucially, at the lower elevation of 450 meter. The scenario has become increasingly critical with the uncontrolled over-exploitation of ground water resources. Over and above this the region has vast areas under reserved forests especially in the South and the South West. Also the topography of the region has strong valley formations which provide an 'opportunity' and is viewed as a positive constraint for development. It is in this context that the consideration of ecological parameters assumes significance towards achieving sustainable development in the region.

1.2.3 Purpose for revision of the BMR Structure plan 2011

The existing structure plan set out its vision and targets for the horizon year 2011. Prepared in 1998, the plan got statutory approval only in 2005. Several plans and policies have been formulated after the preparation of the structure plan. New growth directions have emerged as a result of various economic, demographic and several infrastructure development initiatives. These infrastructure

developments and amenities have however not been able to keep pace with the overall growth and have resulted in unregulated development. One of the major reasons for this has been the lack of enforcement of the BMR SP 2011 in totality, but also a piecemeal reorganization of some of the major dictats of the plan as reactions to on ground realities.

Although the BMR SP 2011 has articulated its vision and strategic development framework, the changing global trends and the liberalised economic environment makes it imperative to revise the structure plan from time to time and make it relevant to the present day needs. In this context, the structure plan becomes significant and it needs to address some of the issues mentioned below.

- Current and anticipated regional disparities by containing the growth of Bangalore and increasing the potential of smaller urban and rural local bodies to attract investments and achieve greater fiscal autonomy;
- Conserve the ecological parameters of the region and ensure that all future investments / plans in the region are informed from this perspective thereby addressing the downward spiral in environmental conditions and physical quality of life in the region especially for the poor and the marginalized.
- Focus on the economic development and integration of the region while enhancing the liveability aspects of the cities specially for the economically weaker sections. The plan will evolve policies and frameworks towards inclusiveness of this target group which is largely bereft of any benefits of planned development

Hence the existing structure plan needs to be revisited in the context of a) the transformed regional scenario, and b) the emerging imperatives of the region given its unique topographical setting and the need to manage and guide development in the numerous settlements within the region. The revision needs to incorporate suitable modifications in the strategy and set targets adhering to the overall vision mission of balanced regional development.

1.2.4 Objective of the RSP 2031

In context of the above, the objective of the BMR RSP 2031 is to address regional disparities and promote balanced regional development through the following

- Provide the strategic policy framework for planning, management and development in the region without compromising on one, the ecology and supporting parameters and two, ensuring inclusiveness and representation of the weaker sections of the society.
- Ensure sectoral development and coordination by evolving dynamic sector policies (addressing changing environments) in tandem with the National and State planning policies and regional guidance (i.e. The SKR Concept Plan),
- Securing consistency between various local plans (both rural and urban) for contiguous or neighbouring areas by dovetailing existing plans and providing the framework for future plans, therefore ensuring streamlined and realistic development

1.3 Approach and methodology

1.3.1 Approach

Planning for a region requires a strategic approach, which will address various geographical scales at the state level, regional and the local level. This essentially translates into recognition of place specific development trends, potentials and issues with an objective of channelizing development that is equitable and desirable and respects the natural environment. Therefore the most appropriate approach is one found to be anticipatory, realistic, adaptable, flexible, consultative, and contractual and includes a process which is:

- Iterative – ensuring a back and forth iterative approach where dovetailing of plans at various scales from the micro level to macro level occur
- Inductive and deductive - ensuring dovetailing of micro and macro plans through an inductive process and analysis of various sectors through a deductive process
- Consultative and Participatory – providing a common platform for consensus building among stakeholders
- Leveraging Technology – Use of latest technology to formulate relevant and realistic total spatial solutions through GIS enabled planning

1.3.2 Methodology

The methodology for the preparation of the BMR RSP 2031 has been divided into a series of activities and tasks as illustrated in the diagram below. The initial stages will include data collection and collation and the compilation of a comprehensive GIS database. Simultaneous literature reviews of relevant case studies followed by a review of the existing and proposed plans & proposals at various levels will help to inform the plan making process. The existing situation analysis will be inter-sectoral as well as interdisciplinary and will address issues from scales ranging from national level, state level, regional and local levels.

The general overview and analysis of the existing situation was considered for the following sectors

- Land use and Environment
- Demography
- Transport
- Economy
- Physical infrastructure
 - Water and sanitation
 - Power and telecom
 - Solid waste management
- Housing
- Social infrastructure
- Heritage and tourism

Unique and innovative tools are to be introduced into the plan making process such as Development Scenarios and Land capability Analysis (LCA).

The Land Capability Analysis (LCA) is a GIS based land suitability analysis method. (In this case - Balanced Arithmetic weightage overlay) It is used to identify capable land parcels for development. Individual parameters like environment, transport, demography and economy with multiple sub parameters under each sector were considered while arriving at this capability. Different sectoral and inter sectoral thematic maps are generated for studying and analyzing the land capability of the region (See the LCA section for further details)

Post the analysis stage, strategies for the development of the region are to be formulated along with articulation of the vision. The vision will then be elaborated upon through the demarcation of zones as well as sector policies and recommendations. Frameworks for implementation as well as priority plans and projects will be detailed out as part of the final deliverable.

The following diagram summarises the tasks and activities proposed for the assignment and the workflow for the same.

Methodology

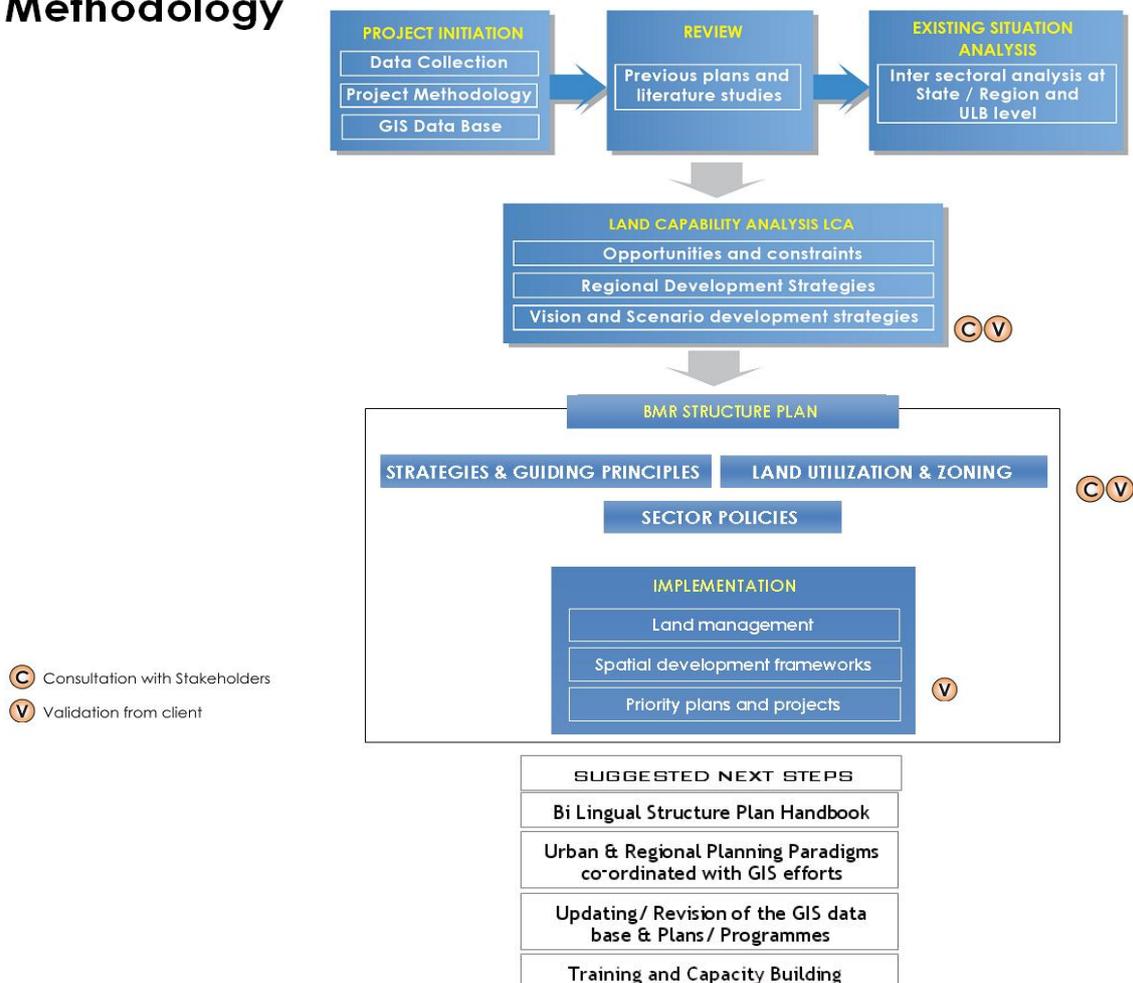


Figure 4: Diagram indicating the BMR Structure Plan revision process

1.4 Existing Situation Analysis and Diagnosis

1.4.1 Spatial Development framework

The BMR is comprised of three districts, namely Bangalore Urban District (BUD), Bangalore Rural (BRD) and Ramanagaram District (RD-a newly created district carved out of Bangalore Rural district with Ramanagaram, Chennapatna, Magadi and Kanakapura taluks) covering a total of 8005 sq kms. The three districts in the BMR are further divided into 11 Taluks. The taluks in turn have 11 ULBs and 284 Gram Panchayats covering 2551 villages. The details of districts, Taluks, ULBs and GPs within BMR is shown in Annexure 2, Section 2.1.

1.4.1.1 Planning Framework in BMR

The region has only one corporation namely the Bruhat Bangalore Mahanagara Palike i.e., BBMP which covers an area of about 800 sq.km and houses a population of approximately 6.8 million. Whereas BBMP is the biggest Urban Local Body within Bangalore urban district, the whole of BBMP area including some of the surrounding areas, termed as Bangalore Metropolitan Area (BMA), comes under the planning jurisdiction of Bangalore Development Authority (Refer Figure-5).

Furthermore, while there are a total of 295 local bodies within BMR which are elected third tier of Government, the planning / development authorities are a different setup within the region. Figure-6 shows an overall planning / development institutional structure within BMR.



Figure 5: Map showing jurisdictions within BMR

The BMR SP 2011, the first planning tool for the region, had divided the entire BMR (excluding the planning area of the Bangalore Development Authority) into five Area Planning Zones (APZs) ⁶ and six Interstitial Zones (IZs). While the APZ's were identified as the development zones, the IZ's were classified as the conservation / preservation zones. Subsequently the BMRDA reclassified the APZ's

⁶ APZ 1 – Bidadi and kanakapura, APZ 2- Nelamangala and Magadi, APZ 3 – Dovenahalli and Doddaballapur, APZ 4 – Hoskote and APZ 5 – Anekal .

and the IZ's to constitute, what is referred today as the Local Planning Area (LPA's), with the planning function being taken care by the respective planning authorities.

The LPA's are larger areas and at times comprise of more than two local bodies. These LPA's come under the jurisdiction of the respective Local Planning Authorities. Consequently there are two urban development authorities i.e. the BDA⁷ and the RCUA⁸ and 6 Planning Authorities functioning under the provisions of the Karnataka Urban Development Authorities Act and the Karnataka Town and Country Planning Act, 1961(Refer Figure-6) All these

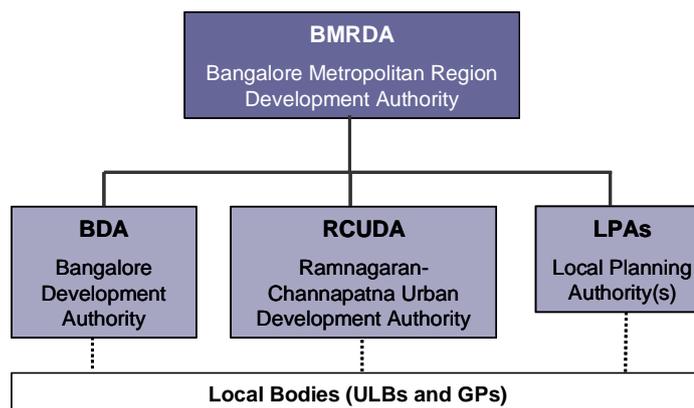


Figure 6: Institutional Framework of Planning Authorities in BMR

planning agencies are required to prepare detailed Master Plans⁹ as per the Karnataka Town and Country Planning Act, 1961 and other relevant legislation/regulations.

The LPA's were carved out of the APZ's and the IZ's and do not confer to the original boundaries of the APZ's and the IZ's. As such certain portion of the APZ's and the IZ's continue under the BMR SP 2011 nomenclature as is evident in the above figure. In a nutshell, in the present context, the total area of 8005 sq kms under the BMRDA jurisdiction is divided into 8 planning authorities / agencies and the remaining part of APZ 1 and the IZ's. Consequently, planned development in the remaining part of the APZ 1 and the IZ's appears to be an ambiguous activity.

Apart from the planning and administrative divisions controlling the BMR, there is a plethora of organisations, mainly parastatals active in the 'planning and development' of the region. The main ones amongst these are the Revenue, Industries (KIADB), and service providers like the KUWS&DB and BWSSB, the BMLTA, KSRTC, BMPTC, PWD, BMRC, traffic police and BESCOM.

⁷ (BDA) was constituted on the 16th of January 1976 under the Karnataka Town and Country Planning Act, 1961. The authority controls, monitors and facilitates urban development within Bangalore Metropolitan Area covering an area of 1307 sq.km. to ensure sustainable and orderly growth. BDA jurisdiction is also referred as Bangalore Metropolitan Area (BMA) which comprises BBMP area, surrounding villages

⁸This planning Authority has been recently created. It controls, monitors and facilitates urban development in Ramanagar-Channapatna Planning area.

⁹The Interim Master Plans (IMP's) have been prepared for the Anekal, Hosakote, Kanakapura, Magadi, Nelamangala and Ramanagaram- Channapatna planning areas and have been approved by the Government. These IMP's would pave the way for a planned urban growth in about 4,000sqkm of area around the BBMP.

Furthermore, the recently launched Jawaharlal Nehru National Urban Renewal Mission promises to make available Rs.50,000 cores over a 7 year period to as many as 63 cities across the country, Bangalore being one of them, with the hope that a similar amount would be raised by the cities and the states concerned. The Mission is also contingent on a set of reforms to be undertaken. Effective implementation of decentralisation measures as envisaged in the 74th Amendment is one of the mandatory reforms prescribed in the NURM. If this is not to remain a mere exhortation, several changes need to be brought about in the current situation and the recommendations of the Kasturirangan Committee (KRR) and ABide task Force (Agenda for Bangalore Infrastructure and Development), the two initiatives of the GoK to streamline governance in the region elaborates on this explicitly and strongly. (Refer Annexure-2, section 2.2 & section 2.3)

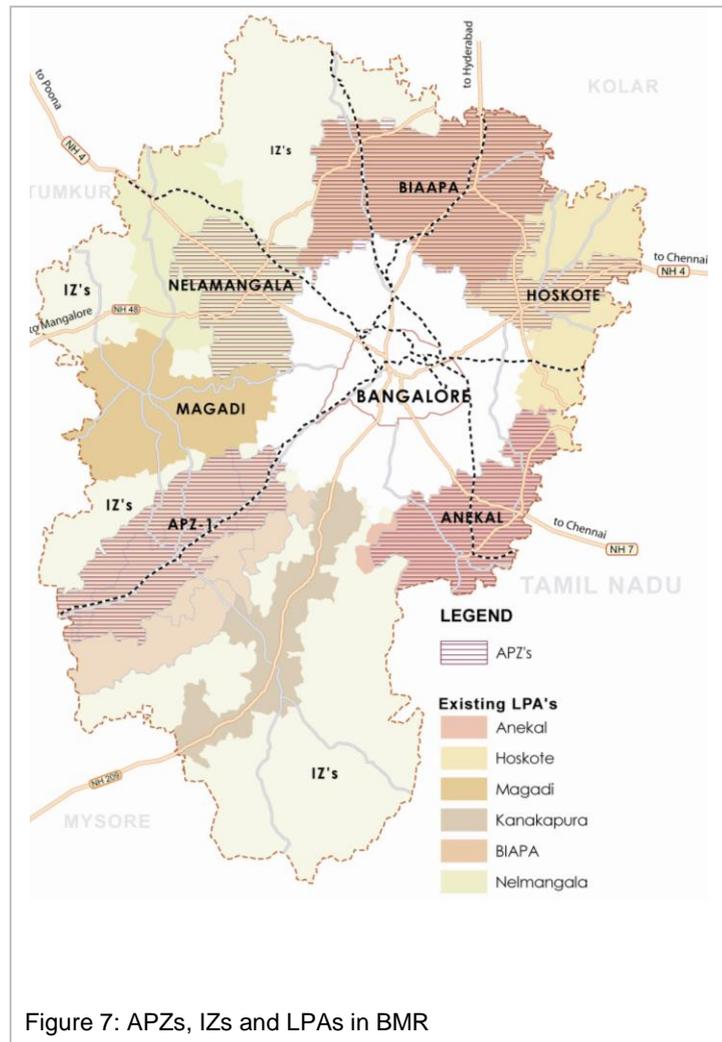


Figure 7: APZs, IZs and LPAs in BMR

Contextualising the above to the BMR essentially means the following plans (Refer Figure-8)

1. BBMP covered by the CDP under the JNNURM, prepared by the BBMP;
2. BMA covered by the RMP 2015 prepared by the BDA under the KTCP 1961;
3. The LPA's (only some of the them with the others in the offing) covered by the IMP's prepared by the respective planning authorities;
4. The BMRDA covered by the Structure Plan 2011 (currently under revision) prepared by the BMRDA.

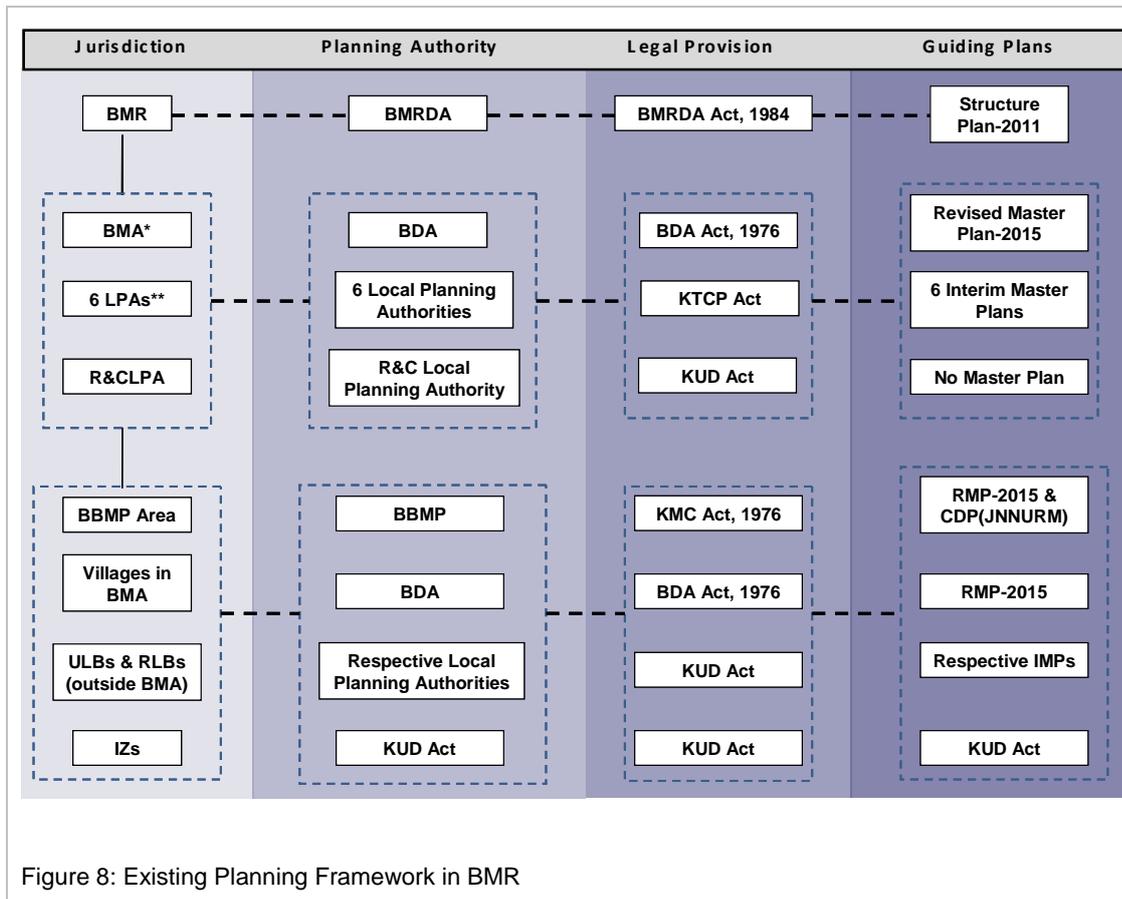


Figure 8: Existing Planning Framework in BMR

In this scheme, the local bodies have little or no role to play in the planning and development of their jurisdictions. However, with the implementation of decentralisation agenda outlined through the 73rd and the 74th CAA, it is expected that the spatial development framework in the region will get streamlined.

1.4.1.2 Decentralisation Agenda and BMR

Karnataka is one of the first states of the Union to address changes in relation to the 73rd and the 74th Constitution Amendment Acts (73/74 CA Act 1993) geared towards participatory governance. Among several updates, the State has amended the following acts in order to further the decentralisation agenda.

- Karnataka Town and Country Planning Act, 1961;
- Karnataka Municipal Corporations Act, 1976;
- Karnataka Municipalities Act, 1964;
- Karnataka Panchayati Raj act, 1993.

Box – 1

- As per section 81 of the Karnataka Town and Country Planning Act, powers to be exercised by any Planning Authority may be delegated to the concerned Urban Local Bodies. In this regard, the Government of Karnataka has declared 45 Local Bodies as Municipal Planning Authorities. The Department of Town Planning is extending technical assistance to these Municipal Planning Authorities.
- Apart from these, there are 28 Urban Development Authorities and 27 Planning Authorities functioning in the State.
- Provision is made in the Karnataka Municipal Corporations Act and Karnataka Municipalities Act for the urban local bodies to prepare city development plan based on the Master Plans prepared for their jurisdiction.
- As far as the Regulation of land-use and construction of buildings is concerned, the Karnataka Town and Country Planning Act is extended to 100 cities / towns in the State. For all these local bodies where the Karnataka Town and Country Planning Act is extended, powers are delegated to issue Commencement Certificate for building constructions. Out of the 100 local authorities, for 45 Municipal Planning Authorities the land use regulation powers are fully delegated

Source: **'Note on 74th CAA and the action taken in Karnataka'** (DMA website)

The legislative changes have brought in the following reforms:

1. Through these legislative changes the state has enabled the constitution of the District Planning Committees (DPC's) in place for all its Districts (29 in 2001);
2. Has regrouped the 50,000 plus villages in the state into approximately 8,000 village Panchayats (VP's) for facilitating participatory development actions through elected Panchayats (with a majority of VP's having populations between 3000 to 7000); and
3. Classified its 250 odd municipalities into Municipal Corporations (MC's); City Municipal Councils (CMC's); Town Municipal Councils (TMC's) and Nagar Panchayats (NP's) for likewise participatory actions.

In the context of the BMR, the recommendations of the Kasturirangan Committee and the ABide Task Force propose the implementation of the 73rd and the 74th CAA on a priority basis. The committee as well as the task force have made a series of recommendations (Annexure 2 section 2.2 & 2.3). Some of the notable ones from the Committee report are listed as under:

- The committee suggests that the BMR jurisdiction to be notified as the metropolitan area in future;
- The abolition of the LPA's and the functional devolution of the urban planning including town planning to the local bodies as per the 73rd and the 74th CAA.;

- Establishment of the Article 243ZE in the 74th Constitution Amendment provides for the Metropolitan Planning Committee¹⁰ (MPC COI Part 9A – Art 243ZE). Section 503B of the Karnataka Municipal Corporations Act, 1976, provides for constitution of MPC. It also says that the Metropolitan Area to be specified by Governor of Karnataka. However, this part of the Act is yet to be notified and hence is not in force. The committee recommends that the MPC may in turn have sectoral sub-committees on water and sanitation, environment, transport, rural-urban social sector issues in addition to constituting an Executive Board which will meet more frequently to review progress on all fronts and give its report on proposals to be examined and endorsed by the MPC;
- BMRDA to act as technical secretariat of MPC. In this context it suggests certain modifications in the functioning of the BMRDA i.e. for it to act as a metropolitan level regulator and planner, it should no longer be directly involved with project implementation;
- The Committee also recommends on the size and composition of the MPC as illustrated in the figure below.

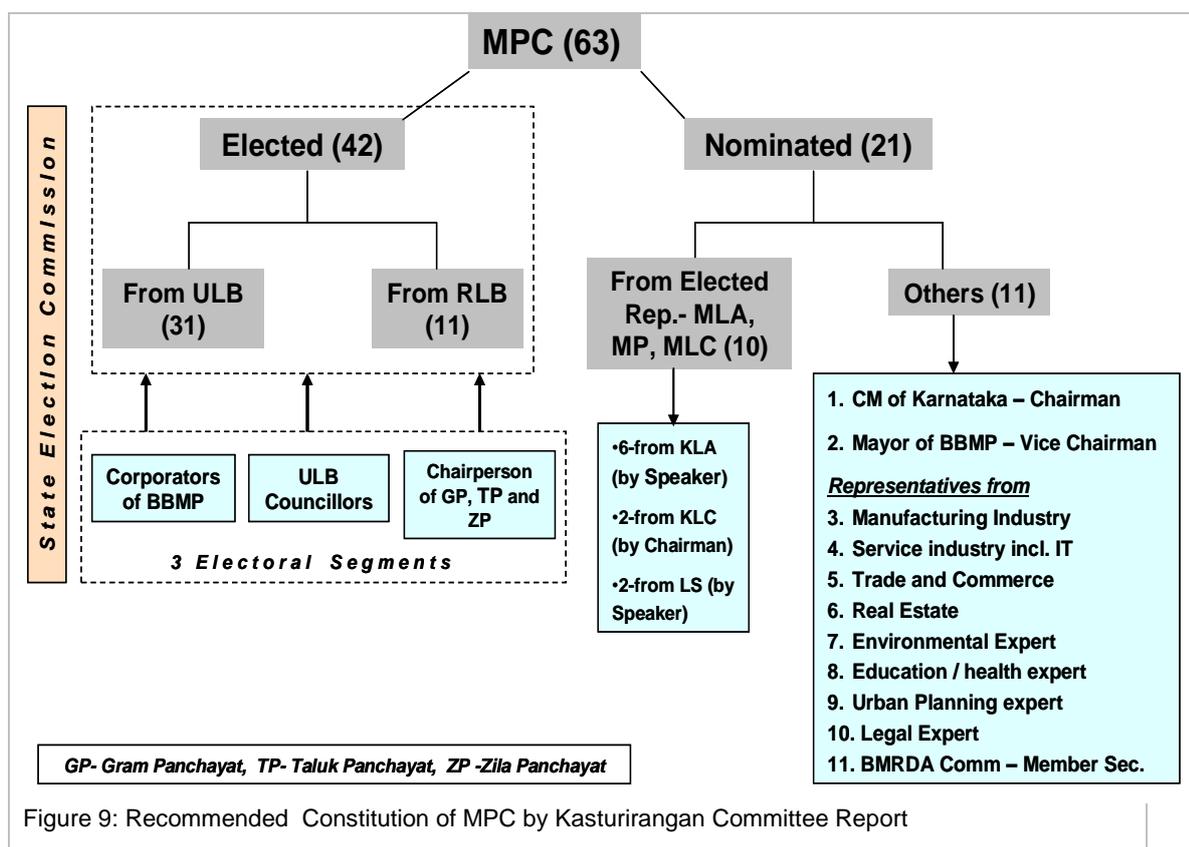


Figure 9: Recommended Constitution of MPC by Kasturirangan Committee Report

As suggested by the committee, of the total 31 seats for ULB representatives, the no seats for each ULB including BBMP will be as per their population share. However, according to this formula, more than 90% of 31 seats (29 nos) goes to BBMP and remaining 2 seats are distributed among remaining 10 ULBs (refer Table 1). This skewed constitution may restrict MPC from serving its larger purpose. Thus, a more realistic and comprehensive formula for the seat sharing between ULBs would have to be worked out and will be addressed further in section 5.2.2 .

¹⁰ It defines a metropolitan area as 'an area having a population of ten lakhs or more, comprised in one or more districts and consisting of two or more municipalities'. The multimunicipal character is, therefore, an essential requirement of a metropolitan area.

Table 1: Representation from ULBs in MPC based on Population				
SI no	ULB	Population_2001	Share of total Urban population in BMR	No of representatives in MPC
1	Nelamangala	25287	0.39%	0.1
2	Dod Ballapur	71606	1.11%	0.3
3	Devanahalli	23406	0.36%	0.1
4	Hosakote	36323	0.56%	0.2
5	Magadi	25031	0.39%	0.1
6	Ramanagaram	79394	1.23%	0.4
7	Channapatna	63577	0.99%	0.3
8	Kanakapura	47060	0.73%	0.2
9	Anekal	33157	0.52%	0.2
10	Vijayapura	29540	0.46%	0.1
11	BBMP	6000000	93.25%	29
	Total	6434381	100%	31

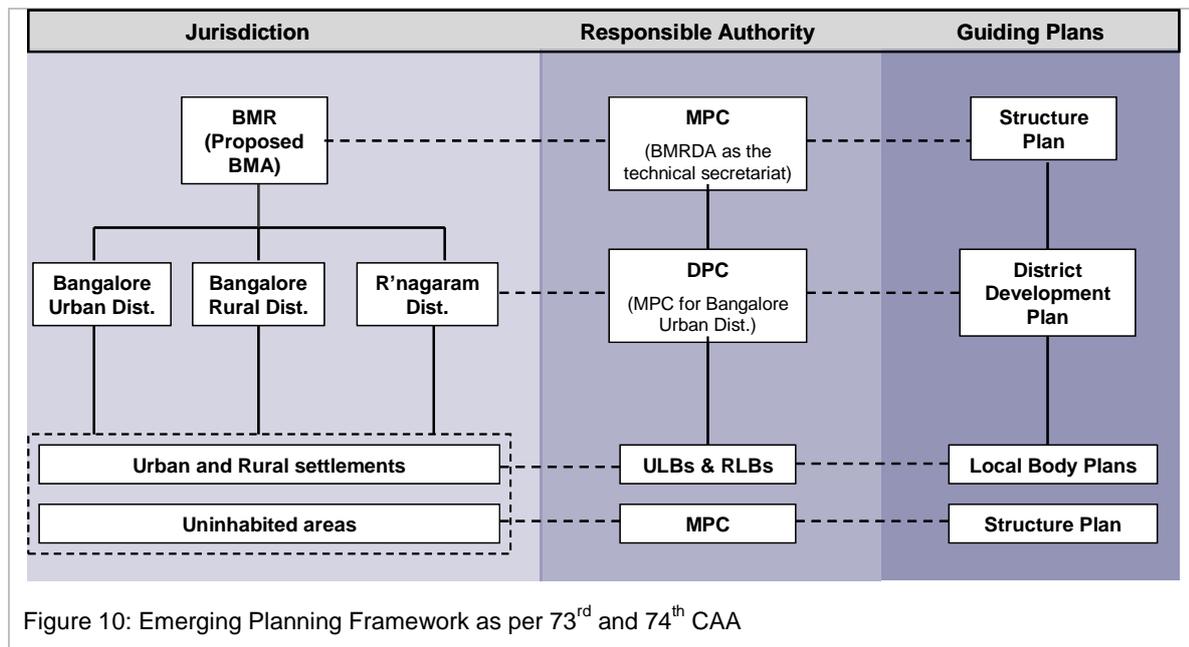
It is notable in this context that while the COI Part 9A – Art 243ZE recommends the establishment of District Planning Committees (DPC's)¹¹ to incorporate the local development plans into District Development Plan (DDP), the Kasturirangan report observes that in context of the wide and comprehensive mandate of MPC, need for constituting DPCs might not be necessary or can be reviewed. This issue has been further discussed elaborately in section 5.2.2.

With the mandated 73rd and the 74th CAA coming into play, the existing spatial development framework as outlined above requires to be progressively reoriented towards the stipulations of these amendments as illustrated in Figure 10. In the context of the BMR, the planning functions will be confined to the following:

1. 295 local bodies as the lowest or third tier of governance;
2. 3 DPC's for the three revenue districts of Bangalore Urban, Bangalore Rural and Ramanagaram and Channapatnam¹²
3. 1 MPC for the BMA (currently the BMR).

¹¹ The District Planning Committee should have "regard to matters of common interest between the Panchayats and the Municipalities including spatial planning, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation, the extent and type of available resources whether financial or otherwise".

¹² The KRR report recommends the reorganisation of the Bangalore urban district which currently comprises of the BBMP, the Anekal TMC and some adjoining rural areas be reorganised by removing the rural components. The urban district will then reflect its urban character by limiting it to the BBMP and Anekal TMC while merging the rural local bodies in Bangalore Rural or Ramanagaram district in an appropriate manner. In such an eventuality the no. of DPC's will reduce to 2



1.4.1.3 Emerging Issues

From the dynamics discussed above, the emerging issues in this context are discussed below:

- 1. Partial Implementation of the Decentralisation Agenda** - As of date there has been a partial implementation of the decentralisation agenda. While the state government has amended the required acts and other legislative instruments on one hand to expanded the functional domain of the LSG's, the removal of the issuing of the commensurate certificate from the domain of the UDA's and devolving it to the local level (Refer Box-1) also implies a weakening of the development authorities. The Panchayati Raj Act has been suitably amended to allow for the DPC's to be constituted while the constitution of the MPC is still in proposal stage. The issue of multiple plans for multiple jurisdictions continues to persist, in the process resulting in functional, political and economic gaps and overlaps.
- This partial implementation of the decentralisation agenda has further added to the current problem of a mismatch between the planning and the administrative jurisdictions. With the parastatals continuing with their respective functional domains, the local governments continue to be weak functionally and financially. Furthermore, in the current scenario the region has several plans each evolved independent of the other with little or no coordination. 'Parastatals are far less accountable and accessible. The present system is a separation of authority and accountability. When the process of local planning is itself not localized, the opportunity for monitoring and upholding that plan is also reduced. Responsibility and accountability are undermined. Departments of state governments or a development authority are far less accessible. Though in the initial stages of preparing a plan including a master plan, a system of public hearings and suggestions is adopted, later on, very important changes are made in the master plan, by executive action on the basis of some committee recommendations or other' (K.C. Sivaramakrishnan, "Metropolitan Governance", June 2006).

3. **MPC vs DPC-Competition or Collobaration:** The decentralisation agenda recommends the constitution of the Metropolitan Planning Committee within metropolitan areas. As defined in the 73rd and 74th CAA, the MPC should consolidate all the local plans. However, there is a debate on the requirement of DPC's within metropolitan areas as in the case of the BMR where the metropolitan area comprises of three revenue districts. While, the constitution of both the MPC and the DPC could lead to confusion between the roles and responsibilities of the two, consequently minimizing their efficiency, where metropolitan areas are spread over more than one district as in the case of the BMR, it may be difficult for the MPC to consolidate all the local plans while defining a strategic vision. This gap may emerge even more glaring in the case of the BMR undergoing a transition with the a large number of human settlements emerging urban¹³ as elaborated in Annexure 4,section 4.14.
4. **Technical and financial capacity of local bodies** - The decentralisation process introduces a level of autonomy for local bodies to manage their own development through the definition of local plans. However, because urban development and planning requires specific knowledge, this autonomy would be really efficient if local bodies have technical and financial capability to undertake such plans. The assistance of the DPCs (or MPCs) to the local bodies - especially the rural bodies - should be well balanced in order to strengthen and not minimize the bottom-up approach.
5. **Transition period: which structure is legitimate to arbitrate** - During the period of transition, it will be necessary to manage the interface between the local action plans, the Comprehensive District Development Plans, the Metropolitan Plan, the Master Plan, the Comprehensive Development Plan, the City Development Plan.

In conclusion it is expected that the State, to ensure state wise integrated planned development action would have to strengthen existing instruments pertaining to Regional and Settlement Development Planning and to Municipal and Panchayat functions. As a collorary, it is expected that the State would also accelerate its training mechanism of elected representatives and planners and other officials at LSG level as also citizens so as to take forward new and changed processes as emanating from the 73rd / 74th CA Acts.

¹³ The census identifies three criteria for a rural settlement to be declared urban; population more than 5,000 persons, a density of 400 persons /sq.km and a Workforce participation which entails more than 75% of the male workforce to be engaged in non-agricultural activities. Given these criteria, a large number of rural settlements will emerge urban in the coming decade.

1.4.2 Overview of existing plans

1.4.2.1 SKR Plan and BMR SP 2011

The South Karnataka Region (SKR) concept plan¹⁴ is essentially a strategic guidance plan to which the District Planning Committee's will be encouraged to comply with when formulating their respective district structure plans. The SKR concept plan 2011 has envisaged incorporating implementable megacity/ metropolitan city structure plans and implementable district level guided development plans for socio-economic investments/ welfare through projects and programmes in consonance with the 73rd /74th CAA.

i) Mission statement and fundamental goals

The mission of the integrated SKR and BMR development strategy was to change the landscape of investment opportunities of Southern Karnataka, so that development gets appropriately managed in the BMR and successfully promoted in the surrounding SKR, thereby creating more equitable and sustainable regional economic conditions and growth prospects. Therefore, important common goals for the SKR and the BMR are articulated to set out an integrated strategy which was to contain and guide the future growth of Bangalore through the renaissance of its garden city image; offer a unique quality of life; and simultaneously encourage the decentralisation of economic activity for the benefit of the SKR without jeopardizing Bangalore's future (refer figure below)

ii) Vision and Development Strategy

Based on the evolution of an integrated transport network and an urban nodal pattern of the region, the SKR Concept Plan and the BMR SP 2011 were expected to work together and have a common strategic development vision, namely "decentralized concentration" of development within the SKR combined with "containment and dispersed concentration" from the Bangalore Metropolitan Area (BMA) to the BMR.

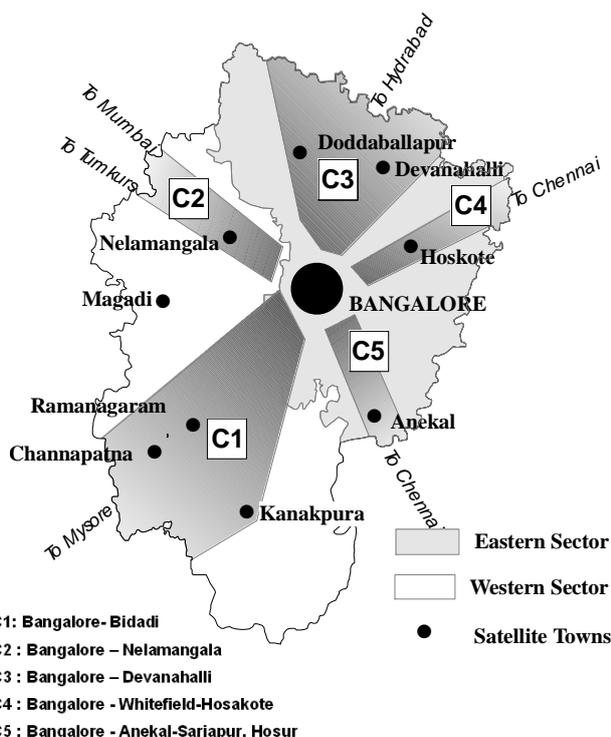


Figure 11: Conceptual diagram

¹⁴ Prepared in conjunction with the Structure plan for the BMR, the SKR plan, though not a statutory one, provides the context for the investment and growth management approach in the region.

The preferred SKR development strategy for 2011 prioritised developments along Mysore – Hassan and Bangalore – Mysore corridors. Through this strategy, economic developments were to be planned in the SKR to help absorb about 60% of the population growth which was expected to be deflected from BMR. The pressure for development on ground water deficient zones was low and on prime agricultural lands was moderate. Mysore and Hassan were to serve as counter magnets to the BMR and Tumkur and Mandya were to be growth centres in the SKR.

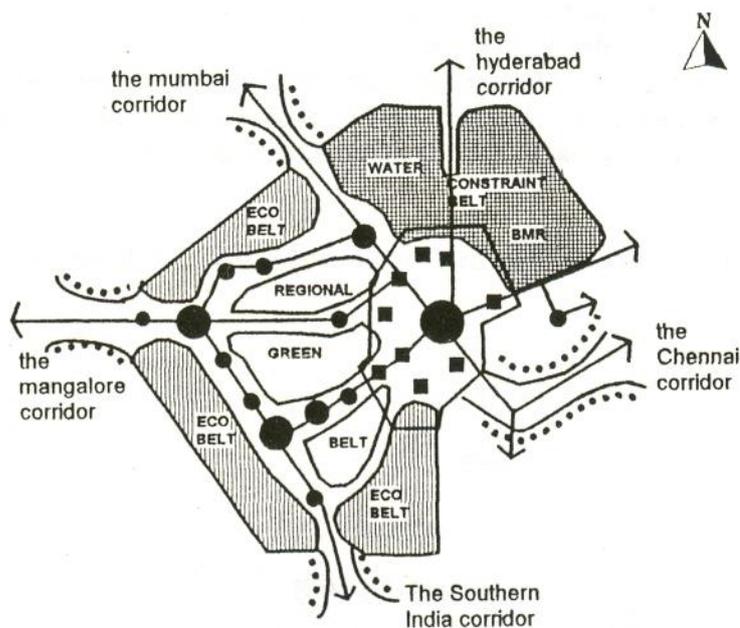


Figure 12: Schematic Diagram of Development Vision for BMR

The BMR SP 2011 outlined the following a prerequisite to translate the broad strategic development ‘Vision’ into a more operational development strategy for the BMR:

- Establish overall population distribution and growth targets within particular planning time horizons;
- Formulate spatial development framework to meet these targets;
- Introduce mechanisms and instruments to guide and control development towards the achievement of the desired strategic development vision.

iii) Strategic Themes

The main thrust of the development strategy identified as part of the SKR and BMR strategy report (February 1998) centred on prioritizing development along Bangalore- Mysore and Nelamangala corridors. The adoption of this twin approach combined the objectives of

- Modulating and containing development pressures in the eastern segment and;
- Integrating the metro BMR with macro SKR strategy which recommends focusing development firstly on infrastructure and nodal growth along the Bangalore-Mysore corridor and secondly along Nelamangala growth centres on the Mangalore-Bangalore corridor.

iv) BMR strategic themes recommended were modified trends, containment and dispersed concentration.

▪ Modified trend strategies

The critical water situation and the high cost of delivery in the eastern segment led to development of this strategy. The spatial orientation of development focused on the western arc through promotion of

the south sector ring-road and growth nodes interlocked with Mysore and Hassan corridor axis. This would shift the focus of development away from the BMR's eastern quadrants and towards the western arc.

▪ **Containment strategy**

Ribbon development and accretion growth along the corridors formed the basis for development of this strategy. Key themes of this strategy had been the pre-emption of ribbon development along the south periphery ring road and the need for NH-4 corridor and area constraint policies and area plans to be required to contain development within the prescribed manageable thresholds. Development of Nelamangala as an urbanisable block was recommended to counter-balance the development of Tumkur.

▪ **Dispersed concentration**

Haphazard development of peri-urban fringe areas and the resulting land conversion pressures led to the development of dispersed concentration strategy for the BMR which aimed at deflecting and attracting growth away from the city. In the urban periphery, dispersed concentration and containment strategies marry up with the aim of attracting and controlling growth in satellite towns and at transport interchange growth nodes.

v) Preferred Development Strategy

The following are the highlights of the preferred scenario

- Optimal groundwater resource conservation and proximity to the existing primary water supply system;
- Effective inter-meshing with the SKR concept plan corridor priorities;
- Maximisation of transport infrastructure and area development synergy effects to lever private sector participation;
- Potential to positively harness and integrate existing public and private sector initiatives without jeopardizing the achievement of strategic objectives;
- Offers the mostly likely scenario to achieve the population redistribution targets;
- Offers a strategic response that is robust due to its bi-polar rather than mono-polar growth concept.

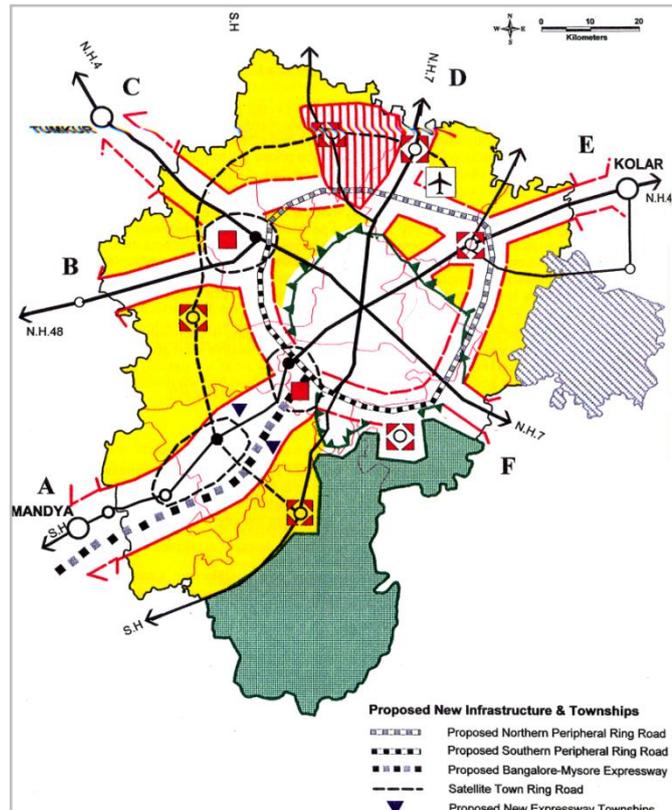


Figure 13: BMR - The Strategic Response-Containment and Dispersed Concentration

In order to maximise the utilisation of existing and available infrastructure and to minimise the need for conversion of agricultural land, the concept of Area Planning Zones (APZ) was recommended in the plan. For the areas which were not covered in the APZ, Interstitial zones (IZ) were designated largely for preservation of natural resources as also agricultural lands.

vi) Implementation of the preferred SKR and BMR development strategy

The formulation and implementation of the preferred strategy was expected to reflect and promote three processes initiated at the national level that impacted the region's economic and social development:

- The rise of economic liberation;
- The changing role of the public sector and ;
- The decentralisation of democratic authority.

vii) The guiding principles for the implementation of the preferred strategy

- It must harness and guide the market;
- The public sector implementation of the strategy must enable, facilitate and encourage the growth of the private sector;
- The plans associated with the strategy must empower local communities to manage and direct their own future to a greater degree than it was possible in the past.

viii) General Sector Policies

Within this larger strategic intent, the BMR SP 2011 outlines policy guidelines applicable at an overall BMR level and policy guidelines specific to the BMR's western and eastern segments and individual area planning zones and interstitial zones. Further more, policy guidelines have been set out by on Sectoral basis as highlighted in (Annexure 1, section 1.3)

1.4.2.2 Interim Master Plans for the LPAs

i. Interim Master Plan for Anekal LPA

Vision: The vision of the Interim Master Plan (IMP) is to direct the growth of Anekal LPA according to sound urban planning practices resulting in balanced growth of urban infrastructure, industries, social institutions, housing, entertainment, transport, shopping and education facilities, encouraging a work reside and play relationship among its residents. The objective is to achieve a self sustained settlement which would act effectively as a counter magnet to Bangalore city, thereby decongesting the core.

Area of Anekal LPA (in HA)	: 40,230
Population (2001)	: 0.19 million
Projected population (2021)	: 1.08 million

ii. Interim Master Plan for Magadi LPA

Vision: “Economic development of the region needs to adapt to local conditions and integrate with socio-economic growth of the existing residents. The development should be linked to integrate the infrastructure in rural and urban areas, giving adequate space for the resident population as stakeholders in the development process. Natural resources have to be preserved to ensure a balanced and environment-friendly development. The urban centers and nodes within the LPA need to be developed to a desired level to encourage and supplement the processing and value addition of the resources available within the region. An environment conducive for investors for economic activities, in carefully selected locations, has to be created, so as to relieve Bangalore Urban conurbation from undue urban pressure, ensuring a sustainable environment”.

Area of Magadi LPA (in HA) : 47,851
 Population (2001) : 0.13 million
 Projected population (2021) : 0.43 million

iii. Interim Master Plan for Hoskote LPA

Vision has not been formulated in the Interim Master Plan for Hoskote LPA

Area of Hoskote LPA (in HA) : 57773
 Population (2001) : 0.23 million
 Projected population (2021) : 0.33 million

iv. Interim Master Plan for Nelamangala LPA

Vision: To integrate the development strategies of BMA and BMR to change the landscape of investment opportunities of BMR, so that the development is appropriately managed in BMA and successfully promoted in BMR. The IMP has adopted the overall vision of the Structure Plan 2011 of BMR.

Area of Nelamangala LPA (in HA) : 73500
 Population (2001) : 0.24 million
 Projected population (2021) : 0.50 million

v. Interim Master Plan for Kanakapura LPA

Vision: Improvement in economic conditions and quality of life in the LPA. Creation of around 2 lakh jobs due to industrial development in the LPA (excluding the Sathanur Township) out of which 40000 persons will be employed from the existing population of the LPA

Area of Kanakapura LPA (in HA) : 41278
 Population (2001) : 0.17 million
 Projected population (2021) : 1.12 million

vi. Interim Master Plan for BIAAPA

Vision: A Modified and containment strategy that laid emphasis on “Selecting a core planning (development) area subjected to special environmental controls and an action area corridor so that the corridor becomes a processional way to Bangalore. Utilizing the opportunity to harness and transform the ribbon and associated unplanned accretion growth into planned and focused nodal center. Developing a satellite town or Airport township taking the benefits of available infrastructure. Considering three towns (Doddaballapura, Devanahalli and Vijayapura) as not only the growth centers influenced by the airport related activities, but also as containment centers of the excess population from the Bangalore Metropolitan Area”.

Area of BIAAPA (in HA)	: 79200
Population (2001)	: 0.41million
Projected population (2021)	: 1.50 million

1.4.2.3 RMP 2015

The RMP 2015 a statutory document, promoting and guiding the growth of the BMA, identifies growth perspectives, develops land use plans addressing the urban agglomeration area’s growth and lays out Zonal regulations (ZR) to regulate the city’s development. The RMP 2015 addressed long term sustainable development through the directive principles which include nature (through natural and hydraulic balances), economic efficiency (economic competitiveness to facilitate quality spaces), social equity (equal access to facilities) and historical heritage (conservation of Bangalore’s heritage). Based on these directive principles, an overall vision for the city was developed. The governing concept of the Master Plan is to ensure “structured continuity” in the Bangalore Metropolitan Area through

- (i) Selective extension of urbanisation, while preserving large parts of the Green Belt and environmentally sensitive areas
- (ii) Access to new extensions through peripheral ring road and
- (iii) Natural renewal of areas already urbanized.

The population of Bangalore Metropolitan areas in the year 2001 was 6.17 million. It is proposed in the Master Plan that this population would increase to 8.02 million by 2011 and to 9.97 million by 2021.

Broad strategies in the RMP 2015 also recognized the criticality of water resource and identified the following:

- Preserve areas towards the Western belt through restricted development zone; this belt being rich in water resources, thereby the need to preserve it.
- Open up green belt towards the North and the South eastern areas for future urbanisation as per the current trends and investments
- Promote IT and related mixed use developments towards the south-eastern belt

1.4.2.4 City Development Plan-JNNURM

This City Development Plan (CDP), prepared for the city of Bangalore in 2006, is a prerequisite for availing financial assistance under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM). The area covered under CDP is 1351.1 sqkm and includes BMP, BDA and BIAAPA. The CDP has estimated the population as 99.68 lakh for the BMP and non-BMP area in 2021

Vision: To retain its pre-eminent position as a City of the future, the City shall enable and empower its citizens with:

- Growth opportunities to promote innovation and economic prosperity;
- A clean and green environment;
- High-quality infrastructure for transport and communication;
- Wide-ranging services aimed at improving the quality of life for all;
- Conservation of its heritage and diverse culture; and
- Responsive and efficient governance.”

An analysis of the various plans operational in the region reflect not only contrary development strategies as in the BMR SP 2011 and the RMP 2015 but also a certain level inherent contradictions, and a lack of coordination and acceptance of the overall policy framework laid out by the BMR SP 2011. Rationalizing these contradictions emerged as the main objective of the BMR RSP 2031.

1.5 Land Capability Analysis

1.5.1 Need for the land capability analysis (LCA)

Bangalore region is one of the most sensitive regions with respect to water resources. It is one of the urban agglomerations in the world situated above 1000 metre altitude mark, which is sited on a plateau with catchments in all directions draining away from the city. The city's development has been totally driven by a reliance on the nearest perennial source, River Cauvery, situated at a distance of 108 KM and more crucially, at the lower elevation of 450 metre. There are numerous water and environmental related sensitive issues which are vital to be addressed for the sustainable development of Bangalore region. To enable an identification of these ecological parameters and allow them to be used positively for the development of the region, the BMR RSP 2031 engages the LCA a GIS based decision making method using multi criteria parameters to arrive at a capability analysis. In the case of the BMR, environmental, demographic, transport and economic factors have been used. Suitability coefficients¹⁵ (or weightages) are used in the generation of various sectoral and intersectoral thematic maps. The output of the LCA is used to effectively address and incorporate the region's natural resources in the physical and policy planning framework for development

¹⁵ BMR RSP 2031 adopted the **Balanced arithmetic weightage overlay** method for the LCA process. Through the LCA method natural characteristics of the region such as topography, soil, vegetation, agricultural patterns, are graded based on intensity. Weightages are assigned to each of the identified attributes of the natural resource layer and then converted into raster format and assigned relative weightages between themselves before converting into composite raster to arrive at potential land parcels capable for development (Refer annexure-3, section 3.1)

While the land capability analysis is not new in urban and regional planning exercises; the normal procedure is to use Cartesian grid for assessment and grading of land parcels. Such a division, assessment and grading of land resource, whether urban or rural, fails to effectively recognize any of its natural characteristics. Acknowledging this aspect of conventional land capability analysis as a limitation and recognizing the critical nature of the Bangalore region's natural resources, specially the criticality of water resource, the random Cartesian grid has been replaced by the mini-watershed as the reference grid.

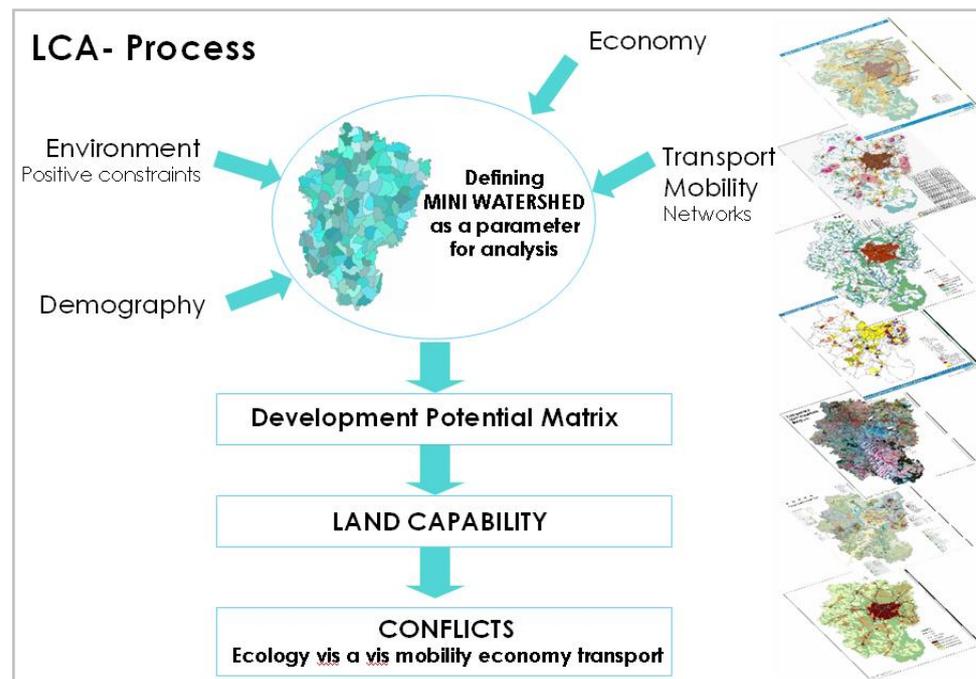


Figure 14: Land Capability Analysis Process

Thus the LCA as employed by the BMR RSP 2031:

- Recognizes the critical nature of Bangalore's natural resources to effectively allow the mapping of the sensitive ecological features as a pre requisite to identifying the development needs of the region;
- Employs the mini-watershed as the defining parameter for analysis and grading of land parcels;
- Finally grades the natural potential of land in concert with anthropometric parameters such as industry, transport, demographics, etc, to evolve a *development potential matrix*¹⁶

The major parameters used for the land capability analysis includes natural resources, transport, demography and economic activity. The land capability thus derived identifies all land parcels that have the potential for development. Further the LCA was used to identify conflict areas in existing and proposed broad land use patterns. The intensity of conflict is graded to evolve a balanced understanding of the severity of the decision / investment, thereby enabling the evolution of the development strategy for the region.

¹⁶ Multiple parameters taken together and graded with a relative ranking of priority and criticality, supported by grading the natural potential of land in concert with anthropometric parameters such as industry, transport and demographics helped to arrive at the grading the natural potential of land in concert with anthropometric parameters such as industry, transport and demographics helped to arrive at the development potential matrix

Output of the LCA

The land capability analysis with respect to the natural resources (Refer figure15) shows that at a regional level, there is concentration of capable lands in two segments. The Western segment in general has good capable land intervened by large conservation areas. Areas immediately surrounding the core (BMA) in the N & NE have highly capable lands, In line with the current trends of development, the North and NE parts of the region have a concentration of land parcels with moderate and high capability for development. The S-SW parts show a lesser capability because of the presence of large patches of conservation areas which restrict development choices. Areas towards extreme south are to be conserved mostly as highly sensitive areas.

The transport composite map (Refer figure 16) analysis shows that most of the developable parcels and existing settlements in the N & NE parts are well accessed by road and rail. Few pockets in the West are also likely to be well accessed provided the STRR, TRR and IRR proposals are implemented. The South shows less accessibility as there are fewer urban settlements and roads.

A similar conclusion can be arrived at through the demographic capability (Refer figure 17). The region is characterized by moderate to high capability in the Northern part has compared to the Southern segment. The South has mostly moderate-low with a few highly capable areas concentrated around the existing settlements. The areas immediately surrounding the core on all sides have a higher demographic capability.

The economic investments in the region are concentrated in two arcs, the North to SE arc and the NW to SW arc. In the North to SE arc, several KIADB industrial estates and residential layout developments are in the vicinity of the Dodaballpur-Devanahalli area, and the Hoskote and Anekal towns. In the NW to SW arc, majority of the industrial investments are in Bangalore-Nelamangala corridor and a few are along the Mysore road corridor.

An integrated analysis of the above parameters indicates that the potential for development is focused in the N, NE and the SE (i.e. the Eastern Arc). Towards the W and the SW, the development potential is largely concentrated along the Bangalore Mysore corridor and the Bangalore Nelamanagala corridor. The West and the SW emerge as the conservation zones.

Based on the understanding of the existing context, and the LCA, the possible Vision for development of the BMR has been articulated. Alternative strategic choices for spatial and non-spatial development have been made through multiple scenario developments elaborated in section 2.4.

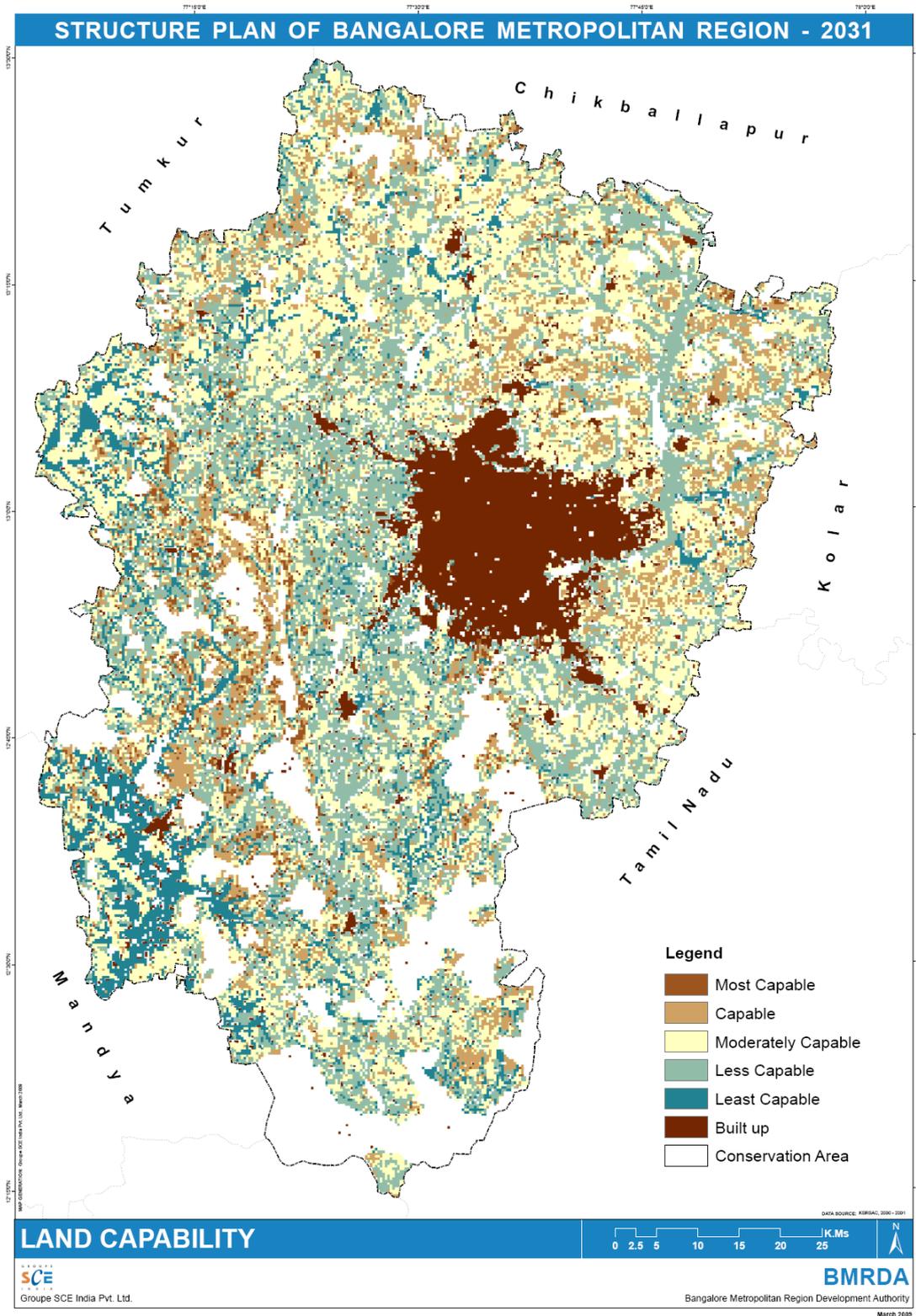


Figure 15: Composite map of natural resources

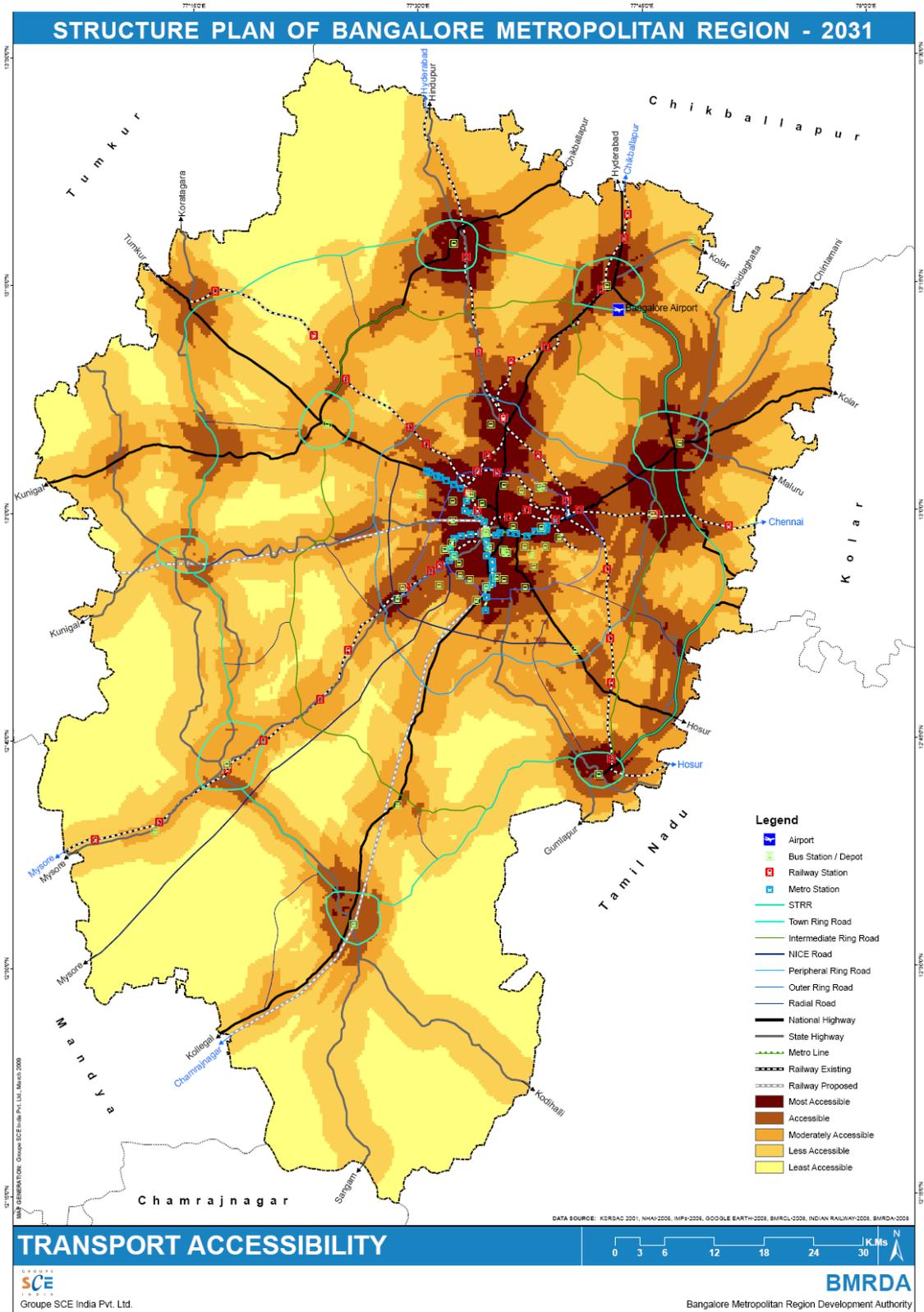


Figure 16: Composite map of Transport

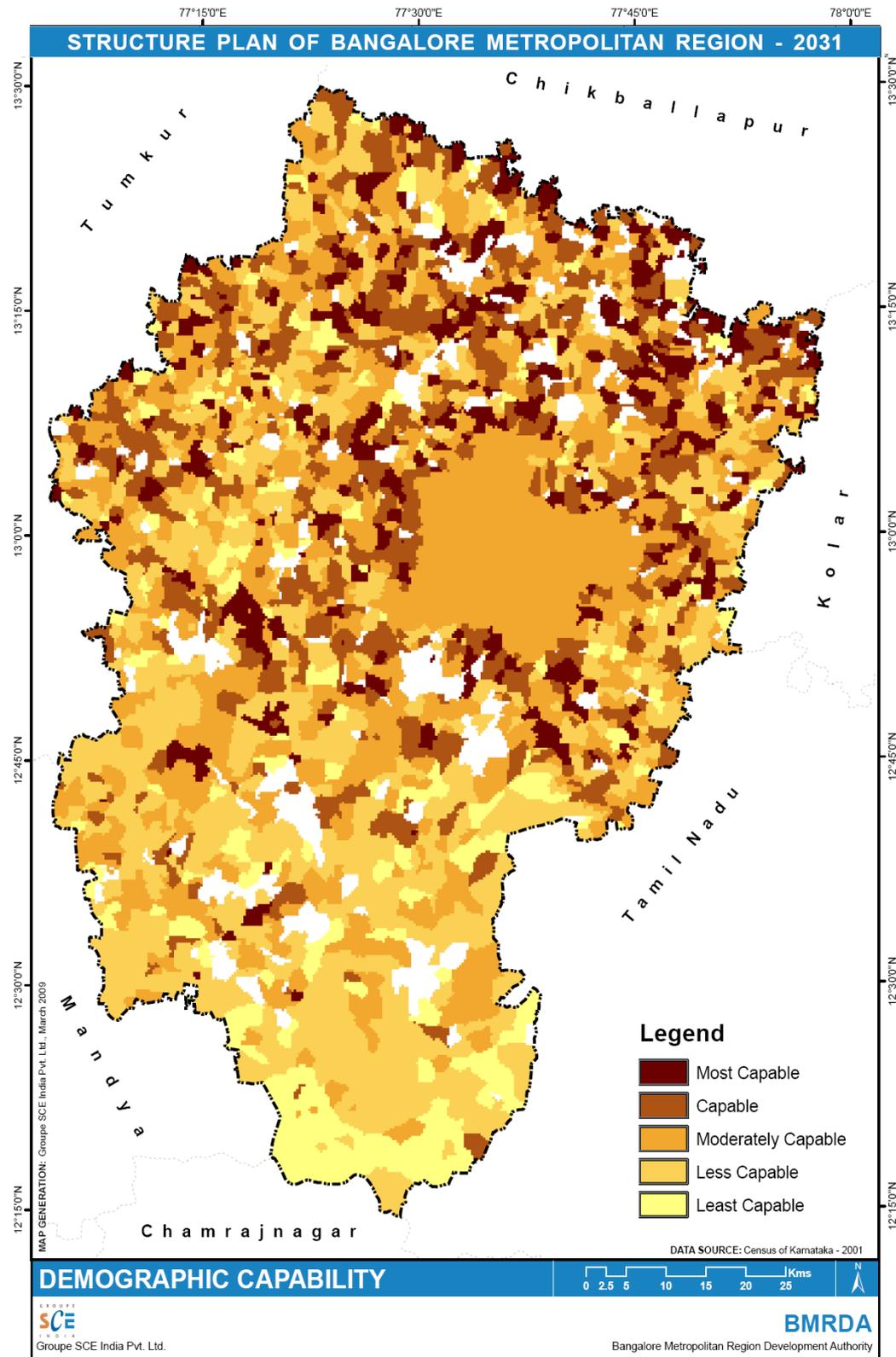


Figure 17: Composite map of Demography

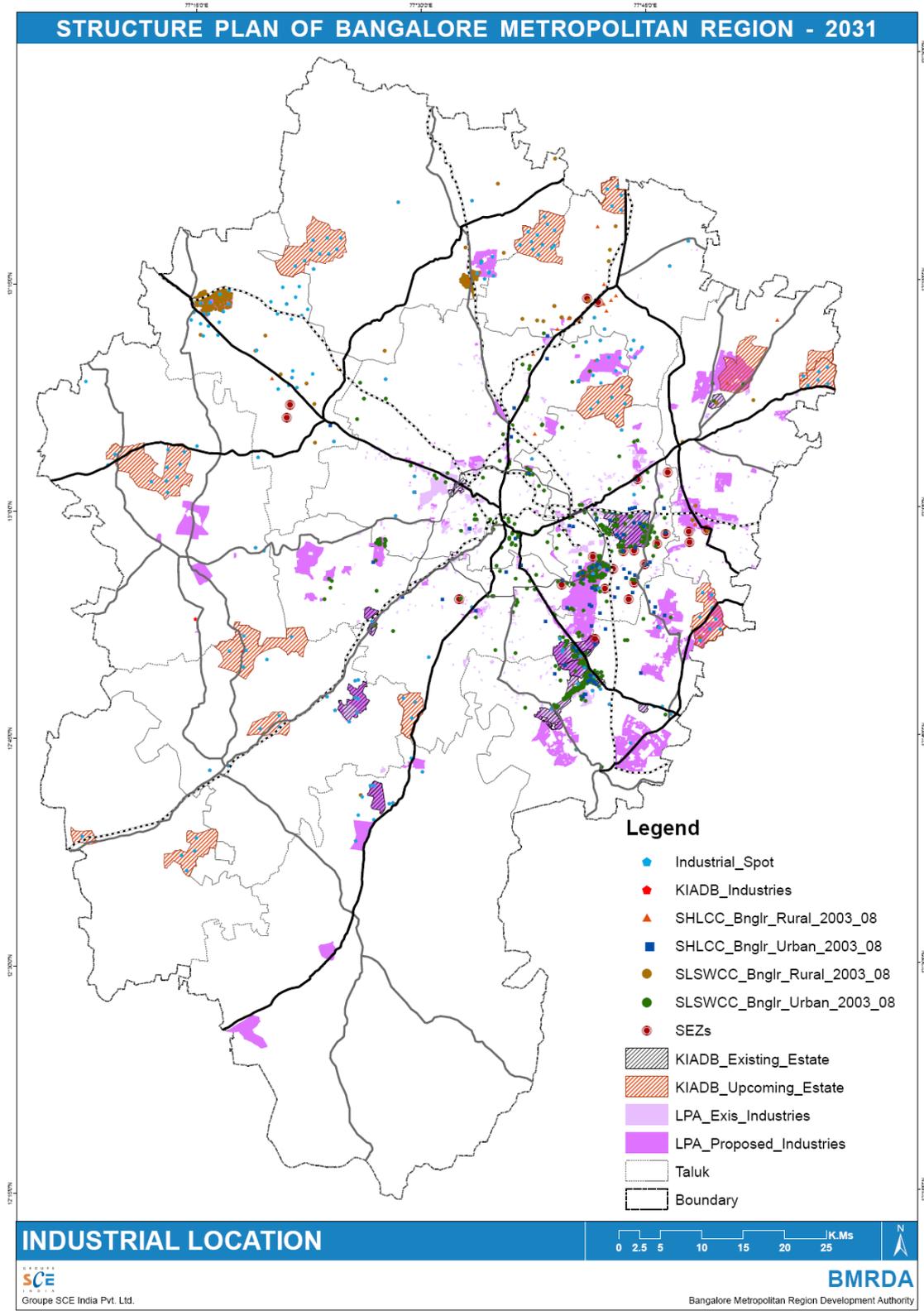


Figure 18: Location of industries in the region

1.6 Demography

1.6.1 BMR At a Glance

This section attempts to provide an overview of the demographics of the BMR as well as its constituent areas. As an introduction, the following figure and table illustrates the basic information of the BMR and its key jurisdictions. Figure 19 and Table 2 shows taluka and town wise key demographic features for BMR.

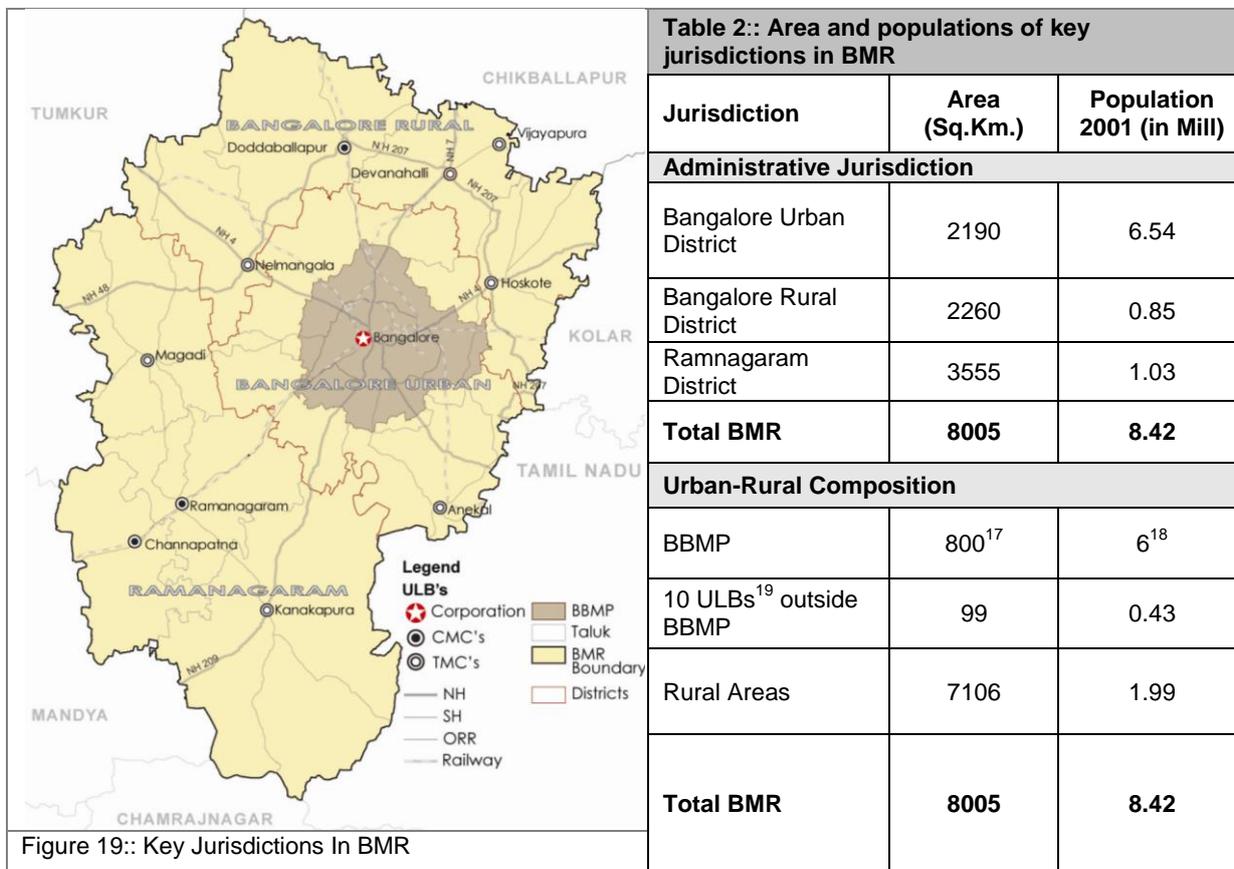


Figure 19:: Key Jurisdictions In BMR

1.6.2 Demographic Situation Overview

The detail statistics on population over past five decades in the constituent districts and talukas of BMR is appended in Annexure 4, section 4.1a, 4.1b. The following section highlights the important observations on the distribution of population in BMR and the associated trends (Refer Annexure 4, section 4.15).

Both the BMR and BMA have, over the past decades shown a steady growth in terms of population size As per 2001 Census, the BMR and BMA hold 8.42 mill and 6.17 mill populaion respectively.

¹⁷ Official website of BBMP

¹⁸ 2001 BBMP population has been considered approximately as 6 million as in can be anywhere between 5.7 mill (BMP+7 CMC+1 TMC population) and 6.17 Mill (BMA Population)

¹⁹ 10 ULBs outside BMA : Anekal, Hoskote, Devanahalli, Didballapur, Vijayapura, Nelamangala, Magdi, Ramnagaram, Channapatna, Kanakapura

However, in terms of rate of growth of population, BMA shows a higher rate over BMR as the BBMP constitutes the majority of the BMA. During 1991-2001, the BMA had grown at a rate of 43.5% against 29.3% of BMR (Refer Figure 20). In terms of a proportional distribution between the core (BMA) and the BMR, as against a 48:52 proportion in 1991, 2001 shows a share of 73:27 (Refer Figure 21). The steady increase in core population share vis-a vis a declining regional population share indicates the growing primacy of Bangalore over the region in attracting population. A continuation of this trend is anticipated to be detrimental to the region with the core growing at the cost of the region.

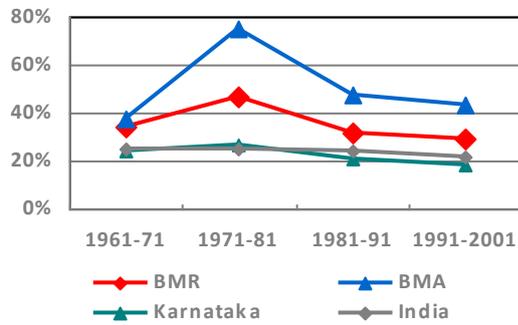


Figure 20: Decadal Growth Rate of Population in BMA and BMR²⁰

The density profile of BMR shows a dense corporation area represented by erstwhile BMP having a density of approximately 19000 persons/sq.km (Refer figure 22). However, the average urban density is 4697 persons/sq.km. only, attributed to the 10 smaller ULBs in the region. The density of BMA is also less compared to BMP as it covers rural areas and a green belt in its periphery. The average rural density in BMR is a miniscule 275 persons/sq.km.

The level of urbanisation in BMR is 73% as on 2001 (Refer figure 23)

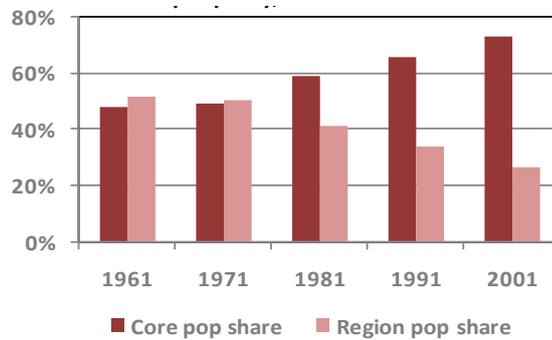


Figure 21: Trend of Population Share Between Core and Rest of Region in BMR²¹

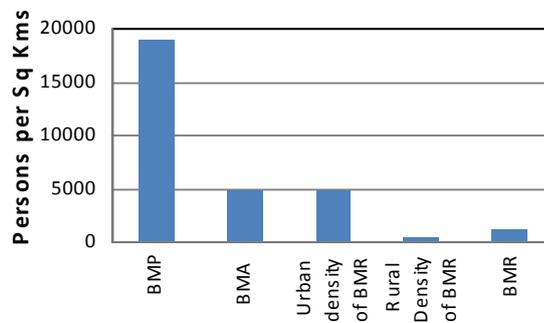


Figure 22: Density Profile of BMR²²

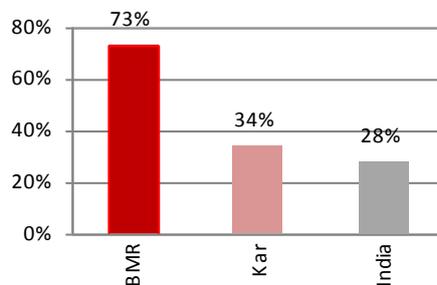


Figure 23: Urbanisation Level in BMR compared to Karnataka and India

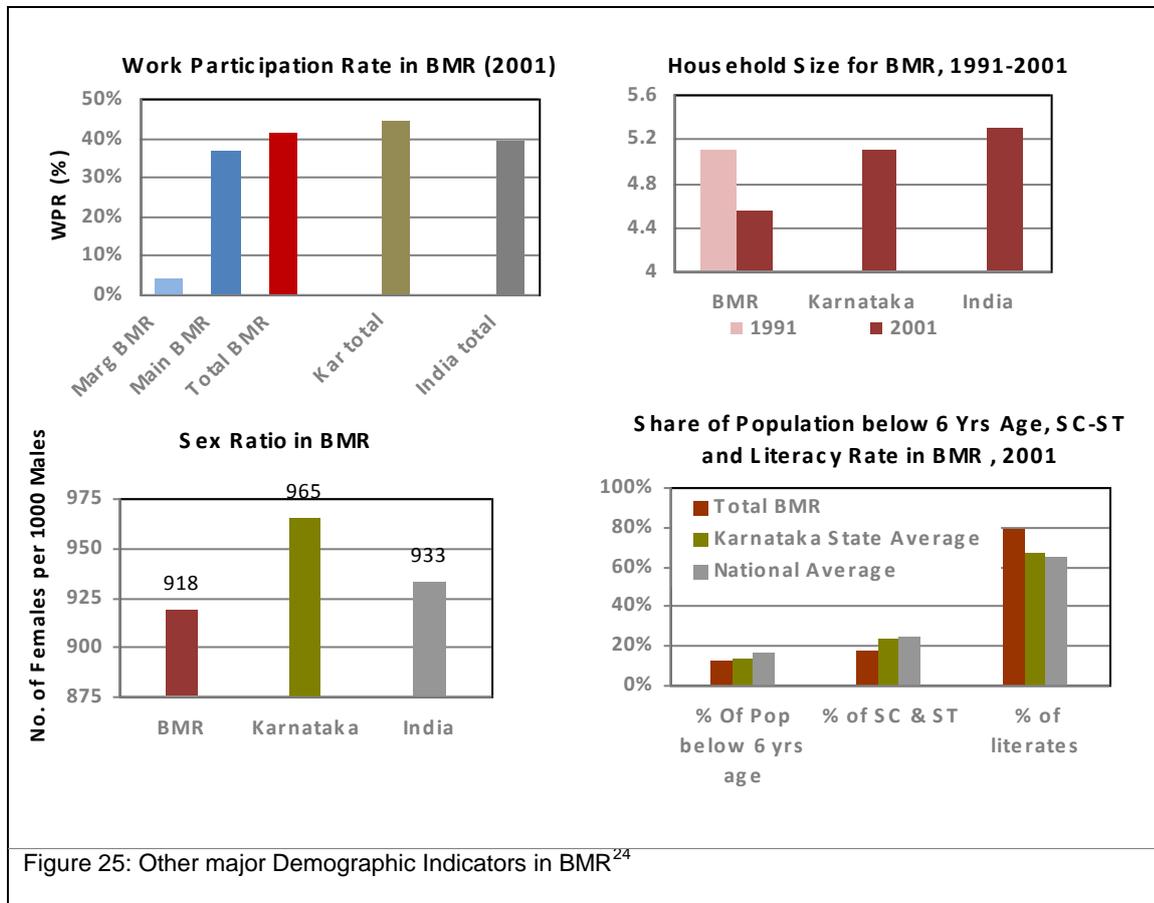
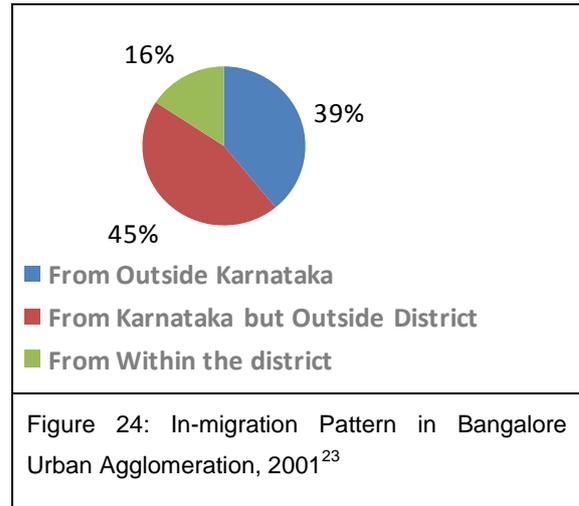
²⁰ Census of India and SCE Analysis

²¹ ibid

²² ibid

The migration data analysis reveal that BMR has about 3 million migrated population registered in 2001. Of this, Bangalore Urban District witnesses approximately 2.5 million. A large percentage of this migration is from the state itself (Refer Figure-24).

Status of other major demographic and socio-economic indicators for BMR, like Work Participation Rate, literacy rate, SC-ST population share, sex ratio, average household size etc. are presented in Figure-25 below.



²³ Census of India and SCE Analysis

²⁴ Ibid

1.6.3 Plan Interventions: Population Strategies

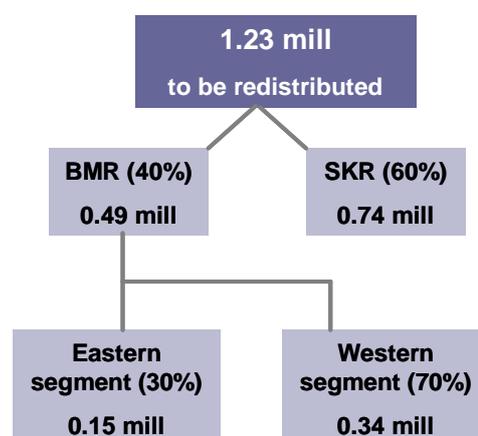
The Bangalore metropolitan area, metropolitan region as a whole and the constituent Local Planning Authority areas have been and are being subject to various plan interventions. An analysis of the population strategies of these interventions is highlighted as under:

- **Structure Plan -2011**

The BMR SP-2011 divided the BMR into five APZs and further projected their growth based on development of regional level growth centres / emerging settlements. Apart from BMA, 9 settlements spread over BMR were selected as growth centres for future projection. The population distribution strategy of SP-2011 emerges out of its spatial growth strategy which propagates the concept of deflecting growth towards western segment against the ongoing trend towards Eastern segment. Cumulatively, this strategy was targeted to result in a 60:40 population share between Western :Eastern segment within BMR.

Table 3: SP-2011 population Estimates and Distribution

Item	2001	2011
BMR Population projected in Mill	8.63	11.49 (1.9%)
BMA Population projected in Mill	6	8.23 (3.2%)
Project induced population in BMA		0.6
Total projected population of BMA		8.83
BMA population carrying capacity		7.6
Population to be redistributed outside BMA		1.23



- **Revised Master Plan for Bangalore -2011**

The RMP 2015 for the BMA proposes further densification of BMA, advocating a carrying capacity of 8 million by 2011 and about 10 million by 2021. It is estimated that by 2015 the population of BMA will be approximately 8.9 million. In terms of density, this translates into 23637 persons/sq.km for erstwhile BMP area.

The RMP 2015 adopts a differential growth rates for the erstwhile BMP area and the non-BMP area within BMA. With the constitution of the BBMP, the

Table 4: RMP-2015 Population Estimates

Jurisdiction	BMP	Non-BMP	BMA
Area in sq.km.	226.20	1080.80	1307.00
Pop_2001	4.30	1.87	6.17
CAGR(%) 2001-11	1.80	4.40	2.65
Pop_2011	5.14	2.87	8.01
CAGR(%) 2011-21	0.78	4.38	2.2
Pop_2015	5.35	3.56	8.90
Density_2015	23637	3292	6814
<i>Note: Population figures are in million</i>			
<i>Table Source: RMP-2015</i>			

growth dynamics in the newly added areas are expected to undergo a notable change and this constitutes the basic premise of the population allocation strategy of the BMR RSP 2031.

▪ **IMPs of Local Planning Areas**

There are 6 IMPs and 2 other Local Area Plans applicable over BMR. The population estimates of 7 LPAs (excluding BMA) together suggest a BMR population of 6 million by 2021 outside the core. In addition, considering the RMP 2015 population estimates, it is expected that by 2021 the region will hold a population of 16 million.²⁵ (Refer Annexure 4, section 4.4 for LPA area and population details).

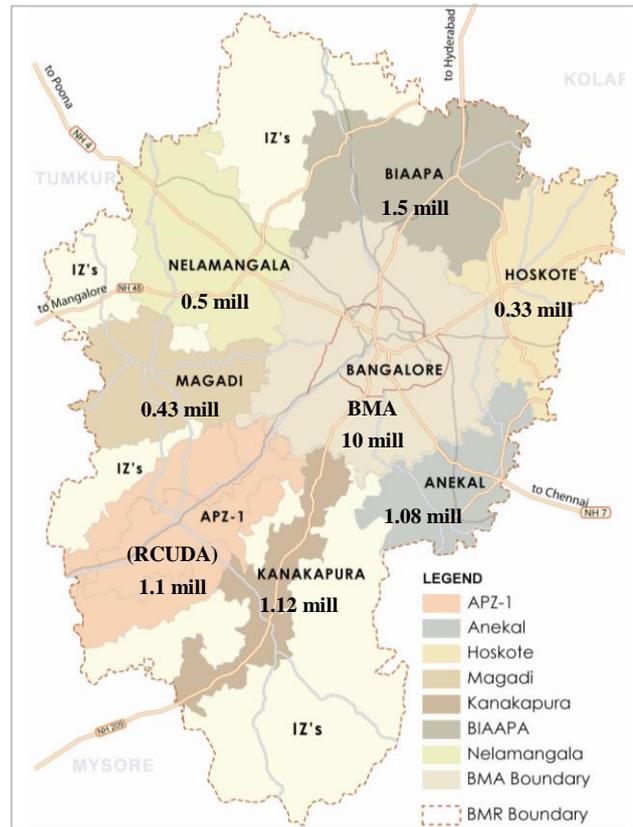


Figure 26: LPA population projections for 2021²⁶

1.6.4 Summary of findings

The existing situation analysis and the review of plans highlights the following:

1.6.4.1 Growing Core – Declining Region

Past trends reflect the the core (BMA) growing at a rate faster than the rest of BMR²⁷. While this is not surprising, the proportion of population distribution between the Core and the region stands at a 73:27 ratio (whereas the proportionate geographical area is in the order of 16:84 respectively) in 2001 as against the 48: 52 in 1991.

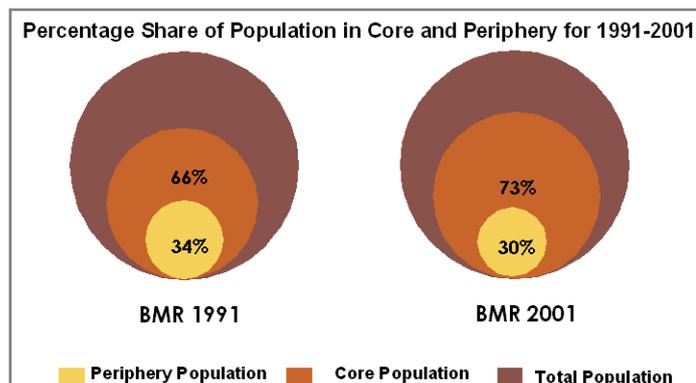


Figure 27: Percentage share of population in core and periphery for 1991-2001

²⁵ This calculation does not include IZ population and BMICPA population due to non-availability of data

²⁶ IMP Documents and SCE Analysis

²⁷ Refer Annexure-4, section 4.5 & 4.6 for population growth trend of BMA and BMR

1.6.4.2 A low urbanisation level outside the core

The urbanization level in BMR is at 73% as of 2001 while outside the core (BMA) it is as low as 19%. Among the existing ULBs in 2001 in the BMR, Ramanagaram has the highest population of merely 80 thousand after Bangalore. While on one hand this signifies the primacy of Bangalore over the whole region, it also point at the lack of urban facilities outside BMA in general (Refer annexure 4,section 4.3)

1.6.4.3 Western Arc Strategy of SP-2011 did not work

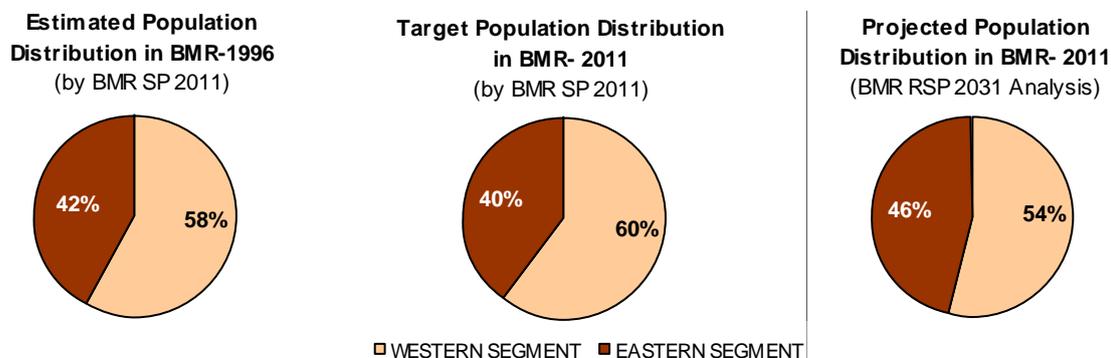


Figure 28: Population based assessment of western arch strategy

The western arc strategy for population allocation adopted by the SP-2011 had targeted a 60:40 population share between the Western : Eastern segment. However, this target does not seem to be satisfactorily met as per the 2001 population trends²⁸. The major population share continues to favour the north and north-east part in close proximity to the core.

1.6.4.4 RMP recommendation and formation of BBMP - further densification of the core expected

The population deflection strategy (from the core) advocated by various previous plans has not worked in past for Bangalore. It seems even more unrealistic in the present context where on one hand the RMP-2015 proposes a further densification of the erstwhile BMP (approximately 9 million by 2015 vis a vis 7.6 mill population cap proposed by SP-2011) and on the other , the formation of BBMP in all probability will attract more population towards the core. Thus the movement towards the enlarged core is expected to continue in future and will be facilitated by upgradation of infrastructure facilities in the newly added areas of BBMP.

1.6.4.5 Over-optimistic IMP population projections

Review of IMPs reveal that higher growth rates have been adopted for most of the respective jurisdictions assuming a deflection of population from BMA and absorption of the same in the LPA's. This assumption may not be fully justified in context of the following

- The RMP 2015 has proposed densification of core. This might result into a lesser population to be deflected from BMA than assumed by IMPs
- The BBMP on account of a larger area will have a higher carrying capacity than assumed

²⁸ Refer Annexure-4, section 4.7 for population trend assessment

- Cumulatively, the IMP and the RMP 2015 together indicate a CAGR of about 3.3% (excluding IZs) for the BMR between 2001-21; difficult to sustain over such long period²⁹

1.6.5 Population Projection

1.6.5.1 Assumptions

In context of the above, the BMR SP 2011 outlines three major assumptions as the basis for population projection as under :

1. Erstwhile BMP will grow as per RMP-2015 projections and will saturate by 2016;
2. BBMP will be the core of the region – present jurisdiction of BMA will not exist;
3. The present BMR jurisdiction will be the future BMA jurisdiction.

1.6.5.2 The core : BBMP till 2031

While projecting population for the core, the BBMP population has been represented by BMA population³⁰. The projected population for BBMP have been worked out based on the premise mentioned in the assumptions above. The projected population range for the core i.e., the BBMP is presented in the table below³¹.

Jurisdiction	Population				
	2001	2010	2016	2021	2031
<i>CAGR(%)</i>	<i>1991-2001</i>	<i>2001-11</i>	<i>2011-16</i>	<i>2016-21</i>	<i>2021-31</i>
Erstwhile BMP	4.30	5.14	5.35	5.35	5.35
Newly added areas of BBMP	1.87	3.36	4.43	5.89	9.05
BBMP (Total)	6.17	8.50	9.77	11.24	14.40
<i>CAGR (%)</i>	3.68	3.26	2.83	2.83	2.51

²⁹ As even during the high economic growth period during 1991-2001, especially growth of IT sector in Bangalore, the CAGR was 2.6% for BMR

³⁰ Refer Annexure-4, section 4.8 for population rationalization of BBMP

³¹ Refer Annexure-4, section 4.9 for BBMP population projection details

1.6.5.3 The Region : BMR till 2031

▪ Projected Alternatives³²

Based on the above assumptions, the population was projected through various methodologies. The results showed a minimum projection of 12 million and a maximum of 22.5 million, both of which are unrealistic based on their non-conformity to one or more of the assessment criteria mentioned below. An inbetween projection of 17.66 million (18 million) appears to be most realistic for the region when assessed from the point of view of the criteria mentioned below.

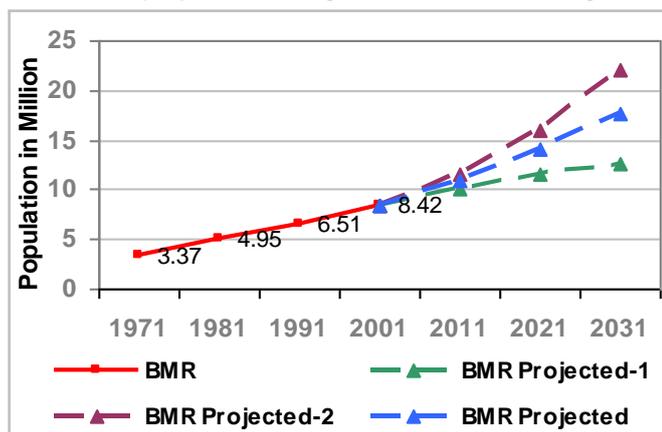


Figure 29: Population projection alternatives for BMR

▪ Assessment

The three scenarios³³ were assessed against the following set of criteria :

1. Conformity to water availability based population carrying capacity - 21 million for BMR till 2031³⁴
2. Proportional distribution of population between the state and the region, conforming to the past trend
3. Share of population between the core (BMA) and the rest of BMR; conforming to the trend

▪ Preferred Population for the region

Based on the level of conformity to above three assessing criteria, the preferred population range was selected for the BMR till 2031. The Medium Range emerged as the preferred scenario and the adopted projected population figures for BMR are as mentioned in Table 6.

Jurisdiction	Population				
	2001	2011	2016	2021	2031
CAGR(%)	1991-2001	2001-11	2011-16	2016-21	2021-31
BMR	8.42	11.00	12.50	14.20	18.00
CAGR(%)	2.61	2.71	2.59	2.58	2.40

³² Refer Annexure-4, section 4.10 for projected population alternatives for BMR

³³ Refer Annexure-4 section 4.11 for population projection scenarios for BMR

³⁴ The population capacity based on water availability from all possible sources (i.e., ground water, surface water, rain water harvesting and recycling) till 2031 has been worked out to be 21 million. Refer Annexure-10, Section 10.2. for note on water availability based population capacity

1.6.6 The Core & the BMR: The emerging trend

The population projection analysis shows that the share of the core (BMA) in the total BMR population is all set to increase further in coming years. While in 2001, the core constitutes about 73% of the total BMR population, the same is expected to grow to 80% by 2031 if the present regional dynamics continue without any planned intervention.

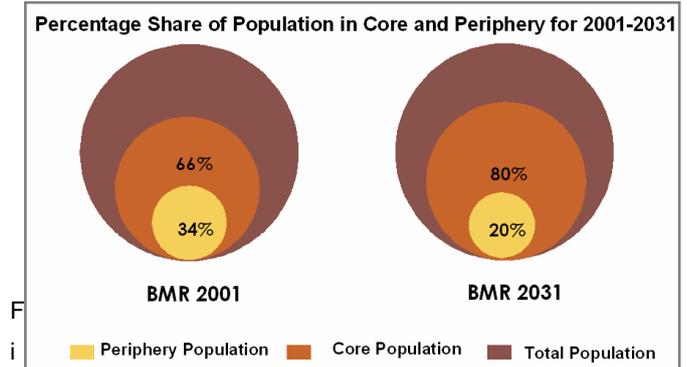


Figure 30: Percentage share of population in core and periphery for 2001-2031

2 PART II BMR STRATEGIC DEVELOPMENT VISION

2.1 Analysis of issues and emerging opportunities

This section looks at the dynamics within the BMR region and in context of the larger SKR with an objective of outlining the BMR strategic development vision. Essentially this entails an analysis of the development strategy and the economic and urban development policies of the previous structure plan (BMR SP 2011) within the larger SKR concept plan. It would also mean a comprehensive analysis of the various issues and opportunities that plague the region / offered by the region. In this context the following section outlines

1. An assessment of the BMR SP 2011 in the context of the SKR concept plan;
2. The development strategies outlined by other statutory plans currently governing and managing the region. Statutory Plans of various Planning Areas in the BMR indicate either opposing development strategies or unsustainable projected population distribution;
3. The sectoral issues and opportunities as identified through an in depth sectoral analysis, supplemented by the land capability analysis (LCA).

In the light of the above assessments, the RSP BMR 2031 attempts to

- Identify the current issues and opportunities that will influence development in the region;
- Based on the above outline a revised vision with governing principles for regional development;
- Prepare development scenarios based on the assessment; and
- Choose a preferred scenario and a development strategy to implement this scenario, such that it will address the current issues, support the new vision/development strategy and ensure a balanced growth for the future.

2.1.1 Assessment of the Bangalore Metropolitan Region Structure Plan 2011 (BMR SP 2011)

The preparation of the BMR Structure Plan 2011 was in the larger context of the South Karnataka Region Concept plan. An assessment of the SKR development strategy for 2020 indicates that the priorities for focusing developments along Mysore – Hassan and Bangalore – Mysore corridors still remain a necessary goal. Mysore and Hassan will therefore continue to serve as counter magnets to the BMR and Tumkur and Mandya will be growth centers in the SKR. This may be attributed to the fact that the population of the towns in the SKR is increasing since 1991 (Refer figure 31). Considering the growth rates and the current investments that are being made in these towns, one can expect that the growth trends for these 4 towns in the SKR will continue³⁵

³⁵ Mysore has the highest growth in absolute numbers, but in terms of decadal growth rate, Mandya is way ahead of other towns. It has grown nearly 5 folds in last decade. Mysore and Tumkur have grown at a rate of 30-40%, while Hassan has witnessed the lowest growth rate of about 12% between 1991 and 2001. With respect to the WPR, all towns are in the range of 30-40% and all, with the exception of Mandya, have seen an increase (1-2%).

The concerns for deflection of population from the BMA (about 60% i.e., 0.74 mill of 1.23 mill) for strategic economic development in the SKR due to development pressures on ground water deficit zones and prime agricultural lands continue to be pertinent.

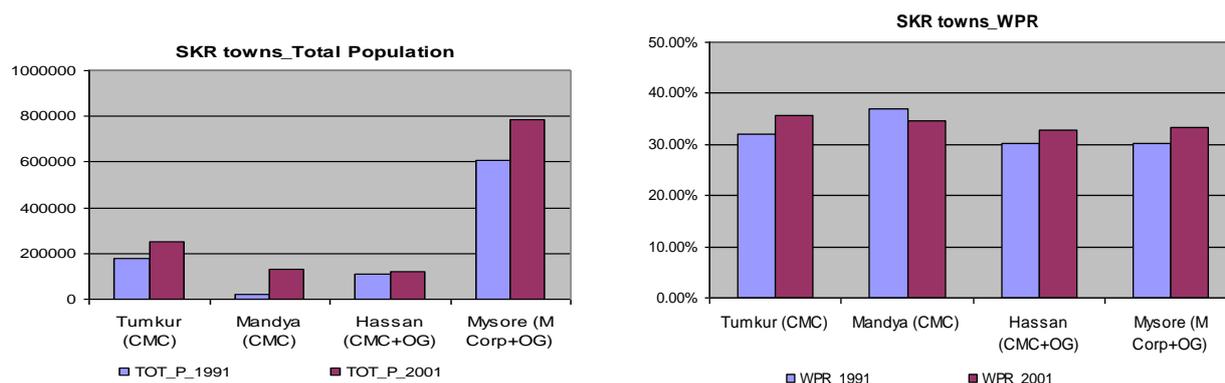


Figure 31: Increased population in SKR towns post 1991 especially in Mysore and Mandya (5 fold growth in the last decade)

Figure 32: Increased work participation rate in all towns except for Mandya indicates a continuation in growth trends

The common development vision for the SKR and the BMR was “decentralized concentration” of development in the SKR combined with “containment and dispersed concentration” from the BMA to the BMR (As mentioned in section 1.4.21 on SKR and BMR SP 2011). In this context, the BMR SP 2011 focused on an integrated strategy which aimed at modifying trends of economic investments in the N-NE segment. Termed as the “Western Arc” strategy, it focused on re-orienting the future growth of the region towards the west and the south (Bangalore-Nelamangala and Bangalore-Mysore corridors), rather than continue the past trend of development towards the east and north while containing development within the BMA. The BMR SP 2011 also recommended primary and secondary indicators/targets that would serve as benchmarks to determine the success/failure of the BMR SP 2011 development strategy which are:

Primary Indicators

- Induced population numbers in the satellite towns, growth centers and nodes in the BMR (outside the core); and
- Secondary sector employment generation in the satellite towns, growth centers and nodes in the BMR (outside the core).

Secondary Indicators

- Growth of key industrial sectors and increased economic participation rates;
- Increase in regional GDP benchmarked against leading regions in India and that of newly industrialized economies;
- Reduction of travel times and traffic congestion;
- Reduction in air pollution and associated health problems;
- Improvement in wastewater treatment and solid waste collection and disposal;
- Reduction in the rate of loss of agricultural lands.
- Maintenance of green belt area.

An assessment of the above mentioned indicators, particularly an analysis of redistribution of population and employment (outside the core) and factors impacting the growth pattern / structure in the region has been carried out as follows:

2.1.1.1 Population and employment (primary indicators) in the BMR

Population redistribution as per BMR SP 2011

As part of the population redistribution strategy for 2011 the BMR (outside the core) was to hold 40% of the deflected population of the BMA (i.e. 0.49 mill out of a total of 1.23 mill). Of this the Eastern segment was expected to hold 30% (0.15 mill) and the Western segment 70% (0.34 mill).

reflecting a 40:60 ratio between the Eastern and Western segments³⁶. A further assessment of the population growth of the towns in the region shows that by 2011 the ratio between the Eastern segment and the Western segment is 46:54 (As discussed in section 1.6.4.3).

This clearly indicates that the population trends are not in the trajectory of the targets set and the strategies to induce population to the satellite towns and other nodes within the BMR have either not been implemented or if implemented have not shown the desired results. Inducement of population by creation of new townships (5 integrated townships of the BMRDA) has not been implemented. Therefore, as of now, the spatial restructuring between the BMA and the BMR and between the Western and Eastern arcs of the region has not emerged as envisaged in the Structure Plan 2011.

Employment distribution as per BMR SP 2011

The employment distribution in manufacturing and commercial sectors is based on urban population targets for 2011. The work participation rate (WPR) is projected at 40% of the total population. 30% of this projected WPR is expected to seek employment in the secondary/manufacturing sector (i.e. 12% of the total population and 30% of the total workforce). The balance 70% is expected to take up jobs in the primary and tertiary sector³⁷. Within the BMR, as of 2001, 22% of the workforce is in the primary sector, 26% in the secondary sector and 52% in the tertiary sector. The trend indicates that the targeted 30% of the total WPR for the secondary sector, as envisaged in the previous structure plan, is likely to be achieved by 2011. However, keeping in mind the increasing trend of tertiary sector workforce, it is anticipated that the primary sector workforce would see a strong declining trend in future. (As discussed in section 4.1.2.3)

2.1.1.2 Other factors impacting the growth pattern / structure in BMR (secondary indicators)

- Speculation and current trends of development have resulted in encroachment of the green belt and conversion of prime agricultural lands for development at a regional level³⁸. A study

³⁶ On the addition of the natural growth of population to the induced deflected population the Eastern segment then reaches a population of 1.34 mill and Western segment reaches 2.01 million

³⁷ BMR SP 2011, page 31

³⁸ Accurate data to substantiate this fact is currently unavailable; As per The Hindu, Statistics available with the Government indicate that in just over a year (2004-05), about 6,295 acres of land were converted from agricultural to industrial and housing purposes (mainly layouts) in the five taluks of Bangalore Urban district.

conducted by IISC from 2000 to 2006 also indicates that the green cover in the city has been declining at an average rate of 30 sq km per annum, Built up area has increased by 61.6% and water bodies have been depleted by 23.7%. (See Annexure 6, section 6.1 for details)

- Induced generators have also impacted growth patterns in the region, particularly the NICE corridor and the new International Airport at Devanahalli.
- Statutory Plans of various Planning Areas in the BMR, mainly the IMP's have made proposals for residential and industrial areas within their conurbation zones. The proposed conurbation areas are often in conflict with the natural valley systems. Furthermore the LPAs do not follow the jurisdictional boundaries of the APZs and IZs set by the Structure Plan 2011.

2.1.2 BMR spatial and administrative set-up

The recent constitution of the BBMP provides an opportunity for this area to be planned and governed comprehensively. With a larger area now constituting the core of the region, the extended area presents an opportunity for absorbing additional population within the BMA, thereby reducing the share of the projected population to be distributed outside the BMA, within the region. Furthermore, the devolution of powers for planning functions to the local bodies (decentralization) as per the 73rd and 74th CAA though initiated by revising the relevant acts, is not yet complete, continuing to pose a challenge in terms of multiple jurisdictions with multiple plans with little or no coordination between these various planning tools³⁹. A framework that facilitates dovetailing of all the plans in the region emerges as an imperative, specially in view of the conflicting strategies of these plans. An assessment of the Revised Master Plan 2015 for Bangalore reveals that contrary to the BMR SP 2011, the RMP 2015 strategises development in the N and the SE and restricts development in the west, The plan recognizes, one, the presence of ecologically sensitive areas (such as the T G Halli catchment area) as a natural constraint to development to the West, two, the water resource rich area towards the West and therefore the need to preserve the same and three, the continuing trend of existing development to the N, NE and the SE⁴⁰. In this context the RMP 2015 restricts development towards the west and opens up the green belt selectively towards the north and the east.

As far as the IMP's are concerned, while they have not outlined a different development strategy vis a vis the BMR SP 2011, in terms of population projections, a 16 million population is estimated by 2021 possible to be achieved if a high CAGR rate of 3.3% from 2001-2021 is sustained, is not possible in the long run (As discussed in section 1.6.4.5). Thus both spatial restructuring and a realistic population allocation is the need of the hour. The efforts of the both the GoI (through the JNNURM scheme seeking to operationalise the decentralization agenda by mandating compulsory and optional reforms to avail central government funds) and the GoK at streamlining the multiple plans and bringing the BMR region's jurisdictions in conformity with the decentralization agenda (through the Kasturirangan Committee's agenda and the Karnataka Vision 2020 report) assume significance.

³⁹ The LPA jurisdictions transcend the local body's jurisdictions, as most LPA's have more than one municipal boundary.

⁴⁰ The trends on ground reflect the directives of the RMP 2015 as urban development and growth of IT industry is concentrated in the eastern south-eastern and northern segments of Bangalore (Electronic City, Sarjapur, Bannerghatta and Whitefield in the south & east and areas around Hebbal and Devanahalli to the north).

2.1.3 Sectoral issues and the Land capability and land potential analysis

2.1.3.1 Overview of sectoral issues and opportunities

Economy: In line with the national and the state trends, a declining primary sector vis-à-vis a growing tertiary sector mark the overall economic trend in BMR. The economy of BMR has been growing substantially, mainly dominated by IT-ITES and textile industries. However, while the economic growth have not been translated into an overall growth of the region as Bangalore remained the focus of investments, it could not achieve an inclusive growth covering all section of society. Lack of crucial infrastructure still remains a hindrance in inducing investment climate. The cluster and agglomeration economies, which were largely concentrated in and around the core, indicate the potential to develop the smaller towns in the region. A growing workforce with growing informal sector shows potential if supported by suitable policy measures at national, state and regional level.

Transport Sector: The towns in the BMR are in the process of increased urbanization and population growth but face issues of inadequate transport facilities to sustain this growth. Increased levels of congestion and environmental deterioration are evident. Part of the alignment of transport proposals such as the STRR and PRR are in environmentally sensitive areas. There is a potential to set up mass public transport systems due to high density of population and increased private vehicular ownership in urban areas. Extension of the proposed metro in the BMA to towns within the BMR is also possible.

Water supply: Areas to the north and north-east of the BMR have low ground water tables and rely heavily on uncontrolled ground water extraction. Other urban areas such as the BMA face problems of leakage and lack of systemic monitoring. Potential for groundwater recharge and recycling measures are present.

Sanitation: Sewerage systems are either absent or not functioning effectively in most parts outside the BMA (core). Within the BMA also sewage flows into the drains meant to carry storm water. Reduction of water body and soil pollution is possible through the introduction of an effective sanitary system.

Solid waste management: The management of waste is often not done in an environmental friendly way, and is not backed by an integrated policy or guideline. Adoption of appropriate technology will reduce environmental degradation as well as promote recycling of waste material and convert waste to wealth.

Housing: BMR will face a shortage of 2.56 million housing units by 2031. More than 80% of this from EWS and LIG groups. With rising costs of land and infrastructure, affordable housing has become an issue in the region which will cause squatting and further increase of slums. Promoting low cost and low plinth housing units at one hand and encouraging builders to build houses in sub 20 lakhs

category on the other will substantially bring down the housing demand and there by achieving the affordable and legal housing to all.

Power & Telecommunication: Increasing demands for power are being met without considering the sustainability of the source. Revenue losses are suffered in the power sector due to low-paying categories, theft in electricity, high transmission & distribution losses. There is a potential to explore non conventional energy sources and explore private service providers in power and telecom.

Heritage and tourism: Several heritage sites and monuments within BMR are under threat as they are sometimes not identified or protected by any heritage authority. Cultural and historic heritage has the potential to be conserved and promoted for their unique culture and art and craft and also as revenue generating sites or as tourist places. Places of interest in the BMR and surrounding areas could be connected as tourist circuits and create employment as tourism is a labour intensive industry.

Education: Quality of school facilities and learning levels in urban government schools is declining due to its neglect. Vocational courses adopted by schools and ITIs are outdated or do not match the local manpower requirements of the region. Participation of self financing schools at the lower primary stage is required.

Health: The concentration of higher order facilities health facilities within the Bangalore urban district brings out the disparities between Bangalore Urban and Bangalore Rural. The region faces shortage of both medical officers and other staff whereas the urban areas have the lowest levels of vacancies.

As mentioned in section 1.5 the BMR RSP 2031 employs a detailed land capability analysis as a methodological tool to analyse the region's potential for development and to effectively address and incorporate the region's capability to hold development. In line with the current trends of development, the composite LCA analysis reflects a high potential for development in the the North and NE parts of the region where a concentration of land parcels has emerged. vis a vis the S-SW parts (consists of large patches of conservation areas which restrict development choices) which show lesser capability in terms of emerging developable parcels of land. This encourages the expansion of the core in the N and NE directions. The transport composite map analysis shows that most of the developable parcels and existing settlements in the N & NE parts are well accessed by road and rail. Few pockets in the West are also likely to be well accessed provided the STRR, TRR and IRR proposals are implemented. This is in contrast to the Southern part of the region which shows less accessibility as there are fewer urban settlements and roads. A similar picture emerges as far as the demographic capability is concerned as the region is characterized by moderate to high capability in the Northern part as compared to the Southern segment. Lastly an analysis of the economic investments in the region shows a concentrated in two largely in the two arcs; the North to SE arc and the NW to SW arc. Thus, the LCA analysis clearly indicated a potential for development towards the N and NE portions and also the East and SE parts (i.e. the Eastern Arc).

2.1.3.2 Emerging Directions

The above assessment shows that the Bangalore Metropolitan Region has undergone substantial change since the preparation of the BMR SP 2011. The changes could be seen in the areas of urban sprawl, availability of infrastructure, pace of urbanization, mobility pattern, and population distribution. These have been a function of various factors such as public as well as private investments, economic activity, new developments, employment opportunity etc. These, coupled with various plan and policy directives, have created a change in dynamics of growth in and around the region. Specifically the following issues and opportunities emerge

i. Review of Plans and Emergent Growth Dynamics

The spatial restructuring as envisaged by the BMR SP 2011 between the Western and the Eastern Arc has not been fully successful. Furthermore corresponding failure of the population redistribution strategy has allowed the growth trends to continue in the N, NE and the SE.

As per the LCA, most of the emergent developable parcels of land are concentrated in the N-NE and E-SE (Eastern segment), the Eastern segment continues to attract a lot of investments on ground. However, the water extraction level in this segment is very high, therefore posing it as a scarce resource. This emerges as a challenge and needs to be addressed in the BMR RSP 2031. Furthermore both the RMP 2015 and the SP 2011 recognise the criticality of this resource and in an attempt to address it have come out with contrasting development strategies, the former to protect it, therefore outlining development in the water scarce area and the latter to capitalize on the same, defines development in the water rich areas i.e. W and the SW. These contrasting strategies pose a challenge as call for rationalization in the BMR RSP 2031 .

ii. Ecological Mapping of the Region and Emerging Issues and Opportunities

The increasing built area and reducing green cover poses an issue. A detailed ecological mapping of the area along with the spatial mapping of all the existing and proposed industrial and residential uses shows a varying level of conflict with the natural valley system which need to be revisited. The mapping of the forest cover, the natural valley systems and the lakes and other water bodies are visualized as positive constraints to development and provide the opportunity of being mapped upfront before any development proposals are finalized. The BMR as a fragmented Spatial entity with multiple jurisdictions having multiple plans each independent of the other and the lack of consistency between the various plans emerges as an imperative and calls for a dovetailing and streamlining of the governance and planning structures.

iii. Economy, Infrastructure and Inclusiveness Issues

While Bangalore has emerged on the global map as an IT and ITES hub, in terms of its position of 'doing business', it scores a comparatively lower rank (6th rank among 36 selected cities) in India due to its poor road infrastructure and communication facilities. Therefore to create an investment climate bringing in an 'industrial ecology' and achieving an inclusive development process are the key tasks of the BMR RSP 2031 without compromising on the ecology of the region. The economy is transitioning from a secondary sector to primarily a tertiary one, the BMR RSP 2031 needs to address this without

losing sight of promoting inclusive growth⁴¹ when the city is playing a global role and where most of the stakeholders are at the margin of the system. With an array of human settlements, other than the core or the BBMP, in the metropolitan region, economic and social integration also emerges as an imperative. Bangalore city which is the core of the BMR has, in the last 2-3 decades, as a result of globalisation, witnessed high economic growth with rising per capita incomes and new patterns of consumption linked to the world consumer markets. In parallel, there are certain undesired elements which have emerged, one of them being the spatial polarisation of economic benefits in the core with the small and medium towns and the rural hinterlands experiencing either slow growth or stagnation. This is evident from the growth rates experienced by Bangalore vis a vis the surrounding human settlements. Environmental degradation, uncontrolled sprawls, crowding and congestion and dismal service delivery, while on one hand threaten the livability of cities, on the other, are usually being downplayed by governments as inevitable consequences of rapid economic growth. Thus economic growth along inclusiveness emerges as the third imperative in the region.

⁴¹ Recognising the importance of the inclusive growth, the Eleventh Five Year Plan at the Central Government Level and the State Five Year Plan at the Karnataka level gives priority to poor in terms of inclusive planning.

2.2 Guiding principles

This section lays out the guiding principles for the plan evolution process. These principles have been formulated based on the above assessment of the region from various perspectives.

As the plan needs to transcend various scales in the BMR, the need of the hour is to view the BMR as an integrated spatial entity positing a financially and environmentally viable, programmed and integrated development plan for an inclusive society

In this context, the following three Guiding Principles emerge:

Ecology: Protect, conserve and enhance the natural environment and areas of ecological value within the region through judicious management of natural resources, especially water. This calls for the mapping of the 'positive constraints' of ecologically sensitive parcels before the developmental needs and opportunities of the region are superimposed in an integrated manner.

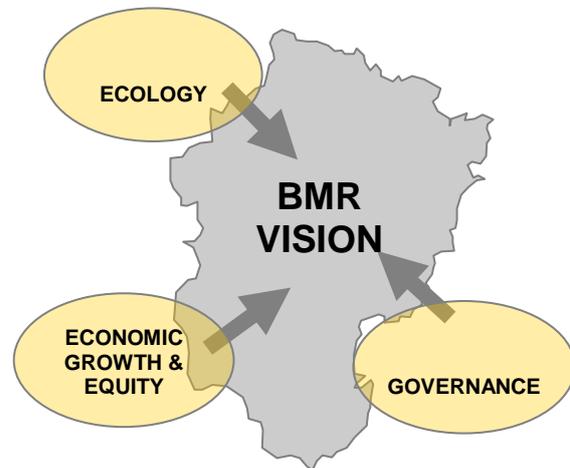


Figure 33: Three guiding principles for the RSP 2031

Governance: Address the main provision of the 73rd and 74th CAA by promoting an integrated spatial urban strategy that will synergise between environmentally sensitive initiatives and development oriented initiatives of the 2nd and 3rd tier planning and governance wings. This calls for jurisdictional, functional and sectoral coordination in implementation of plans and management of the region.

Economic growth and equity: Ensure economic growth in the region outside the core, while emphasizing the importance of the idea of 'livable' human settlements whereby 'development' is viewed as the improvement in the quality of life in numerous human settlements in the region. This calls for economic enhancement and integration but also for social upgradation of the various settlements.

2.3 Vision Statement

By 2031 it is projected that the BMR will accommodate 18m population with 75% concentrated within the BBMP and 25% outside this core (within the region). This implies that balanced population and employment distribution needs to be supported by a strong public transport network, an enhanced emphasis on social convergence and adequate provision of physical infrastructure.

The BMR RSP 2031 intends to achieve a balanced growth in the region through concerted action to bring about a strong economic interdependence across the region while avoiding an over centralization which seems to accompany economic development.

In this context, BMR RSP 2031 defines the following as its vision.

“To promote the region’s ecological and cultural values, while seeking optimum land utilization suited to its capability for sustained balanced economic production and inclusive growth by inducing agglomeration economies and clustered development through a decentralized planning and governance system”.

To fulfill this vision, the regional development strategy will focus on:

- Maintaining the primacy of Bangalore as a centre;
- Promoting development that is economically, environmentally and socially sustainable;
- Establishing a streamlined planning and governance system that addresses the decentralization agenda of the 73rd/74th CAA.

The regional development strategy and policies of the BMR RSP 2031 will aim to:

- Constitute a decentralized regional planning structure to promote functional coordination, encourage public participation, increase transparency and accountability, and build a strong sense of public ownership;
- Make an environmentally sustainable plan that will exploit land capability for productive uses, including promoting open public spaces (green networks);
- Strengthen the regional economy by linking development opportunities with regional infrastructure investments and coordinating investments of the public and private and NGO sectors at a regional level;
- Ensure social equity and inclusiveness in delivery of infrastructure services and public amenities; and
- Promote fiscally, environmentally and socially sustainable growth patterns by maintaining compact urban settlements and protecting rural communities and integrating land use and transportation within the identified positive constraints of the environment.

2.4 Development scenarios

The BMR RSP 2031 evaluates the economic, environmental, demographic and mobility related forces that shape the BMR and explores alternative ways that growth and development can be accommodated in the context of varying environmental, economic, and social patterns.

The primary intention of preparing development scenarios is to

- Look at possible alternatives of development patterns and strategies in the region;
- Assess impact of the guiding principles that have been outlined for guiding development within the BMR for each scenario;
- Choose a preferred scenario for further analysis; and
- Arrive at a development strategy for the region.

Four scenarios have been developed based on specific guiding principles outlined earlier. Development patterns for each have been described. In all scenarios, the emerging urban development pattern considers the following:

- The establishment of the BBMP and development within or around the BMA;
- Development around other existing urban settlements;
- Development along existing and proposed transport corridors; and
- Development triggered by existing and proposed industrial investments and proposed townships (both NICE and BMRDA).

Scenario 1 - Sprawl

This scenario is based on the continuation of current trends of development in the region. It assumes that the BBMP is in place and all approved plans, current regulations and policies that are in place will continue. The development pattern is characterized by:

- Uncontrolled spread of development in all directions leading to a thin spread of population across the region, mostly low density;
- No containment – expansion of core (BMA) with medium to high density development;
- Encroachment of the green belt;
- Ribbon development along existing and proposed transport corridors;
- Development around all existing settlements;
- Development triggered by existing and proposed industrial areas and proposed townships (both NICE and BMRDA).

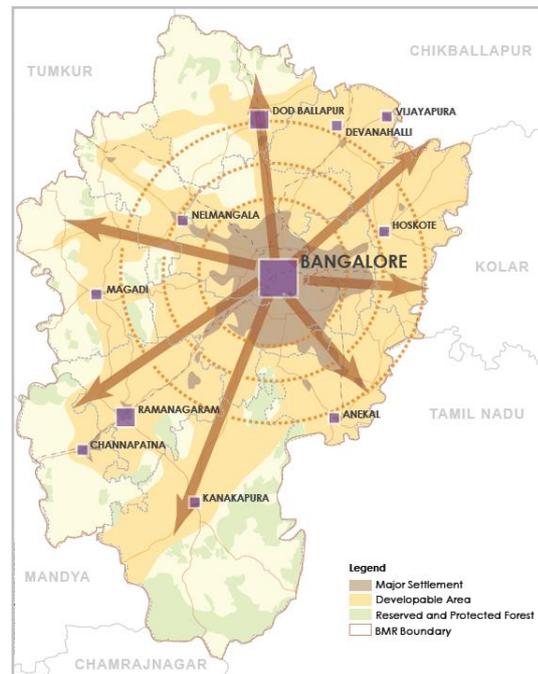


Figure 34: Scenario 1 – Sprawl

This scenario does not respect the natural valley systems and the other ecological parameters in the region, further depleting and polluting water sources. The region's indigenous bio-diversity & habitat is impacted as development is in direct conflict with all ecologically sensitive zones of the region. The envisaged low density and sprawling development pattern would result in increased cost of provision of physical infrastructure (water supply, sewerage, power etc) and social amenities, leading to inequity. Agricultural land depletion can lead to imbalance in regional economy and food security in the long term. Although development is mostly well accessed by the existing and proposed road network, the lack of regional level public transport can bring about social inequity issues. Given the uncontrolled development in all directions, this scenario may not be able to capitalize fully on the demographic capability available in the area. Moreover it would be difficult to manage the sprawling development given the current institutional and policy frameworks.

Scenario 2 - Investment Led

This scenario is based on reinforcing and continuing market led development in the region, particularly proposed public and private investments in the form of industrial estates, SEZs, and BMRDA residential layouts. Development is induced in areas where such market led projects are taking place and management of these projects is conceived to reduce conflicts with the region's environmental features. The development pattern is characterized by:

- Induced development in two arcs: N to SE and NW to SW, leading to medium to high density development;
- Containment of core (BBMP) in NW and South (outside the two arcs) and expansion of core inside the two arcs with medium to high density development;
- Development triggered by existing and proposed industrial areas and proposed townships (both NICE and BMRDA);
- Contained growth of existing settlements;
- Low density in the rest of BMR

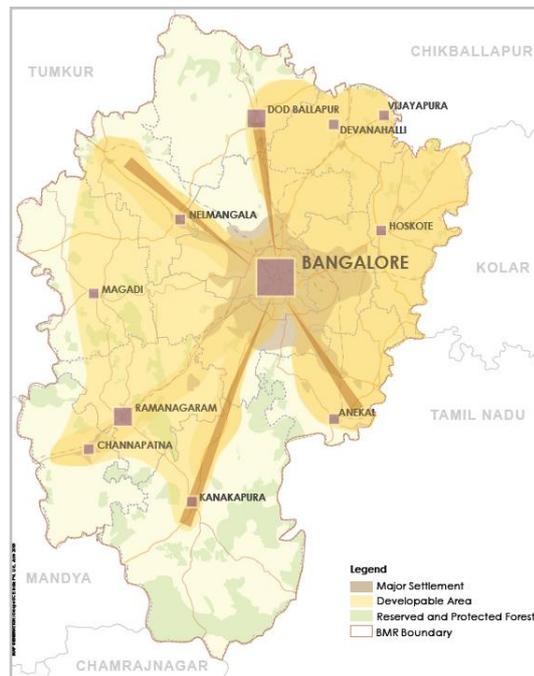


Figure 35: Scenario 2-Investment led

In this scenario conflicts with the natural environment, including the natural valley systems, in the two arcs where development is induced and promoted, are high. Some major valley systems may be blocked by development and regulations for managing these conflicts will be needed. In the areas outside the two arcs, the conflicts between the natural environment and development are low. The development pattern may possibly encourage encroachment of the green belt. Additionally, focusing development in the N to the SE Arc will not only further deplete the scarce ground water, but will also increase the physical infrastructure development cost particularly, water supply in the N to SE arc. Agricultural lands are maintained in NW & S parts. Since investments will be concentrated in the two arcs, it may result in inequity at a regional level. Although development is mostly well accessed by the existing and proposed road network, the lack of regional level public transport can bring about social inequity issues. The demographic capability supports the focused investments in the N to SE arc better than the NW to SW arc. Growth needs to be guided and managed by specific regulations and capacitated local bodies.

Scenario 3 - Green Network

This scenario emphasizes the region's green network as a system of valleys, water bodies, forests and ecologically sensitive areas. The existing settlements are maintained as it is. While all proposed industrial projects and townships in conflict with the green system will not be considered, the proposed road network is to be implemented as priority. The green belt around the BMA, which has failed to serve as a feature to contain urbanization, is considered part of the regional green network.

The following are the characteristics of this scenario:

- Green network emphasized as a system supporting productive recreational uses;
- Development restricted to infill in existing settlements;
- Concentration in core (BBMP) with selective expansion;
- Very high density development in the BBMP;
- Low to medium density in the BMR.

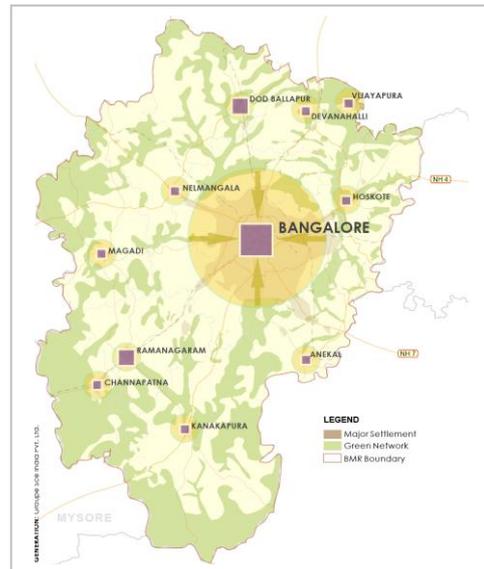


Figure 36: Scenario 3- Green network

This scenario has very low level conflicts between proposed development and the region’s natural environment. Development respects the valleys, and water bodies. The green belt is selectively opened for development. All ecologically sensitive areas are conserved. With the core (BBMP) taking in most of the population density, there is need for provision of additional physical and social infrastructure which would require increased investments. In addition, investments needed to contain development and maintain the green network at a regional scale will be very high. Agricultural land is maintained and protected. Although development is well accessed by the existing and proposed road network, the lack of regional level public transport can bring about social inequity. The core requires high level capacities and management mechanisms. Special guidelines and regulations are needed to manage the green network. Local bodies will need very high capacities to manage the regional green network and increased densities within the BBMP.

Scenario 4 - Clusters

This scenario focuses on maintaining a balance between the natural environment and development. Based on the outcome of the land capability analysis and the conflicts map, development is focused in land parcels that emerge as highly capable for industrialization, and urban development. The development pattern is characterized by:

- Focused development in and around existing settlements based on land capability;
- Focused development in new nodes created as a result of land capability analysis;

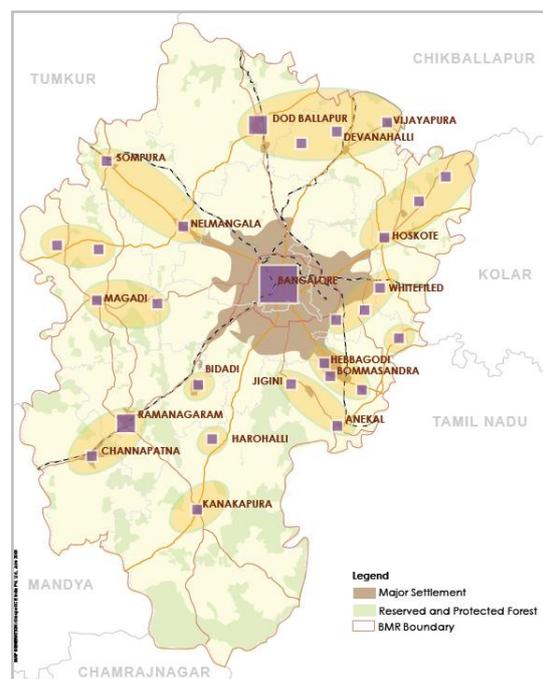


Figure 37: Scenario 4- Cluster

- Interdependent nodes/agglomeration economies constituting clusters;
- Nodes and clusters in least conflict with the ecologically sensitive areas;
- Infill and containment of core (BBMP) with high density development;
- Medium density in the rest of the BMR.

Based on the analysis of the region's land capability, this scenario projects urban development to be focused in nodes across the region. The nodes form clusters based on their proximity and agglomeration economies. The clusters are well accessed by the transport network, supported by demographic capability and by the current economic investments. This scenario presents very few conflicts with the natural environment. The conflicts are such that they can be managed with regulations for conserving the natural elements. Water supply needs to be addressed as the N-NE parts are water-scarce areas. Agricultural land is maintained and protected. Current demographic capability is best utilized in this scenario as all clusters are well-supported. Growth is guided and managed by environmentally sensitive measures and regulations for sustaining the clusters and by local bodies with higher capacities.

2.5 Preferred scenario and development strategy

An evaluation of the four development scenarios presents that Scenario 1 is not a desirable situation as it promotes sprawl and is in maximum conflict with the LCA and all its parameters. Scenario 2, which concentrates development in two arcs, has high conflicts with the LCA, particularly in the NW to SW arc, where there is a concentration of ecologically sensitive areas. While the availability of developable parcels (as per LCA), are more in the N to SE arc, there are still a few conflicts with the natural environment that need to be managed. Scenario 3 and 4 are idealistic situations. In Scenario 3, while conservation of environmentally sensitive areas is critical, the green network which covers all the valleys and forests in the region is very difficult to implement and manage. Also several projects proposed in the region are in conflict with the natural environment. These need to be managed with strict regulations or need to be reconsidered. In Scenario 4, the concept of the balanced clusters is idealistic and difficult to implement. Conflicts between existing and upcoming developments within the clusters and the natural environment need to be resolved through management and enforcement mechanisms and by proposing alternative lands for development.

The preferred development scenario is one which expresses the vision for the BMR and considers a combination of scenario 2, 3 and 4 as these are informed through the LCA.

Main features of the preferred scenario

- i. Inclusion of a more realistic and implementable regional green network (scenario 3);
- ii. Continuation of the trend of investments in the two arcs and management of urban development, particularly in the N to SE arc, where there is a high concentration (scenario 2); and
- iii. Identification of nodes across the region which, in turn, based on agglomeration economies are identified as clusters that are in balance with the natural environment (scenario 4).

All these features support the outcome of the region's land capability analysis which is based on parameters such as the natural environment, demography, transport and economic investments. Urbanisation is focused in the form of nodes in and around existing settlements and in identified new nodes based on land capability. Each parcel of land is programmed for land utilization suited to its capacity, be it conservation areas, agricultural lands, industrial areas or urbanisable areas. Nodes that are in proximity to each other, have a similar economic base, and/or are interdependent, are grouped to form clusters. In some instances, certain towns remain as independent nodes and these are identified as growth nodes.

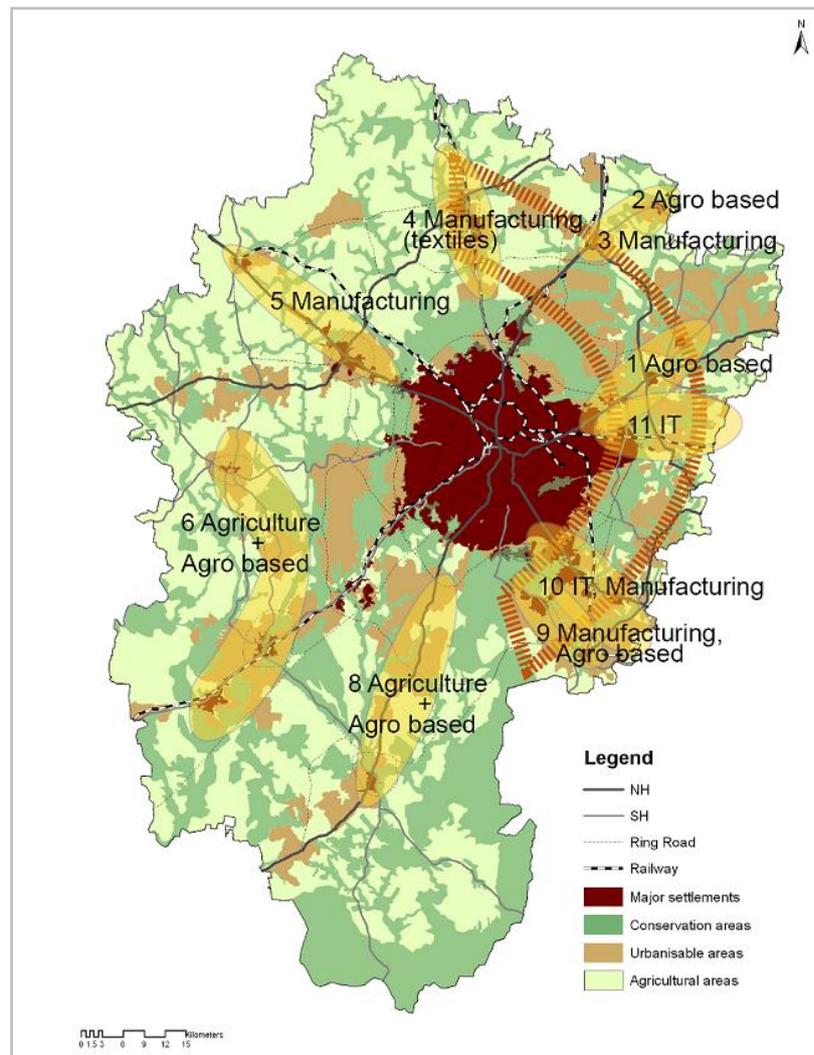


Figure 38: Preferred scenario map

The proposed clusters and nodes are dispersed across the region, but mostly concentrated in the N to SE arc (eastern arc) where the LCA indicates that the potential for development is high. A regional green network that includes the most sensitive ecological features and the green belt of the RMP 2015, is identified as a conservation zone. Agricultural land is maintained and protected as far as possible. Existing and proposed investments for industrial development are earmarked for each cluster / node (Refer figure 38: preferred scenario map with the representation).

The proposed clusters and nodes as well as the core are supported by the existing and proposed transport network, however, new interventions in the form of public transit are needed to improve regional connectivity and address equity issues. Current demographic capability is best utilized and development is supported by the current investments trends. Though there are several conflicts between proposed urbanization and the natural environment, only those areas that can be managed with regulations for conserving the natural features are considered for urbanization in the preferred scenario. In line with the decentralization agenda, the local bodies will be responsible for directing and managing growth in the respective jurisdictions. Capacities will have to be augmented accordingly.

Development Strategy

The preferred development scenario expresses the vision and development strategy for the BMR. Considering the imperatives which the region, its location and setting offer, the emerging development strategy for the preferred scenario aims to:

- 
 • Promote infill and containment of the core city to retain its primacy and enhance its role as a growth pole attracting other clusters of economic activity.
- 
 • Encourage development in the form of economic clusters and growth nodes, keeping in mind the region's land capability, to provide the small towns and larger villages with an economic impetus that will revive or upgrade them.
- 
 • Manage the clusters and nodes of economic activities, particularly in the Eastern segment where there is a higher concentration, such that they remain compact areas that are in least conflict with the region's ecology.
- 
 • Implement a realistic and productive green network that links existing ecologically sensitive areas including the green belt around the core city, with the intent of conserving them, and ensuring a balance between urbanization and ecology.

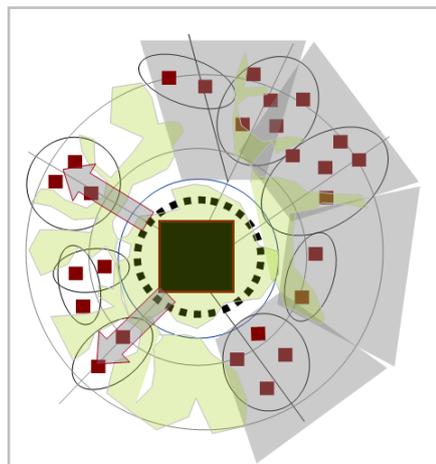


Figure 39: Conceptual development strategy

Thus the BMR RSP 2031 advocates a strategy for the BMR which promotes clustered and nodal development based on the settlement pattern in the region, their potential for growth supported by the identified developable parcels of land through the LCA. The spatial organization envisaged, harmonizes the urbanisation requirements of the region without compromising on the ecological parameters. It ensures land utilisation suited to its capability for sustained economic production - be it agriculture, industry, institutions, forests or housing. The strategy does not propose any planned intervention to reverse or deter the current development trends of development in the N, NE and the SE, rather it emphasizes management of growth in tandem with institutional reform with focus on physical and social infrastructure investments thereby encouraging inclusive development. In contrast to the BMR SP 2011 and the RMP 2015, the emergent strategy for the BMR RSP 2031 promote neither the conventional satellite town and corridor development model, nor a direction based growth strategy, rather it advocates growth in the region as per the identified potential of land based on the LCA. In line with this strategy, the BMR RSP 2031 identifies clusters and growth nodes, not in one particular direction but across the region, with a concentration in the N, the NE and the SE. While water as a resource continues to pose a major challenge and dictates the underlying decision in identifying the current development strategy, it does not emerge as a resource determining the growth direction as in the previous plans. Rather it is posited as a resource, the availability of which helps to define the kind and extent of development not necessarily in a certain direction, considering the fact

that the resource is equally available in all the directions. The strategy additionally moves away from the urbanisation vs non urbanisation growth to the identification of parcels for land (based on natural and other endowments) which are 'developable' and not necessarily 'urbanisable'.

In this context, the current plan preparation effort emphasizes identification of zones defined demarcated as per the LCA, having a certain characteristic or a use. More importantly the plan focuses on how to implement and retain the character of these zones. Towards this end, the evolution of zonal regulations as articulated in the part III assumes prime importance. The implementation of these regulations within the larger context of the outlined vision and the development strategy calls for, other than the policy stipulations, certain institutional re-organization, governance reforms and implementation mechanisms which have been detailed out in part IV

2.5.1 Proposed Spatial-Population Strategy: SP-2031

Based on the strategic development vision, this section outlines the BMR RSP 2031 population allocation strategy. The population redistribution strategy of the previous plans served as the starting point. The BMR SP 2011 and the IMP's suggest a series of interventions in the BMR with the objective of deflecting population from the core to the smaller urban centres spread over the region and at the same time continuing primacy of Bangalore in BMR. Although the primary intention was to relieve population pressure from the Bangalore city and its crumbling infrastructure, the induced development strategies were also meant to provide an opportunity to improve the economy and infrastructure of smaller urban centres outside the core and therefore aiming to upgrade the quality of life in the rest of the region. An assessment of the demographics of the numerous settlements in the region shows that although the smaller towns are growing in terms of population, it is more of a natural increase. The towns have not experienced an overall growth of economy and supporting infrastructure to attract population or even to retain its own population. Projections show that the Core :Rest of BMR population share is expected to grow for 73:27 in 2001 to 80:20 in 2031⁴². As an obvious consequence, the present Bangalore Metropolitan Area is expected to cross 8 million population by 2011 as against a 7.6 million cap set by Structure Plan-2011. A renewed effort by the BMRDA to deflect population from the core by promoting Integrated Townships within BMR⁴³, has also not met with the envisaged success. Thus, on one hand there is an effort to establish new integrated townships outside Bangalore to decongest the city, on the other, there are the existing settlements lacking the required growth impetus leaving their potential unexplored. Furthermore, the recent formation of BBMP has undoubtedly increased the capacity of the core and thus raises a question on the very need for an attempt to deflect population from the core in the immediate future. Rather the BMR RSP 2031, in context of the projected population for the horizon year 2031, attempts to maintain the primacy of Bangalore while promoting a balanced growth in the rest of the region through the identification of the cluster and nodal Development model. In this context, the basic

⁴² Refer Section 1.6.6

⁴³ GO No. UDD 97 BMR 2006 Sub: Development of New Integrated Townships in the Bangalore Metropolitan Region (BMR) - Reg.

premise of the population allocation strategy is the share of population between the core and the rest of the BMR, pegged at a ratio of 75: 25.

It has been reiterated in the SP-2011 and various other documents that the primacy of Bangalore in South Karnataka Region and thus in BMR has to continue. The RSP-2031 is in consensus with this stipulation and thus assumes that Bangalore will continue to attract people with the same level of growth of economic activity. Although the erstwhile BMP has to reach saturation at some point of time, the formation of BBMP and thus the three fold enlargement of the core will enable a larger share of economic activities and population to be accommodated in the near future. Given the previous demographic trends, it is envisaged that the share of population between the core : rest of the BMR will grow from 73:27 in 2001 to 80:20 by 2031.

In an attempt to retain the primacy of the core, while allowing the region to grow as envisaged in the development strategy advocating clusters and nodal development, the BMR RSP 2031 recommends a population allocation between the core and the region not to exceed 75: 25 which essentially means that a total of 7% has to be deflected from the core into the region. A considerable decreased share for the core (as compared to 2001) is not realistic also as it has been observed that past attempts for deflecting population from the core has not worked. The metropolis continues to be the magnet. Also, it would negate Bangalore's primacy over the region which is not the desirable outcome.

2.5.1.1 Emerging urban spatial canvas : Strategic Intervention

Based on the above premise and further analysis, the spatial canvas that tends to emerge across the region is summarized as following:

▪ Revised population share between the Core & the BMR – Alternative Scenarios

While the present trend suggests a 80:20 population share between the core and the rest of BMR, the analysis of present and future dynamics tends to revise this share towards a denser region outside the core in the backdrop of the spatial development strategy introduced above and in order to address the long term issue of regional disparity. Three alternate population share alternatives between the Core and the rest of BMR as illustrated later in this section have been worked out. These were further analysed as well as assessed considering a range of parameters under the following heads in order to arrive at the preferred alternative:

Justifiable & Desirable - Against the BMR RSP-2031 objective of regional development without compromising with primacy of Bangalore

Workable & Achievable – Within 2031 against the present and future spatial trend of population and economy

Feasible – Against various operational parameters

Alternative 1 – Population Share between Core : Rest of BMR = 75:25

Table 7: Revised population targets till 2031 (in Million) under 75:25 population share scenario between the core and rest of BMR					
YEAR	2001	2011	2016	2021	2031
CAGR (%)	1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)					
Population	8.42	11.00	12.50	14.20	18.00
CAGR (%)	2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)					
Population	6.17	8.03	9.38	10.65	13.50
CAGR (%)	3.68	2.67	3.15	2.58	2.40
Density (persons/sq.km.)	7713	10038	11719	13313	16875
% of total BMR Pop	73%	73%	75%	75%	75%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015					
Population	4.30	5.14	5.35	5.35	5.35
CAGR (%)	2.69	1.80	0.78	0.00	0.00
Density(persons/sq.km.)	19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)					
Population	1.87	2.89	4.03	5.30	8.15
CAGR (%)	6.44	4.46	6.89	5.65	4.39
Density(persons/sq.km.)	3254	5031	7020	9242	14209
Rest of BMR (Outside BBMP- 7205 sq.km.)					
Population	2.25	2.97	3.13	3.55	4.50
CAGR (%)	2.25	2.82	1.02	2.58	2.40
Density(persons/sq.km.)	312	412	434	493	625
% of total BMR Pop	27%	27%	25%	25%	25%

Assumption

Erstwhile BMP shall grow as per RMP-2015 projections

Observation

- Steady and realistic CAGR for BBMP newly added areas
- Steady and realistic CAGR for rest of the region outside BBMP

Alternative 2 – Population Share between Core : Rest of BMR = 70:30

Table 8: Revised population targets till 2031 (in Million) under 70:30 population share scenario between the core and rest of BMR					
YEAR	2001	2011	2016	2021	2031
CAGR (%)	1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)					
Population	8.42	11.00	12.50	14.20	18.00
CAGR (%)	2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)					
Population	6.17	8.03	8.99	10.06	12.60
CAGR (%)	3.68	2.67	2.28	2.28	2.28
Density (persons/sq.km.)	7713	10038	11234	12573	15750
% of total BMR Pop	73%	73%	72%	71%	70%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015					
Population	4.30	5.14	5.35	5.35	5.35
CAGR (%)	2.69	1.80	0.78	0.00	0.00
Density(persons/sq.km.)	19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)					
Population	1.87	2.89	3.64	4.71	7.25
CAGR (%)	6.44	4.46	4.75	5.29	4.41
Density(persons/sq.km.)	3254	5031	6345	8212	12641
Rest of BMR (Outside BBMP- 7205 sq.km.)					
Population	2.25	2.97	3.51	4.14	5.40
CAGR (%)	2.25	2.82	3.41	3.35	2.69
Density(persons/sq.km.)	312	412	488	575	749
% of total BMR Pop	27%	27%	28%	29%	30%

Assumption

Erstwhile BMP shall grow as per RMP-2015 projections

Observation

- Steady and realistic CAGR for BBMP newly added areas
- CAGR outside BBMP for rest of the region is a little fluctuating but still realistic and achievable. However the increase in growth rate in rest of the region after 2011 needs to be justified through suitable spatial development strategy

Alternative 3 – Population Share between Core : Rest of BMR = 60:40

Table 9: Revised population targets till 2031 (in Million) under 60:40 population share scenario between the core and rest of BMR					
YEAR	2001	2011	2016	2021	2031
CAGR (%)	1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)					
Population	8.42	11.00	12.50	14.20	18.00
CAGR (%)	2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)					
Population	6.17	8.03	8.65	9.31	10.80
CAGR (%)	3.68	2.67	1.49	1.49	1.49
Density (persons/sq.km.)	7713	10038	10809	11641	13500
% of total BMR Pop	73%	73%	69%	66%	60%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015					
Population	4.30	5.14	5.35	5.35	5.35
CAGR (%)	2.69	1.80	0.78	0.00	0.00
Density(persons/sq.km.)	19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)					
Population	1.87	2.89	3.30	3.97	5.45
CAGR (%)	6.44	4.46	2.72	3.74	3.24
Density(persons/sq.km.)	3254	5031	5753	6912	9504
Rest of BMR (Outside BBMP- 7205 sq.km.)					
Population	2.25	2.97	3.85	4.89	7.20
CAGR (%)	2.25	2.82	5.34	4.87	3.95
Density(persons/sq.km.)	312	412	535	678	999
% of total BMR Pop	27%	27%	31%	34%	40%

Assumption

Erstwhile BMP shall grow as per RMP-2015 projections

Observation

- Unrealistic CAGR for BBMP newly added areas. It will be difficult to justify a huge drop in CAGR in the newly added areas of BBMP when the area is being upgraded in terms of infrastructure and services and is actually growing fast due to speculative development also.
- CAGR outside BBMP for rest of the region witnesses a huge jump after 2011. It will be difficult to justify such growth rate with a cluster and growth node based development model which promotes a spontaneous growth of local economy and population with facilitation.

▪ Preferred Scenario

Considering a range of factors including maintaining primacy of Bangalore while promoting regional growth, the 70:30 distribution is selected as the most preferred target scenario. This would either mean restricting BBMP population to 13.5 million by 2031 and formulation of strategies to deflect a total 1.8 million population from the core by 2031 (refer table below). In effect, this would also mean enabling the settlement canvas outside the core to achieve a faster pace of growth and accommodate a larger share cumulatively. However, considering the dynamic quality of a region and the different set of interdependent variables on which the population strategy is envisaged, a 75:25 population distribution between the core and the rest of region at the end of plan period should also be considered as a success.

Jurisdiction	2011	2016	2021	2031
<i>Without Intervention</i>				
BBMP population without intervention	8.50 (77%)	9.77 (78%)	11.24 (79%)	14.40 (80%)
Population outside BBMP without intervention	2.50	2.73	2.96	3.60
<i>With Strategic Intervention (i.e., 70:30 population ration between the core : Rest of BMR)</i>				
BBMP population @ 70% of BMR population	8.03	8.65	9.31	10.80
Population outside the core (BBMP) @ 30% of BMR population	2.97	3.51	4.14	5.40
Extra population to be retained outside core (outside BBMP)	0.47	0.79	1.18	1.80
<i>Note : Figures in brackets showing % of total BMR population</i>				

▪ Urban population in BMR under preferred scenario

The urban population growth trend of BMR shows a steady growth over past years and the same is expected to continue in future. However, during 2001-11 the urban population share would get a major push over and above its natural growth due to formation of BBMP and thus conversion of 110 villages (with nearly half a million population) into urban areas. While working out the growth of urban population in BMR, this aspect has been taken into account and thus the urban population share goes up to 81% in 201 compared to 73% in 2001. However, the growth rate is assumed to get stabilised again after 2011 with a moderate pace.

Based on the 70:30 population between the core and the region and that in the present context the core (BBMP) is all urban, it is seen that the core will accommodate an even higher share of total urban population than the total population share. The projected urban population distribution for BMR is presented below. However, it should be noted that these are projected figures and as 'urban' is a status of settlements based on fulfilling of certain set of criterias, these may vary along with conversion of smaller settlements into urban.

Jurisdiction	Population				
	2001	2011	2016	2021	2031
BMR Total Population (in Mill)	8.42	11.00	12.50	14.20	18.00
% of Urban population in BMR ⁴⁵ (Adopted)	73.3%	80.9%	82.5%	84.0%	85.8%
Total Urban population in BMR (in Mill)	6.17	8.90	10.31	11.93	15.45
Population in the core (BBMP- all urban) (in Mill)	5.74*	8.03	8.99	10.06	12.60
Urban population in rest of BMR outside the core (in Mill)	0.43	0.87	1.32	1.87	2.85
% of Urban population outside the core (out of total urban population in BMR)	7%	10%	13%	16%	18%
Urbanisation level outside the core	19%	29%	38%	45%	53%

**Considering only urban areas within the core in 2001 before BBMP formation*

Given this premise the population allocation strategy is detailed in section 2.5.3.

2.5.2 Spatial development model – Clusters and growth nodes

The BMR strategic development vision (As discussed in section 2.3) recommends a balanced growth perspective in the region without compromising on its ecological parameters. In parallel it aims at ensuring economic integration and enhanced liveability through social convergence within the region. In this context 8 clusters and 4 growth nodes have been identified in the BMR; the premise is detailed below.

2.5.2.1 The Cluster concept

Economic activity in general tends to exhibit some degree of geographic concentration and interconnectivity which may be termed as a “cluster”. The spatial organization of economic activities is usually the outcome of a process involving two opposing types of forces – agglomeration (centripetal) forces and dispersion (centrifugal) forces. A cluster is “a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities⁴⁶ (As defined by Michael Porter). This also mirrors what other economists call an agglomeration of a given industry.

Clusters can be organized around products, processes, value chains, technologies, skills, natural resources, or many other factors based on regional challenges, problems and opportunities. The most prevalent explanation for clustering, or agglomeration, of economic activity revolves around the existence of increasing returns of some sort. Suppose, for example, firms are more profitable when they are located near other firms; then, a cluster of firms in some location makes it attractive for other firms to locate there, thereby making the cluster more attractive and reinforcing the phenomenon⁴⁷. Economic mechanisms in terms of incentive schemes or policies can also bring about

⁴⁴ Refer Annexure-4, section 4.12 for urban population projection details of BMR

⁴⁶ Porter (1998)

⁴⁷ <http://132.203.59.36/CIRPEE/cahierscirpee/2003/files/CIRPEE03-24.pdf>

agglomerations. Clusters grow on locations where sufficient resources and competences amass and reach a critical threshold, giving it a key position in a given economic branch of activity, with a decisive sustainable competitive advantage⁴⁸ over others places, or even a world supremacy in that field⁴⁹. Clusters vary in the depth and sophistication of their inter-related economies. Cluster identification involves an informed process of understanding the most important linkages and complementarities across industries, institutions and other economic activities. Some clusters may include end-product or service companies; suppliers of specialized items, components, machinery and services; financial institutions; and firms in related industries. They may also include firms in downstream industries; producers of complementary products; and specialized infrastructure providers. They may involve a number of institutions, governmental or otherwise, that provide specialized training and education, research and technical support such as universities, training centres etc⁵⁰. Elements within a cluster may serve different industry segments or may be contribute to different segments of the economy, but may share many common facilities and opportunities or constraints to productivity. Identification of a group of industries, institutions and towns as a cluster provides an opportunity for coordination and mutual improvement in areas of common concern.

The underlying concept of clusters is agglomeration economies. Agglomeration economies are a force that explains the benefits or advantages of the clustering effect of many activities, the availability and diversity of labour, and market size. These benefits are related to economies of scale and network effects. The more related the firms are in a cluster, the lower the costs of production and greater the market they can sell to. Nodes that are either in proximity to each other, have a similar economic base and/or are interdependent are grouped and termed as “clusters”.

2.5.2.2 The Growth Node concept

A growth node may be defined as a centre of activities that spurs economic growth in and around its vicinity. They may function as independent economic centers, mostly dependant on their hinterlands, but are yet well connected with other towns or nodes. Growth nodes could be large scale transport hubs, town centres with moderate to high density, or even large institutions that have impact on the growth of their surrounding area. In land use planning, the growth node concept attempts to focus urban growth to concentrated centres of population, commerce and employment. These growth nodes are conceived as compact activity centres that are well connected by transportation networks.

⁴⁸ Competitive advantage is a position that a firm occupies as against its competitors. A firm has competitive advantage when it offer the same services at lower costs, offers greater services at the same price or focuses on a market niche.

⁴⁹ Porter 1998

⁵⁰ The Oxford handbook of Economic Geography by GordonL/ Clark, maryann P. Feldman, Meric S. Gertler, Kate Williams

2.5.2.3 Cluster and growth nodes based development model

The cluster and growth node development model recognizes and endorses the existing spatial pattern of economic activities that are clustering in the Bangalore Metropolitan region. The strategy of this growth model is to encourage and enhance the existing pattern of economic activities by forming clusters and growth nodes that will attract human capital and investment with an objective of providing better opportunities to people in the smaller settlements thereby restricting their migration to the core city.

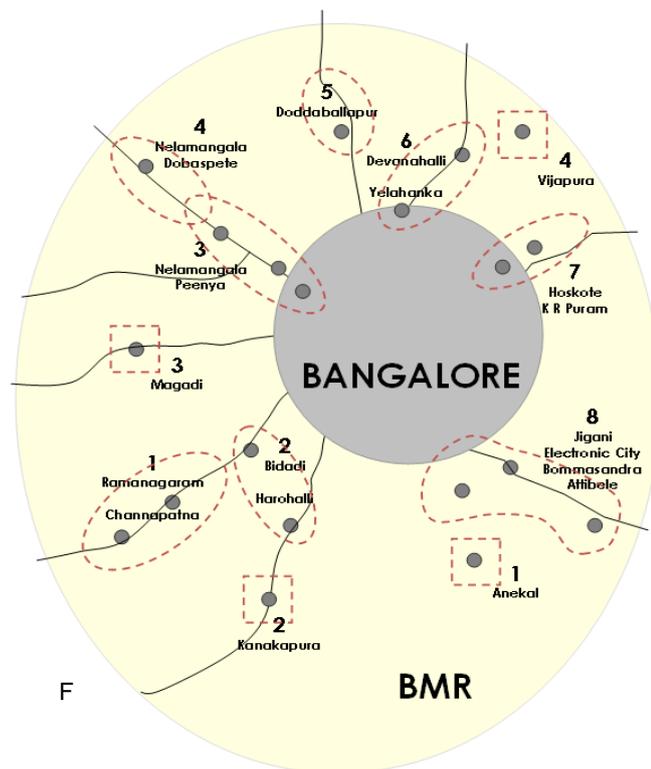


Figure 40: Conceptual cluster and growth nodes

This is possible by capitalizing on the benefits of agglomeration economies, and through provision of better urban amenities and economic infrastructure. The economic clusters and growth nodes will be developed such that they contribute to the regional (in some instances, national) economy as well as spur and sustain local economic growth. The cluster formations and compact growth nodes will optimize and enhance use of local resources to generate activities with higher levels of productivity, in an equitable way.

2.5.2.4 Criteria for identification of clusters and growth nodes

In the context of the BMR, there are 10 major settlements and a host of smaller emerging towns that contribute to the region's economy along with their hinterlands. An analysis of the forces of agglomeration with respect to these towns, and their interconnectedness with each other, their commonalities and complementarities will provide an understanding of the idea behind cluster or growth node formation in the region.

The factors to be analysed include the following (Details present in Annexure 6, section 6.2):

- Location of settlements
- Growth potential of settlements
- Primary economic activity

- Employment trends
- Connectivity (transport) to other parts of the region
- Infrastructure facilities
- Government interventions
- Private interventions
- Planning efforts impacting development
- Resource availability

While the analysis in terms of each of these factors was not possible (on account of lack of data) a qualitative analysis was done to arrive at the possible clusters and growth nodes.

2.5.2.5 Clusters and growth nodes in the BMR

The spatial organization of economic activities in the BMR reflects the dynamics of the two opposing types of forces as mentioned earlier, i.e. agglomeration (centripetal) forces and dispersion (centrifugal) forces. Bangalore, as an urban agglomeration with good infrastructure, logistics, services and regional level facilities, has attracted external investments and achieved global attention as an economic centre. The centrality of Bangalore as a core city exerts substantial influence on the region's economic and spatial restructuring process. The city serves as a centre / growth pole. Infact, Bangalore's primacy and centrality have evolved since the post independence era into a manufacturing hub for heavy industries such as Hindustan Aeronautics Limited, Indian Telephone Industries (ITI), Hindustan Machine Tools and Bharat Electronics Limited (BEL). Since the 1990s the establishment and success of high technology firms in Bangalore has led to the growth of Information Technology (IT) in India. The growth of the IT industry is concentrated in the eastern SE and N segments of Bangalore. This includes Electronic City an industrial park spread over 330 acres in the SE, The EPIP and EOIZ areas in Whitefield in the East, areas along the ORR stretch from Sarjapur road (SE) to Hebbal (NE), and near Devanahalli (NE). The other existing concentration of mostly small and medium scale industries is in the Peenya industrial area in the NW part of the core. Success of these specialized clusters is due to the prevalent 'collective efficiency' i.e. the competitive advantage derived from the combination of local external economies and joint action such as specialized and skilled labour pool, availability of specialized inputs, Improved market access and enhanced access to specialized information on technologies and markets. There is an agglomeration of economic activities in and around this growth pole leading to formation of distinct and specialized industrial clusters or dynamic economic clusters / nodes.

Cluster development has also been promoted through pro-active measures undertaken by the Karnataka Government such as in its Industrial Policy 2009-14. The policy states "*Cluster development approach will be encouraged for development of enterprises in order to harness natural resources and skills concentrated in the respective cluster. A thorough analysis of the industries that have competitive advantage and resource availability in the surrounding regions will be made. This*

will lead to identification of clusters and their pillar industries at the taluk / district / region level. An action plan for each cluster / region will be made once they are identified and pro-active measures through policies, concessions and promotions will be made to selectively promote them. KCTU, Karnataka Council for Technological Upgradation will be made a Nodal Agency to promote clusters in the State.⁵¹ Other policy decisions that have impacted the region and city's growth include the NICE corridor and the new International Airport at Devanahalli.

2.5.2.6 Clusters and growth nodes outside the core, within the region

Outside Bangalore city, a host of settlements within the BMR contribute to the primacy of the core. Economic activities either in proximity to each other, some independent and others with interdependent economies are dispersed within the spatial arena of the region forming clusters and growth nodes. A cursory empirical analysis⁵² of the economic activities in the region was carried out to identify the various clusters and growth nodes in the BMR. Major settlements that have the status of City Municipal Corporations, Town Municipal Corporations, Town Panchayats, and Census Towns were analyzed based on the cluster identification criteria as mentioned in subsection 2.5.2.4. Assessment of the functioning of the nodes and clusters was undertaken as well as ascertaining whether they can sustain themselves in the future. The analysis helped to understand the dynamics of the spatial organization of economic activities which lead to formation of clusters and growth nodes. Urban settlements including existing ULBs and some villages with rapid growth, which are likely to convert to urban in the near future, were included as potential constituents of the clusters.

Based on the above Eight clusters and four growth nodes have been identified (Refer map on clusters and nodes). Each cluster and growth node become a focal point for development and can provide an opportunity as an enabling environment for development. As per the proposed development strategy, the clusters and nodes will not be in conflict with the interconnected proposed regional green network. They will be linked with a network of transportation corridors.

While the clusters have been identified in terms of presence of agglomeration economies (arrived at by analyzing the above factors) the growth nodes are those settlements which are 'stand alone' in the region. They are not economically integrated with the surroundings and with the larger region and therefore have neither been able to align themselves with a cluster nor been able to emerge as centers attracting investments. Yet the BMR RSP 2031 recognises the potential of these nodes in terms of connectivity, resource endowment, location etc. which when exploited should not only contribute to the region but also its larger hinterland. Thus the plan recognizes the need for these nodes to emerge economically at par with the surrounding settlements. This would essentially require a boost in the economy of these nodes, which the BMR RSP 2031 envisages to be provided through the locating of regional facilities / higher order facilities relevant to the larger hinterland and the neighbouring clusters and in tune with the potential of land as determined by the LCA. The provision

⁵¹ Policy 5.7.6, page number 13,14, Karnataka Industrial Policy 2009-2014, Department of Industries and Commerce, Government of Karnataka

⁵² The empirical analysis involved site surveys, discussions with experts familiar with the region, and study of secondary data in terms of news articles and several official websites of the Karnataka State departments.

of these facilities coupled with provision of physical infrastructure would serve the objective of economically integrating these settlements in the region

Furthermore, the BMR RSP 2031 recognises that the sustenance of these settlements as also the clusters is not determined solely through the economic integration in the region, but also through social convergence (being defined as improvement in the quality of life) through the provision of adequate and qualitatively enhanced health and education facilities coupled with basic services as articulated in the vision) of these settlements, therefore the focus on enhancing the livability of these cities.

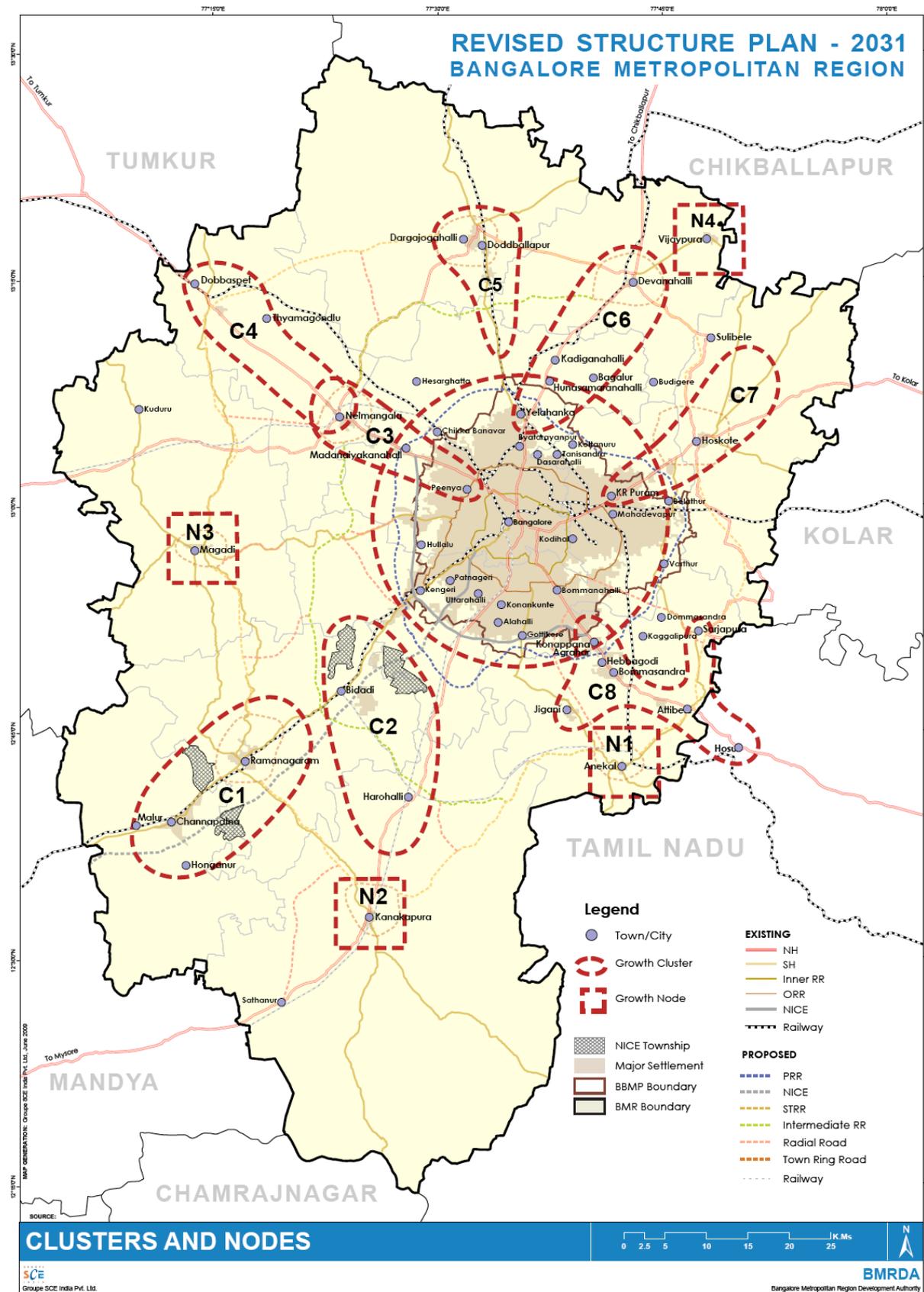


Figure 41: Cluster and growth nodes in the BMR

2.5.2.7 Role of regional level facilities in the cluster and growth node spatial model

Key higher order regional level facilities such as education, health, markets, sports and recreation contribute significantly to the development of an area. The provision of these facilities is known to be instrumental in accelerating development. Such facilities also play a key role in maintaining the attractiveness and viability of these areas and provide a focus for community activities of various types at the local and the regional level. Regional and social facilities play an important part in daily life, and can influence people's perception of an area as a place in which to live and work.

High order facilities and services in priority locations will generate a strong economic pull factor that will contribute to developing local economies. This is to ensure a social and economic future for the settlements and communities especially in the more rural and underserved areas of a region. Improvements in the social sector will pave the way for equity and in turn for economic development. Establishment of key higher order facilities are viewed as a tool to trigger growth in the region which will eventually result in the creation of larger agglomerations. The facilities will not only determine growth but also serve the purpose of human resource development and balanced regional development. It is envisaged that the provision of these facilities in the region will also induce other investments through a gradual building up of backward and forward linkages enabling the growth of local settlements to diversify into a wider functional, operational and sustainable network.

BMR RSP 2031 envisages that the Identified clusters in the BMR may be strengthened through the introduction of suitable regional level facilities that not only serve the regions needs but also are contextualized to the needs of the settlements. To illustrate an example, setting up of an educational institution offering courses and R & D related to the settlements local needs and economy will give an institutional backing to upgrade the existing labor market thereby bridging the gaps between the needs of industry and the skills generated locally. This will actively engage the population of the hinterland by upgrading the skills and techniques of local craftsmen, thereby allowing them to improve the quality of their product and to help them access a larger international market. Similarly other regional level facilities in health, recreation, agricultural processing etc can be envisaged to give clusters and nodes a competitive advantage in responding to global markets as well as contributing to local economy. The facilities may be common between clusters enabling the potential for state level support in terms of tax incentives, financial support and subsidies. The following section outlines the emerging clusters and the growth nodes. Detailed descriptions of the clusters and growth as well as the regional facilities to be provided are available in Annexure-6, section 6.3).

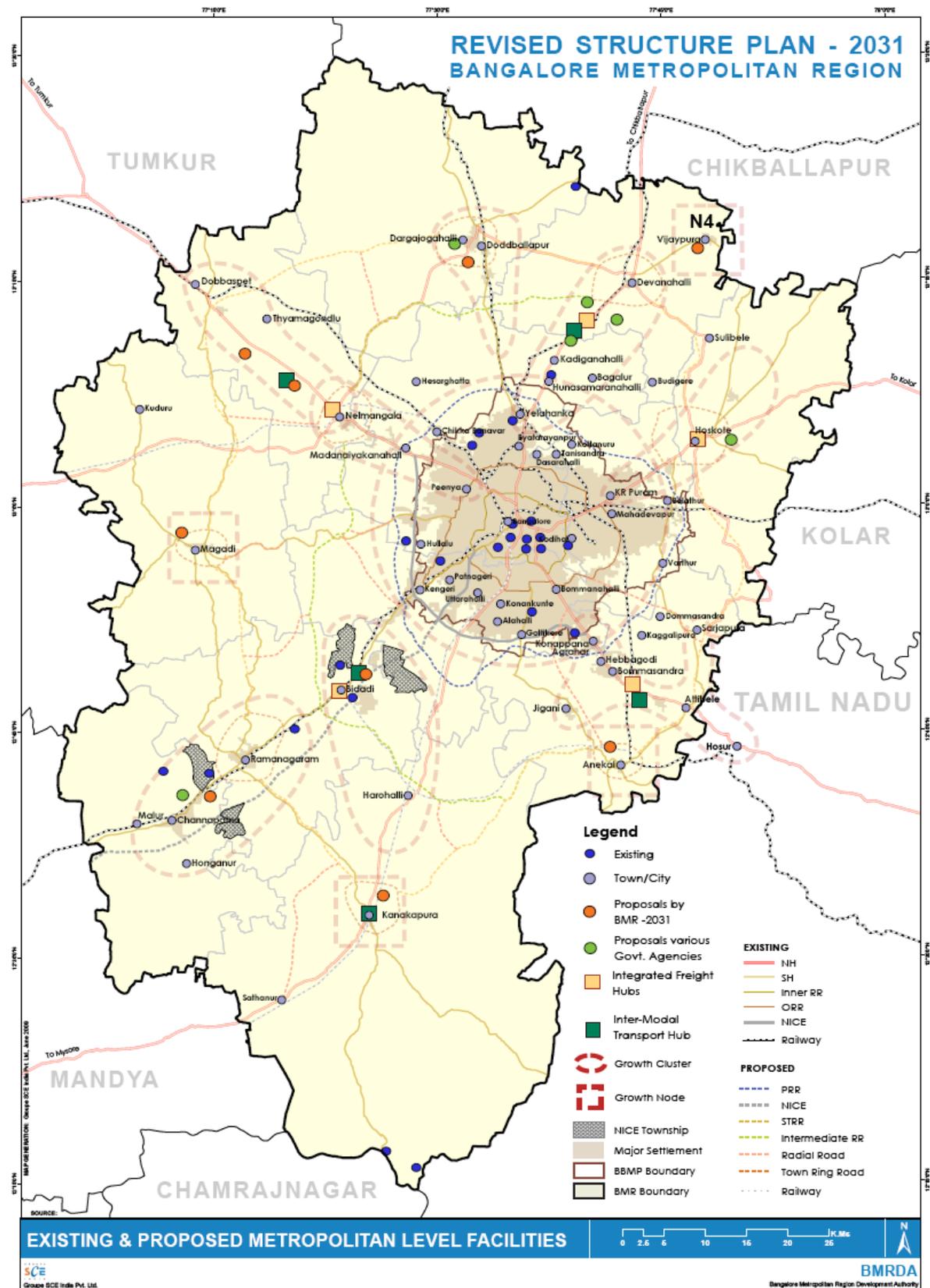


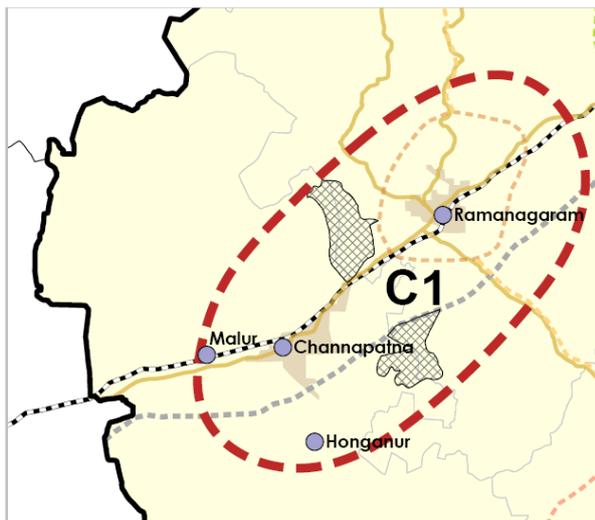
Figure 42: Existing and Proposed Metropolitan level facilities

CLUSTER 1 - Ramanagaram – Channapatna

This cluster is located in the SW part of the region along the Bangalore-Mysore corridor. It consists of 2 major towns - Ramanagaram and Channapatna and 2 smaller settlements of Malur and Honganur.

In the vicinity of these towns/settlements are two proposed townships, one industrial and the other with a heritage theme, by the Nandi Infrastructure Corridor Enterprise. In addition, three proposed Industrial Areas by the KIADB also are part of this cluster.

The economy of the major towns is mainly a product-based secondary sector economy which includes agro-based textile industry, tobacco products, toys and wooden products, and engages a large segment of the workforce.



Having a high growth rate of population and WFPR⁵³, with a similar economy supported by Malur and Honganur, the cluster is well accessed by SH 17 which connects it to Bangalore (about 50-60 kms) in the NE and Mysore (80-100 kms) in the SW. The NICE corridor will enhance this connectivity in the future.

A fair level of infrastructure facilities and educational institutions are present that offers engineering courses and artisan training and product development and marketing. At present agents assist craftsmen to access national as well as international clientele.

The clusters inter connected economy shares workforce as well as educational and social facilities. To prevent the decline of Ramanagaram and Channapatna as centers of economic, intellectual and social activity, it is imperative to focus energies on creating an urban cluster that attracts human capital and investment. Consolidation of the existing trends of the cluster, the BMR RSP 2031 proposes a regional level educational facility which will enable the nodes in the Cluster to access and share this common facility. This will also give an institutional backing to upgrade the existing labor market thereby bridging the gaps between the needs of industry and the skills generated locally.

The proposed Educational Facility could have the following components:

- a) Institute for higher learning
- b) Research and Development Centre (R & D)
- c) Industrial Training Institutes (ITI)
- d) Incubation center
- e) Museum for art and craft of the region

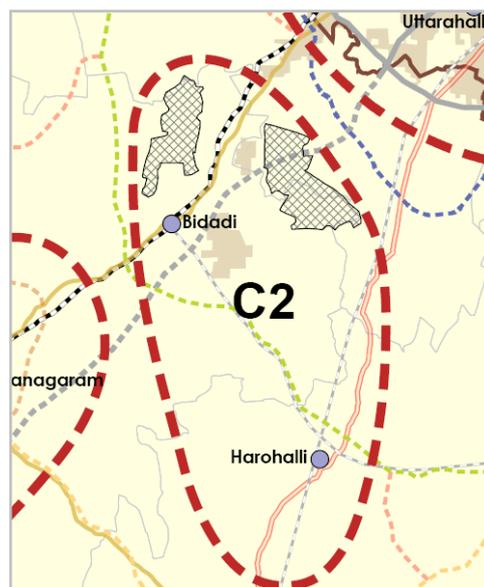
CLUSTER 2 – Bidadi - Harohalli

⁵³ The growth rate of population is high at 57.4% and 15.7% and the WPR is 39.8% and 37% respectively for Ramanagaram and Channapatna.

This cluster is located to the SE of the region almost adjoining the core of Bangalore. It consists of 2 minor towns of Bidadi and Harohalli as well as existing and proposed KIADB industrial areas (I.A). In the vicinity of these towns/settlements are two proposed townships by the Nandi Infrastructure Corridor Enterprise, one for corporate uses and the other with a commercial theme. The Toyota factory in the Bidadi Industrial area is a major generator of activities, encouraging more industries to locate in this area. The existing Industrial area at harohalli covers almost 1000 acres.

The economy is product-based with manufacturing industries located in the existing Bidadi Industrial area and Harohalli Industrial area.

The cluster is accessed by NH-209 and SH-17. Harohalli is connected by NH-207 and nearest city is Bangalore (40 kms) in the NE and major town is Kanakapura (17 kms) towards south. Bidadi is connected by SH 17 which connects it to Bangalore (about 30 kms) in the NE and Mysore (114kms) in the SW.



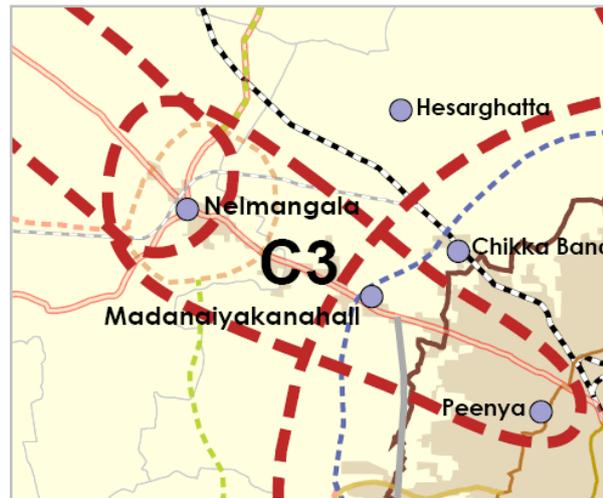
The presence of many recreational and sports facilities in proximity to this cluster makes it the ideal destination for visitors and tourists as a get away from the busy city. The presence of a major valley which is the catchment area for the Vrishbhavati River serves as a natural constraint to urbanization but also serves as a potential both in terms of its inherent nature as well as location and connectivity for a regional park and recreational facility. The setting up of a regional park will help to conserve the rich bio diversity of the region which will have several long term economic, aesthetic and recreational value benefits. The present Bidadi industrial estate, Toyota plant and proposed extensions to the KIADB estates will also require an organized transport and logistics hub in this area in addition to the existing railway station present in Bidadi.

The proposed Regional Park and Recreational Facilities and Logistics Hub could have the following components:

- a) Regional park
- b) Sports facilities and water based activities and could contain a Global Sports Village
- c) Inter Modal Interchange Hub
- d) Integrated Freight Hub

▪ CLUSTER 3 - Nelamangala – Peenya

Located in the NW part of the region, along the Bangalore Tumkur road, this cluster consists of one major town Nelamangala and two minor settlements Madanaiyakanahalli and Chikka Banavara. Existing Peenya Industrial area and its extension also form part of this cluster. Since the Tumkur Road was upgraded, the entire corridor from Peenya to Nelamangala (and even beyond) have seen an increase in the numbers of industries locating along it. With Peenya at one end, and Nelamangala at the other, this stretch is a cluster in the making.



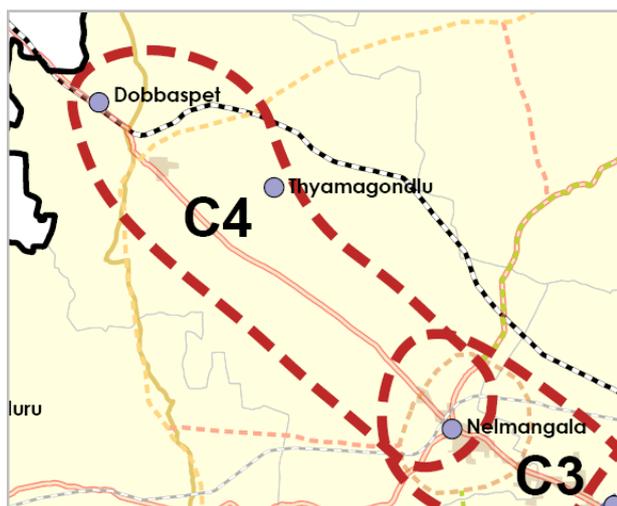
The economy is product based manufacturing with textiles and other small and medium scaled manufacturing industries in the Peenya Industrial Estates. Other products contributing to the economy are horticulture and tobacco products

The cluster is accessed by NH-4 which connects it to Bangalore (about 30 kms) in the SE and Dobbaspeta, Tumkur (42 kms) in the NW. NH-207 connects Nelamangala with Dodballapur (30 kms) in the NE and further to Hoskote and Hosur. NH-48 connects Nelamangala to Hassan (156 kms) in the west.

The main feature of this cluster is its good connectivity and predominance of small and medium scaled industries. Introduction of a well connected integrated inter modal transport facility that has good public transport connectivity with the rest of the region will allow for labor pool to have access to employment from a much wider region.

CLUSTER 4: Dobbaspete – Nelamangala

This cluster is located in the NW part of the region and it overlaps with Cluster 3. This cluster consists of one major town Nelamangala (also included in CLUSTER 3) and two minor settlements Dobbaspete and Thyamagondlu. The existing KIADB Dobbaspete Industrial area and its extension also form part of this cluster. In Sompura, and Thyamagondlu area KIADB has proposed a total of 5093 acres for future industrial development. Some of this is along the Dobbaspete – DodBallapur Road.



The economy is product based manufacturing with textiles and manufacturing: (iron, steel), plastic, bio tech, electronic and electrical and ancillary automobile in the KIADB Industrial Estate

Dobbaspete is accessed by NH-4 which connects it to Bangalore (about 54 kms) in the SE and Tumkur (21 kms) in the NW. Major district roads connects Dobbaspete with Dodballapur (35 kms) to its NE is Nelamangala and links the cluster to Dodballapur (30 kms) in the NE and Magadi (37 kms) in the south. Dobbaspete is also linked to Bangalore and Tumkur by a railway line, with the closest stations at Nidavanda and Tumkur (20 kms).

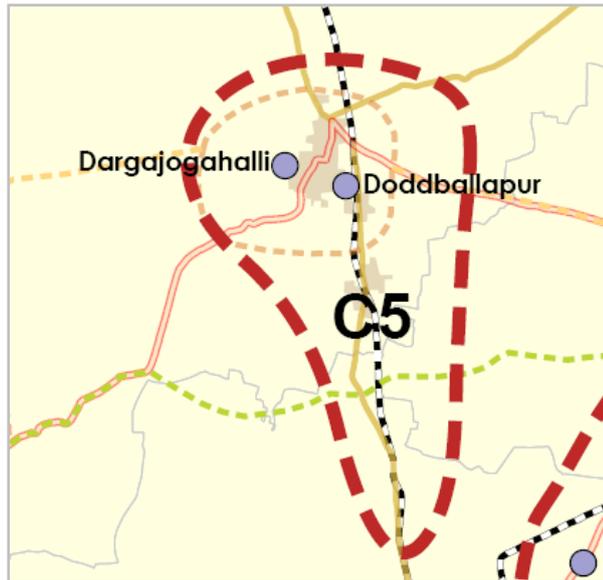
This cluster is well connected to Bangalore and Tumkur and is an upcoming industrial hub with existing industrial estates as well as enormous proposals for industrial development by KIADB. The potential industrial development of the area makes it pertinent to allow for a logistics hub to come up in this largely manufacturing oriented cluster.

The proposed Logistics hub could have the following components:

- a) Inter Modal Interchange Hub
- b) Integrated Freight Hub

▪ **CLUSTER 5: DodBallapur**

This cluster is located in the Northern part of the region and is comprised of one major town, that of DodBallapur, and one smaller settlement of Dargajogahalli. The existing KIADB Industrial estate of 360 acres, consisting of general and chemical industries and the existing Apparel park Phase I and II of 452 acres make up this cluster. In addition the KIADB has proposed 738 acres for phase III of the Apparel park. The concentration of industries related to textiles and weaving, in the vicinity of the DodBallapur town, makes this a unique cluster.



The economy is product based dominated by the textile industry (silk weaving) and apparel parks. Other economies include floriculture, wine industry and food processing.

Dodballapur is well connected to Bangalore by rail as well as road (SH 9). It is connected to Nelamangala (30kms) by NH 207 and is just 27 kms away from the Bengaluru International Airport at Devenahalli. To its north is the town of ChikBallapur about 30 kms away.

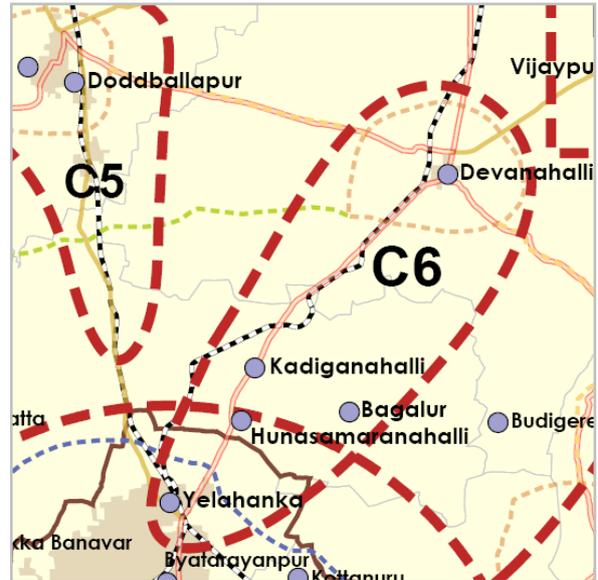
DodBallapur and the related Apparel Parks in its vicinity face a dire shortage of water. Water supply for the IIIrd Phase of the park is planned to be drawn from Yelahanka which is 25 kms away. This cluster has a unique concentration of industries related to textiles and weaving as well as Apparel Parks set up by KIADB. A further proposal for Phase III of an apparel park indicates a dominant textile oriented economy with an advantageous proximity to the new international airport making it an ideal cluster to develop as a regional commercial and fashion hub (IT/ITES, Fashion, Design, etc.). This would form a low polluting second category commercial hub, which will be for creative industry.

The proposed Regional Commercial & Fashion Hub could have the following components:

- a) Fashion Hub
- b) Readymade garment units
- c) Research and development center
- d) Industrial Training Institutes (ITI)
- e) Common amenities

▪ CLUSTER 6: Devanahalli – Yelahanka

This cluster is located in the Northern part of the region and consists of the major settlement of Devanahalli and Yelahanka. Devanahalli is the location of the Bengaluru International Airport while Yelahanka is a small town located inside Bangalore. Besides these towns, this cluster includes Kadigenahalli, Hunasamaranahalli, Begalur, Budigere, and one proposed KIADB estate. An IT Park of about 1029 acres is also under consideration along with a 900 acres Aerospace park and 970 acres of Hardware Park to the South of the Airport. The Race Course that is to be moved from the city core is likely to locate in this cluster, in the vicinity of the Airport. The corridor between Yelahanka and Devanahalli is dotted with small industries including ITC. Several SEZs have been under consideration (not yet approved) to the South of the town. Yelahanka has an Industrial Estate with the Wheel and Axle plant, Escorts and the KEB gas turbine area.



The economy is product based manufacturing and textile industry with the proposed Hardware Park and Aerospace Park. Airport related freight and logistics services and horticultural activities are also dominant.

This town links with Bangalore by road (39 kms) on the NH 7 and with ChikBallapur about 20 kms in the north. SH 96 connects it with Vijayapura. Hoskote is about 28 kms away from Devanahalli on NH-207, while DodBallapur (25 kms) is also linked to this town.

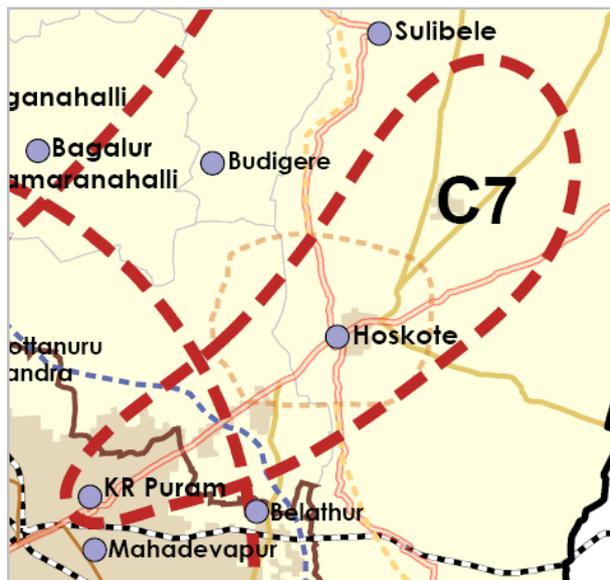
Due to the presence of the new international airport in this cluster there are several proposals for regional facilities ranging from an Aerospace Park and the Race Course. The proposal of high end services in this area will also encourage the north-eastern existing industrial zones to re-densify their existing areas. Proposals such as high end malls, fashion convention centers and exhibition halls can be reserved for this cluster. Due to the presence of several industries, airport related freight and logistics services the need for a transport and logistics hub is pertinent.

The proposed Logistics and Transport hub could have the following components:

- a) Inter Modal Interchange Hub
- b) Integrated Freight Hub

▪ CLUSTER 7: Hoskote – KR Puram

This cluster is located in the NE part of the region and consists of the town of Hoskote, an existing industrial area and a proposed KIADB industrial area. BPL, Bengal lamps and several other manufacturing units are dispersed along the NH 7 linking it to the industrial area in KR Puram, which includes the ITI and the Tin Factory. United Motors & Heavy Equipment Pvt Ltd located at KIADB Industrial Area is one of the major hi-tech engineering industry manufacturing spares of heavy earthmoving machineries. Bell Ceramics Limited, located at Chokkahalli village and the manufacturing unit of Volvo are also located in this area.



The economy is product based manufacturing with a concentration of heavy engineering industries in the KIADB estate at Hoskote, and textile, tobacco products. Oil refineries and silk manufacturing also dominate the economy of this area.

Hosakote is accessed by NH-4 which connects to Bangalore (25 kms) in the SW and further connected to Tumkur and Mumbai, Kolar is located (44 kms) in the east and further connects to Chennai. SH-82 connects the town to Chintamani (50 kms) in the NE while SH-35 connects to Sidlaghatta (40 kms) in the North whereas SH-85 connects to Malur in the SE.

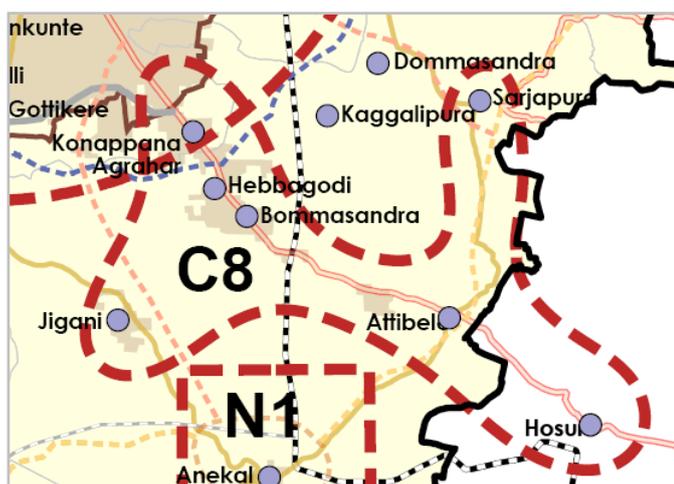
This clusters manufacturing, industrial and textile base along with its proximity to the new international airport has prompted several regional level facilities to be planned here by various departments such as the world trade center and an integrated food park.

The proposed Logistics and Transport hub could have the following components:

a) Inter Modal Interchange Hub

▪ CLUSTER 8: Jigani – Electronic City – Bommasandra – Attibele

This cluster located in the SE part of the region, along Hosur Road consists of several small towns. The major attraction in this cluster that has caused industries to agglomerate in this region is the Electronic City in Bangalore. Industries along the entire stretch along NH- 7, from Electronic City to Attibele, and beyond, to Hosur in Tamil Nadu form this cluster. Attibele, located at the TN State border, Jigni, Bommasandra, Hebbagodi, Chandapura and Sarjapur are part of this cluster. The industrial areas of



The industrial areas of

Attibele, Bommasandra and the Jigani-Bommasandra contribute to the economy of the cluster. The industries concentrating around Sarjapur town and a few scattered ones along the Sarjapur-Attibele Road also form a part of this cluster. Adjacent areas such as Hebbagodi, Dommasandra, Chandapura (a market town), and parts around Jigani and Anekal town serve as a residential base for the cluster. This cluster has the internationally known multi-speciality hospital – Narayana Hrudalaya.

The economy is product based secondary sector manufacturing and textile industry with the KIADB Industrial areas. Attibele is home for most manufacturing and textile industries. Automobile giants of India - TVS Motors and Ashok Leyland are very near this town. Attibele, Bommasandra and the Jigani-Bommasandra Industrial areas consist of manufacturing industries.

Attibele is 35 km from Bangalore and 5 km from Hosur on NH 7. The towns of Bommasandra, Hebbagodi, and Electronic City area are well connected by both BMTC buses (Routes 360 and 360B with a 10 minutes frequency) from Bangalore and TNSTC town buses (Routes 6A, 6B, 41, 42, 35, 35A, 10 with a 5 minutes frequency) from Hosur, Many private buses from both the cities also ply on this route. Attibele is about 14 kms from Electronic City and Sarjapur and Attibele are located about 10 kms apart on the NH 207. Bommasandra is only 8 kms away from Jigani and is linked by Bommasandra-Jigani link road. This cluster is in proximity to the major settlement of Anekal (Attibele to Anekal is 12 kms on SH-35, Jigani to Anekal is 8 kms), identified as a growth node and Hosur a major settlement in Tamil Nadu. In addition, there is a railway station close to Chandapura on the NH 7 that provides access to this cluster. The proximity and high level of connectivity of all these towns makes access and transport of goods and materials easy, thereby contributing to the notion of a cluster.

The presence of the Electronics city in this cluster has caused several industries to agglomerate here that have a strong manufacturing base. It forms a well connected, serviced and economically sustainable cluster.

The proposed Logistics and Transport hub could have the following components:

- a) Inter Modal Interchange Hub
- b) Integrated Freight Hub

GROWTH NODES

The following are the four growth nodes identified in the BMR:

- 1) Anekal - Product based textile industry with Agro-based industries
- 2) Kanakapura - Manufacturing of silk and agro-based products
- 3) Vijayapura - Product based textile industries
- 4) Magadi - Manufacturing of silk and agro-based products

All the four growth nodes are TMCs and their population as of 2001 ranges between 25,000 (Magadi) and 47,000 (Kanakapura). Vijayapura is the largest in terms of area (14.5 sq kms), however, its

population (2001) is only 29540, while Magadi and Anekal are only 5 sq.kms with populations of 25,031 and 33,157 respectively. Kanakapura which is 7 sq.kms has a population of 47,060, the highest of the four growth nodes. The following table indicates the population and workforce participation ratios of each town identified as growth nodes.

Table 12: Population and work force participation ratios of towns identified as growth nodes

TOWNS (ULBs+CTs)	Population	Area (Sq.km.)	Density (persons/sqkm)	Decadal Growth rate	WPR
Kanakapura	47060	7.20	6536	24.26%	37.43%
Anekal	33157	5.00	6631	32.96%	37.72%
Vijayapura	29540	14.55	2030	22.27%	38.18%
Magadi	25031	4.98	5026	27.41%	41.87%

Of the four growth nodes, Anekal shows the highest decadal growth rate (33%) while Vijayapura the lowest (22%). This is possibly because Anekal is just 36 kms away from Bangalore on NH 7, and is linked with three major employment hubs - the Jigani Industrial area, Bommasandra Industrial area and the IT industries in Electronic City in Bangalore.

▪ **GROWTH NODE 1: Anekal**

This node is located in the SE part of the region, about 36 kms from Bangalore, close to the Tamil Nadu border. Linked via rail to Byappanahalli and Yelahanka in Bangalore and Dharmapuri in Tamil Nadu, it's closest local railway station is Anekal Road

Anekal and its surrounding areas serve as a residential base for the workforce employed in the IT, ITES and manufacturing companies located in the cluster formed by Jigni, Attibele, Bommasandra, Hebbagoddi and Electronic City in Bangalore. Many of these towns are themselves growing fast; Hebbagoddi's decadal growth rate is 113% and Bommasandra's is 69%, which is spurring Anekal's growth. Anekal is about 13 kms away from both Jigani and Attibele, both towns having manufacturing units. It is close to the Bannerghatta National Park, a regional and national tourist attraction. Shirdi Sai Engineering College and the Regional Theology Extension Center, Jnanajyothi are some institutions that serve the population of this town. The economy of the town is product based textile industry with Agro-based industries. Anekal is known for its Silk industry and is home to a number of skilled weavers.

This cluster serves as a residential base for the workforce employed in the surrounding nodes. High potential for employment opportunities around Anekal as well as areas for recreation and its large resident population makes it pertinent to strengthen the existing educational base of the town. The proposal of a regional level educational facility will allow the existing labour market to upgrade and improve their skills, bridging the gaps between the needs of industry and the skills generated locally and to avail skilled jobs available in proximity to this node. This kind of an intervention also allows Anekal to establish forward and backward linkages with its surrounding nodes to strengthen and

diversify its own economic base. The presence of an existing reputed medical hospital adds to the economical attractiveness of this growth node.

The proposed Educational Facility could have the following components:

- a) Institute for higher learning
- b) Research and Development Centre (R & D)
- c) Industrial Training Institutes (ITI)

▪ **GROWTH NODE 2: Kanakapura**

The major economy of this town located on NH 209, about 56 kms South of Bangalore, is Sericulture (textiles) and agro-based products including tobacco. The other closest towns are Harohalli (16 kms) and Sathnur (15 kms) along this highway. Kanakapura is linked with Ramanagaram, about 30 kms away, via SH 3 road. NH 209 links the town to Mysore, which is 97 kms away, via Malavalli. This town is highly dependant on its hinterland for its agro-based economy and is not in proximity to any major towns. It is located in an ecologically sensitive area and the agricultural lands that serve as a resource base for this town needs to be conserved. The growth rate of this town is 24% and the water capacity is about 14 LPCD. The workforce participate rate of 17.5% is fairly high. The Central Silk Board's Silk exchange unit is located in this town and there is one artisan training institute.

This growth node is not located in proximity to the primate city of Bangalore or to any of the other major towns. Its agro based economy relies heavily on its agricultural hinterland. Several food products such as gherkin, potato and tomato have surplus production in this area due to favorable climatic conditions.

Its predominant silk textile and food product base as well as its ecologically sensitive location near river catchments and forest land makes it an ideal location for setting up of an Agri based Integrated Complex. A regional facility of this nature will ensure that the main resource base of this town is conserved as well as benefiting local farmers who will have a much wider market access as well as a huge export potential. The hinterland of the town is fairly rural and has sufficient scope for dairy development and sericulture. There is also great scope for growing and processing mulberry in this region.

The proposed Agri based Integrated Facility as well as an Integrated Freight Hub could have the following components:

- a) Food Park
- b) Research and development (R & D)
- c) Secondary processing and storage infrastructure.
- d) Warehouse
- e) Community threshing yards and commodity and terminal markets
- f) Upgrading APMC's
- g) Common amenities
- h) Poultry and dairy activity

▪ GROWTH NODE 3: Magadi

Magadi, located to the West of Bangalore, is 40 kms away along SH-17E road. The economy of this town is mostly textile and agro-based products including tobacco, similar to the growth node of Kanakapura. This town is growing at a rate of 27% and has a population of about 25,000. It is connected with Ramanagaram (30 kms) in the South by SH-3 road and Solur (18 kms) in the North via SH 3 road. To its West, is the major settlement of Hassan, however it is 140 kms away, not close enough to impact its development. Similar to Kanakapura, this town relies heavily on its hinterland for its agro-based economy and sericulture industry. The town has a 13 acre KSSIDC industrial area. No major investments, in terms of new industries, have been made in the recent years except for a 920 acre area proposed for future industries by the KSSIDC, along Magadi road (about 15 kms away). With its predominantly agro based economy that relies heavily on its agricultural hinterland and lack of new investments this node will benefit greatly from the introduction of an agro processing facility. This will help to conserve its agricultural hinterland and help farmers have a much wider market access as well as a huge export potential.

The proposed Agri based Processing Facility could have the following components:

- a) Secondary processing and storage infrastructure
- b) Warehouse
- c) Community threshing yards and commodity and terminal markets
- d) Upgrading APMC's
- e) Common amenities
- f) Poultry and dairy activity
- g) Research and development (R & D)

▪ GROWTH NODE 4: Vijayapura

Vijayapura is an independent town located in the NE of Bangalore along the SH 96. Similar to Kanakapura and Magadi, this town subsists mostly textile and agro-based products including tobacco. It relies on its hinterland for its agriculture produce and is a centre for milk supply to Bangalore. The town is connected with Devanahalli (12 kms) and Kolar to the East (40 kms). The immediate town to its North is Sidlaghatta, which is a centre for cocoon production and silk thread making. Although close to the Bengaluru International Airport, Vijayapura has not seen major industrial / manufacturing investment in the recent years. It is identified as a growth node that needs to have compact growth, while retaining the surrounding agricultural base.

This node has a predominantly agro based economy that relies heavily on its agricultural hinterland for agricultural produce as well as the production of milk. The node although being in proximity to the New International airport has not harnessed its locational potential and could form linkages to other nodes through the provision of a regional facility like that of an Agri based Processing Facility and Dairy and Poultry Facility. The gradual establishment of forward and backward linkages with its surrounding nodes will eventually strengthen and diversify its own economic base.

The proposed Agri-based Processing Facility and Dairy and Poultry Facility could have the following components:

- a) Secondary processing, warehouses and storage infrastructure** for value addition to agricultural produce through proper post harvest processing, grading, packing, transportation and storage.
- b) Strengthening poultry and dairy activity** for procurement, processing, marketing, dairy farming including facilities like slaughter houses

2.5.3 Population allocation in clusters and growth nodes⁵⁴

The Revised Structure Plan-2031 for BMR advocates a balanced cluster concept of development for addressing regional disparities and promoting growth across the region. Conceptually it has identified nine clusters of interdependent urban settlements⁵⁵ and industries and four stand alone settlements as growth nodes. The populations of the clustered settlements as well as growth nodes are assumed to grow in proportion with BMR population and restraining the region from a disproportionate population concentration at the core. Thus each settlement in clusters or growth nodes have been assumed to maintain the same population ratio as on 2001 with BMR, as in future also till 2031. Based on this premise, the future population for clusters and growth nodes have been worked out. This population allocation strategy supports the the spatial development strategy which does not seek to promote an induced development or a deflection, but a balanced growth facilitated by strengthening of economy and provision of infrastructure.

The 70:30 population distribution between the core (BBMP) and the rest of BMR has been elaborated further in terms of allocating sizable population in clusters and growth nodes as well as the whole of rural hinterland. While doing so, a combination of three broad approaches has been tried out which were then assessed and evaluated in terms of the overall regional scenario each of these approaches portrays, based on a set of criteria. The finally adopted allocation strategy assigned population in cluster and growth nodes as a function of the total population outside BBMP, i.e., in rest of BMR. The resulting overall population scenario as emerges for BMR is presented here (Refer Figure-43). The details of all three approaches applied over all the three alternative distribution ratios between the core and the BMR are elaborated in Annexure-6

▪ **Assumption for Population Distribution outside the Core (in Clusters and Growth Nodes):**

The population of settlements within clusters and growth nodes maintains the same ratio with the total population outside BBMP (i.e., in rest of BMR) in future years also. Thus as the total population share for rest of the region increases, the population in clusters and growth nodes also increases (i.e., cluster and growth node population is a function of population share between the core and rest of BMR)

⁵⁴ Refer Annexure-4, section 4.13 for details of population allocation in Clusters and Growth Nodes

⁵⁵ The urban settlements considered within clusters include existing ULBs and some fast growing villages which are likely to converted to urban in near future.

Table 13: Population Distribution in BMR in Clusters and Growth Nodes					
Jurisdiction	Population in Lakhs				
	2001	2011	2016	2021	2031
BMR	84.20	110.00	125.00	142.00	180.00
BBMP	61.70	80.30	89.90	100.60	126.00
BMR outside BBMP	22.50	29.70	35.10	41.40	54.00
Cluster-1 (Ramnagaram, Channapatna, Malur, Honganur, 2 NICE townships)	1.56	2.06	2.44	4.87	5.75
Cluster-2 (Herohalli, 2 NICE Townships)	0.18	0.24	0.28	2.33	2.43
Cluster-3 (Nelamangala)	0.25	0.33	0.39	0.47	0.61
Cluster-4 (Thyamagondlu)	0.08	0.11	0.13	0.15	0.20
Cluster-5 (Dodballapur, Dargajoginahalli)	0.78	1.03	1.21	1.43	1.87
Cluster-6 (Devanahalli, Kadigenahalli, Hunasamaranahalli)	0.36	0.48	0.57	0.67	0.87
Cluster-7 (Hoskote)	0.36	0.48	0.57	0.67	0.87
Cluster-8 (Hebbagodi, Bommasandra)	0.20	0.26	0.31	0.37	0.48
Total pop in Clusters	3.78	4.99	5.90	10.96	13.07
% of pop in clusters out of total pop in BMR	4.49%	4.54%	4.72%	7.72%	7.26%
% of pop in clusters out of total pop outside BBMP	16.80%	16.80%	16.80%	26.46%	24.21%
Total pop in 4 Growth Nodes	1.35	1.78	2.10	2.48	3.23
% of pop in clusters out of total pop in BMR	1.60%	1.62%	1.68%	1.75%	1.80%
% of pop in clusters out of total pop outside BBMP	5.99%	5.99%	5.99%	5.99%	5.99%
Total population in Clusters and Growth Nodes (urban)	5.13	6.77	8.01	13.44	16.31
CAGR (%)		2.82%	3.41%	10.91% ⁵⁶	1.95%
Average density	3089	4078	4823	8096	9825
% of pop in clusters & growth nodes out of total pop in BMR (urban)	6.09%	6.15%	6.40%	9.46%	9.06%
% of pop in clusters & growth nodes out of total pop outside BBMP (urban)	22.79%	22.79%	22.79%	32.45%	30.20%
Total projected urban population outside BBMP in rest of BMR		8.72	13.20	18.72	28.51
Urban pop in rest of BMR outside clusters and Growth Nodes (likely to be in upcoming urban settlements)		1.95	5.19	5.28	12.21

⁵⁶ The discrepancy in CAGR between 2016-2021 is due to coming up of NICE townships by 2021 and a resulting increase in cluster population

2.5.3.1 RSP-2031 Population Strategy and Need for Integrated Townships and New Urbanisable Blocks

The idea of new townships has long gained importance from policy makers and has been advocated and initiated by urban managers in various instances. In recent past, a number of such townships are proposed in BMR - 5 Integrated Townships proposed by BMRDA and 4 townships along NICE corridor. While these proposed facilities promise a better quality of life with adequate infrastructure and social amenities, they are also perceived to be a major step towards decongesting Bangalore. However, in light of the population dynamics emerging out of the above study, a further analysis from projected population figures reveals some interesting which questions the very necessity of these new townships in immediate future. Summarised in the following points are the outcomes of the need assessment analysis for new townships in BMR:

1. The existing population dynamics and projections suggest that the BMR does not demand new townships in near future if the existing urban settlements are developed to utilize its capacity. The total area of the proposed integrated townships is 247 sq.km. To offer a comparison, it is equivalent to the area of the erstwhile BMP. Assuming the core accommodates 75% of the total BMR population in future and four NICE townships⁵⁷ will essentially take shape in the coming years, then further analysis reveals the following⁵⁸:
 - i. If the BMRDA townships are to come up in addition to the proposed conurbations and the NICE townships, the average density drops even lower, to around 1700 p/sq.km., which is clearly undesirable. On the other hand, if the existing ULBs and their proposed conurbation areas (incl NICE townships) are to house all the urban population outside BBMP, then the average urban density will be below 2500 p/sq.km.
 - ii. If the conurbations as proposed in the IMPs do not come up, then also the average density of existing ULBs, 4 NICE townships and 5 BMRDA townships become around 5000 p/sq.km. by 2031. However, the emerging urban settlements are not being taken into account which will certainly have a share in total urban population and thus a lesser average density than mentioned above.
 - iii. Alternatively, if a higher density and thus higher population is attempted for the the BMRDA towns it will essentially pan out either one or a combination of the following:
 - a. The core (BBMP) holds a lesser share – unrealistic in present context
 - b. The towns outside BBMP (i.e. existing ULBs) experiences a decline in density – this is also not desirable and sustainable
2. On the other hand, if only the existing ULBs and proposed 4 NICE townships are to house all the urban population outside BBMP, then the average urban density will be around 15000

⁵⁷ The 4 NICE townships proposed inside BMR jurisdiction are assumed to come up as the contract between Govt and the private developer provides for the same and the land is under the ownership of the private developer

⁵⁸ All density calculations are for the year 2031. Refer Annexure 4, section 4.12 for detailed density analysis

persons/sq.km. by 2031, which is comparable to the projected density of the newly added BBMP areas⁵⁹. Moreover, the emerging urban settlements in future would also constitute a share in urban population and thus lessening the average density. High density developments also promote sustainable and compact development⁶⁰ while optimising environmental conflict and socio-economic integration.

3. It is observed that the popular perception of integrated townships does not converge economic and spatial planning. Far removed from local economy, sustenance of such facilities outside the major cities becomes an issue in long term and they do not live up to the desired standard of life. On the other hand, smaller existing towns outside the metropolis city remain as stand-alone units, not benefiting from economic activities spread across the region which can otherwise complement each others growth.
4. In many instances, such townships encourage the concept of a homogenous community in parcels which conflicts with the heterogeneous fabric of a social structure. Experts have argued that they become gated communities and the defensible urbanism may promote conflict, negate democratic principles of equality and freedom and foster inequality⁶¹. The gated communities are criticized to have exclusionary and polarizing social effects (Irazabal, 2006). Perceived as fortified enclaves with superior facility and conceptually removed from the old city, the townships do not strengthen citizenship which is essential for improved governance. The proposed townships in its present form may have exclusionary social effect and can become gated communities which degrade the livability⁶² aspect of cities in long run (i.e., to achieve better quality of life by social and economic integration through streamlined governance, environmental sustainability and equal access to facilities and amenities).
5. A further assessment of these townships vis a viz the land capability analysis conducted as part of this exercised revealed that most are located in moderately to highly sensitive areas thereby jeopardizing the ecological sensitivity of the area further. Also patches of prime agricultural lands are covered by these townships
6. In terms of investment outlined, the townships envisaged a total of INR 22 thousand crores (220 billion). The same investment targeted towards the social equity and physical infrastructure provision in the identified growth nodes will boost the economies in these settlements while making the region robust and dynamic.
7. The housing demand and supply trends in urban India indicates that the shortage is highest in middle to low income and economically weaker section⁶³. Whereas the housing product mix generally offered by the new integrated townships range mostly in high income to upper middle

⁵⁹ Refer Annexure 4, section 4.12 for details

⁶⁰ Compact cities concept can be defined as the approach 'to increase built area and residential population densities, to intensify urban economic, social and cultural activities and to manipulate urban size, form and structure and settlement system in pursuit of the environmental, social and global sustainability benefits derived from the concentration of urban functions' – Burgess (2000)

⁶¹ Localising Urban Design Traditions: Gated and Edge Cities in Curitiba by Clara Irazabal, 2006

⁶² Refer Section 2.2

⁶³ Source : Report of the Technical Group (11th Five Year Plan, 2007-12) on Estimation of Urban Housing Shortage

income group, with a minuscule share for low income and EWS. Thus if at all these townships are meant for decongesting the city, its success is doubtful from housing perspective as the target income group has ample supply of housing in the core city itself.

On a similar instance, two Urbanisable Blocks spread over approximately 22 sq.km. of land are being proposed in Bidadi under Interim Master Plan for Ramnagar-Channapatna Local Planning Area. The Urbanisable Blocks are proposed to accommodate a population of 0.25 million by 2021. Moreover, the draft IMP also expects a spill-over population in the proposed Urbanisable Blocks and assumes the same to be absorbed by proposed Integrated Townships at Bidadi and Ramanagaram. A critical assessment of this proposal in context with BMR RSP 2031 proposed Cluster and Growth Node based spatial development model show that assuming all the census towns and villages in the clusters will emerge as ULBs in near future, the population accommodated by the Clusters and Growth nodes by 2021 shall be 1.35 million as against a total projected urban population of 1.95 million outside BBMP⁶⁴. The left over population in all probability shall be accommodated by other emerging urban settlements outside the clusters. The whole allocation strategy also ensures sustainable densities for existing and emerging settlements. Thus the 2.5 million population capacity in proposed urbanisable blocks is uncalled for in the emerging context. The same rationale applies for Integrated Townships also. Given the fact that Bidadi is one of the settlements under Cluster-1 in the proposed development model, it is likely to emerge as an urban settlement in near future. However the extent of urban facility needed has to be assessed for future vis a vis the capacity of other urban settlements in the vicinity and thus the proposed urbanisable blocks need to be reworked.

Taking cognizance of the issues emerged and the anticipated spatio-economic dynamics of the region, the BMR RSP 2031 seeks to reiterate the idea of physical and economic upgradation / extension / development of existing and emerging urban settlements in tune with its identified / planned local economic driver in order to enable them accommodate a higher population and higher density. Any further urban development initiative, if at all needed in future, can be made part of existing / emerging towns and not as ad-hoc development initiatives in stand alone pockets as proposed by Integrated Townships and Urbanisable Blocks. Thus it shall not be merely a real-estate or construction activity as perceived popularly. Rather it is a concept, where a settlement grows hand in hand with growth of local economy, supported by suitable spatial planning and policy initiatives and thus ultimately achieving a better quality of life for its residents. And this very concept is articulated in the form of Clusters and Growth Node based spatial development model introduced above. Discussed below are the economies of such clusters in brief.

⁶⁴ Refer Annexure 4, section 4.12 for details of figures

2.5.4 Functional framework for the clusters and growth nodes strategy

On the basis of the clusters and growth nodes spatial development model, broad based land utilization zones have been designated for the region. The zones will serve as a functional framework for realizing the spatial development model. Each zone has specific regulations to control or promote certain productive uses. The proposed zones and their regulations are detailed in Part III – EMERGING ZONES AND ZONAL REGULATIONS of this Plan. Sectoral policies and an institutional and legislative re-organisation proposed as the main thrust of the BMR Revised Structure Plan 2031 in Section IV and V are central to ensuring implementation of the proposed zoning, development strategy and spatial model.

3 PART III REGIONAL LAND UTILIZATION PLAN AND ZONAL REGULATIONS

3.1 Land utilization plan and emerging zones

The clustered and nodal spatial development model proposed by the BMR RSP 2031 is determined through a land capability analysis of the region. While the BMR Structure Plan 2011 focuses on a corridor-based approach, which was the basis for the designation of the APZs, this model promotes growth in clusters and nodes across the region. It ensures land utilisation suited to its capability for sustained economic production - be it agriculture, industry, institutions, forests or housing. Further this model, as explained in the vision and development strategy, ensures minimal conflict with the region's ecologically sensitive areas. To address the general strategy of this model and the issues that have emerged from the analysis of available land utilization data, four broad based regional land utilization zones have been designated for the BMR. They are:

- Urbanisable (UZ)
- Industrial (IZ)
- Agricultural (AZ)
- Conservation (CZ)

Lands identified in each zone are “developable”, but not necessarily ‘urbanisable.’ All parcels of land are programmed for productive uses. To address the issues emerging from the analysis of the land utilization maps of 2000 and 2008, the zonal regulations will ensure that compact development, which includes regional level facilities and industrial investments, is promoted in and around each major settlement. This approach will promote the sustenance of the clusters and nodes. In addition, urbanisable areas are organized such that there are no encroachments into the ecologically sensitive areas. The following sections describe the four emerging zones, while Section 3.2 outlines the development controls for each zone and general regulations for the BMR region. These regulations will serve as a guide for future development in the BMR region.

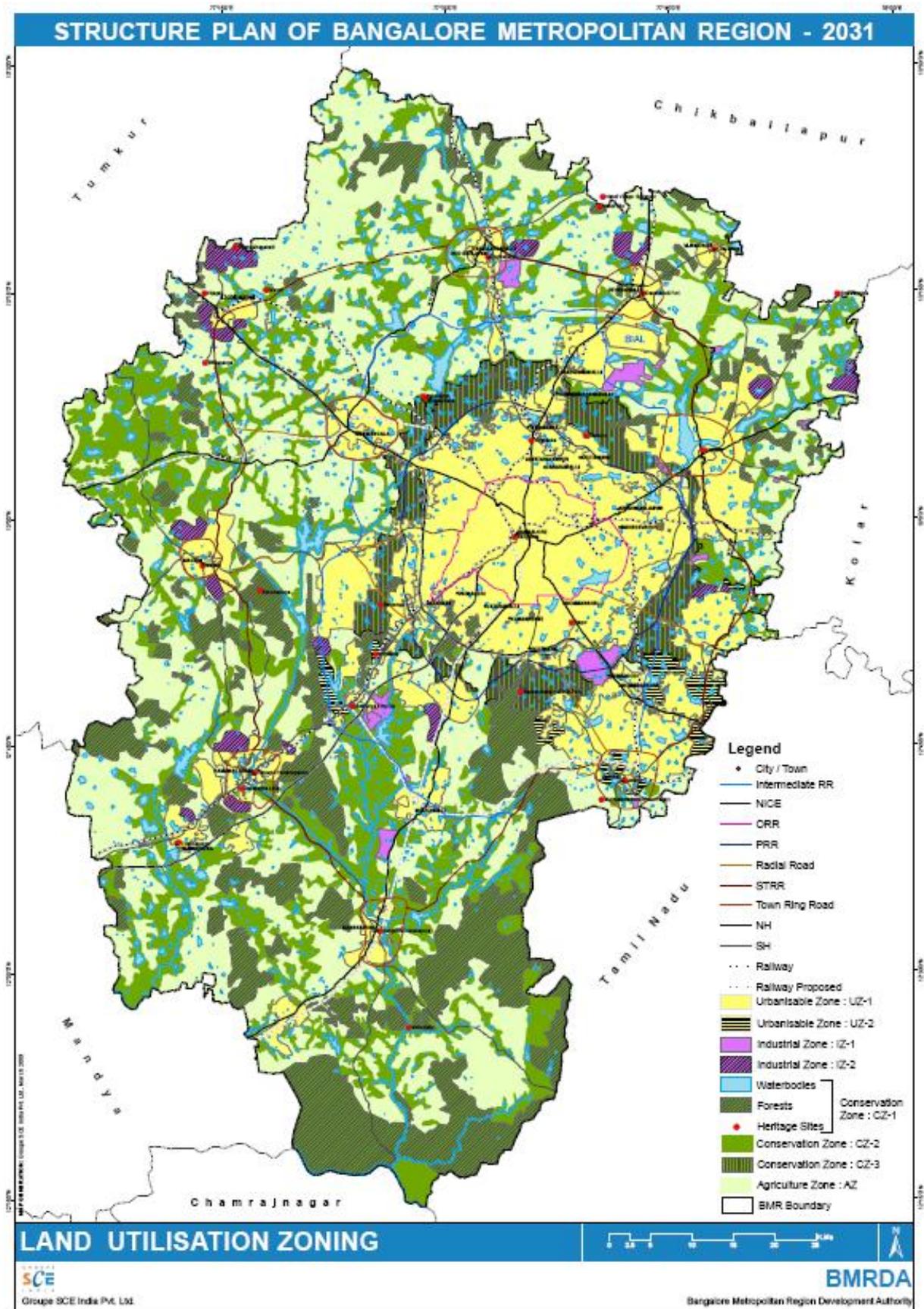


Figure 44: Proposed land utilization zones in the BMR

3.1.1 Urbanisable Zone (UZ)

The Urbanisable zone covers land parcels that are already urbanized as well as areas that have a tendency for urbanization. This includes existing settlements in the region and urban extensions to existing settlements. This zone is applied with the intention of promoting compact urbanization in and around major settlements such that it is in least conflict with the ecologically sensitive / agriculturally productive areas. These urbanisable areas are well accessed and supported by physical infrastructure.

The green network proposed as a Conservation Zone takes precedence over the urbanization zone and is not impinged upon; instead it is earmarked for protection if it occurs within the urbanisable zone. The urbanisable zone includes major proposed / up-coming regional level facilities related to transport, water, etc. The urbanisable zone is classified into two categories:

Urbanisable Zone 1 (UZ-1):

This zone covers the existing settlements and areas earmarked for planned expansion of those settlements, particularly the planned conurbation areas proposed in the Interim Master Plans (IMPs) for the 5 LPAs and Development Plans (Master Plans) for the remaining three LPAs. It is recommended that the conurbation areas of the IMPs be evaluated and re-considered based on population to be allocated and conflicts these areas are having with the natural environment⁶⁵.

The proposed development regulations and uses permitted in the Master Plans of the concerned settlement are applicable in this zone.

Urbanisable Zone 2 (UZ-2):

This zone covers urban extensions to the UZ-1, which are determined based on the potential of lands for future development. The following factors are considered in delineating the UZ-2:

- Development trends and forces around the settlements in terms of proposed industries and residential projects help determine the potentially urbanisable lands.
- Developable lands with high and moderate capability (derived from the land capability analysis) are considered for extending the urbanization.
- Highly productive agricultural lands adjoining the settlements and proposed conurbation areas are preserved, and Kharif lands, wastelands, as well as fallow lands which are in proximity to urban areas are considered for urbanization.
- Lands earmarked for urbanization based on the above factors are well accessed by road and/or rail.

The areas in UZ-2 may serve as “urban reserves” or “transition zones,” which means that these lands are existing agricultural lands that are likely to transform into urban areas. This zone includes two

⁶⁵ It has been clearly established in section 2.5.1 of the plan that of the 18 million projected population, only 1.95 Million is to be allocated to the towns outside the core city of Bangalore. The proposed conurbation areas have the capacity to accommodate a much larger population, therefore they need to be reassessed.

blocks in the Bidadi area that are earmarked as urbanisable blocks for the horizon period of 2021⁶⁶. In addition, other lands earmarked for future development after the horizon year of 2031 are included in this zone. Up to 2031, these lands will continue with their current agricultural use.⁶⁷ Policy LU2 of the BMR RSP 2031 recommends that these urban reserves that are to be considered for development post 2031, be based on the Developable Lands Map Section 4.1.1.5, Figure 47 prepared as an outcome of the land capability analysis.

3.1.2 Industrial Zone (IZ)

In the region, industries may locate inside the UZ-1 and UZ-2 zones as well as in the Industrial Zone. The Industrial Zone covers existing and potential industrial areas located outside the proposed conurbation areas in the region. The intention of this zone is to promote orderly establishment and development of industrial activities such that they are not in conflict with ecologically sensitive areas and are supported by available workforce, physical infrastructure and amenities. The Industrial zone is specifically meant for establishing industrial areas/estates and may be part of the UZ-2 zone. The lands for these industrial areas/estates are either already acquired or will be acquired and developed by the KIADB. The Industrial Zone is classified into two categories as below:

Industrial Zone – 1 (IZ-1)

This zone covers all existing and up-coming industrial areas that are located outside the planned conurbation areas and formed by the KIADB. The regulations that are already in place for the KIADB estates shall continue to be applicable for this zone.

Industrial Zone – 2 (IZ-2)

This zone covers potential industrial lands outside the proposed conurbations of various settlements in the region. These potential land parcels are delineated with due consideration given to the following factors:

- Lands under consideration by the KIADB for future industrial estates are assessed based on the region's land capability. Lands with high and moderate capability for development (derived from LCA) close to the UZ-1, having good accessibility and least conflict with the ecologically sensitive areas, are considered for locating the industries outside the proposed conurbations.
- Highly productive agricultural lands are avoided in determining the industrial lands outside the conurbations, and Kharif lands, wastelands, as well as fallow lands which cannot be put to any productive use are considered for this zone.
- Industrial areas are well accessed by road and/or rail.

⁶⁶ These urbanisable blocks are earmarked as per the approved Special Area Development Plan 2021 for Bidadi Urbanisable Block APZ1, prepared by the BMRDA.

⁶⁷ Since the proposed conurbation areas (as per IMPs) are very large and can accommodate more than the share of population to be accommodated in the region by 2031, it is suggested that the urban extension areas be earmarked and opened up for urbanization only after 2031. Therefore the regional level land utilization map with the proposed zones delineates the Bidadi urbanisable blocks, and some others in the Anekal Taluka, but does not delineate the extension areas post 2031.

- The proposed green network (Conservation Zone - CZ), consisting of existing reserved and protected forests, otherwise Forest Department owned lands, valleys and water bodies and areas that are ecologically sensitive, takes precedence over the Industrial Zone. This green network is not impinged upon and is earmarked for protection if it occurs within the earmarked Industrial Zone.

Since the KIADB has been receiving several proposals from private parties to locate new industries close to the core city of Bangalore, the earmarking of the IZ-2 will assist the KIADB in addressing this demand. The earmarking of this zone will also ensure that locations chosen are not impinging on prime agricultural lands or the region's valleys, water bodies and other ecologically sensitive areas. Special regulations are introduced in section 3.2 to address development of the proposed industrial estates in this zone.

3.1.3 Agriculture Zone

This zone covers the rural and agricultural areas that form the hinterlands for the BBMP areas and all other ULBs within the region. The intent of the Agricultural Zone is to preserve and protect the rural and agricultural areas of the region from indiscriminate development of urban uses or urban sprawl, while permitting certain uses that are compatible with agricultural uses or are intended to serve the agricultural community. Regulated regional level amenities and recreational facilities are allowed in this zone.

This zone includes crop lands, agricultural plantations, lands with low productivity such as single crop lands (only Rabi or only Kharif), fallow lands, grass lands, wastelands, and some double crop lands. Specific regulations that will allow non-intrusive development and will minimize commercialization of prime agricultural lands are proposed and described in section 3.2. Prime agricultural lands adjoining or along valleys are included in the Conservation Zone-2 for protection from indiscriminate development.

3.1.4 Conservation Zone

This zone intends to conserve and protect the region's ecologically sensitive areas, natural corridors, prime agricultural lands along and adjoining valleys and water bodies and the remaining portion of the green belt around the BBMP, in the form of an integrated green network. Identified through a land capability analysis, the region's ecologically sensitive areas, and natural features that constitute the Conservation Zone include:

- existing reserved and protected forests and Forest Department owned lands,
- water bodies (tanks, streams and rivers),
- valleys (natural drainage system),

- prime agricultural lands along or adjoining valleys and water bodies,
- wildlife sanctuaries,
- areas with indigenous flora and fauna,
- man-made, natural and cultural heritage features and resources, and
- other areas and routes that are ecologically sensitive.

As emphasized in the Vision, the mapping of this zone takes precedence over other zones in the region. The lands under double cropping patterns are preserved as Agricultural Reserves, which implies that urban occupation of these lands is prohibited and stringent restriction on land use conversion is imposed. Non-agricultural activities or uses are allowed if they are ancillary to agricultural use. The green network of the Conservation zone is designed and managed for its ecological services and productive utilization that will provide economic benefits. The green network may serve as:

- a) A link for areas with bio-diversity (wild life corridor, bird sanctuaries, etc.)
- b) Proposed nature trails – with trekking / bicycle routes, if the above linkage is overlaid with the region's natural and cultural resources / heritage
- c) Green infrastructure – an ecological service corridor that contributes to flood control and ground water recharge, integrated rain water collection, and storage and management, and improves storm water drainage.

In the context of the BMR, the Conservation Zone is classified into three categories:

Conservation zone 1 (CZ-1):

CZ-1 covers ecologically sensitive areas that need to be protected and enhanced. It includes forests, wildlife and its habitat, bird sanctuaries, waterfalls, water bodies, natural heritage, cultural resources/heritage, scenic view points and view corridors. It also includes sites, remains, ruins, and monuments of national and regional importance and natural resources which are used by the craftsmen as raw material. These areas are protected and excluded from all types of development activity. These elements have to be determined and mapped after detailed on ground analysis.

Conservation zone 2 (CZ-2):

CZ-2 includes greenways or natural green corridors and green buffers along or adjoining valleys and streams, and buffers around natural water bodies. This zone also covers the best and most versatile agricultural lands with high productivity (Kharif and Rabi - double crop lands) which are mostly concentrated in proximity to the valleys or natural drainage systems and water bodies in the region. These types of lands may be preserved as Agricultural Reserves, which implies that urban occupation of these lands is prohibited and stringent restriction on land use conversion is imposed. Generally, the CZ-2 zone will allow certain non-intrusive, productive uses such as regional level natural trails and parkways; non-motorized transportation and regional parks that may showcase local species of flora / fauna; and agriculture.

Conservation zone 3 (CZ-3):

CZ-3 covers the remaining portion of the green belt around the conurbation of Bangalore as defined in the RMP 2015. This zone may allow urbanization at a low intensity, similar to the agricultural zone in the region. The green belt should be conserved and expansion of existing development should be restricted. The areas coming under this zone should be protected from all development activity and conversion of agricultural land to non-agricultural uses should be restricted.

3.2 Zonal Regulations

3.2.1 Extent and Commencement

These regulations shall be called the Zonal Regulations for the Bangalore Metropolitan Region, 2009. (hereinafter referred to as “these Regulations”).

3.2.1.1 Jurisdiction

These regulations shall apply to development of any land situated within the Bangalore Metropolitan Region as defined in the Bangalore Metropolitan Region Development Authority (hereinafter referred to as “BMRDA”) Act, 1985.

- a) Excluding the areas where Development Plans or Planning Proposals have been prepared and sanctioned.
- b) Notwithstanding the generality of the above, regulations 3.2.3.4 (i) and 3.2.3.4 (ii) shall apply to the entire Metropolitan Region.

3.2.1.2 Commencement

These regulations shall come into force on the day of sanctioning of the BMR RSP-2031 and shall replace the provisions contained in the previous structure plan i.e. BMR SP 2011 approved vide Government Order No. UDD 51 BMR 2002 dated 2nd June 2004 and 21st September 2005.

3.2.2 Definitions of Terms and Expressions

3.2.2.1 The terms and expressions in these regulations shall have a meaning as defined hereinafter:

- a) “Environment Impact Assessment (EIA)” means a statement indicating probable changes in the environment, such as, changes in the air quality, water quality, soil quality, noise levels, vegetation and wild life, landscape quality, land use, vehicular traffic, infrastructure, population, economic activity, etc. which may result from any development either during the course of development being carried out, or thereafter.

b) “Environmental Management Plan” means a course of action designed to minimize the unavoidable adverse environmental impacts both during the construction and operational phases of the project.

c) “Floor Area Ratio (FAR)” means the ratio of the combined gross floor area of all floors to the gross area of the plot, viz :-

$$\text{Floor Area Ratio (FAR)} = \frac{\text{Total covered area on all floors}}{\text{Gross Plot area}}$$

FAR should be on floor area/plinth area basis and not carpet area basis.

d) “Planned Development” means development carried out by, or under the overall control of, a single agency in accordance with a proper sub-division plan or layout of buildings with adequate provision of infrastructural facilities, such as, roads, storm water drainage, sewerage, water supply, power supply, etc. as specified by these Regulations, and may involve consolidation of adjoining land parcels into a large plot.

e) “Layout Plan” means a document consisting of a statement and maps giving particulars of the proposed Planned Development.

f) “Regional Level Facilities” means infrastructural facilities and social and physical amenities that contribute significantly to the development of the region. In the context of the BMR RSP 2031, the provision of these facilities in the region will induce other investments through a gradual building up of backward and forward linkages enabling the growth of local settlements to diversify into a wider functional, operational and sustainable network. The facilities may include education and health institutions, markets, sports and recreation facilities, business centres as well as sewage and solid waste management facilities, power supply and water treatment plants.

g) “Gramathana” means old village settlement as earmarked in the revenue survey map (village map).

3.2.2.2 The terms and expressions other than those defined in Regulation 3.2.2.1 shall have the same meaning as in the Karnataka Town and Country Planning Act (hereinafter referred to as KTCP Act) 1961; BMRDA Act, 1985; and the Rules made there under.

3.2.3 General

3.2.3.1 No person or Authority shall undertake any development in the Region which may be specified by issuing a notification in the Gazette, without prior permission of the BMRDA, as stated under section 10 of BMRDA Act, 1985.

3.2.3.2 At or after the date on which the BMR RSP 2031 comes into operation, the BMRDA may allow changes in land use / utilization or development from the BMR RSP 2031 only with the previous approval of the State Government, The procedure laid in section 14-A of the Karnataka Town and Country Planning Act, 1961 shall be followed for the change in land use.

3.2.3.3 No Authority shall grant a permission or No Objection Certificate (NOC) for any development otherwise than in conformity with these Regulations and the policies of the BMR RSP 2031 except in the areas included in the jurisdiction of any Planning Authority, or a Development Authority and for which Development Plans (Master Plans) or Planning Proposals have been prepared and sanctioned.

3.2.3.4 No development of the type listed in items (a) to (l) in Regulation 3.2.3.4 (i), and items (a) to (f) in Regulation No. 3.2.3.4 (ii) shall be or permitted to be carried out by any person or by any authority without obtaining prior concurrence of the BMRDA. Such concurrence may be given with or without conditions.

- i) Any person who intends to carry out any development of the type listed in this Regulation anywhere in the Metropolitan Region shall submit to BMRDA a copy of the application along with the accompanying information for approval submitted to the Ministry of Environment and Forests in respect of the development proposed.
 - a) Pit Headed Thermal Power Stations
 - b) Hydro-power, major irrigation projects and/or their combination including flood control projects;
 - c) Quarring activities
 - d) Major mining activities, which are permitted in accordance Karnataka Minor Mineral Concession Rules 1994
 - e) Regional Parks, Golf course and club / race course / stadiums above 40 ha.
 - f) New Townships above 40 ha.
 - g) Major KIADB / BDA projects above 40 ha.
 - h) Major road development projects including flyovers or elevated roads.
 - i) Power projects / grids and water supply schemes.
 - j) Planning and development of major warehousing and marketing facilities.
 - k) Development of lakes and water bodies.
 - l) Major bus terminal facilities (public and private)

- ii) Any person who intends to carry out any development of the type listed in this Regulation anywhere in the Metropolitan Region shall submit to BMRDA a copy of the application for development permission submitted by him to the concerned Planning Authority. If the environmental screening based on this information indicates that the proposed development will have significant impact on the environment, the BMRDA may, at its discretion, call upon the applicant to submit an EIA and EMP report for such development.
- a) All projects listed as item (a) to (m) in Regulation 3.2.3.4 (i) where investment is above Rs. 50 Crores.
 - b) Quarrying for stone, murum, and earth, including sand dredging from tanks, rivers and streams.
 - c) Tourist resorts, holiday homes, farm houses, health centres, amusement parks and motels in AZ on land admeasuring more than 10 ha. The motels shall be located only along NE/NH with a minimum distance of 5kms between them.
 - d) Any development of land admeasuring 40 ha or more, except in UZ-1 and UZ-2.
 - e) Setting up of a new industrial unit or expansion of an existing one where the investment is Rs.50 Crores or more or the land area is more than 40 ha.
 - f) Poultry farms, cattle stables, piggeries, having an investment more than Rs. 1.00 crore.

Note: The EIA report referred to in the foregoing shall be prepared in accordance with the guidelines issued by the Ministry of Environment and Forest (MoEF), Govt. of India from time to time.

3.2.3.5 No construction shall be permitted within the buffer areas as prescribed in regulation no. 3.2.7.2 except in the UZ-1, where such construction shall be permitted beyond 100 m. from the high flood line of the water course, subject to the provisions of the sanctioned Development Plan.

3.2.3.6 No development of any land in zones other than UZ-1 or IZ-1 and IZ-2 shall be permitted unless the owner undertakes to provide at his own cost physical and social infrastructural facilities, such as, roads, water supply, sewage disposal system, solid waste collection and disposal system, electricity, recreational open space, playground, school, etc. as, in the opinion of the Planning Authority, may be reasonably required for the development proposed, and provided that the owner also undertakes to maintain these facilities for a reasonable period specified by the Planning Authority. Where the Planning Authority decides to provide and/or maintain any of the aforesaid infrastructural facilities, the owner shall surrender to authority or any other agency nominated by it, the land required for such facilities.

- 3.2.3.7 No layouts, subdivisions, industrial estates, regional level facilities or planned developments shall be allowed in the Region without the provision of either a public or a private road to access it.
- 3.2.3.8 Layouts and sub-divisions on approved land shall be regulated in accordance with the subdivision regulations of the sanctioned Development Plans.
- 3.2.3.8 All developments existing on or prior to coming into force of these Regulations which are authorised under Karnataka Town and Country Planning Act 1961 and Karnataka Land Revenue Act 1964, but which are not in conformity with the use provisions of the BMR RSP 2031 or these Regulations shall be allowed to continue as if they are in conforming zone and shall also be allowed reasonable expansion within the existing land area and the prescribed regulations.
- 3.2.3.9 The BMRDA shall be the final authority for interpretation of the provisions of these regulations in conformity with intent and spirit; and this decision shall be final. In cases of genuine hardship the Metropolitan Commissioner, in consultation with the BMRDA, may use his discretion to condone provisions of these Regulations except the provisions related to FAR by recording the reasons.

3.2.4 Urbanisable Zones (UZ-1 and UZ-2)

- 3.2.4.1 The lands in the UZ-1 may be developed for residential, commercial, industrial, and warehousing among other urban uses. Such development shall be in conformity with the detailed land use provisions and development regulations proposed in the Development Plans (Master Plans) of the concerned settlement and the related Development Control Regulations as enforced by the concerned planning authorities for their respective areas will apply.
- 3.2.4.2 The lands in the UZ-2 may be developed using the land pooling technique or as a planned development where conversions from agriculture to non-agriculture is regulated in accordance with the Karnataka Land Revenue Act, 1964. Provision of basic public (physical and social) infrastructure is a requirement in these lands.
- 3.2.4.3 Use Provisions for UZ-2
- i) For the Bidadi urbanisable blocks, the uses specified in the approved document of the Special Area Development Plan 2021 for Bidadi Urbanisable Block APZ1, will be allowed.
 - ii) The areas in the UZ-2 to be urbanized post 2031 may be used for any of the following purposes, namely,
 - a) Residences.

- b) Hotels, tourist resorts, holiday homes, motels and club houses.
 - c) Retail shops, wholesale shops, restaurants and banks.
 - d) Offices of local authorities, local offices of the Government and public utility concerns, and offices of the professionals and others providing similar services.
 - e) Personal service establishments and repair service establishments.
 - f) Educational, medical, social or religious institutions, heritage sites, libraries and museums.
 - g) Research and development institutes, scientific institutes and laboratories and training institutes.
 - h) Warehouses, container parks, truck terminals, vehicle parking areas, garages, petrol pumps, weigh-bridges, service stations and automobile repair workshops.
 - i) Non-polluting, high-tech, high-value-added industries and service industries.
 - j) Television and broadcasting studios, film studios, art galleries, exhibition centres and convention centres.
 - k) Parks, gardens, play-fields and swimming pools, stables.
 - l) Golf-courses, race courses, shooting ranges, amusement parks and theme parks that are not greater than 25 ha.
 - m) Public services and utility establishment, such as water treatment plant, sewage treatment plant, electricity sub-station, gas works, fire brigade, police station, telephone exchange, bus shelters, terminals, depots, solid waste treatment and disposal facilities.
 - n) Cemeteries and crematoria.
 - o) Roads, bridges, dams, railway lines and related facilities, heliports, pipelines, electricity transmission lines, communication towers, etc.
 - p) Agriculture and allied activities, such as, poultry farms.
- iii) The uses or activities in (h), (i), (j) shall be at least 500 m. away from a village gramthana boundary or from the boundary of UZ-1.
- iv) Integrated solid waste management facilities may be permitted with a buffer zone of 500m around the site, within which development is prohibited.
- v) The uses and activities in UZ-1 or on gramthana lands or lands within 200 m. from the gramthana boundary shall be regulated in accordance with regulations prescribed for the closest ULB.

3.2.5 Industrial Zones (IZ-1 and IZ-2)

3.2.5.1 No industrial use shall be permitted in the BMR, except in the Industrial Zones (IZ-1 and IZ-2) of the BMR RSP 2031 or the industrial zones of the various Development Plans of the settlements in the region and in the Urbanisable Zone, as provided for in Regulation 3.2.4. No spot zoning for industrial uses is allowed in the region.

3.2.5.2 Industrial lands inside the settlements and in the UZ-1 zones are to be developed in accordance with the approved Zonal Regulations of the concerned settlement's Development Plan and/or the regulations applicable to the KIADB industrial areas.

3.2.5.3 For IZ-1 lands, which are the existing KIADB Industrial Areas located outside the Development Plan area of settlements, the rules and regulations of the KIADB estates are applicable.

3.2.5.4 For the IZ-2 lands, which are located outside the Development Plan areas and are to be acquired by the KIADB, industrial development shall be located as a part of a Planned Development. Such a Planned Development will integrate other uses such as housing, logistic facilities, community facilities and service sector uses. The following uses and regulations shall apply for this zone:

- i) A layout plan and plans for provision of infrastructural facilities shall be required for this planned development. The plan shall contain specific regulations for storm water management, integrated solid waste management facility, rain water harvesting, and for managing conflicts with the ecologically sensitive features.
- ii) A minimum of 10% open space shall be reserved in the Industrial Estates and shall be developed mainly for greenery.
- iii) Only non-polluting industries shall be allowed to locate in proximity to the water bodies and low-lying valley areas; however they shall locate outside the buffers prescribed in section 3.2.7.2 of the Conservation Zone.
- iv) An Environment Impact Assessment (EIA) Study shall be carried out prior to setting up of the Planned Development and industrial units within it.
- v) Permissible uses for this zone are as follows:
 - Medium and small-scale non-polluting manufacturing units including biotech industries, IT and ITES, electronics, white goods, plastic products, agro-based industries, textile industries, food and food products, leather products, paper products and printing and publishing, wood products and the like.
 - Flatted factories
 - Service sector enterprises and ancillary units such as suppliers of raw materials and consumables, transport agents, workshops, tool rooms etc.
 - Housing, day care centers and commercial uses to support the housing
 - Community facilities such as primary schools, medical centres, daycare centres etc.
 - Logistic hubs, STPs and ETPs

3.2.6 Agricultural Zone (AZ)

3.2.6.1 Developments in the AZ lands shall be regulated in accordance with the following regulations:

- i) To minimize commercial exploitation of AZ lands adjacent to urban areas, only non-polluting uses, farming, and recreational uses may be permitted.
- ii) The lands in this zone may be used for any of the following purposes:
 - Horticulture, farming, dairy, milk chilling centres,
 - Gramthanas and gramthana expansion schemes in accordance with Regulation 3.2.13.1
 - Farm houses and accessory uses
 - Burial grounds, religious places, crematorium and cemetery
 - Sports grounds, parks and garden land, playgrounds
 - Subject to safety margins within the plots and environmental clearance under relevant legislation, storage of obnoxious or hazardous goods, includes bottling, packing, repacking of LPG but excluding any manufacturing activity.
 - Godowns, container parks, open ground storage of non-hazardous and non-obnoxious nature on the major district roads, state highways, or rights-of-way width having width 18.00 m or more and 500 m away from gramathanas and National Highway.
 - Agricultural and allied activities and agro-based industries in accordance with the regulations of the Industrial Promotion Policy for Agro Food Processing Industries: 3 (GO No. CI 167 SPI 2001 dated 30th June 2001)
 - Rice mill, saw mill, cold storage, poultry farms, cattle stables, piggeries, and livestock rearing
 - Public utilities such as water treatment plants, power plants, fuel stations and other highway amenities such as weigh bridges, check posts, toll gates, having access to major roads
 - Service and repairs of farm machinery
 - Social forestry/plantations
 - Quarrying of stone, murum or earth including mechanised stone crushing or stone dressing and temporary housing of laborers, offices and other accessory buildings related to quarrying activity in accordance with the guidelines given in Karnataka Minor Mineral Concession Rules 1994 and regulation 3.3.11 and an undertaking to observe all necessary care and precaution during quarrying operations as required by these guidelines.
 - Parks, gardens, play fields, golf courses, swimming pools, race courses, shooting ranges, camping grounds, facilities for water sports, amusement parks, theme parks;
 - Roads and bridges, railways, heliports, airports, dams, pipelines, electricity transmission lines, communication towers, and such other essential services, subject to Regulation 3.2.3.4;

- Highway amenities and services such as petrol pump, small shops, service stations including emergency repair services, restaurants, parking lots, police check-post, subject to Regulation 3.2.11
- iii) Fresh water intensive uses and brick kilns shall be prohibited in this zone.
- iv) Institutional uses and other regional level facilities shall be permitted on only classified fallow and waste lands in the AZ, that cannot be put to any productive use. Regional level facilities including education, health, social, cultural and religious institutions along with residential quarters, and shops for the staff shall be permitted on plots not less than 80 ha (200 acres).
- v) Development activity in the AZ shall be regulated with a maximum ground cover of 5%. Construction of buildings shall be restricted to a height of 7 metres.

3.2.7 Conservation Zone (CZ-1, CZ-2, CZ-3)

3.2.7.1 The lands in the Conservation Zone covered by the Thippagondanahalli Reservoir catchment area shall be regulated in accordance with the regulations of the Notification - No FEE 215 ENV 2000.

3.2.7.2 The lands in the Conservation Zone -1 (CZ-1) shall be protected from all development activity. The following regulations apply for CZ-1 lands.

- i) A buffer of 1km shall be maintained around all Reserved and Protected forests and Forest Department owned forests, where no urbanisation is permitted.
- ii) For all streams and water bodies (perennial and dry courses) the following buffers shall be maintained as “non-urbanisable zones.”

Sl.No	Water body area (hectares)	Buffer (metres)
1	<0.01	To be determined on a case by case basis
2	0.01 to 0.25	100
3	0.25 to 1.0	100
4	1.0 to 6.25	200
5	6.25 to 25	200
6	25 to 100	300
7	100 to 500	500
8	>500	1000

- iii) For valleys the following buffers shall be maintained, within which no urbanization shall be permitted.

Valleys	Buffer in Meters
Primary	500
Secondary	350
Tertiary	200

- iv) For the buffer areas mentioned in Regulation 3.2.7.2 (i), (ii) and (iii) the following apply:
- No cash crops or pesticide usage are permitted.
 - Land use change and conversion is restricted.
 - No building construction shall be permitted.

3.2.7.3 Where any land is situated in the Reserved Forests or Protected Forest as defined under the Indian Forests Act, 1947, or the forest acquired under the Karnataka Forests Act 1963, such lands may be used for Gramathana and gramathana expansion only in accordance with the Regulation 3.2.13.

3.2.7.4 Developments in the CZ-2 shall be regulated in accordance with the following regulations and controls:

- i) All activities such as quarrying, mining, and deforestation shall be strictly prohibited.
- ii) No land conversion may be allowed in designated valley areas and the CZ-2 irrespective of land use.
- iii) Non-intrusive, productive uses such as the following are permissible:
 - Regional level natural trails and parkways,
 - Parks, gardens, bird habitats, and other recreational uses
 - Non-motorized transportation (bikeways and pedestrian trails)
 - Regional parks with local species of flora / fauna
 - Agriculture and horticulture
 - Floriculture
 - Social forestry/plantations including afforestation
 - Regional recreational activities with no construction exceeding 0.5% of the area with the permission of the competent authority.
 - STPs

3.2.7.5 Developments in the CZ-3 lands that cover the remaining portion of the green belt area surrounding the Bangalore Metropolitan area shall be regulated in accordance with the following regulations. As indicated in the Policy LU8 these Regulations shall take precedence over the zonal regulations of the Revised Master Plan 2015 for Bangalore, 2005.

- i) No land conversion shall be allowed in this zone, irrespective of land use. If there is any change in the land use whatsoever, permission from BMRDA will have to be taken.

- ii) Such development occurring in this zone shall be regulated in accordance with the following regulations:
 - Maximum FAR: 0.5
 - Maximum height: Ground level only
- iii) All existing polluting industries are to be phased out, in a stipulated time frame, from the BMR.

3.2.7.6 In addition to the use provisions for CZ-2 in 3.2.7.1, the use provisions for CZ-3 are as follows:

- i) Residential development as per zonal regulations prescribed in the Revised Master Plan 2015 for Bangalore, 2005.
- ii) Urban amenities such as burial grounds, sports grounds, playgrounds, parks and garden land.
- iii) Agro processing units using local agriculture products as raw materials.
- iv) Public utilities such as water treatment plants, power plants, fuel stations and other highway amenities such as weigh bridges, check posts, toll gates, having access to major roads.
- v) Agriculture, horticulture, dairy, milk chilling centres,
- vi) Farm houses and accessory uses with a ground cover not exceeding 2.5% and minimum plot size of 1.2 ha. Construction of buildings shall be limited to 7 metres.
- vii) Service and repairs of farm machinery.
- viii) Piggeries and poultry farms, livestock rearing.

3.2.8 Planned Development

3.2.8.1 The Planned Development may be undertaken by a co-operative society of land owners, a land owner, developer or builder on behalf of a land owner, local authority or any public agency who shall submit to the planning authority or where there is no Planning Authority the Deputy Commissioner of the BMRDA, a Layout Plan for approval in principle. Such a Layout Plan shall indicate (through index map, sketch plan and description) brief particulars of the proposed Planned Development, such as,

- a) Location and area of the land, including particulars of the surrounding development.
- b) Existing and proposed access to sites.
- c) Land uses or activities proposed.
- d) Proposal for provision of basic infrastructure, such as, roads, storm water drainage, water supply, waste disposal facilities, power supply, etc.

3.2.8.2 The Planning Authority or the Deputy Commissioner of the BMRDA as the case may be shall consider the Layout Plans in light of the planning proposals or layouts that may have been prepared or may be under preparation for UZ-2 and IZ and/or in light of the Layout Plans approved, and Development Permission granted earlier for the development of adjoining lands and other lands in the vicinity. The Planning Authority or the Deputy Commissioner of

the BMRDA shall either approve the Layout Plan in principle, reject it, or return it for modification.

3.2.8.3 Based on the approved Layout Plan, referred to in Regulation 3.2.8.2 above, an application for Development Permission for Planned Development shall be made. Such application shall include the following:

- a) Sub-division of land into plots or layout of buildings and proposed use of plots or buildings.
- b) Existing or proposed roads of the Regional Plan, Development Plan, Planning Proposals or Layout, access road to individual plots and building and parking arrangements.
- c) Recreational open spaces, spaces reserved for social facilities and amenities, such as, shopping centres, schools, community centres, health centres, etc.,
- d) Utility services, such as, electric sub-station, water tank and pump house, sewage treatment plant, etc.
- e) Landscape plan of the area.
- f) Details of the arrangements for provision of water supply including source, treatment and distribution arrangements.
- g) Details of the arrangements for collection, treatment and disposal of liquid and solid waste.
- h) Details of the arrangements for electricity supply and distribution including provision of street lights.

3.2.9 Heritage, Recreational and Tourism Areas

3.2.9.1 For the purposes of these Regulations, the Heritage, Recreational and Tourism areas consist of:

- a) Heritage areas specifically mapped in the BMR RSP 2031 under the heritage sector policies.
- b) Places of recreational and tourism value, such as,
 - i) Heritage and cultural sites;
 - ii) Major religious places;
 - iii) Objects, features, structures and places of architectural, natural and scientific interest, and educational value; and
 - iv) Tourist circuits as proposed in the BMR RSP 2031.
- c) Hilly areas, areas of scenic value, and other natural heritage features that are included in the Conservation Zone

3.2.9.2 Notwithstanding anything stated in Regulation 3.2.4, 3.2.5, 3.2.6, and 3.2.7, Heritage, Recreational and Tourism areas shall be regulated in accordance with the following regulations provided that the places or areas mentioned in 3.2.9.1 (a), (b) and (c) above are shown in the Section 4.1.7.1 Figure 63: Heritage and Cultural Assets in BMR region, of the BMR-RSP 2031.

- i) A belt of 500 meters shall be maintained, as a recreational and tourism area, around the places mentioned in 3.2.9.1 (b) above, but excluding existing gramthanas.
 - ii) For ASI notified heritage sites, the regulations of the ASI shall apply in addition to the above regulation.
 - iii) Residential and mixed use development catering to tourism amenities shall be permitted within the recreational and tourism area in the belt of 500 meters around the places mentioned in (b) above with a plan prepared for the area. This includes the following developments:
 - Expansion of existing gramthanas
 - Hotels, tourist resorts, holiday homes, motels and club houses
 - Retail shops, restaurants and banks
 - Religious places, and allied activities
 - Parks, gardens, play fields, golf courses, camping grounds, swimming pools, facilities related to water sports, race courses, amusement parks, theme parks
 - Temporary constructions for limited period, such as, during fairs, ceremonies, etc
 - Essential public services and utilities, such as, public toilets, water and sewage treatment facilities, electricity sub-station and bus-shelters
 - Access roads, bridges, vehicle parking areas, jetties, ropeways
 - Petrol pumps, servicing and repair services
 - iv) Non-polluting industries shall be permitted beyond a belt of 1 km from the places mentioned in 3.2.9.1 (b) above
- 3.2.9.3 No development of the type mentioned in Regulation 3.2.9.2 (iii) shall be permitted within the places mentioned in Regulation 3.2.9.1 (b) or within 100 m. therefrom except for the purposes of restoration, conservation, improvement, maintenance and management of recreational and tourism value.
- 3.2.9.4 Activities such as mining, quarrying and deforestation shall not be permitted in or within the places mentioned in Regulation 3.2.9.1 (b) or within 500 m. therefrom.
- 3.2.9.5 All developments mentioned in Regulation 3.2.9.2 (iii) and other activities such as mining, quarrying and deforestation shall not be permitted within the places mentioned in Regulation 3.2.9.1 (a) and (c).
- 3.2.9.6 Heritage areas such as the Devanahalli fort and the religious town of Shivaganga shall be earmarked as Conservation Areas, within which no development of the type mentioned in Regulation 3.2.9.2 (iii) shall be permitted.

3.2.10 Quarry Areas in the Agricultural Zone

- 3.2.10.1 Quarry areas shall be permitted only in the Agricultural Zone in the region and they may be used for any of the following purposes, namely:
- a) quarry of stone, murum or earth;
 - b) mechanised stone crushing or stone dressing;

- c) temporary housing of laborers, office of the supervisors, managers and other accessory buildings related to quarrying activity.
 - d) Public utilities and services.
- 3.2.10.2 No quarrying permission shall be granted unless the application for quarrying is accompanied by an excavation and restoration plan prepared in accordance with the guidelines given in Karnataka Minor Mineral Concession Rules 1994. The applicant shall also have to furnish an undertaking and observe all necessary care and precaution during quarrying operations as required by these guidelines.
- 3.2.10.3 Quarry areas permitted in the AZ shall function in accordance with the following regulations.
- i) For quarries that are active, and which undertake blasting, a buffer of 200 m. shall be demarcated around them, where no development is permitted.
 - ii) Quarries which involve blasting shall not be permitted within 200 m. from any public road, railway line or residential area including gramathana.
 - iii) No temporary housing of the laborers, office of the supervisors and other quarry-related structures shall be located more than 500 m. away from the place of blasting.
 - iv) For quarries which do not undertake blasting 50 m. buffer shall be maintained.
 - iii) After the lease period for quarry use is completed, a productive use shall be assigned to the inactive quarry areas.

3.2.11 Developments along Highways

- 3.2.11.1 Notwithstanding anything stated in the foregoing Regulations the accesses to and developments along the National Highway (NH) and State Highway (SH), outside the boundaries of the major settlements in the Region, shall conform to the following Regulations.
- 3.2.11.2 No development abutting the NH or SH, shall be permitted without obtaining the NOC for access to such development from Highway Authorities or the appropriate authority. The development shall have to be separated from such highway by a parallel service road at least 12.00 m. wide.
- 3.2.11.3 Essential highway amenities and services, namely, petrol pump, service station including emergency repair services, restaurants, parking lots, motels, police check-post, toll station, octroi post shall be permitted direct access from the NH and SH. Such access shall be provided with proper lay-by as per the guidelines specified by the Indian Road Congress.

3.2.12 Areas adjoining STRR and IRR

- 3.2.12.1 A buffer area of 0.5 kms alongside the STRR and IRR shall be maintained. Highway amenities and services such as petrol pump, small shops, service stations including emergency repair services, restaurants, parking lots, and police check-post etc. shall be allowed in this buffer area.

3.2.13 Rural Development

- 3.2.13.1 Notwithstanding anything stated in Regulation 3.2.4, 3.2.5, 3.2.6, and 3.2.7 the developments within the boundary of the existing gramathana (village site) and the gramathana expansion scheme situated in other than UZ-1, UZ-2, IZ-1 and IZ-2 shall be governed by the following Regulations.
- 3.2.13.2 For the purpose of these Regulations, the boundary of the existing gramathana shall be as shown in the revenue maps prepared on or before the date of coming into force of these Regulations.
- 3.2.13.3 The lands in the gramathana may be used for any of the following purposes:
- Residences;
 - Retail shops, restaurants and banks, personal service establishments and repair service establishments;
 - Schools;
 - Community centres and other social institutions;
 - Religious places;
 - Clinics, dispensaries, health centres;
 - Essential public services and utilities including local Government offices.
 - Stables for domestic animals subject to limit of 5 animals on each plot.
 - Traditional household industries;
 - Storage of crop, fodder, manure, agricultural implements and other similar needs;
 - Parks and playground; and
 - Public conveniences.
- 3.2.13.4 The lands included in gramathana expansion shall be used for the following:
- All uses stated in Regulation 3.2.13.3, items (a) to (l).
 - Service industries.
 - Warehousing and cold storage on plot not more than 0.20 ha.
- 3.2.13.5 Within a radius of 150 m from the boundaries of the gramathana for those villages having a population up to 1000 as per 2001 census, and for every additional 1000 population additional 50 meters for uses permitted under residential and agricultural zone shall be permitted. Developments required for the natural growth of the village may be permitted with the following regulations:
- FAR: 0.66
 - Maximum height: 7 metres
- 3.2.13.6 Outside this buffer around the gramathana, uses that are as per the zones of the BMR RSP 2031 shall be permitted.

3.2.14 Public Utilities

- 3.2.14.1 Buffers for various utility facilities such as power, water pipeline, oil pipelines, high voltage lines, gas lines and any other public utilities should be maintained as stipulated by the technical standards prepared by the concerned authority.

3.2.15 Regulations for large scale developments

- 3.2.15.1 Developments on lands over 40 ha shall be permitted after a “no objection certificate” is obtained from the BMRDA. Such large scale developments including Planned Developments as stated in Regulation 3.2.8 shall prepare an Environment Impact Assessment and an Environment Management Plan.

3.2.16 Recommend guidelines for Master Plan areas

- 3.2.16.1 Notwithstanding the regulations in the BMR RSP 2031, the following regulations shall apply for the conurbations of the sanctioned planning areas in the region.
- i) No new highly polluting/ hazardous/ obnoxious industries shall be permitted within the conurbations of the sanctioned plans or within the BMR. .
 - ii) Existing polluting industries from the BMA and the Master Plan areas shall be either relocated to an area outside the BMR or shall continue to function provided a buffer zone of 0.5 kms is given, after a land allocation strategy is developed for the region.
 - iii) The above industries have to conform to all regulations for disposal of toxic and hazardous wastes. Industries have to participate in separate collection and transport of non-hazardous and hazardous wastes to designated disposal sites subject to approval of Karnataka State Pollution Control Board (KSPCB).
 - iv) Buffers for water bodies, valleys and other environmentally sensitive areas as proposed in the BMR RSP 2031 are to be considered for water bodies inside the Master Plan areas after evaluating the on-ground realities.
 - v) Special hawking zones, especially in low income areas within urbanized areas are to be identified and earmarked.
 - vi) Development in the green belt area defined in the RMP 2015 needs to be managed and regulated in accordance with the proposed regulations of Conservation Zone-3 of the BMR RSP 2031.
- 3.3.17.1 The Master Plan areas should strictly follow the proposed regulations of the BMR RSP 2031 and no deviation from the prescribed regulations shall be allowed without the permission of the BMRDA.

4 PART IV SECTOR REVIEW, POLICIES AND RECOMMENDATIONS

4.1 Sectors

4.1.1 Land Utilisation and Environment

4.1.1.1 Introduction

As mentioned earlier, Bangalore region is a sensitive region with respect to water resources. Given its topography, the region faces numerous water and environmental related sensitive issues which are vital to be addressed for balanced development of Bangalore region.

4.1.1.2 Overview of the BMR SP 2011

The BMR Structure Plan 2011 designated 5 Area Planning Zones and 6 Interstitial Zones to spatialize the region's land resource management policies. These zones and policies were derived after an analysis of remote sensing data themes such as land use, land cover, transport networks, drainage and contours. The APZs and IZs served as a simple land planning tool for maximizing the utilization of existing and available infrastructure, and for minimizing the need for conversion of agricultural land for urbanization. They were conceived to make the development strategy of the BMR Structure Plan 2011 operational. Policy guidelines for land resource management, expansion of forest land and agricultural resource management have been recommended in BMR SP 2011. Water resource, watershed and greenbelt management measures have also been outlined in the plan.

4.1.1.3 Existing Situation

The BMR RSP 2031 uses 5.8 meter resolution LISS-4 (IRS-P6) multi spectral satellite image data received from the National Remote Sensing Centre (NRSC) for the year 2008 to analyse the land utilization in the 8006 sq.kms of the BMR region. The image was processed to extract the land utilisation data under the seven categories as shown in the table below. In addition to the NRSC image, various data themes including transport networks, valleys and drainage, forests and water bodies, soil conditions, hydrology, and geomorphology, provided by the Karnataka State Remote Sensing Application Centre (KSRSAC), were updated and used to conduct a land capability analysis. The following table shows the categories of land utilization, the area covered by each in 2000⁶⁸ and 2008, the percentage of each category vis-à-vis the total area of the BMR, and the percentage change of land utilization between 2000 and 2008 for each category.

⁶⁸ Data source: Karnataka State Remote Sensing Application Centre (KSRSAC) based on 5.8 meter resolution, PAN+LIS III satellite image (2000), as well as 1:50,000 Survey of India topo sheets and field observations.

Table 14: Land utilization change between 2000 and 2008					
Land utilization categories	2000		2008		% change
	Area in sq.kms	% of total BMR	Area in sq.kms	% of total BMR	
Agricultural land	5323	66.49%	5288	66.06%	-0.65%
Built-up land	723	9.03%	920	11.49%	27.18%
Forest	830	10.36%	831	10.38%	0.15%
Grassland / Grazing land	22	0.27%	5	0.07%	-74.80%
Waste lands	690	8.61%	599	7.48%	-13.14%
Water bodies and Wetlands	340	4.25%	287	3.58%	-15.62%
Others	79	0.99%	76	0.94%	-4.47%
TOTAL	8006	100.00%	8006	100.00%	

The following maps show the land utilization categories for 2000 and 2008.

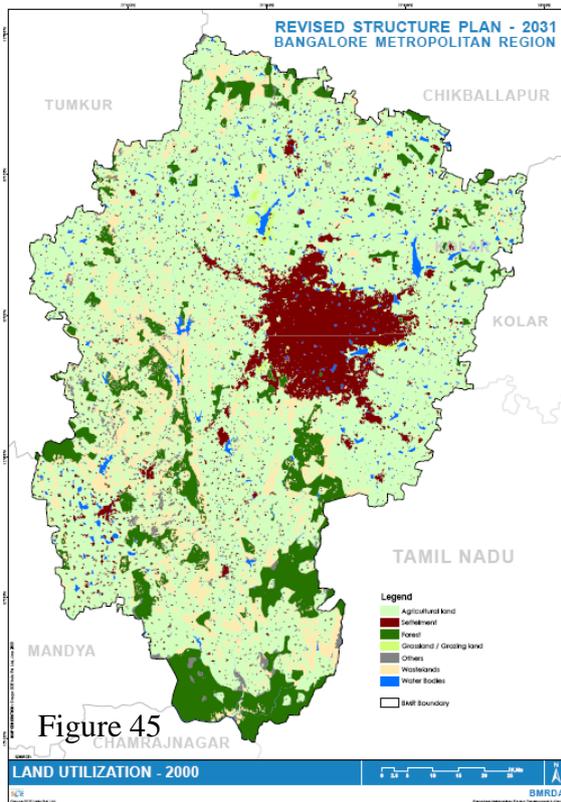


Figure 45: Land Utilisation Map – 2000

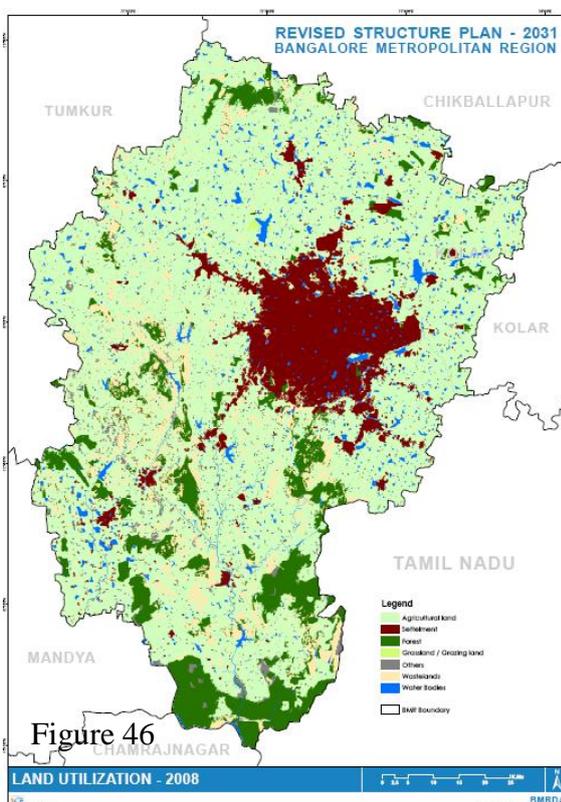


Figure 46: Land Utilisation Map - 2008

An analysis of the above shows the increase in built-up area (27.18 % increase by 197 sq.kms) , reducing Water bodies (by 15.62% - 53 sq.kms) and the wastelands by about 13.14% - 91 sq.kms in this eight-year period. In addition, agricultural lands have reduced by 0.65%, amounting to 34 sq.kms and grasslands/grazing lands are lesser by 74.8% (16 sq.kms) since 2000.

4.1.1.4 Emerging Issues and Opportunities

- The above analysis implies that water bodies, wet lands and agricultural lands, which ought to be conserved, have been encroached upon by the built structures. Particularly in the core area (Bangalore), the valleys and water bodies have been built upon.
- The green belt around the core, largely an agricultural zone, has been encroached by urbanization. The issue at hand is the way in which urbanization is impinging upon valuable natural resources.
- Corridor type urbanisation is observed along the Bangalore-Bidadi corridor and the Bangalore-Nelamangala corridor. The Bangalore-Attibele route along NH-4 and Bangalore-Jigani connector, have also seen increased urban development. The Devanahalli-Yelahanka corridor is more urbanized since 2000. If these types of indiscriminate corridor development patterns are continued, the core city will continue to sprawl and have adverse impacts on the surrounding natural features and agricultural lands. Other major towns also will expand and sprawl if care is not taken to regulate the growth.
- Most of the water features in the Bangalore region are severely threatened due to a combination of encroachment, catchment depletion, eutrophication and bad management practices.
- Indiscriminate drilling and extraction of groundwater in Bangalore region has led to severe depletion of the aquifer.
- Bad management practices for sewage and industrial pollution has led to extremely high levels of contamination of groundwater, both chemical and biological.
- Agricultural practices are heavily reliant on ground water extraction, chemical fertilizers and other destructive practices. In addition to the degradation of the land, these practices give a low return to the farmer, increasing the temptation for conversion of land to non-agricultural uses.
- The extent of mining in the Bangalore region is uncontrolled and badly managed by local authorities. Serious long-term damage is being inflicted on the environment under the guise of resource extraction. These activities are permitted by ill-informed local authorities with little knowledge of environment or sustainable resource extraction

4.1.1.5 Policies

a.Land allocation and development strategy

Policy LU1: Land allocation strategy to promote compact development

A land allocation strategy should be developed to propose land for future expansion. Lands should be allocated in and around existing towns, to ensure compact development. These lands should support mixed uses and be planned with all necessary infrastructure facilities. Conversion of prime agricultural lands to non-agricultural use should be banned. Lands with ecologically sensitive areas should be conserved. Agricultural lands in proximity to urban areas should have non-polluting development.

Policy LU2: Designating urban areas that serve as urban reserves or transition zones

The Developable lands Map shown below is an outcome of the land capability analysis conducted for the region. Lands indicated in this map are suitable for urbanization, agriculture and other productive uses. Using this map as a base, existing agricultural lands that are likely to transform into urban areas should be designated as urban reserves or transition zones. Those lands that have convenient access, are in proximity to existing urban areas and are capable for urbanization can be earmarked as transition zones. These zones serve as extensions to urban areas and can be used for development post 2031. Specific regulations need to be formulated for these areas and it is recommended that the land pooling approach be adopted to integrate these areas. Further, once opened up for urbanization, conversions from agriculture to non-agriculture should be regulated through compulsory provision of basic public (physical and social) infrastructure in these lands.

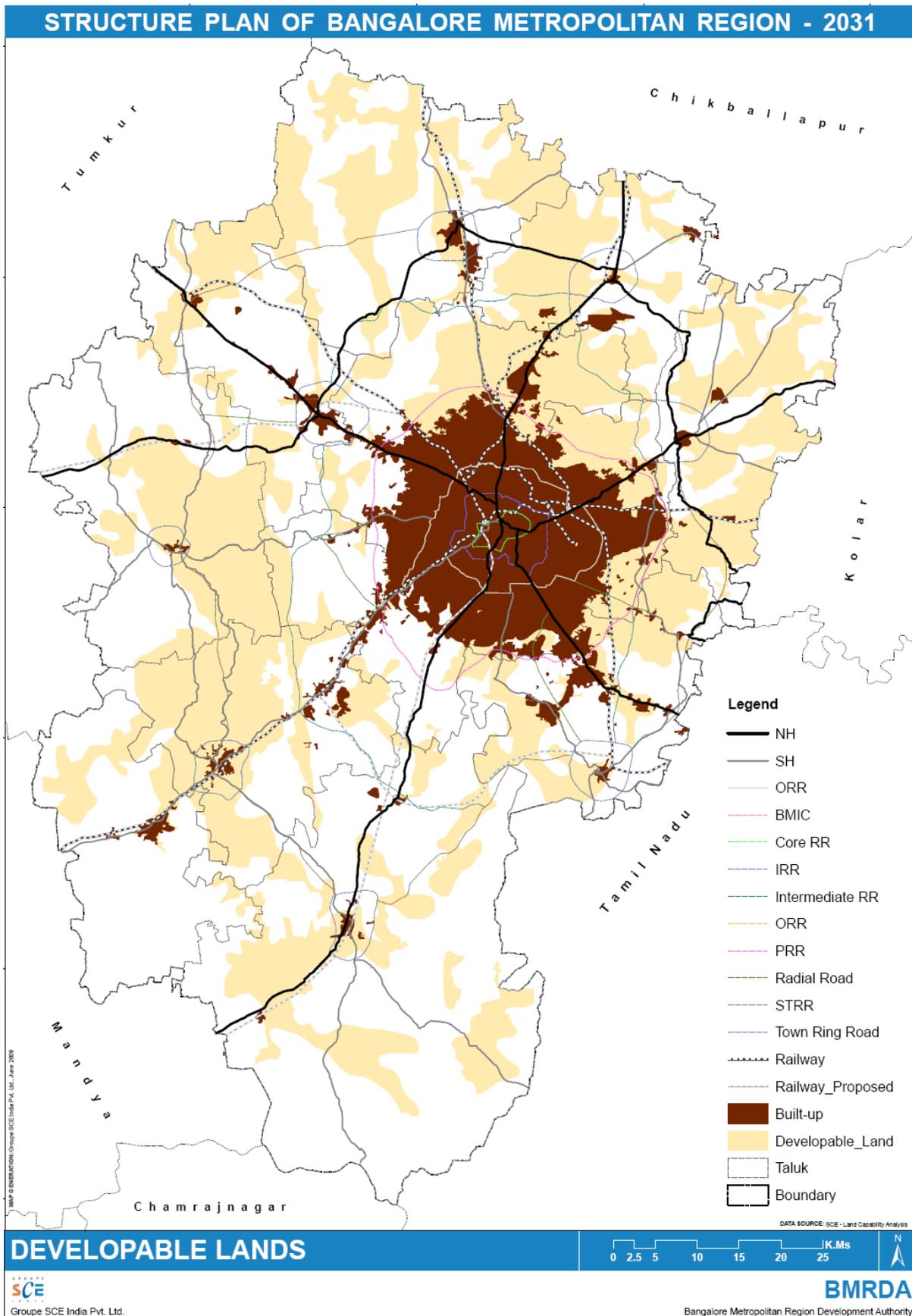


Figure 47: Developable lands

Policy LU3: Decentralization and relocation of congestion generating uses from the BBMP

Impacts of uses such as the wholesale trade market with its goods vehicle parking, Central bus terminus, private bus terminus needs to be assessed to develop a relocation and decentralization plan. The relocation strategy should identify suitable locations and provide for phasing of these activities in a stipulated time frame.

Policy LU4: Urban agriculture should be encouraged to achieve urban food security and local employment generation

Limited agricultural activities within urbanized areas could be introduced through proper land use policies / regulations. It can be also encouraged through adequate incentive mechanism. However, guidelines should be made to identify suitable type of urban agriculture practices which are environment friendly. Types of agriculture permitted in a particular area should also be specified based on land suitability.

Policy LU5: Development framework to integrate proposed industrial estates

Besides addressing conflicts with ecologically sensitive areas, the development framework for proposed industrial estates in the Industries Zone should address the fact that these areas tend to be mono-functional and act as exclusive enclaves that detract from the region's livability. In order to strengthen their forward and backward economic linkages, the estates should be developed in association with housing and community facilities. Service sector uses that will strengthen the supply and production linkages of the economic clusters in the region should be accommodated. The Industrial zone should also allow logistic and other regional level facilities. No spot zoning for industrial uses should be allowed.

POLICY LU6: Minimizing conflicts between the proposed industrial estates and ecologically sensitive areas

Locations chosen for industrial development should not impinge on prime agricultural lands or the region's valleys, water bodies and other ecologically sensitive areas. The conflict between major valleys cutting across proposed industrial zones and development should be minimized. Specifically only non-polluting industries should be allowed to locate in proximity to the water bodies and low-lying valley areas; however, they need to be outside the prescribed buffer area. By using the mini-watershed as a base unit, the layout plan for the industrial estate should be worked out such that provision for rain water harvesting and protection of the water bodies and valleys is incorporated in

the design. Specific regulations for storm water management and solid waste management should be introduced. Common STPs and ETPs should be set up within the estates to reduce costs.

POLICY LU7: Environmental impacts of industrial estates

The industries have to obtain environmental clearance under the Environment (Protection) Act, 1986 either for locating new units in BMR or carrying out extensions at the existing locations. An Environment Impact Assessment (EIA) Study is to be carried out prior to setting up of industrial units. The industries have to conform to all regulations for disposal of toxic and hazardous wastes. Industries have to participate in separate collection and transport of non-hazardous and hazardous wastes to designated disposal sites subject to approval of Karnataka State Pollution Control Board (KSPCB).

Policy LU8: Green belt management and inclusion in the Conservation Zone

The green belt area outlined in the RMP 2015, which is primarily an agricultural zone, is being encroached over time. The BMR RSP 2031 includes the remaining portion of the green belt as part of the proposed green network and zones it as Conservation Zone - 3. The BMR RSP 2031 recommends that the RMP 2015 be amended as per the KTCP Act 1961, to limit conversion of agricultural into non-agricultural uses and expansion of existing development. All new development will be permitted in accordance with the development control regulations of the Conservation Zone -3 of the BMR RSP 2031.

Policy LU9: Assessment of the proposed conurbations of the Interim Master Plans

The proposed conurbations of the IMPs are very large and can accommodate more than the share of population to be accommodated in the region by 2031. It is recommended that these conurbation areas be assessed in light of the BMR RSP 2031 development strategy that promotes compact development in and around existing settlements and cluster and nodal growth in the region based on a land capability analysis. The IMPs need to promote increased FAR, group housing and mixed use development that will reduce urban sprawl.

a. Agricultural Resource Management

Policy EV1: Conservation of productive agriculture lands

Productive agriculture lands including plantations, double cropped areas, under horticulture and floriculture farms, nurseries, etc should be conserved for their social and economic values.

Agricultural lands are critical to the environmental, social and economic well-being of the region. If left unaddressed, the degradation of these assets would have a domino effect on the environment and natural cycles combined with displacement of the farming community. Indiscriminate conversion of these lands for non-agricultural purposes, if left unchecked, would have serious consequences for the long term development of the region. Specifically, prime agricultural lands along valleys and around water bodies are protected by this zone. By doing so, the viable agricultural economy of the towns in the BMR is protected.

Policy EV2: Promote sustainable agricultural practices

The present agricultural practices are highly resource intensive with low returns. It is critical that sustainable agricultural practices addressing soil, water, chemicals, etc are aggressively promoted.

In addition to conservation of agricultural lands and controlling conversion of land use, it is critical that the related issues of resource management are tackled. The present scenario is heavily reliant on ground water extraction, chemical fertilizers and other destructive practices. While severely degrading the health of the land, these practices also ensure a low return to the farmer, increasing the temptation for conversion of land to non-agricultural uses. Chemical-free, organic practices will ensure higher return on investment, improve degraded soils and contribute the long term water security of the region.

b. Water Resource Management

Policy EV3: Protection of Surface Water Bodies

All water features like rivers, reservoirs, lakes, seasonal stream beds and wetlands should be protected, maintained and enhanced in capacity. This is critical from the long-term ecological well-being of the region as also to address the infrastructural needs for development.

Most water features in the Bangalore region are severely threatened due to a combination of encroachment, catchment depletion, eutrophication and bad management practices. An integrated management strategy is urgently needed to ensure survival of these critical natural resources if development in the region is to be sustained in both the short term and the long term.

Policy EV4: Active rejuvenation of lakes and tanks

All lakes and tanks in the BMR should be actively rejuvenated. This should include existing lakes as well as ones that have been degraded / lost due to bad management in the past.

The protection, conservation and revival of lakes and tanks is one of the most critical measures in ensuring the continued habitability of the region. Strategies should be actively pursued at both the regional level and the local level to ensure conservation of these natural resources. Among the many

functions they perform are active water storage, storm water control, wetland habitats, aquifer recharge and micro-climate amelioration.

Policy EV5: Water-demand based land use

Recognizing the critical nature of water in the Bangalore region, it is strongly recommended that land use / activities that are disproportionately intense on water consumption is actively discouraged. Where such uses need to be permitted in the future, it should be done so after ensuring that the development shall incorporate every water conservation measure available and without recourse to groundwater.

Policy EV6: Strict control on Groundwater extraction

There should be strict monitoring and control on groundwater extraction. Individual drilling, extraction and use should be stopped and community extraction and supply should be regulated.

The situation of groundwater in the Bangalore region is alarming. Indiscriminate drilling and extraction has led to severe depletion of the aquifer. In addition, bad management practices for sewage and industrial pollution has led to extremely high levels of contamination of groundwater, both chemical and biological. It is imperative that a strict and effective mechanism to stop further deterioration is put in place at the earliest. Similar to the control and management of groundwater extraction as practiced by KIADB within the industrial estates, a regional or even state-wide policy is urgently needed.

Policy EV7: Integrated Watershed Management

Physical planning at the local area should necessarily integrate watershed management so as to address both development and environmental issues in a balanced manner.

Active integration of watershed related issues such as catchment protection, storage enhancement, storm water management, valley, streambed protection and aquifer recharge etc, will ensure long term sustainability of the development. It will effectively reduce potential conflicts by addressing development issues in a manner that integrates the physical environment for its ecological services and not seen as an impediment.

c. Environmentally Sensitive Areas

Policy EV8: Protection of Environmentally Sensitive Areas

Developments of any nature should be strictly monitored and controlled in and around designated environmentally sensitive areas such that further deterioration of the areas is arrested.

Clear guidelines need to be spelt out highlighting the extent of environmentally sensitive areas. These should necessarily include forests, valleys, water bodies, wetlands, hills, etc. The nature and extent of development allowed within and in the vicinity should also be clearly spelt out, in keeping with the directives of National Parks, Forests, Inland water bodies and such other related legislations. The development plans for such areas should include demarcation of core & buffer areas, wildlife corridors, visitor management plans, etc. Such areas should necessarily be monitored by the technically relevant authority and not left to the local authority alone, to ensure that conflicting land uses and detrimental activities do not cause further degradation of these areas. Even public interest projects such as highways, reservoirs, social housing, employment generation schemes, etc should be strictly monitored to ensure no core principle of conservation is compromised.

d. Wastelands Development

Policy GEV9: Active integration of wastelands in the development strategy

All identified degraded and waste lands should be necessarily co-opted for productive and developmental uses so as to ensure proper usage of unproductive lands and protection of potentially productive lands

Development of wastelands and degraded landscapes should be actively pursued. Non-agricultural uses should be directed to explore all available options for locating on degraded lands, specially constructions such as industries, processing zones, etc. Integrating available wastelands for productive uses such as plantations, biodiversity parks, protected and social forests, etc will address both conservation and economic issues. Managed commons for fodder is one such land use that should be actively encouraged at the local level.

e. Mining and Quarrying

Policy GEV10: All mining and quarrying activities should be strictly monitored and controlled to effectively address development and environmental issues in a balanced manner

The extent of mining in the Bangalore region is uncontrolled and badly managed by local authorities. Serious long-term damage is being inflicted on the environment under the guise of resource extraction. These activities are permitted by ill-informed local authorities with little knowledge of environment or sustainable resource extraction. While extraction of these resources, specially building materials and related raw material, is needed in the region to drive the development, it needs to be done under well-developed guidelines for monitoring, extraction, management and rejuvenation. At present no such frameworks exist, except granting of a licence for mining. A proper accountability framework needs to be developed and adhered to, that holds the miner responsible for the safe and sustained use of the site and its resources, including measures for rehabilitation and rejuvenation of the natural environment

4.1.2 Economy

4.1.2.1 Introduction

Bangalore has been one of the dynamic cities with creative clusters (Wu, 2005) due to its target oriented, policy induced transition. While the development of clustering is often independent of significant government intervention, the critical role played by public policy in fostering a technology sector in the city of Bangalore is perhaps the most important factor in its success (cited in Skordas 2001). The software cluster in Bangalore initially developed in response and because of government intervention. However its position in terms of 'doing business' Bangalore scores much lower rank (6th rank among 36 selected cities) in India due to its poor road infrastructure and communication apart from private investments (Debroy, 2002). On the other hand, the agenda of achieving an inclusive development process, especially when a city is playing a global role and where most of the stakeholders are at the margin of the system, will continue to daunt the future planning exercises. Recognising the importance of the inclusive growth, the Eleventh Five Year Plan at the Central Government Level and the State Five Year Plan at the Karnataka level gives priority to poor in terms of inclusive planning. The impact of national economic policies are felt in the local economy⁶⁹ and as in the case of India, Karnataka's economy too is undergoing structural changes, where in Service Sector dominates the development process in the GDP. The initiatives of Gol through its flagship programmes are facilitating suitable change in state initiatives. In this context, this section focuses on the BMR RSP 2031 approach to draw a roadmap for balancing the tasks of creating an investment climate, bring in 'industrial ecology' and achieve an inclusive development process without compromising on the development strategy objectives discussed earlier.

4.1.2.2 Overview of BMR SP 2011

The previous Structure Plan aligned its economic policy in close conjunction with environment and the current effort supports this mandate as has already been explained through the LCA. . The following are the major policy guidelines / recommendations from SP-2011:

- Stringent and up-to-date environmental standards, benchmarking, monitoring process and incorporation of environmental / social best practices in determining industrial locations;
- Recommends location of industrial and residential areas in proximity to one another;
- Optimisation of existing industrial areas and land resources;
- Provision of effective public transit to be made integral part of industrial development;
- Innovative land management;
- Local economic development initiatives;
- Prioritising industrial areas in western segment ;
- Energy efficiency in agricultural practices.

⁶⁹ Refer Annexure-7, section 7.1 for detailed note on National economic scenario and its effect on local economy

4.1.2.3 Existing situation analysis

a. Emerging spatio-economic dynamics

At present, the major industrial locations are concentrated on the North-West part of the region, starting from the core (Peenya) and extending towards Nelamangala and Beyond. The rest of the region dominated by textile and agro-industries are concentrated in and around existing towns. The IT- sector is mostly contained towards the East and South-East. However, an analysis of the proposed investments (including both industries and townships) indicate the emergence of a two cone pattern in the region- defined by major existing and proposed roads. The following are the major observations from the emerging dynamics (Refer Figure 48):

- Major investments are proposed along Kanakapura Road, Existing Mysore Expressway and proposed Bangalore-Mysore Infrastructure Corridor (BMIC). These includes emergence of six new specialised towns in this corridor.
- Concentration of investment in and around Anekal, Hoskote.
- The corridor between the core connecting Devanahalli has been seeing major investments (mostly residential) after establishment of new International Airport. This corridor will see a change in terms of fast urbanisation and residential development.
- Bangalore-Nelamagala corridor continues to be the location for heavy industries

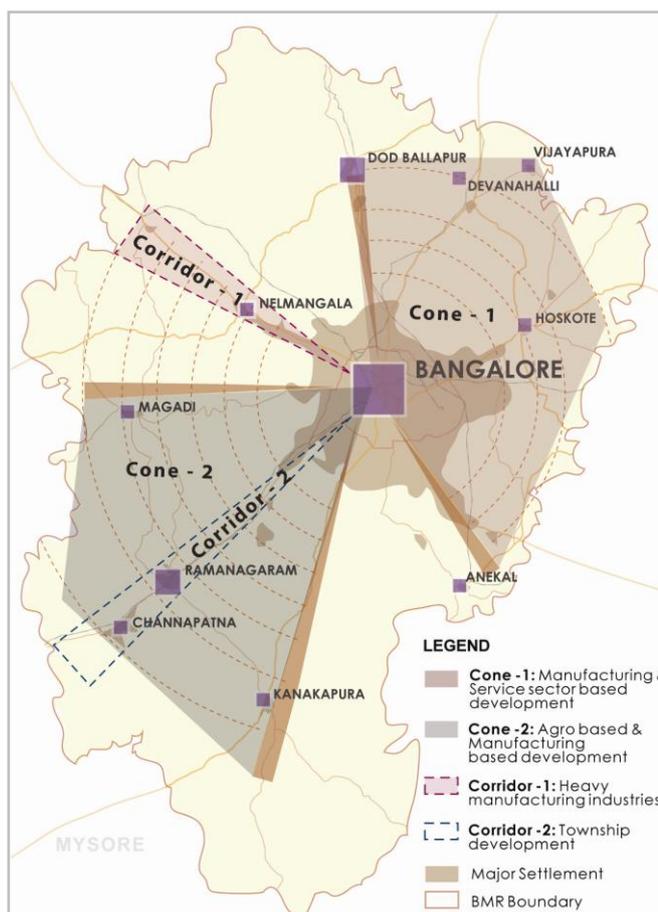


Figure 48: Emerging Spatio-economy in BMR⁷⁰

⁷⁰ Census of India and SCE Analysis

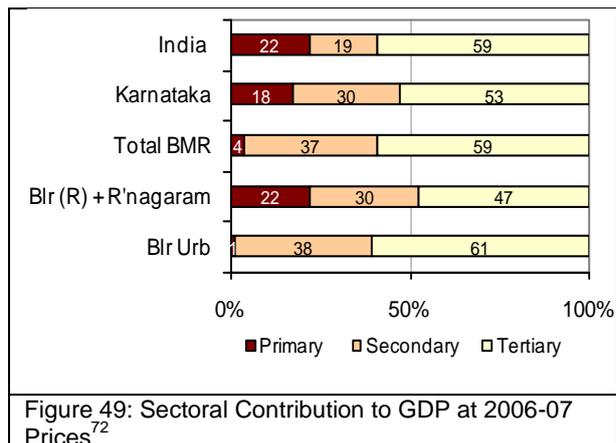
Two strong cones of development are emerging from the above observation:

- 1. The cone between Bangalore-Anekal road and Bangalore-Dodballapur road: Manufacturing and service sector based development**
- 2. The cone between Bangalore-Magadi road and Bangalore-Kanakapura road : Agro-based and manufacturing based development.**
- 3. Bangalore-Nelamangala corridor experiences concentration of heavy manufacturing industries**
- 4. Next strong corridor is the Bangalore-Mysore corridor with Ramanagaram and Chennapatna merging with Bangalore as a conurbation.**

b. Macro and micro-economic overview⁷¹

Bangalore had the highest per capita income of Rs.52,550/- (as per 1993-94 prices) in 2004-2005 within Karnataka. BMR (Bangalore Urban, Bangalore Rural and Ramnagaram District) contributed 34% of the State's Domestic Product (SDP). It also contributed 37% of Tertiary Sector and 43% of manufacturing sector of the SDP. Contribution of registered manufacturing from BMR to the SDP was 59% which was the highest among all the districts of Karnataka. During the same year, the gross domestic product of Karnataka (in constant prices of 1993-94) stood at Rs.35, 96,211 lakhs. Of this GDP, 34.8% came from industrial sector and 63.42% came from tertiary sector (Refer Figure 49).

The economic growth of 1990-2008 has been induced by IT industry. However, simultaneous development of textile industry has diversified the economy in the industrial sector. Due to the current recessionary trends in IT and ITES, and the problems generated by WTO for textile manufacturing have started affecting employment in these sectors. Large scale lay offs and increasing number of sick industries are happening in BMR area during this fiscal year



2008-2009. Construction industry will continue to benefit from the economic growth as witnessed during the decades 1990-2000 and after. However, comparative cost advantages saw the development of the peri-urban areas within the BMR. The court's decision on Bangalore-Mysore Corridor saw the land prices in this sector spiralling along the corridor inducing growth towards that direction.

⁷¹ Refer Annexure-7, section 7.2 for detail figures

⁷² Census of India and SCE Analysis

c. Local economy of towns ⁷³

For the 10 ULBs in BMR which are outside Bangalore, most of the towns have a secondary sector based economy combined with primary sector in their rural fringe land. In these towns, manufacturing is dominated by Small and Medium enterprises with clustering taking place. For example, towns in South and South-East of Bangalore is dominated by Textile and silk products, while in South-West, it is wooden products and agro based industries.

For the towns which have been included recently within the Corporation area after formation of the BBMP, most are dominated by secondary or tertiary sector. Again textile industry combined with certain heavy industries (cement, steel, iron, machinery etc.), electronic goods plays the major role there. It is to be understood that the whole region is surrounded by rich agricultural belt of Karnataka inducing the agro-based industries in the BMR.

d. Employment Scenario

The Census of India workforce data analysis ⁷⁵ reveal that there is an increasing participation rate in the main workforce of BMR over 1991-2001 period. The Census decade (1991-2001) also witnessed a shift from agriculture to non-agricultural activities of the workforce as witnessed by the decreasing percentage workers in terms of cultivators as well as agricultural labourers and the corresponding increase in the non-agricultural workers (Refer Figure 50). This is in tune with the National trend of emerging non-farm employment in the rural areas.

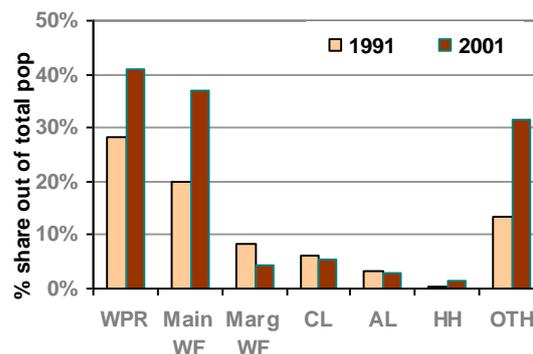


Figure 50: Growth of Workforce in BMR ⁷⁴

The sectoral distribution of workforce between three major economic sectors show a shift towards tertiary sector (Refer Figure 51). However, this is largely due to Bangalore and surrounding urbanized area's predominance in the regional economy. In Bangalore Rural and Ramanagaram District together, Primary sector constitutes about 69% of the total workforce.

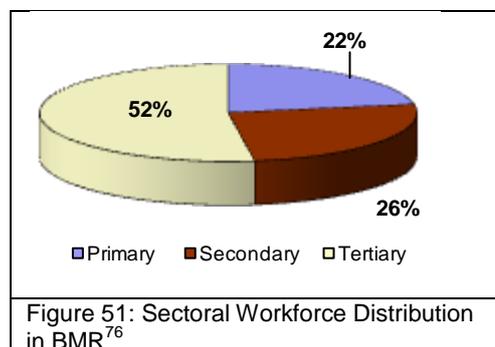


Figure 51: Sectoral Workforce Distribution in BMR ⁷⁶

⁷³ Refer Annexure-7, section 7.3 for detailed note on Local Economy of BMR towns

⁷⁴ Census of India and SCE Analysis

⁷⁵ Refer Annexure 7, section 7.4, section 7.5 for Census of India Workforce Tables and Annexure 7, section 7.6 for Note on observations from Census Workforce Tables

⁷⁶ Census of India and SCE Analysis

The Age pyramid analysis for BMR also shows signs of a wider workforce for the region in coming years (Refer Figure 52). More over the continuing high growth of the city's economy will fuel further migration to the city in the long –run adding more workforce in the region. Continuous private sector investments in higher education which has been one of the major asset of the State's policy will continue to sustain the high quality labour supply required by the future economy of the region.

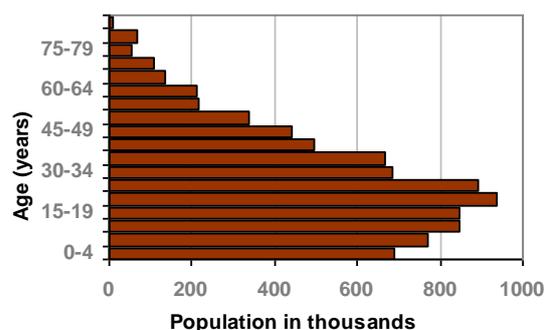


Figure 52: Age wise Break-up of BMR Population⁷⁷

4.1.2.4 Emerging Issues and Opportunities

The section below discusses the issues and opportunities grouped under three major heads and emerging out of the national and state level policy initiatives as well as the current dynamics on-ground:

a. Policy Impact

- The industrial promotion policies of the Government of India benefitted the city and the surrounding areas enormously post 2000 period. Many new job opportunities were generated as a result of the investment climate created by the State as well as by the local authorities.
- More infrastructure investments were made and committed⁷⁸ in recent past in BMR, such as setting up of an international airport within the BMR, setting up of SEZ areas, and IT Parks, enabled the industrial environment. However, Bangalore could not cope up with this fast phase of industrial development, especially where clustering occurred by natural process of agglomeration economies.
- National and State level strategies are expected to give impetus to growth through stimulus packages especially for infrastructure industries. This is expected to revive the local economy as well in the long run.
- Various centrally sponsored programmes have brought in Public – Private Partnerships in infrastructure provision at the local level, which is a positive development in the provision of largescale infrastructure.
- Another important aspect of future development of BMR is the emergence of SMEs in the industrialisation process in tune with the India Vision 2020. These industries to be promoted in tune with the policy of 'industrial ecology' or ecoindustries ;principles with cleaner production system.

⁷⁷ Statistical Abstract of Karnataka-2005 and SCE Analysis

⁷⁸ Refer Annexure-8, section 8.7 for indicative investment scenario

b. General Economy

- The Bangalore city has witnessed economic boom in IT and ITES sector during the last two decades. The traditional assumption of industrial based development is all set to be replaced by tertiary sector based development in Bangalore. Within the tertiary sector, informal sector will be dominating. In addition to that, growth of administrative services will push the development process in tertiary sector. Globalisation of Karnataka's economy shall continue not only through IT and ITES sector, but also through Service Sector by 2031, especially Financial Services Sector. Most of this IT and ITES are expected to be located in the BMR area. BMR area will also attract technology related industries such as biotechnology, nanotechnology, and light engineering industry (particularly precision engineering)⁷⁹. Also, with one of the strongest bases of education and research institutions in the country, Karnataka aspires to be a global education and research hub by 2025. BMR, like Chennai Metropolitan, can be a nodal area for locating these educational and research institutions which will generate a great number of jobs. However, the Global character of the city obtained through Knowledge Economy and its sustenance through a favourable investment climate, could not take with it the marginalised groups within the city.
- Crucial infrastructure such as power, transport and water are still concerns for the sustained economic growth and to achieve high levels of investment climate of the region. Long duration of travel and associated travel cost, pollution and failure to meet electricity demand, made the city unattractive and pushed down its ranking to sixth rank among 36 cities in terms of 'best city to live in India'. However, coming future is expected to witness lowering of travel and pollution cost through the provision metro rails within the city.
- Cluster growth and agglomeration economies that enabled the growth of the city worked negatively for the poor of Bangalore. High land prices and high cost of infrastructure resulted in increasing informality in housing as well as workforce. At present, there is a spatial spread of economic activities with strong clusters emerging interms of industrial clustering even among the towns surrounding Bangalore city which has potential to emerge as strong economies.
- Lack of efficient connectivity is one of the major hindrance in growth of smaller towns surrounding Bangalore. However, huge potential is there to connect the surrounding towns with the mother city of Bangalore through this transport network, which can act as an economic booster to smaller towns.
- Karnataka vision document states about harnessing the tourism potential of the state which is an important employment multiplier. Bangalore being a prime industrial center, business tourism development shows a promising potential.

⁷⁹ Dr. Nanjundappa Committee Report has already identified environment friendly industries (that is Bangalore- Urban for Pharmaceutical and Bio-tech industries and Textile for Bangalore –Rural, in addition to Media and Entertainment for Bangalore –Rural and Ramanagara) for BMR. It has also identified Kanakapura and Magadi as backward areas within the region and suggested strong fiscal incentives for industrial location. The current effort will take this into account while locating the future industries

- Revenue generation through land banking and development and municipal asset management will enhance the provision of infrastructure at the local level. BMR alone accounted for more than 17% of Karnataka's manufacturing, service sector and infrastructure investments (Sivaramakrishnan: 2001) and will continue to attract more investments in the future.

c. Population and Workforce

- The 41% WPR and a high employment rate in the total population is due to an enhanced investment climate in BMR. The anticipation for a better investment climate with better infrastructure and policy initiatives is expected to further increase the WPR and employment opportunity in future.
- Higher workforce in BMR is anticipated in coming years as a result of population growth; both natural and due to migration. It is assumed that Bangalore Urban Agglomeration and its surrounding will experience the same rate of migration as experienced during 1991-2001 with largescale migration of technical workforce and unorganised sector workforce.
- As of 2001, BMR has a 3.46 million strong workforce out of 8.42 million population (i.e., 41% WPR). The Karnataka 11th Five Year Plan (2007-12) have projected that by 2026 the population in working age will grow to 61% of population. Thus a proportionate growth in WPR is also expected triggering demand for more job creation.
- With a higher WPR, it is assumed that most of them will be in tertiary sector occupation, which will be propelling the economy of the region and the city.

4.1.2.5 Policies

As the Karnataka Vision 2025 document states for Karnataka as a whole, 'knowledge intensive and ecologically friendly economic activities', Bangalore Metropolitan Region will follow the vision set by the Karnataka vision document. In other words, ecologically friendly economic activities that are highly productive should be facilitated within the region. similar idea has been recommended by BMR SP 2011 through environmentally integrated economic policies. The following are the major policy recommendations grouped under for future economic growth of BMR:

Policy E1 A comprehensive and elaborate land allocation strategy should be formulated for BMR

The future development of BMR shall be based on a planned development strategy which needs to be further made implementable through a comprehensive Land Allocation Strategy. An effective land allocation strategy should be formulated to foster and induce investment climate for industries and service sector. The strategy should be comprehensive enough to lay out guidelines for allocating land for different economic purposes (such as manufacturing, service sector, residential etc). The strategy

should be based on land capability analysis and align itself with the overall development strategy so as to facilitate emergence of strong cluster economies and growth node economies.

The land allocation for various types of industrial and service sector activity should be properly planned to reap benefit of agglomeration economies in future. Other than general categories of industries, the Land allocation strategy shall identify land for 'creative industries' (IT/ITES, Fashion, Design, Film city etc.) within the BMR area, especially in new locations. Factors like connectivity, labour pool, existing resource base and capability of land should be considered in the land allocation policy for industries.

Policy E2 Industrial and any other economic investment locations should be identified based on land capability

Suitable land use policy should be derived at local level for land allocation of land which should identify and earmark land for different economic activities. This should be based on land capability and thus to negate adverse impact on environment, natural resources and habitation. The land use policy based on land capability should be made integral part of local development plans.

Policy E3 Spatial spread of economic activities should be planned

Spatial spread of economic activities show strong industrial clusters emerging around BBMP. This growth needs to be planned through effective land use policy to benefit Bangalore and surrounding areas within BMR and to restrict unplanned development. There should not be concentration of economic activities around the core triggering sprawl. Rather these should be located in a planned way in identified locations based on suitable factors (such as connectivity, infrastructure, labour pool) so that it can harness growth in the settlements around.

Policy E4 Growth of service sector in BMR should be encouraged

The service sector including IT and ITES and Financial Services are expected to grow in BMR. The work force is also showing a shift towards tertiary sector. Suitable strategic interventions should be made in land allocation and investment strategy to accommodate these activities.

Policy E5 Encouraging SMEs in the region

Several small companies interested in locating in proximity to the core city of Bangalore cannot afford land and find it difficult to set up. Flatted factories need to be allowed in the core city areas to accommodate the needs of such small companies so that they can take advantage of the services and facilities offered by being in proximity to larger urban centres.

Policy E6 BMR should be developed as a nodal area for locating educational, healthcare facilities and research institutions

With one of the strongest bases of education and research institutions in the country, Karnataka aspires to be a global education and research hub by 2025. Bangalore city already has a number of such institutes. This agglomeration effect should be further exploited by providing suitable supporting infrastructure at identified locations in BMR to attract healthcare, educational and research institutes. This could generate ample employment opportunity in the region

Policy E7 BMR should be developed as centre for high-end scientific and engineering industries

Using its already existing and emerging base of research and educational institutes, suitable strategies could be framed to attract high-end scientific and engineering industries like Biotechnology, Nano-technology, Precision Engineering etc. The educational institutes could provide suitable labour pool for such types of industrial activities. The strategy should be aligned with national and state industrial policies.

Policy E8 BMR should be developed as business tourism destination

The city of Bangalore is a centre of various business locations including some of the major IT-ITES and textile businesses. Various new industrial locations are emerging across BMR. The clustering of economic activities should further attract new businesses. This potential could be tapped by developing Bangalore and surrounding economic centres as destinations for business tourism. Plans for hospitality industries should be linked with locations of transit hubs such as airport, railway station, bus and metro terminals. The strategy developed for this should align with national and state level tourism policy.

Policy E9 Spatial development initiatives like new townships / residential areas outside BBMP should be made integral with the local economy of existing settlement and in conjunction with the larger hinterland

Indicating a shift from current practice of locating new townships as a residential facility without a sustainable economic base, the BMR RSP 2031 recommends development of any such facility along with economic development initiatives. Priority should be given to develop such facilities in existing towns as an integral part of their local economic development plan. Any further development need can be catered by town expansion and developing growth centres in emerging settlements rather than creating satellite townships. For other locations removed from existing townships, the residential facility should be integrated with existing and planned economic activity therein. All such development

should aim at reducing the travel requirement between place of work and residence and thus reducing travel cost and pollution effect.

Policy E10 Small scale and medium scale polluting industries should be relocated outside the BBMP

The existing polluting industries inside BBMP should be relocated. The relocation strategy should identify suitable location for relocation which are not environmentally sensitive and outside human settlements. Suitable phasing and incentives for relocation could be worked out to facilitate such relocation. Broad zones can be earmarked for future location of polluting industries. Common facility for integrated effluent management can be established where polluting industries are spatially agglomerated.

Policy E11 Settlements in BMR should be made economically sustainable by clustering of economic activities

Existing and emerging economic clusters in BMR should be strengthened through suitable land use and investment strategy. Future investment could be planned accordingly to exploit the existing economic base, natural and man-power resource of the region in a particular location. Settlements outside a cluster economy (i.e., Growth Nodes) can be strengthened by locating large scale regional level facilities. Selection of suitable regional level facility could trigger forward and backward linkages in economic activity.

Policy E12 The areas within the city and emerging investment destinations across BMR and existing towns (clusters and growth nodes) should be connected with efficient public transport system

Linking destinations by an efficient public transport system within the city like Metro Rail will lower the travel cost, time and pollution. For the entire region, an integrated, multimodal transit network should be put in place for this purpose. . Rail connectivity could be established supported further by road connectivity. This should foster exchange of resources and labour between centres and thus shall promote further economic growth and employment opportunity.

Policy E13 Local Economic Development (LED) policy should be developed at each town level as a part of the Local Area Development Plan to boost employment in the surrounding towns

The smaller towns already have certain economic activity and some natural and man-power resources. The Local Economic Development Plan should take into account the existing economic base of the town, its future potential, already planned investment in the vicinity and then identify

suitable forward and backward economic linkages that the town can support. The plan should focus on employment generation for the town and surrounding settlements and strengthening the town's economy. The towns in BMR have strong agricultural base combined with industrial activities in some cases. This potential should be tapped for further economic development of the towns through local economic development plan with specific employment generation targets in identified sectors.

Policy E14 Special hawking zones within Bangalore city and in identified locations in each zone should be earmarked

The contribution of informal sector to the BMR economy is expected to grow further. This potential should be tapped by proper strategic initiatives like creating hawking zones in identified locations of BBMP. This will be in line with the National Vendor Policy and the Bill. In this context, the BMR RSP 2031 is in consensus with the NCEUS suggested (NCEUS: 2008, Box. 12.3, p.177) policy as mentioned below:

- I. Restrictions on street vending in urban areas should take place only at the consent of the owner of those activities.
- II. Town Vending Committee (TVC) at Ward Level, CEO at Municipal Level and Official at State level should be set up to implement the policy. Ward level committees should be set up in all towns by municipal authorities.
- III. There should be Greater role for TVC while clearly removing the role of Resident Welfare Associations (RWAs) and Market and Traders Associations in TVC. Outlining the role of the TVC, the policy states that the TVC need to identify three zones: **no restriction zone for hawking, with certain restrictions, and no vending zone**. NCEUS recommended that hawking zone to be city specific and area specific within a city. The policy recommended regulation of space based on its availability, previous occupancy, and lottery if applicants exceed space to be undertaken, by TVC. The allocation of space is to be based on payment of fee as recommended by TVC and should be collected by TVC. It also recommended amendment of Section 283 of IPC and Section 34 of the Police Act to exempt street vendors from their purview with reasonable restrictions.

Policy E15 Environmental impacts of industrial estates

The industries have to obtain environmental clearance under the Environment (Protection) Act, 1986 either for locating new units in BMR or carrying out extensions at the existing locations. An Environment Impact Assessment (EIA) Study to be carried out prior to setting up of industrial units. The industries have to conform to all regulations for disposal of toxic and hazardous wastes. Industries have to participate in separate collection and transport of non-hazardous and hazardous wastes to designated disposal sites subject to approval of Karnataka State Pollution Control Board (KSPCB).

Policy E16 Proposed industrial estates and large investment destinations should be so developed to integrate with local economy and livelihood

In order to strengthen their forward and backward economic linkages, the industrial estates are often developed in association with housing and community facilities. However, while developing these facilities, the physical design and economic sustainability model should address integration of the same with local livelihood and economy. The development framework should prevent these areas to act as mono-functional and exclusive enclaves that detract from the region's livability.

4.1.2.6 Recommendations

- i. Preparation of Land Allocation Strategy for BMR – The strategy document should layout comprehensive guideline on land allocation for various economic purposes such as light manufacturing, heavy manufacturing, service sector, residential projects. It should also elaborate on types of industrial activity and preferred location to facilitate cluster formation, location for Regional level facilities etc.
- ii. Preparation of Common Database – The data base should consist of all types of spatial and non spatial data for BMR. and parcel of land wherever applicable.
 - Demographic data (population, workforce, socio-economic character)
 - Economy (existing and upcoming investment locations, types of industries, sectoral employment)
 - Connectivity (rail, road, air)
 - Natural Resources
 - Physical features (Topography, Hydrology, Soil characteristics etc)
- iii. Feasibility study and detailed plan for developing BMR as **nodal area for locating health-care, educational and research institutions**
- iv. Feasibility study and detailed plan for developing BMR as **centre for high-end scientific and engineering industries**
- v. Feasibility study and detailed plan for developing BMR as **business tourism destination**
- vi. Preparation of Local Area Development Plan at Local Body Level which should address both spatial and local economic development plan
- vii. Feasibility study and relocation plan for polluting industries from existing settlements
- viii. Cluster level feasibility study for economic development
- ix. Feasibility study and plan for regional level transport network
- x. feasibility study for earmarking hawking zones

4.1.3 Transport

4.1.3.1 Introduction

Transport is a binding sector for development that plays a major role in the economy of the region. It enables the movement of people, goods and services from one place to another. Transport systems in the Bangalore Metropolitan Region comprise of roads, railways and airport. In the region, roads are the primary means of transport and carry the bulk of the total traffic.

Transport is a key sector where problems are growing both in magnitude as well as complexity. The problems are related to land use, climate change, energy, local air quality, safety and security and health and economic competitiveness.

The BBMP area serves as the economic power house of the region as well as the state. The population in the core city has grown 1.5 times in the last ten years and projections indicate that from around 6 million in 2001 it will grow to 14.4 in 2031 without any intervention. The population of the Bangalore Metropolitan Region is predicted to grow from 8.42 million in 2001 to 18 million in the year 2031. (As indicated in section 1.6 on Demography). This growth of population indicates great pressure on all city and regional functions including the transportation system. As transportation infrastructure is unable to keep pace with population growth and development as has been seen in the past, the BMR RSP 2031 essentially advocates the following approach

- Incorporation of transport planning as an important parameter at the urban planning stage rather than being a consequential requirement. In this context the effort of the GoK (through the BMRDA) to prepare a comprehensive traffic and transport strategy is appreciated.
- Efficient use of the system must be propagated as well as exploring of alternate and new systems
- Increased rate of transport infrastructure provision to keep pace with urban development
- Encourage shift to the use of public transport for longer distances and soft modes of transport such as walking and bicycling for shorter distances
- Provision of an efficient, people friendly transportation system with minimum travel time & maximum safety and comfort- 'An integrated, multi modal and seamless transport system'

4.1.3.2 Overview of BMR SP 2011

The BMR SP 2011 highlighted the widening gap between the demand and supply of urban transport infrastructure in the BMR region, and identified a three pronged strategy which primarily aimed at increasing the rate of infrastructure provision, while managing the growing demand.

Broad guidelines for transport sector were brought out in the plan to guide urban growth, to manage demand and to enhance road and railway transportation network. However, most of the developments that happened in the BMR have not been in line with the transport policies. To cite an example, the identified spatial location of the proposed integrated townships of the BMRDA shows little consideration for the impact on transport.

4.1.3.3 Existing situation and analysis

The BMR is strategically placed in the SKR in relation to increasingly important road links with Tumkur, Kolar, Mysore, Hosur and Chickballapur. The primacy and centrality of Bangalore within the BMR has evolved post independence and is today the main hub for economic, social, educational, health and recreational facilities and activities.

With the population of Bangalore expected to cross 14.4 million in 2031, the city is poised to enter the top 20 big mega cities of the world in a few years. Between 1991 and 2001, Bangalore's household revenue has increased at an average of almost 10% per year. The increased disposable income of its inhabitants and easy availability of loans has seen a sharp rise in the ownership of private vehicles and causes congestion and pollution. An overview of the BMR transport sector is as follows:

a. Vehicle statistics

BMR has a total vehicular count of 31.37 lakh vehicles with two wheelers constituting the highest percentage of vehicular composition (Refer Annexure 8, section 8.1 for vehicular statistics and composition). Between 1990 and 2006, the number of vehicles registered in Bangalore has increased from 6.28 lakhs to 25.27 lakhs⁸⁰. Two wheelers constitute about 72% of the total registered vehicles and are growing at a rate of 13% per annum. The growth of vehicle ownership has also increased from 58 to 365 vehicles per 1000 population from 1981 to 2006. Within the region, Bangalore urban has the majority of the vehicular population compared to the Bangalore rural district and Ramanagaram.

b. Rail Network

BMR is served by five broad-gauge rail corridors radiating out of Bangalore.

- B.G. line from Chennai on east
- B.G. line from Mumbai-Pune on north-west
- B.G. line from Guntakal on the north
- B.G. line from Salem / Trivandrum from east
- B.G. line from Mysore from south-west

Though at present these rail corridors serve only intercity traffic, a small number of conventional short distance passenger trains are run in the morning and evening hours from Bangalore to nearby (satellite) towns like Tumkur, Chikballapur, Bangarapet, Hosur and Mandya to serve the commuters⁸¹. The major rail traffic movement is along the Chennai (east) to Mysore (south-west) line as seen in the adjoining map.

⁸⁰ Source: Transport Department and RMP 2015

⁸¹ Source: CTTIP for Bangalore by RITES

c. Road Network

BMR is intercepted by 2 National Expressways and 3 National Highways and 12 state highways connecting major towns and cities within BMR and beyond. The radial road network in the BMR converges into the core and contains centre-periphery traffic, as well as the transit traffic which asphyxiates the city center. The city is plagued by decreasing travel speeds and increasing travel distances. Within the core road network capacity is grossly inadequate. Most of the major roads are with four lane or less with little scope for widening. Traffic volumes on major road corridors as indicated in the adjoining figure shows that the majority of traffic is along the Tumkur and Hosur routes. Peenya, Nelamangala and Dobaspet towards the north-west houses the larger industrial areas of the region and Electronic city and Hosur are the IT areas as well as the border towards Tamil Nadu to the south-east. Movement towards the north where the new international airport has come up has also increased. The increased volume on these corridors indicates the need for judicious use of available road space as well as increasing of road capacity to match the rate of growth in traffic. Increasing road capacity is not a long term measure and needs to be supplemented with other mass transit proposals.

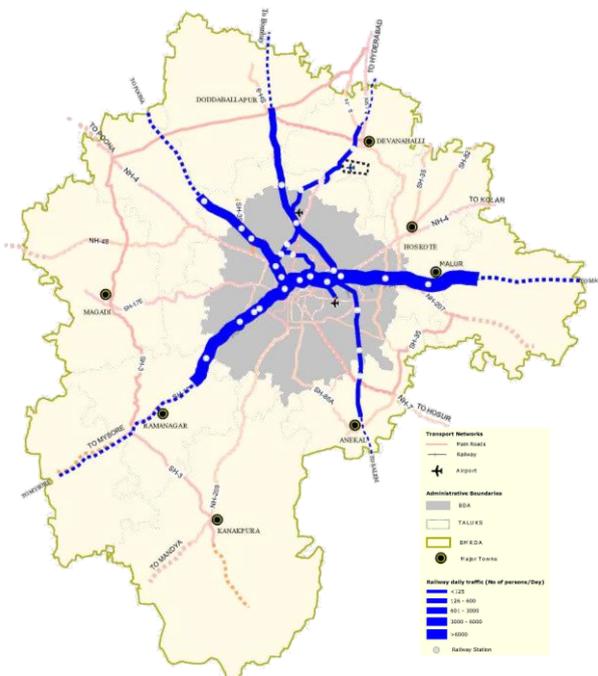


Figure 53 Rail volumes along major routes in the BMR



Figure 54 Traffic volumes along major roads in BMR (2008)

d. Public Transport (Bus based)

At present Bangalore Metropolitan Transport Corporation (BMTC) and Karnataka State Road Transport Corporation (KSRTC) connect the city and major towns in the BMR through a bus system. BMTC is one of the better run bus transport systems in the country. It operates 4100 buses and 1700 routes carrying approximately 35 lakh passengers. It is expected that by 2025 at least 60 lakh trips will be performed by buses only, throughout all 27 grid routes i.e. North South, East, West and diagonal directions. Hosakote, Anekal, Kengeri, Magadi, Nelamangala, Doddaballapura and Devanahalli are connected to Bangalore city by BMTC. KSRTC caters to the towns of Ramanagaram, Channapatna and Kanakapura connecting it to Bangalore and other towns and cities within BMR and beyond. Traffic composition on roads however indicates very high share of two wheelers. The share of cars is also growing. This indicates the need to augment and supplement the existing public transport system in the region .

e. Air Transport

Bangalore International Airport (BIA) at Devanahalli, located about 35 km north from the centre of the city of Bangalore serves as the major airport not only for South Karnataka but also between bordering states. The airport serves both domestic and international passengers. BIA connects to 28 domestic airports and 16 international airports⁸². The airport has a capacity to handle approximately 3000 passengers per hour with a 70,000 sqm terminal building located in a site spread over 4000 acres. The major traffic to the airport is from the core city along Bellary Road (NH-7) and has some of the highest traffic volumes along major roads in the BMR

f. Freight Infrastructure

For movement of containers, BMR is catered by Container Corporation of India (CONCOR) through its Inland Container Depot (ICD) at Whitefield; Bangalore with a Container Freight Station (CFS) and 10 warehousing facilities (Refer Annexure-8, section 8.1 for statistics on freight handled by ICD) Container Warehousing Corporation (CWC) also caters BMR through its Rail Side Warehousing (RSW) at Whitefield since 2002. Logistic services are neglected and not provided for in required areas and there is little understanding of the transport component of logistics so vital to supporting efficient economic activity.

g. Transport Agencies

In congruence to the NUTP 2006 and recommendations of National Working Group on Urban Transport for the 11th Plan, the Government of Karnataka constituted Directorate of Urban Land Transport (DULT) in 2007. For BMR, Bangalore Metropolitan Land Transport Authority (BMLTA) has been created to facilitate the functions stated by the DULT.

⁸² Source: Karnataka State Tourism Department (KSTD)

This authority is pertinent to coordinate between relevant transport related authorities such as KSRTC, BMTC, BMRCL, BBMP, PWD, BDA etc. for the implementation of a transportation and traffic strategy with a common vision.

h. Projects in the pipeline

Roads: A series of ring roads namely, Peripheral Ring Road (PRR), Intermediate Ring Road (IRR), Satellite Town Ring Road (STRR), ring roads for all satellite towns, NICE Corridor (other than the peripheral road) and two railways corridors are in the proposal stage. The peripheral road of the NICE corridor which lies within BDA area has been constructed.

Mass transit systems: To enable rapid intra-city transport, the Government has taken up initiatives which include Metro Rail project and commuter rail system to serve intra-city and suburban needs. Bangalore Metropolitan Rail Corporation Limited (BMRCL) is at present implementing the first phase of Mass Rapid Transit System (MRTS). There are also proposals for BRT system and Monorail in Bangalore.

Railway: At BMR level, there is a proposal of two new broad gauge railway lines connecting Bangalore to Kanakapura and further to Chamrajanagar, as well as Bangalore to Nelamangala and further to Hassan which would improve connectivity within the region.

4.1.3.4 Emerging Issues and Opportunities

- Inadequate transport facilities to sustain the process of expansion of the towns and cities in the BMR
- High level of congestion and environmental deterioration due to increase in private vehicle ownership in BMR specifically Bangalore urban district;
- Part of Peripheral ring road and STRR alignment falls in environmentally sensitive areas in the BMR region (Refer Annexure-3, section 3.2 for map on conflict areas with respect to transport sector);
- The alignment of proposed peripheral ring road is in close proximity to the NICE peripheral road; alignment of the IRR is also in close proximity to both the STRR and the PRR towards the east;
- Lack of containerized and bulk freight infrastructure in proximity to the potential freight generating industrial corridors like NH4 (Bangalore-Nelamangala) and Bommasandra-Jigani industrial area;
- Lack of rail connectivity and sidings to large industries for promoting rail base movement of industrial freight;

The current proposals offer certain opportunities in the region as follows:

- Coming up of new airport at Hosur (final decision pending) will alter the passenger movement to and from Devanahalli and get diverted towards Hosur;
- It is feasible to provide mass transport system in the Bangalore urban district as the density of population is high in the Bangalore urban region and hence will have the threshold population to run the system;
- Potential to extend Metro Rail beyond Bangalore city to cater to the population outside the city limits;
- Potential to set up alternative mass transport system by rail networks to interlink all towns in the BMR region due to presence of existing rail lines.

4.1.3.5 Policies

One of the main aims of the structure plan is to address regional disparities and promote balanced regional development. Transport can favorably affect the economy of the region. An efficient transport system can help the economy to respond more effectively to structural changes; for example, by helping people access new opportunities.

The primary aim is to create a transportation policy and a strategic transportation network that increases the competitiveness and efficiency of the BMR, including all modes of transport.

Policy T1 Support and enable the sustained growth of regional business

There is a strategic need for an increase in the region's transport networks and systems so that it measures up to the current requirements of business as well as to be able to accommodate future levels of business growth. The transport network must allow the region's commuters and freight to make efficient journeys and not undermine the potential of BMR to access global markets.

Policy T2 Increasing the share of public transport systems

Increasing the share of public transport and the introduction of an effective integrated multi modal and seamless transportation system is pertinent as it is clear that public transport occupies less road space and causes less pollution per passenger than personal vehicles. This will need to be coupled with specific measures to curb ownership of motor vehicles. This is also in consonance with the National Urban Transport Policy which aims to create an efficient, cost effective and extensive network of public transport which could provide comfortable, convenient and affordable means of transport to the maximum number of commuters.

Policy T3 Rail based transport systems and networks

A suburban rail system needs to be created and developed for high speed train connectivity between major towns, and key activity generators in the BMR. Rail based transportation systems are more cost effective and efficient than many other public transport systems and hence the emphasis needs to shift from a purely road based transport system. The presence of an existing rail network in the BMR serves as a potential for doubling of tracks and introduction of commuter rail. On routes that generate high passenger counts introduction of double-decker trains can be explored.

Proposals of the metro and mono rail that have been proposed in the core areas by various government departments can be extended to cover major settlements within the BMR.

A 'truck on rail system' to be promoted – Due to 'containerization' of goods where a standard inter-modal container is used, possibility for loading of sealed containers for inter-modal transit between modes such as ship, rail, truck and plane is possible. Goods may be transmitted by rail for long distances and on reaching desired destination may then be transmitted by road through trucks to final required point.

Policy T4 Road based transport systems and networks

Strengthening and effective use of road networks within the BMR are to be undertaken to retain the economic attractiveness of areas in the region. In the region, roads are presently the primary means of transport and carry the bulk of the total traffic.

Increasing the capacity of major roads and upgrading of the existing radial roads to sub-arterial road standards to be taken up on a priority. Connectivity between major nearby towns and cities are to be enhanced.

Major highways are to be linked with a structured network.

Road based public transport systems are to be used effectively as feeder systems to larger mass transit systems such as the upcoming metro rail system. This would ease the problems of travel between the centers of population and work such as the interconnections between the clusters and nodes in the BMR. Consideration should be given to bus lanes on the primary road network.

Public transport in smaller towns could also be road based. Several smaller settlements in the region with low density developments have limited viability for mass transit and rails based options and are hence dependant on good road networks for connectivity.

Policy T5 Public transport to be developed taking into account the the size of the urban settlement i.e. smaller towns vis a vis the core.

Existing and future hubs and settlements are to form the basis of strengthening of the transport system and network. Improving transportation and connectivity have a clear role in devising policy interventions for the peri-urban interface as this requires attention to strengthen rural–urban linkages that materialize through the two-way flow of goods and services between villages and urban centers. Smaller towns in the BMR have commuters towards larger towns or the city for purposes of work, education, health services, marketing their agricultural produce and for purchases. Better connectivity also improves social integration and fuels growth.

Policy T6 Interrelationships between transport policy and housing and labour markets

The core and its periphery today have a high concentration of large, specialized multinational organizations. The competitiveness of these organizations depends on their ability to attract and retain highly qualified personnel. As the BMR has a high demographic potential with highly skilled professionals it is imperative that transport systems afford easy accessibility for the workforce to access employment across the region. The dispersion of employment centers within the region results in the distribution of workforce. This is beneficial in the event that if a particular economy fails the ill effects on the wokforce are also not concentrated and are spread evenly across the region.

Policy T7 Linking the new international airport to major urban centers

Rail based transport system to help minimise the undesirable increase of road traffic to the new airport. BIA and its related activities as well as upcoming developments would generate higher traffic movement in that direction. Doubling of the rail tracks and introduction of high-speed city-airport rail transit services will be required.

Policy T8 Promote pedestrianisation and use of NMV

Promote the use of soft mode of non-motorized transport such as walking and bicycling with special consideration for access to people with disability. Bangalore city for example is witnessing considerable pedestrian traffic especially in the CBD areas increasing the demand for better pedestrian facilities. This needs to be considered rather than options of purely widening carriageway widths to accommodate the vehicles resulting in reduction in the size of the foot paths.

Non motorized trips share has been going down due to non availability of cycle tracks on roads and increased trip lengths for almost all purposes in urban areas. Incorporation of pedestrian and cycle tracks must also be considered during planning stages as well as in the roadway design.

Along with promoting pedestrianisation in urban areas, special hawking zones are also to be earmarked in consonance with the National Vendor Policy and Bill.

Policy T9 Expansion of Bangalore Metropolitan Land Transport Authority (BMLTA)

Technical expansion of the BMLTA is required as well as regular training and capacity building of the staff to be in tune with latest transport planning paradigms.

The BMLTA is a pertinent authority to coordinate between relevant transport related authorities such as KSRTC, BMTC, BMRCL, BBMP, PWD, BDA etc. for the implementation of a transportation and traffic strategy with a common vision. BMLTA will facilitate coordinated planning and implementation of urban transport programmes and projects and an integrated management of urban transport systems. Other initiatives such as use of cleaner technologies, concessions and benefits to encourage use of renewable sources of energy, programmes to discourage the use of private vehicles etc could also be explored and implemented.

Policy T10 Transport Proposals to be within the larger framework of a Comprehensive Regional Traffic and Transport Study

As a plethora of transport related authorities are present, it is important that they not only coordinate with the BMLTA before implementation of transport projects but they also need to take cognizance of the Comprehensive Regional Traffic and Transport Study. This will avoid a piece meal addressing of

transport proposals that cause transport issues being transferred from one area to another such as traffic congestion being addressed at a micro level through poorly planned erection of flyovers.

It is pertinent to note here that the BMRDA has at present undertaken a Comprehensive Traffic and Transportation Study (CTTS). Policy guidelines and recommendations being made by the BMR RSP 2031 in the transport sector and will need to be reviewed as per the findings of the CTTS. As the policies and recommendations of the BMR RSP 2031 are based on the emerging development strategy and previous studies and data, the review needs to be done within the overall development strategy and the underlying governing principles laid out by this plan.

4.1.3.6 Recommendations

The previous plan had a focus on road oriented proposals. As is a well known fact, provision of more roads, widening of roads or flyover construction is not the solution. Although such measures may provide temporary relief, as a long term solution, a versatile and comfortable Mass Transit System needs to be introduced. As travel distances are increasing, high capacity mass transport systems connecting work centres with living areas as well as meeting the needs of the long distance / suburban commuters, especially along the major corridors leading to these centers is necessary.

In keeping with the overall strategies and policies that have been formulated for the BMR, a set of transport proposals as well as assessments of previous proposals have been made.

a. Road transport recommendations

The series of ring and radial road proposals of the BMR SP 2011 would improve the connectivity of towns, cities and villages within the BMR region and would also provide for the thoroughfare of non BMR-destined traffic, therefore helping decongest Bangalore city. Parts of their alignments fall into ecologically sensitive areas and micro level variations in alignment, as well as environmentally sensitive design need to be incorporated. (Refer to conflicts map in Annexure 3, section 3.1) Two ring roads, namely the Intermediate Ring Road (IRR) and the Peripheral Ring Road (PRR) have other existing or proposed major roads in close proximity to them. At certain points the distance between them is less than the normally stipulated 5kms and results in excessive allocation of transport infrastructure.

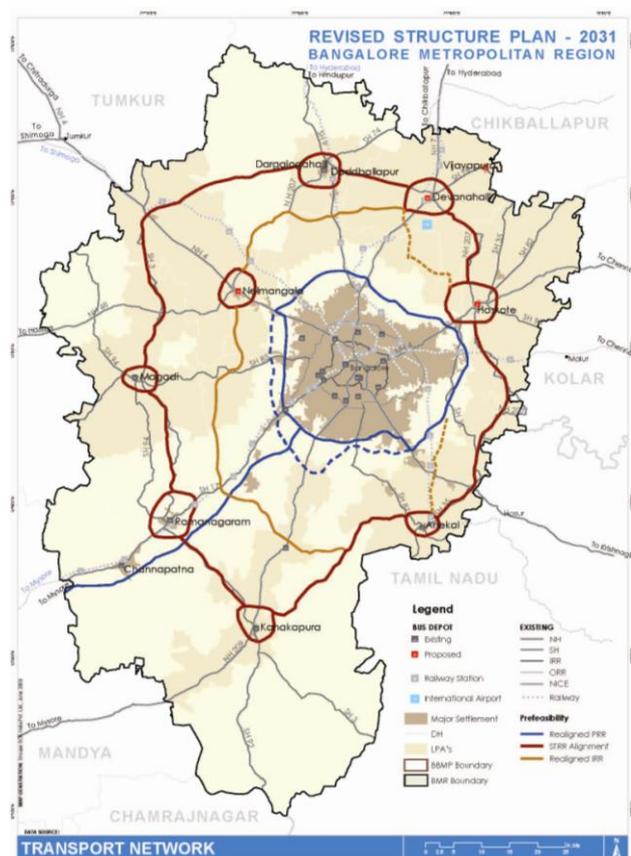


Figure 56: Road proposals

As the map indicates, a preliminary realignment of the two roads is suggested. The northern arc of the PRR could be made to join the peripheral road of the NICE corridor which lies within BDA area to the south and has already been constructed.

The IRR could serve as a major road for inter connectivity between towns and join the STRR at points as indicated in the map alongside.

Based on preliminary road capacity and volume analysis, the following roads that are pertinent to connectivity between clusters and nodes need to be upgraded on priority to increase road capacity:

- a) Peenya to Nelamangala to Tumkur (NH 4)
- b) Bangalore to Electronic city to Hosur (NH 7)
- c) Bangalore to Devanahalli (NH 7)
- d) Bangalore to Hosakote (NH 4)
- e) Bangalore to Channapatna (SH 17)

As per the classification of roads, *Arterial Roads* to have a minimum of 55 metre right-of-way to finally accommodate a divided 6-lane carriageway with exclusive bus lanes and segregated service roads on either side. *Sub-Arterial Roads* to have a minimum of 35 metre right-of-way to finally accommodate a divided 6 lane carriageway with exclusive bus lanes. *Other Major Roads* will have a minimum of 25 metre right-of-way to finally accommodate a divided four-lane carriageway.

On Arterial Roads, access to roadside properties will be from the service roads. Access from the service roads to the main carriageway will be controlled. On Sub-Arterial Roads, there will be free access to the main carriageway from the adjoining properties. However, openings in the central median and intersections along the alignment will be spaced at least a kilometre apart.

b. Public transport recommendations

Commuter Rail Service (CRS): Connectivity of Bangalore to other major towns in the BMR can optimally be done through CRS. Rail connections to major towns already exist and doubling of the tracks is suggested on a priority basis.. Metro rail and mono rail proposals that are in the pipeline are mostly within the BMA boundary and can favorably connect up with the CRS through inter modal interchange hubs. The routes to connect through CRS can be taken up on priority on routes that have high road traffic at present and include:

- Bangalore – Peenya- Nelamangala - Tumkur The metro rail system upto Peenya can also be extended to Nelamangala.
- Bangalore- Bommasandra- Hosur
- Bangalore – BIA- Devanahalli
- Bangalore- Bidadi- Ramnagaram- Chennapatna- Mysore

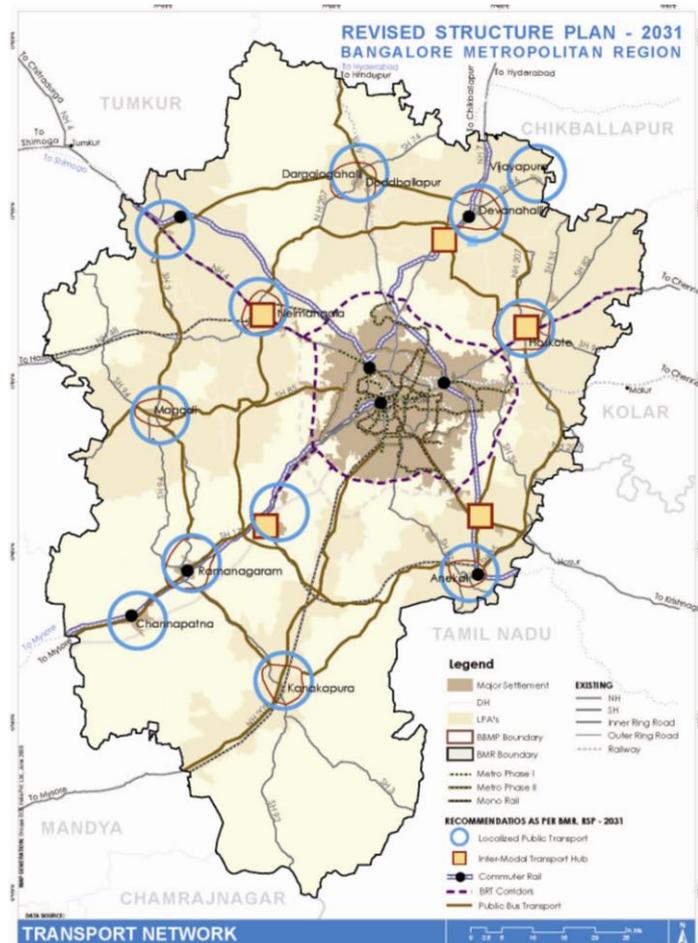


Figure 57: Proposed Public Transport Network

Bus Rapid Transit System (BRTS): A proposal is in the pipeline to introduce BRTS system along the PRR. This system can be extended to routes that have high traffic such as:

- Bangalore – Peenya- Nelamangala
- Bangalore- Bidadi
- Bangalore – Hoskote

Public bus transport can be used as feeder systems to the mass transit systems like CRS, Metro and Mono Rail. Public bus transport services can also ply on all other routes which do not have very high commuter traffic to serve as localized public transport such as within the clusters and nodes identified within the BMR.

The existing public and private bus terminuses located at the heart of Bangalore City are undergoing a decentralization process. Detailed studies need to be carried out for relocation of the same.

Integrated multi modal interchange hubs (IH): Interchange hubs need to be introduced at the intersection of various major transport systems. These interchanges are to have facilities ranging from parking of private vehicles to bus/ metro/ monorail or railway access. This ease of interchange of

modes as well as commuter amenities are to be provided to allow for seamless, efficient and comfortable travel for the public. These interchanges are to be provided at:

- a). Electronic City on Hosur Road
- b). Bidadi on Mysore Road
- c). Nelamangala on Tumkur Road
- d). BIAAPA area on Devanahalli Road
- e). Kondasapura on Kolar Road

c. Freight transport recommendations

Road based freight transportation is essentially handled by the private sector; Urban Local Bodies and the State Government have not been seriously involved in providing freight transport facilities and infrastructure. This has resulted in unregulated and informal developments and has caused considerable problems of congestion and parking along major arterial routes to the city.

The average daily truck traffic is about 8,000 trucks on the National Highways and about 4,000 trucks on the State Highways. Of these trucks there would be about 30% of them undertaking long haul trips and they would need these facilities to cater to them and also these points then become hubs from wherein the wholesale markets can draw their supplies. The terminals have been strategically located at points wherein the National/State Highways are intersecting with the proposed ring roads and include:

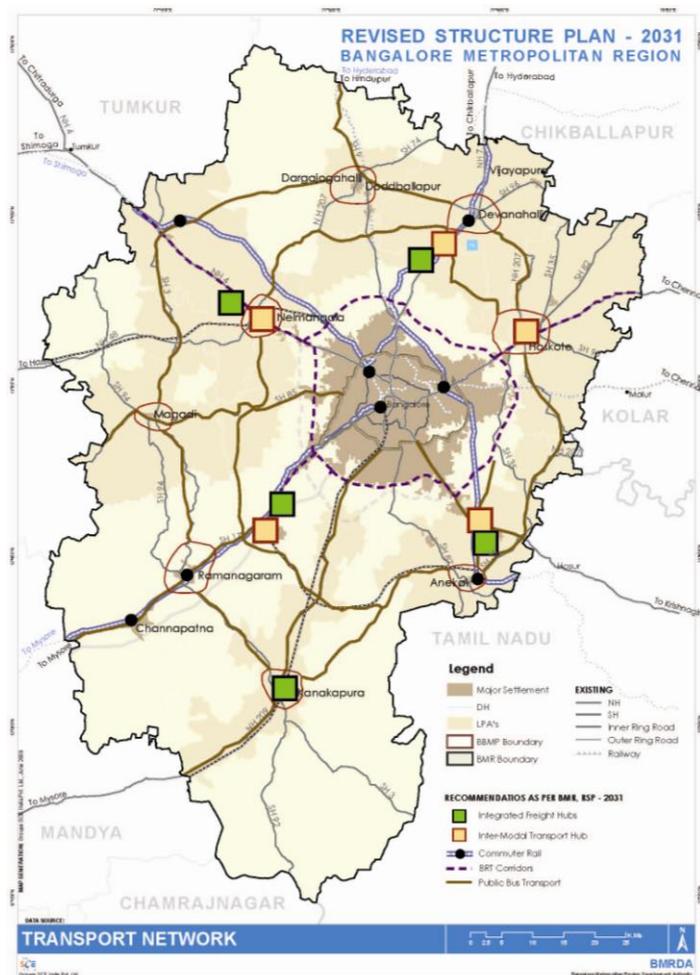


Figure 58: Proposed Intermodal interchange hubs and integrated freight hubs

- a. Nelamangala near Dobaspet
- b. Attibele near Hosur
- c. Bidadi near Ramnagar
- d. Devanahalli - Near the International airport
- e. Kanakapura - Near Harohalli

4.1.4 Housing

4.1.4.1 Introduction

Karnataka state has traditionally given high priority to public housing with its own housing programmes for the economically weaker sections in rural and urban areas from centrally sponsored schemes. Housing needs of low income, middle income and high income groups are also catered for, apart from housing for slum dwellers as a part of their rehabilitation and improvement of slums. Most of these programs are being implemented by Karnataka Housing Board, Rajiv Gandhi Rural Housing Corporation Limited, Karnataka Slum Clearance Board, Karnataka Rajya Nirmana Kendra apart from the ULBs and development authorities.

4.1.4.2 Overview of BMR SP 2011

BMR SP 2011 has proposed several housing policies for improving the housing stock and infrastructure in the region by public private and other means. The policy guidelines also focused on restructuring Karnataka Housing Board, improving accessibility to housing for the urban poor and to maintain an appropriate housing management information system.

4.1.4.3 Existing Situation

As per 2001 census BMR has a population of 8.4 million with overall 1.8 million houses distributed in the percentage of 78.71% in Bangalore urban district, 9.31% in Bangalore rural and 11.98% in Ramanagaram districts. (Refer figure for the distribution of houses based on typology).

Housing condition is better in Bangalore urban district than the rural district. (For details refer

annexure-9, section 9.1). Statistics shows that there is a dominance of rented housing in Bangalore urban district (For details refer annexure-9 section 9.2).

Basic amenities like water supply and electricity have a better coverage in the Bangalore Urban district than the rural districts (For detailed descriptions refer annexure-9 section 9.3, 9.4). There is predominant use of LPG as the cooking fuel in the Bangalore Urban district whereas in the rural districts firewood is being widely used for cooking.

As per the survey conducted by KSCB there are 2555 slum areas in the State. Out of which 542 slum areas are in Bangalore city. Bangalore rural district has 77 slums which accommodates 11,755 households. It is estimated that about 3.5 million people (19.83% of the State's urban population) live

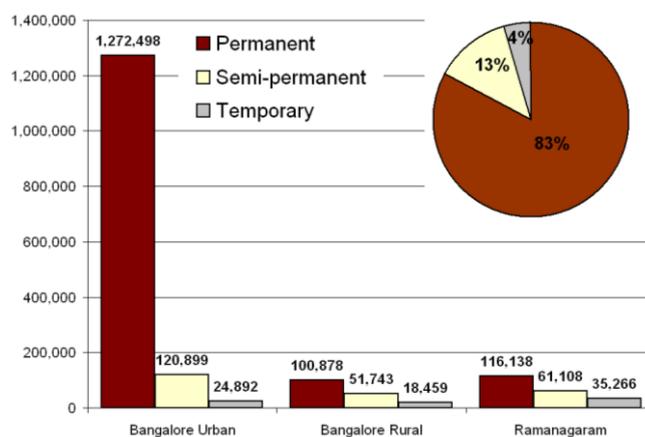


Figure 59: Housing Type⁸³

⁸³ Groupe SCE India, Data Source: 'H - 4 Appendix : Distribution of Households', Housing Series, Census of India 2001

in slums. Totally 2006 slums are declared in the state and 219 slums are declared in Bangalore City and 61 are declared in Bangalore rural district⁸⁴.

Housing Demand and Supply

Housing demand is directly proportional to the population. As per 2001 census 8.4 million population reside in BMR with a total housing stock of 1.72 million units (out of the entire housing stock of 1.8 million only permanent and semi-permanent are considered as available and livable housing stock (refer annexure-9, section 9.1).The housing demand is increasing from 1.8 million to 4.2 million in a span of 30 years, accordingly housing shortage is likely to increase from 0.15 million (2001) to 2.6 million (2031) (For details on the housing demand and supply refer annexure-9, section 9.5). Housing demand is growing exponentially decade after decade. Increasing nuclear families and decreasing average household size are further adding to this demand.

Between 2002 and 2007, on an average approximately 35-40 thousand housing units are added annually in the BMR. This amounts to about 0.4 million units per decade growing at 2% CAGR which is very close to the 2.36% simple growth rate for urban India as mentioned in the study report of the technical group [11th five year plan: 2007-12] on estimation of urban housing shortage, Government of India, Ministry of Housing and Urban Poverty Alleviation (MHUPA). At this rate 2.0 million additional units are going to be added between 2001 and 2031 further leaving a gap of 0.5 million units to the total demand of 4.2 million units (existing 1.7 + 2.0 addition) . The current housing growth 2% CAGR is mainly because of the demand from the middle class as well as from higher income group for investment. The bulk of the demand is in the Rs 200-350 thousand category⁸⁵, excluding the economically weaker category

This growth may not be sustained for a longer period as most of the housing demand is from EWS and LIG sections⁸⁶. This leaves room for government to intervene and make policies and programs to meet and support the demand especially from lower sections of the society which is to be addressed from public private and other means on a continuous basis otherwise this leaves a chance for the development of squatters and further expansion of slums.

4.1.4.4 Emerging Issues and Opportunities

- It is estimated that there will be shortage of 2.56 million housing units in the BMR region by 2031.

⁸⁴ Karnataka Slum Clearance Board

⁸⁵ Bangalore developers move to affordable housing segment, Anjana Chandramouly, Business Line, January 2009

⁸⁶

Group	Housing Demand	
EWS	43%	Source: Report of the technical group [11th five year plan: 2007-12] on estimation of urban housing shortage, Government of India, ministry of housing and urban poverty alleviation.
LIG	38%	
MIG	11%	
HIG	8%	

- Given the current scenario, there are significant regional and rural-urban disparities with respect to the type of housing. In Bangalore rural district, about 60% population live in permanent houses whereas in urban district about 92% live in permanent houses.
- About 43% of Bangalore Urban residents reside in self owned houses which is an indication of migration from other parts of the state (and country) into the cities in search of livelihood⁸⁷
- With rise the price for housing and land, affordable housing has become an issue in the region which will cause squatting of settlements or expansion of slums in the region.
- Dominance of rented housing in Bangalore urban district indicate the need for improving and modifying the rental act on a regular basis and encouraging the house ownership by easy access to the finance by public and private means.

4.1.4.5 Policies

Policy H1 Government land should be supplied within the growth clusters and growth nodes for 'composite' and 'joint venture' housing schemes to be developed in partnership with the private sector.

Providing access to serviced land and resources for the construction of habitat with secure tenancy arrangements is one of the key mechanisms to give priority growth clusters and nodes a competitive edge over other central metropolitan locations. If this can be linked together with the provision of jobs and reasonable transport facilities, the objective of balanced development in the region will be met.

The Karnataka Housing Bank or board (KHB) should earmark and 'bank' government land for group housing particularly of low income groups, and make them available for joint ventures with developers for the construction of housing. A single window agency to handle all regulations for facilitating land transfer to promoters and developers should be set up in support of this.

The developer would be provided with land at controlled or subsidised prices and be bound by agreement and suitable security covenants to construct houses of specified standards and costs within an agreed period, and be allotted through fair and transparent means to those registered on an official housing waiting lists. Special needs groups, defined by specific criteria, should be afforded priority.

⁸⁷ Karnataka Human Development Report 2005, Planning and Statistics Department, GoK

Policy H2 A policy to restructure the functions, roles and operations of the Karnataka Housing Board (KHB), through innovatory changes in the regulatory framework, should be implemented to shift its focus from house builder to land assembler and infrastructure facilitator as a joint-venture partner with the private sector for the provision of housing.

The disappointing efforts in the area of affordable mass housing by the KHB, combined with the achievements and strong upward price trend in conventional housing, serve to illustrate that the KHB has neglected a major part of its mission to provide housing for the urban and rural low-income groups⁸⁸. The KHB should increasingly assemble land so that co-operatives and individual plot beneficiaries would undertake development but within a specified time frame and other rules.

Policy H3 Measures are required to be taken to provide land for group housing for the urban poor at subsidised or controlled prices

A major problem arising from inefficiencies in the land market is inequity. Since land and real estate prices tend to be particularly high in large urban areas, a large majority are virtually excluded from land ownership. It is estimated that the urban poor constitute 30% to 40% of the city population and the majority have no access to land or housing⁸⁹. As per the report of the technical group [11th five year plan: 2007-12] on estimation of urban housing shortage⁹⁰, EWS constitute 43% of the total shortage.

To assist in closing this demand gap the Government's role should be focused on the speedy transfer of land and facilitation of infrastructure within the strategic framework of the BMR RSP 2031. Currently elitist politico-administrative arrangements like allotting prime lands in and around the city as part of PPP project models, sale of prime lands to raise the funds for infrastructure projects by various govt. depts, etc have resulted in the delivery of prime lands to the more affluent groups in society at unrealistically low market prices.

Housing of the genuinely poor is a challenging task in urban centres because their capacity to pay for the cost of land and construction are severely limited. Hence the poor are more often than not, relegated to unsanitary parts of the city, fringe areas, and slums.

⁸⁸ The reputation of the KHB has been gradually eroded over the last decade, in particular, aspects relating to the quality of housing and maintaining the time-bound implementation of schemes has suffered. Criticism has been levelled at the lack of concern for effective financial management or organisational performance. The frequent transfers of personnel have hampered the continuity of and commitment to the organisation. As a result, housing schemes have virtually become a liability to the government.

⁸⁹ Committee on Urban Management of Bangalore City (CUMBC), 1997, Recommended Shelter Strategy.
⁹⁰ Report by ministry of housing and urban poverty alleviation, GoI

Policy H4 The main focus of the Karnataka Slum Clearance Board (KSCB) should be on in-situ up-grading through self-help processes incorporating the participation of appropriate NGO's.

As per KSCB estimates 10 percent of the total population of the Bangalore city are living in slum settlements, with an average of about 800 persons in each settlement. In total the KSCB reckons that about half a million people reside in slums in the Bangalore metropolis and these are scattered in some 340 pockets located in 15 main localities. Significant though this is, it is modest compared to Mumbai and Delhi, where it is assessed that in the order of 50% and 33% respectively of the total city population live in slums.

Abject housing poverty manifested in the form of slums should be dealt with mainly by the KSCB through in-situ upgrading programmes that provide affordable sanitary infrastructure and security of tenure and others as specified under the basic services for the urban poor (BSUP) program. These programmes should be subject to the condition that their implementation will pose no overarching environmental negative impact or jeopardise the strategic intent of the BMR RSP 2031.

Programmes will need to focus on detailed consideration of the needs of the urban low income groups. Conventional approaches to the provision of municipal services will need rethinking. Appropriate skills among technical staff will need recruiting to deal with social communication and economic aspects, and to tap the support of voluntary or community based organisations.

Policy H5 A range of innovative housing supply solutions, including rental housing, should be encouraged to help meet the housing needs of the urban poor.

To facilitate individuals and families to move out to new pioneering fringe communities or to catch rural-urban or inter-state migrants at 'key nodes' on the urban periphery, there is a need for the creation of innovative housing solutions. Besides serviced land, starter units, incremental financing, self-build, and composite housing scheme solutions, efforts should be made to establish conditions that are conducive to the creation of a rental housing stock. This will provide a low entry cost for new arrivals, facilitate filtration within the stock to accommodate changing family needs and increase labour mobility.

In this connection there is the need for rent control laws to be reformed and more exotic financing mechanisms to be introduced. For example, thrift and credit societies, mortgage loan arrangements that acknowledge 'land' tenure rights as leverage collateral and rental streams as security. These need to be specifically structured and targeted at the poor. In this respect HUDCO's financing modalities have in the past ensured that a proportion of housing is built and allotted to the urban poor.

Policy H6 A programme to carry out regular housing needs surveys and to maintain an appropriate housing management information system in support of the formulation of effective housing policy and supply targets

There is no reliable data about the nature of housing need and supply. Here a distinction is essential to be made between *need* and *demand*⁹¹.

It is essential to estimate actual housing needs of the people, particularly those of the economically disadvantaged (poor and low income groups). To achieve this, a policy should be made to institutionalise the process of carrying out regular time series housing needs surveys. This will enable meaningful housing policy programmes to be drawn up for the provision of minimum housing needs according to desired standards and monitored for performance against targets and benchmarks.

The National Housing Policy (VIII Plan) as well as the recent report of the technical group [11th five year plan: 2007-12] on estimation of urban housing shortage has stressed on an appropriate management information system on housing and urban services to be developed at various levels of government, and a comprehensive housing census to be taken up by concerned agencies. The BMR RSP 2031 endorses this move of the government.

Policy H7 Unauthorised layouts to be regularised within the overall strategic intent of the BMR RSP 2031

Informal development in the form of unauthorised housing subdivisions constitute a major part of uncontrolled urban sprawl within the BMR. The haphazard accretion growth of such areas constitutes a major threat to organised growth in the future as areas become 'land-locked, making access and infrastructure provision virtually impossible, disproportionately costly and prone to dispute. Furthermore, these extensive areas of unauthorised development freeze land assets, exert a negative impact on the economic functioning of the city with little contribution to municipal revenues.

With a view to rationalising the irrational, a pragmatic policy of formalising unauthorised subdivisions through land regularisation instruments and the application of betterment levies plus user charges for services should be pursued in a systematic manner

⁹¹ While *need* indicates a shortage or deficit in terms of socially acceptable standards or norms, independent of price or income, *demand* is determined basically by the ability of people to pay for housing.

4.1.5 Physical Infrastructure

4.1.5.1 Water supply and sanitation

Introduction

Water supply and sanitation are important basic needs affecting the quality of life and productive efficiency of the people. The demand for water supply and sanitation services is growing fast owing to the interactive effects of demographic growth, economic development and improvements in living standards. In the BMR, the Bangalore Water Supply and Sewerage Board (BWSSB) is responsible for providing water supply and sewerage facilities in the corporation area. Although the erstwhile BMP is provided with these services by BWSSB, with the formation of BBMP, the BWSSB is trying to provide same level of services to the newly added areas in the corporation. The Karnataka Urban Water Supply and Drainage Board (KUWSDB) is responsible for providing water supply and sanitation services in all the towns outside BBMP. The rapid pace of urbanization resulted in immense pressure on the local bodies for provision of urban municipal services including water supply, sanitation etc. It has also led to an increasing mismatch between the levels of service provided by the urban local bodies. In view of their economic and welfare contributions as well as their political implications, there is always a constant budgetary pressure for additional resource allocation to meet the increasing demand for water and sanitation services both in rural and urban areas⁹².

4.1.5.1 a) Water Supply

4.1.5.1.1 Overview of BMR structure plan 2011

The BMR SP 2011 has highlighted the criticality of water as a resource specially in the northern and eastern area of the BMR and has specified policy guidelines to improve water supply in these areas, primarily to maximize ground water recharge and to reduce water leakage problems in the BMR region. In spite of the guidelines, northern part of BMR specifically Devanahalli and surrounding areas face shortage of water supply.

4.1.5.1.2 Existing Situation

South and South Western parts of BMR have augmented water supply from river Cauvery, the perennial river source. The water is supplied over long distance involving high head to the extent of 500m from source point to the Bangalore city. The northern and north east part of BMR depends on ground water which has been exploited to the maximum extent, about 85%, resulting in depletion of the resource.

Currently 970 MLD surface water (from Cauvery and Arkavathi River) and 148 MLD ground water is available for a population of 6.8 million and thus the per capita availability works out to be

⁹² Water supply and sanitation sector of Karnataka, India: status, performance and change, by R. Maria Saleth and G. S. Sastry

approximately 164 lpcd . The net storage facility is around 813.09 ML which is about 84% of reported supply of 970 MLD from surface water. The BBMP area has intermittent water supply resulting in an increase in the number of private borewells in the region leading to further depletion of the ground water source⁹³. Refer Annexure-10, section 10.1 for details of water supply in towns (other than BBMP) of BMR region.

The water supply demand projected a deficit in the year 2011. If adequate policy measures are provided, an additional supply requirement can be made available by 2016. The demand supply analysis as well as projections done for the BMR Region considering available sources such as the surface water, ground water and other non conventional methods for water harvesting i.e., Rain Water Harvesting and usage of recycled water indicate a population threshold of approximately 21 million in the year 2031 (Refer Annexure-10, section 10.2 for detail of projections on water supply and demand)

4.1.5.1.3 Emerging Issues and potentials

- To sustain water supply in the region, there is a need to adopt strong augmentation, recharge and recycling measures by the public and private sector stakeholders.
- Lack of systematic mechanism for monitoring loss of water and establishing a means of minimizing the same.
- No restriction on drilling deeper borewells for ground water tapping without recharge structure. Devanahalli and its surrounding areas have been declared as grey areas since the groundwater table has dipped to alarming levels.
- Inadequate storage and distribution network in most of the TPs and CMCs.
- Lack of public awareness regarding depleting water source and need for measures like rain water harvesting and ground water recharge

4.1.5.1.4 Policies

Policy W1 Adequate measures to augment supply from surface water source in the BMR region

Measures should be taken to meet the additional water supply requirement by tapping additional 2400MLD (31TMC) so that 200 lpcd of fresh water could be supplied in the BMR region by the horizon year 2031. Water in each river basin including rainfall, groundwater and surface water should be planned, developed and managed in an integrated manner so as to ensure availability of adequate quantity for supply.

⁹³ Data Source: Status of Urban Infrastructure Report ,Karnataka 2007 and SCE analysis

Policy W2 Ensure quality supply in the BMR region

Realising the importance and the pressure of demand on fresh water, it is essential to eliminate the pollution of surface and ground water resources through innovative technologies so as to ensure good quality water supply. For equitable distribution and inclusive growth, effective and serviceable network for water supply should be provided in all urban centres and uncovered areas of BBMP in the region.

Policy W3 Improve efficiency of utilisation

Awareness of water as a scarce resource should be fostered and conservation consciousness should be promoted through education and regulation.

In the domestic sector, various measures such as introduction of domestic water saving devices, water meters on all consumers and progressive water tariff structure could be introduced to conserve and manage water supply.

There is a need to install advanced and appropriate water treatment facilities at the community level and at the same time develop low cost household purification technologies. It is recommended that the treated water be used for non portable uses such as irrigation, vehicle washing, recreation, gardening, industrial processes.

Policy W4 Advocate better water management and conservation measures

Water conservation should be considered as prevention against loss of water. A system of leak detection system and remedial measures for minimization of unaccounted for water should be conducted on a regular basis since a substantial quantity of water is lost in the form of leakage or wastage. Adequate measures should be taken for reducing the share of unaccounted-for-water to a minimum before initiating any process for fresh augmentation to the region. It is recommended to establish a laboratory to test pipes, fittings, fixtures used in plumbing system for performance and leak proof and service.

Conservation measures such as rainwater harvesting and ground water recharge schemes should be made mandatory and should be implemented on priority. Rooftop rainwater should also be stored separately for domestic use or for groundwater recharge. In the North and north eastern parts of the region where there is heavy dependence on the groundwater, it is essential to improve groundwater table through comprehensive groundwater recharge programmes. The detrimental environmental consequences of over-exploitation of groundwater need to be effectively managed through legislation

Policy W5 Implement measures to protect water bodies and tanks

The water tanks and lakes in the region should be protected and safe guarded from encroachment, pollution and developments. Necessary legislation should be made for the preservation of the existing water bodies by preventing encroachment and deterioration of water quality. Measures like desilting of lakes, fencing and creation of buffer zones should be taken up for protection of water bodies.

4.1.5.1.5 Recommendations

- For equitable distribution of water supply in the region, it is recommended to provide Ring main along the peripheral ring road on the outskirts of BBMP and radial mains for the supply to the clusters and nodal centres. The ring and radial mains will meet the water supply requirements of the urban centres and uncovered areas of BBMP in the region.
- Rainwater harvesting should be made mandatory for all public, commercial and private building having built up area of 100 sqm and above. The storage capacity for rainwater should not be less than 10,000 litres for buildings of 100 sqm roof area. Ground water recharge pits for borewells should be made binding so that rainwater is harvested at the borewell point.

4.1.5.1 b) Sanitation

4.1.5.1.1 Overview of BMR structure plan 2011

The BMR SP 2011 had recommended policy guidelines to augment sewage and sanitation system, to maximise the utility and efficiency of the sewerage system and to provide adequate levels of wastewater treatment were recommended in the previous structure plan for BMR region. It has pointed out that most of the towns in the BMR region do not have the sewage and sanitation system.

4.1.5.1.2 Existing Situation

The core area of corporation i.e., the erstwhile BMP (about 226 Sq.Kms) is provided with sewerage network. Newly added areas into BBMP do not have sewerage network. However BWSSB is planning to provide sewerage network for the areas added to BBMP. There are three drainage channels namely Vrishbavathi valley, Hebbal, Koramangala &Challaghatta Valley with sewage treatment plants having a total capacity of about 203 MLD at present.

Karnataka Urban Water Supply and Drainage Board has the mandate for providing drinking water and sanitation facilities to cities and towns outside BBMP area within a phased framework. Local government at the district, block and village levels has the corresponding responsibilities for all the remaining rural areas. Proper functioning of sewerage system and treatment units is a necessity for maintaining hygiene and control of water borne diseases. However, at present the 10 ULBs in BMR do not have UGD system in place, leave alone rural areas. The existing treatment plants are not functioning to the desired designed parameters. The performance therefore, is far from satisfactory. The poor functioning of the sewerage system and treatment plants will result in sewage getting in to natural water courses, nallah, drain and polluting fresh water bodies and getting filled with silt, sludge.

4.1.5.1.3 Emerging Issues

- The sewerage systems are not functioning effectively and hence the sewage flows into the natural nallah drains which are supposed to carry storm water.

- Most of the CMCs, TMCs and TPs in the BMR region do not have underground drainage system.
- Lack of effective maintenance measures for improving efficiency of sewerage system
- Lack of monitoring and corrective measures for the STPs working in the region.

4.1.5.1.4 Policies

Policy S1 Maximize the utility and efficiency of the existing sewerage systems in BMR

The sewerage system in the region is not maintained properly. The existing sewerage system should be checked, cleaned and cleared of blockages for proper utilities. The network should be repaired or replaced with an appropriate size as per the requirement and maintained, for optimum efficiency. This would essentially mean:

- Cleaning, distilling of sewers and manholes.
- Replacement of existing sewers with appropriate sized ones for discharge and slope requirements.
- Rehabilitation of sewage pumps and replacing with higher efficient pumps for the optimum discharge requirements.
- Introduction of pumping station and providing pumping main as per detailed engineering analysis of the site situation on case to case basics.

Policy S2 Measures to be taken for augmentation of sewer network

The uncovered urban area in the BMR and in the BBMP should be provided with sewerage system of adequate capacity after detailed engineering assessment of the requirement. This would involve:

- Providing sewerage network and manholes.
- Provision of pumping station with pumping machinery, back up power systems, pumping mains for efficient conveyance to the treatment units
- Consideration to be given to ensure that raw sewage is not getting entry into storm water drains or water bodies in the vicinity.

Policy S3 Encourage waste water treatment using appropriate technology to protect environment and promote the reuse of treated water for non potable uses

The sewage treatment plants in the BBMP and in the urban area in the rest of the BMR should be planned as per drainage pattern of terrain. The waste water has to be recognized as material resources. Effective operation and maintenance of the existing treatment plant will generate effluent i.e. treated water which can be used for non potable reuses and the sludge after treatment can be used co-composted with municipal solid waste and used as substitute for chemical fertilizers. It is essential to establish laboratory with equipment and trained personal to process control and monitor the operation of treatment units. New emerging technologies in waste water treatment mechanisms should be explored

Policy S4 Enforce vigilance against uncontrolled discharge into sewer network

Industrial and non domestic waste water which is toxic in nature should be prevented from entering into domestic sewer networks, nallas, water courses and water bodies. Industries must be encouraged to treat wastes (particularly toxic wastes) on site and discharge only wastes complying with discharge standards for collective treatment. Opportunities for the recycling and reuse of both liquid and (non-toxic) industrial solid waste must be maximized. State pollution control board and water and sewerage boards should jointly monitor the misuse of domestic sewerage network by non domestic waste generating agencies/ bodies.

4.1.5.2 Power and telecom

4.1.5.2. a) Power

4.1.5.2.1 Introduction

Adequate power supply is a significant input necessary for the economic growth and development. The effective performance of other critical areas of physical infrastructure particularly water supply and environmental sanitation depends on power sector.

4.1.5.2.2 Overview of the BMR structure plan

Previous structure plan brought out policy guidelines to increase power generation capacity and to have improved mechanisms for load management and demand side management. Power generation in the region is still inadequate to meet the growing demand.

4.1.5.2.3 Existing Situation

Electricity is primarily supply through hydel, thermal and wind energy in the State. BESCO is responsible for power supply in Bangalore Urban and Rural districts. In the Bangalore urban district industrial sector are the major consumers of electricity where as in Bangalore rural district, the major consumption is by the agriculture sector for irrigation (Refer annexure-10, section 10.3 for consumption pattern).

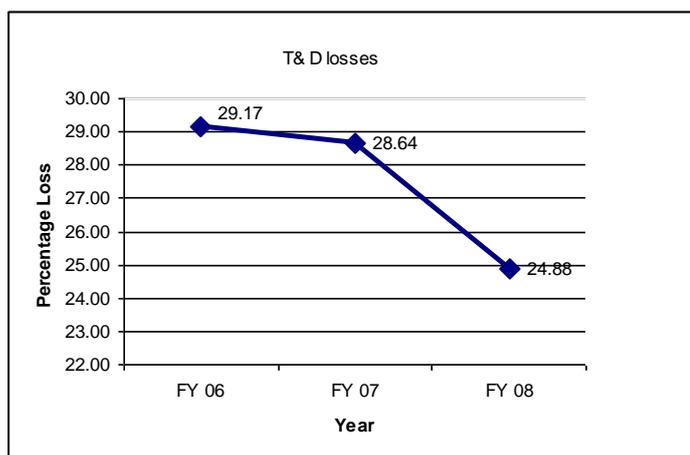


Figure 60: Transmission and Distribution Loss in the State 2006-08⁹⁴

There has been a constant demand-supply gap in electricity resulting in high peak and energy deficits of 15.4% and 2.4% respectively in the State in 2007-08⁹⁵. The State had an installed capacity of 8944 MW as on 15.07.2008. The transmission and distribution loss in the state have shown a steady decline over the last three years (2006-2008).

4.1.5.2.4 Emerging Issues

- The focus of power sector policies has been predominantly in increasing the power supply without considering the sustainability of the source. Least importance has been given to energy conservation and efficient utilization of energy.
- A loss in the distribution of power which is in the State domain has made the sector financially weak. Hence State Power Utilities have only limited success in attracting private investors. This has also resulted in shortage of electrical energy to meet the demands
- There have been revenue losses in the power sector due to low-paying categories, theft of electricity and high transmission and distribution losses which have resulted in low investment in the transmission facilities. The resulting poor performance in terms of reliability (for instance numerous break downs) and supply quality (low voltage and frequency) has turned away the remunerative customer segment from the grid to captive generation (captive power plants are set up by industries to meet their own energy requirement) , thereby lowering the State Power Utility's average revenue realisation.
- Electricity supply to rural areas and specifically irrigation pump (IP) sets is overwhelmed with issues of restricted supply, poor quality supply and large number of unmetered connections.
- The electricity supply to IP sets is highly subsidized which imposes a huge subsidy burden on the State and cross subsidy burden on the other consumers.

⁹⁴ : KERC Annual Report 2008

⁹⁵ Karnataka ,A Vision for Development, December 2008, Karnataka State Planning Board

4.1.5.2.5 Policies

Economic growth is largely influenced by infrastructure services, including electricity. There has been serious shortage of power in the region and in the State as a whole. The power sector reforms have been adopted to meet the severe scarcity of power in the State. To meet the scarcity of power in the region the following policy guidelines are recommended

Policy P1 Enhance power generation capacity with optimum utilization of source through

- Encourage non conventional source of power generation by harnessing the source in an ecologically sound way.
- Explore new initiatives like power generation from municipal wastes to meet the energy shortages.
- Attract private sector investment in power generation by providing adequate legal and commercial frameworks to obtain approvals.

Policy P2 Ensure quality supply of power to the BMR region

- Promote use of clean coal technologies for power generation
- Encouraging private sector participation in initiating the renovation and modernisation of old power plants.
- Better load management practices to reduce transmission and distribution losses in the region.
- Strategic intervention to ensure adequate supply to rural areas
- Imposition of stringent efficiency standards and emission norms on vehicles and consider granting concessions to vehicles based on hybrid / fuel efficient engines which will further reduce demand for conventional fuels, and provide environmental benefits in terms of lower air pollution levels.

Policy P3 Improve operational and financial performance of the distribution sector company

- Focus on reducing distribution losses - both commercial as well as technical.
- Minimize the disparity in costs between various categories of consumers. Provision of subsidy to a particular category of consumers should not be a burden to the distribution sector
- Implementation of strategies to make agriculture an economically viable activity which could potentially lay ground for reduction in quantum of power subsidies provided for irrigation sector.

Policy P4 Introduce improved mechanisms for demand side management so as to reduce the demand for energy

- Reducing consumption in energy intensive industries through R&D efforts and pilot or demonstration plants.
- Building up general awareness of demand reduction needs and promotional campaigns encouraging end-use efficiency.
- Supporting formulation of selective legislation for energy conservation.
- Reducing consumption of energy in residential buildings through use of energy efficient building technologies.

4.1.5.2. b) Telecommunication

4.1.5.2.1 Introduction

Telecommunication is one of the prime support services essential for the development and growth of any economy. In India, telecom sector has recently gained more importance because of the enormous expansion of Information Technology and its impact on related services. Karnataka being one of the largest IT hubs of the country have caused a significant impact on the telecom sector. Telecommunication services being in the Central Government's list, all policies for promotion, development, regulation (including pricing) of telecom services are formulated and implemented for the nation as a whole.

4.1.5.2.2 Overview of BMR Structure Plan 2011

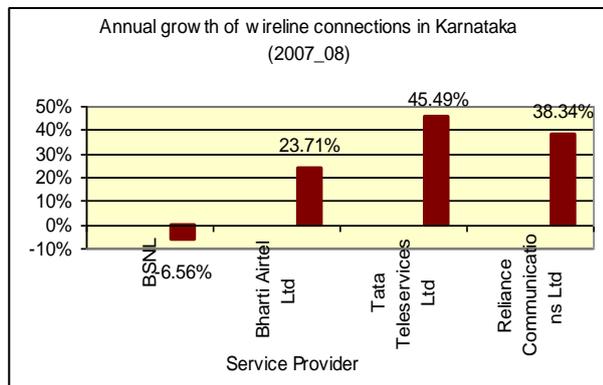
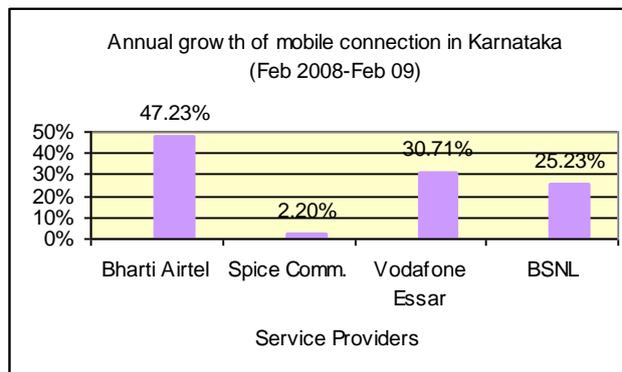
Guidelines to upgrade the existing capacities of telephone exchanges so as to have an enhanced telecommunication facility were recommended in the previous structure plan.

4.1.5.2.3 Existing Situation

Karnataka has leading telecom companies in the sectors of telecommunication network, basic telephony services (both wire line & wireless) and networking services for telecommunication equipments. Entire State is networked via Optic Fibre Cables (OFC) by the State-run BSNL (formerly DOT) as well as private companies like Bharti, Reliance, VSNL and TATA Tele Services. The privatization brought into the sector has played a key role in the development of telecommunication sector in the State. The performance of telecommunication sector in Karnataka was satisfactory in 2007-08. Seven new telephone exchanges were opened in 2007-08.

Table 15: Key indicators of Telecommunication: 2005-06 to 2007-08⁹⁶

Item	Units	2005-06	2006-07	2007-08
Post office	Nos.	9864	9835	9826
Telephone connections provided	000s	2534	2381	2610
Telephone exchanges	Nos.	2710	2720	2727

Figure 61: Annual growth of wireline connections in Karnataka⁹⁷Figure 62: Annual growth of mobile connections in Karnataka⁹⁸

There has been a negative growth in the BSNL connections in the State as the telecom sector has been taken over by the private service provider. Airtel started its operation with 1873 connections in the state in February 2009. Airtel has plans to set up 1200 base stations in the State and invest Rs 1,100 crores⁹⁹

The Software Technology Parks of India (STPI) at Bangalore presently has more than 1050 IT companies as its customers providing them Individual Satellite Connectivity. Bangalore Telecom District (BTD) of BSNL bagged the Best Maintained Telecom System Award in Category –I at the all-India level for 2007-08. In the year 2007-08, BTD had 9 lakh landline and over 2 lakh broadband subscribers which was the highest in the country¹⁰⁰.

4.1.5.2.4 Emerging Issues

There exists a wide gap between urban teledensity and rural teledensity in India. Considering the fact that 70% of the population lives in rural areas in India, the real challenge will be to connect rural India. Telecom manufacturing sector is facing a slow pace of growth. Though National Telecom Policy 99 sought to promote exports of telecom equipments and services, export of telecom equipment remain minimal.

⁹⁶ Directorate of Economics and Statistics

⁹⁷ Annual Report 2007-08, Telecom Regulatory Authority of India

⁹⁸ Annual Report 2007-08, Telecom Regulatory Authority of India

⁹⁹ www.coai.com/statistics

¹⁰⁰ Bangalore Telecom District bags national award, The Hindu, October 05, 2008

4.1.5.2.5 Policies

Policy TC1 Improve telecom connectivity in the rural districts of BMR region

Expansion of rural telephony is a priority area in the eleventh five year plan of the Central Planning Commission. Though significant progress has been made in the telecommunication sector, it is essential to look into the provision of adequate telecom infrastructure services particularly in the rural areas

Policy TC2 Provide fair and transparent policy environment for the telecom market

Telecom manufacturing sector is facing slow pace of growth. Hence there is need to promote investments including foreign direct investments (FDI) for enhancing the performance of the telecom equipment manufacturing sector.

Policy TC3 Enhance the capacities of telephone exchanges

With the increase in population and industrialization it is essential that the telephone exchange capacities are increased to facilitate effective and faster communication.

In order to cater for a greater number of consumers, and to be able to offer consumers the range of services now available in the sector and effectively operate and maintain them, it is essential to upgrade from manual or mechanical to digital exchange technology.

Furthermore, installation of new optical fibre cables overcomes the problem of interference with other underground utilities which are a feature of coaxial systems, and they have a far higher capacity for carrying data, and at higher speeds.

Developments in telecommunication technology in areas such as optic fibres, satellite communication and the growth of sectors linking telecommunication and computers have affected dramatic changes in methods of communication and data transfer. Support infrastructure and incentive frameworks must be put in place to ensure that the latest technology is made available to consumers in the sub region. In this sector, this is best achieved by facilitating the full involvement of the private sector.

4.1.5.3 Solid waste management

4.1.5.3.1 Introduction

There has been a significant increase in MSW (municipal solid waste) generation in India in the last few decades. In India, the amount of waste generated per capita is estimated to increase at a rate of 1%–1.33%. This trend can be ascribed to our changing lifestyles, food habits, and change in living standards. MSW in cities is collected by respective municipalities and transported to designated disposal sites, which are normally low lying areas on the outskirts of the city. The limited revenues earmarked for the municipalities make them ill-equipped to provide for high costs involved in the collection, storage, treatment, and proper disposal of MSW. As a result, a substantial part of the MSW generated remains unattended and grows in the heaps at poorly maintained collection centres. Solid waste management has become a major environmental issue in India.

4.1.5.3.2 Overview of BMR structure plan 2011

The BMR Structure Plan 2011 defines a policy of developing and implementing improved waste management and operational practices. The local bodies within the BMR area had not followed and formulated a waste management policy, thereby a systematic approach in the waste management is lacking.

4.1.5.3.3 Existing Situation

Solid waste management is an essential municipal service consuming 50 to 60% of its budget. An inadequate delivery of this service has led to a variety of economic and environmental issues. The studies conducted in the Region reveals that none of the cities and towns in the Region are collecting and managing the solid waste in accordance with the existing regulations.

As per the City Development Plan under JNNURM for Bangalore the per capita waste generation in BMP area is 363 gm per day. Whereas in the ULBs¹⁰¹ which are part of BBMP, the total waste generated is 632 TPD, of which 80% is collected. It is estimated that about 3056 tonnes of solid waste is generated in the BMR area of which only 69% is collected. 70% of the total waste generated in the city is dumped in low lying land of identified dumping sites, farm land and private manure producing companies like Sunrise, Terra Farma and on the roadside. The waste generated in the BMP area is being collected with partial private participation in 182 wards and the remaining with department staff. Door to door collection is practiced with nearly 100 percent efficiency, but segregation of waste at source is not practiced.

Waste generated is treated in compost plant established by Karnataka Compost Developing Corporation (KCDC) at J.P.Nagar, which can handle a total of 300 tonnes of waste per day. Landfill site have been set up at Mavallipura(100 acres of land), Mandur (135 acres of land and 8 Megawatt Power generation and Doddballapur (100 acres for processing of 1000 MT capacity) on BOT basis¹⁰². There is a proposal to set up landfill sites at Manavarthekeval .For disposal of hazardous industrial waste, landfill site has been identified in Dobaspet industrial area¹⁰³. Engineered landfills are proposed at Ramanagaram and Kanakapura as part of the City Development Plan for Bangalore. The interim master plans for the LPAs proposed land fill sites and solid waste disposal areas within their LPAs (refer section 9.4 for details in the annexure-10). The urban local bodies of Doddaballapur,Devanahalli,Hoskote,Nelamangala and Vijayapura in Bangalore Rural district, Channapatna,Kanakapura,Magadi and Ramanagaram in Ramanagaram district and Anekal urban local body in Bangalore Urban District have received authorization from the Karnataka State Pollution Control Board (KSPCB) for setting up landfill sites in their jurisdictions.

It is estimated that, as per the present level of growth in population and waste generation, the total quantity of waste to be handled is estimated to be increased to 711 tonnes/day by 2031 in the ULBs outside BBMP area .

¹⁰¹ Yelahanka, Bytarayanapura, KR Puram, Bomanahalli, Dasarahalli, RR Nagar, Mahadevapura ,and Kengeri

¹⁰² Status of Urban Infrastructure in Karnataka 2007,KUIDFC

¹⁰³ Karnataka State Pollution Control Board ,Annual report 2005-06

4.1.5.3.4 Emerging issues and opportunities

- Inadequate measures to manage the waste in an environmental friendly way due to absence of integrated policy for the region to provide uniform guidelines.
- Lack of knowledge of local bodies leading to casual approach to solid waste management.
- Absence of comprehensive segregation of waste at source leading to mixed wastes reaching the processing plants. The bulk of the wastes reaching at the disposal site are usually mixed containing plastics, glass, metals etc.
- Absence of policy and regulations to promote waste reuse and recycling and non-availability of suitable land for disposal of solid waste provides an opportunity to recommend policies for reuse, recycling and creating a favourable environment to promote manufacture of reusable material;
- Piecemeal approach for handling of solid waste;
- Non-involvement of stakeholders/NGOs and private agencies;
- Adoption of inappropriate technologies; and inadequate waste treatment capacity when compared to the quantum of waste generated.

4.1.5.3.5 Policies

Policy SWM1: Integrated solid waste management facility in the region

Landfills sites authorized by the KPSCB in the BMR region should be developed into an integrated solid waste management facility¹⁰⁴. The integrated solid waste management facility is to be located in the following locations :

- Doddaballapur, Devanahalli, Hoskote, Nelamangala and Vijayapura in Bangalore Rural district;
- Channapatna, Kanakapura, Magadi and Ramanagaram in Ramanagaram district ;
- Anekal urban local body in Bangalore Urban District.

A buffer zone of 500m should be created around the site as no development zone by notifying the prohibition of development in the buffer zone. A well-defined methodology has to be drawn up and implemented to ensure the restrictions on buffer zones.

As part of the City Development Plan for Bangalore Urban Agglomeration and Interim Master Plans for the LPAs there are proposals to set up landfill sites and solid waste disposal areas in the Region. The requirement of these waste disposal facilities should be assessed taking into account the KPSCB authorized landfill sites in the ULBs as well as the quantity of waste generated in the region. While preparing the master plans and detailed development plan for the ULBs in the BMR, if there is any

¹⁰⁴ Integrated solid waste management is linking of different components of Solid Waste Management like primary collection, secondary storage, transportation and disposal of solid wastes generated by all urban population groups in an environmentally and socially satisfactory manner using the most economical means available. Municipal Solid Waste (Handling and Management) Rules 2000, provide for collection, segregation, storage, transportation, processing and safe disposal of municipal wastes excluding hazardous waste and untreated bio medical wastes

requirement for integrated solid waste management facility, the land should be identified within the larger policy framework laid down by the MSW (Management and Handling) Rules, 2000.

Policy SWM 2: Advanced technologies and practices are to be developed to treat the waste before final disposal and create new economic opportunities

Treatment and disposal facilities should be designed and implemented utilizing advanced technologies to enable the biodegradable part of the waste to be recycled and reused. There should be a system to ensure that MSW does not touch the ground till treatment and final disposal. The land, being a limited resource, requirement of land for the waste disposal shall be brought down to the minimum possible. As stated in the Karnataka State Policy on Integrated Solid Waste Management, the objective of the solid waste management plan should be to establish an integrated and self-contained operating framework for Municipal Solid Waste Management which would include the development of appropriate means and technologies to handle various waste management activities.

Policy SWM 3: Stakeholders involvement in solid waste management

At present the waste generated in the region are being collected by the municipal staff or engaging private operators. The involvement of the waste generators is very limited. The generators of the waste have the responsibility to collect the waste in accordance with the rules and regulations laid down by the local body and deliver the same at such places and such manner notified by the local body. Involvement of the stakeholders in waste management will force them to reduce the waste generation and to dispose the waste at source as far as possible. This can be achieved only with the creation of awareness among the stakeholders regarding their role in the waste management and the importance of reducing the waste generation and disposal of waste at source wherever possible.

Information, Education and Communication (IEC) activities and awareness programmes should be carried at the ULBs by the Non-Government Organizations (NGOs) and Community Based Organizations (CBOs).

Policy SWM 4: Encourage decentralized small waste treatment and disposal facilities with the support of community based organizations to reduce pressure on the centralized facilities and to extend the life of the centralized facilities.

In order to reduce the waste reaching the municipal stream for treatment and disposal, it is proposed to development small waste treatment facilities such as vermin-compost plants, biogas plant, small aerobic compost units etc at public places, wherever space available to treat the waste locally. Such facility could be developed at major public institutions in the region.

Policy SWM 5: Private public participation in waste treatment and disposal

The urban local bodies in the BMR could enter into contract with private operators for various waste management activities under specified guidelines and structures.

Policy SWM 6: Mandate segregation of wastes at the household level

Segregation of waste at the household level should be enforced and made mandatory through ward plans & master plans prepared at the settlement levels.

4.1.6 Social Infrastructure

Social infrastructure comprises of a range of facilities, activities and organizations that support the formation, development and maintenance of social relationships in a community. This section limits itself to key higher order facilities which characterize and contribute significantly to the development of an area such as education, health, markets, sports and recreation.

4.1.6.1 Education

4.1.6.1.1 Existing situation and analysis¹⁰⁵

In Karnataka State, there are 10.238 million students studying in 66,885 schools which are managed by 3, 42,744 teachers. More than 7 out of 10 schools are run by the Department of Education. The Government also gives grant-in-aid to 5,132 private schools. Maximum proportion of schools run by the Department is at the lower primary stage (86.13 %). Of the total schools in rural areas including LPS, HPS, and HS, 89.26 % are run by the Government. There are over 10 million students, 10,238,090 studying in 1 to 10 standards of the State. Gender parity in enrolments is 48.06 percent. It is very near the 49 percent norm as expected according to child-sex ratios in the State.

In the BMR, the education index which was measured using the parameters: literacy rate and combined primary and secondary school enrolment ratio indicated that Bangalore Urban district has the highest index (0.887) when compared with the other districts in the state. Within the region, Bangalore rural district has indicated a lower education index which could be attributed to the fact that the private ownership of secondary schools is high in Bangalore urban district and it has good infrastructure in terms of specialized institutions. Overall, it is observed that there is a concentration of education facilities in urban areas and a lack in Bangalore rural area.

4.1.6.1.2 Emerging issues

- The percentage of schools in urban areas is increasing with increasing urbanization but the quality of school facilities and learning levels in urban government schools is declining due to its neglect. For instance in the erstwhile BMP limits there are as many as 1218 government primary schools, 1288 higher primary schools, and 328 high schools. Apart from this there are a large number of grant in aid institutions. In addition the BBMP runs 78 nursery schools,

¹⁰⁵ Source: Department of Higher Education; <http://www.education.nic.in>

12 primary schools and 33 high schools and 13 PU colleges. For reasons of capacity constraints the BBMP is not in a position to undertake the responsibility of running government schools within its jurisdiction. Thus there is a serious lacuna in terms of accountability of the local bodies (ULB/ZP) towards these educational institutions in urban areas that is not being resolved through the mechanism of the District Planning Committee.

- A National Knowledge Commission (NKC) report on vocational education indicates that in terms of delivery, it is found that vocational courses adopted by schools do not match the local manpower requirements of the region. As a result, few students pursue employment in the skills they were trained in. Also, the existing Industrial Training Institutes (ITIs) face problems such as poor quality trainers, lack of flexibility, outdated syllabus and infrastructure.
- The tremendous push to improve access and retention in elementary schools has resulted in a greater demand for secondary education. As per **Education Management Information System (EMIS) 2006- 2007**, Karnataka has 10,537 schools for secondary education. 35% of these schools are government owned, 25% are aided and 39% of the schools are privately owned. There is a need to improve classroom environments as well as competing effectively with good private schools.
- Nearly 1 out of every 5 schools in the state are self-financing / private unaided schools. This figure gets doubled, 39.22 %, at the high school stage. Participation of self financing schools at the LPS stage is highly limited.

4.1.6.1.3 Policies

Education and health being a State subject, the policy guidelines should be in line with the State Government's plans and policies for the sector

Policy ED1 Mandate minimum standard for all the schools

The State should define a minimum standard for all schools. Right to Education Bill 2005 provides a comprehensive list of norms and standards for a school. The State can make appropriate modifications in the stipulated norms and standards for a school and these norms should be made applicable to all the government, private and NGO run institutions in the State.

Financial support should be extended to the schools in the Bangalore Rural areas as there is a concentration of education facilities in the Bangalore urban districts.

Policy ED2 Enhance capacity of vocational education courses so as to match the employment potentials of the region

Skill courses which are provided through institutes should be made in tune with the local employment opportunities. All institutes should be provided with adequate number of qualified trainers and adequate infrastructure facilities.

Education department should introduce some degree of flexibility in the system of secondary education. Students after the elementary education should be allowed to choose a skill course which is relevant to the local occupation as a core subject.

Policy ED3 Improve access and availability of quality education in the rural areas

Focus should be given to improve education facilities in the rural districts of Bangalore Metropolitan Region. The state will also need to address the need of an inclusive strategy in higher education with respect to access so that talented students from rural backgrounds or belonging to disadvantaged sections are not deprived of participation in institutions of higher learning.

4.1.6.2 Health

4.1.6.2.1 Existing situation & analysis

It is evident from the table below that there is a regional disparity in the distribution of health facilities specifically higher order facilities between Bangalore urban and Rural districts. In terms of health status, Bangalore urban district is better off than other districts in the State

Table 16: Categories of health facilities available in the region

SI No	District/ State	Population	Health*									
			1	2	3	4	5	6	7	8	9	10
1	Bangalore Urban	76,07,000	4327	3992	396	31	42	65	13	185	55	1506
2	Bangalore Rural	20,01,000	260	20	32	73	29	7	15	432	2	2272
3	Karnataka State	5,74,54,000	28058	5257	1545	1679	578	208	637	8143	155	54260

Source: Karnataka at a glance, Directorate of economics and statistics, Bangalore, 2006-07.

* Health legend 1-3 is in terms of no. of beds and 4-10 is in nos. of units

Legend: 1- State government hospitals, 2- Other agency hospitals, 3- Indian medicine system hospitals, 4- Primary health centers, 5- Primary health units, 6- Dispensaries, 7- Dispensaries under Indian system of medicine, 8- Family welfare sub center, 9- Blood banks, 10- Anganwadi centers

4.1.6.2.2 Emerging issues¹⁰⁶

- There is a clear regional disparity in terms of health status as is reported by the Task Force on Health & Family Welfare in 2001. Seven districts of Northern Karnataka are the worst off

¹⁰⁶ Source: Karnataka Development Report 2007

in terms of health status, while the coastal districts and Bangalore urban are better off, and the remaining fall in the intermediate category.

- Bangalore Urban has lowest levels of vacancies of doctors, nurses and pharmacists. But neighboring district of Kolar faces shortage of both medical officers and other staff. Backward districts such as Bidar and Bagalkote show lesser vacant positions, compared with Kodagu and rural Bangalore in the south. Regional disparities emerge as a key issue in service delivery in the state.
- The concentration of higher order facilities such as education and health with the Bangalore urban district brings out the need to reduce the disparities in education and health facilities between Bangalore Urban and Bangalore Rural region.

4.1.6.2.3 Policies

Policy HE1 Improve access and availability of quality healthcare in Bangalore rural districts

The public health care system in the rural areas needs to be realigned based on the need and demand. As there is unavailability of trained health workers and doctors in the rural areas, the focus needs to be on increasing the availability of trained manpower for delivery of health services in rural areas. Primary health centers and community health centers need to conform to Indian Public Health Standards (IPHS) with respect to infrastructure, equipment, personnel and management, and thereby improve quality of care delivered.

Policy HE2 Use of technology to improve accessibility and availability of health services

Karnataka being the home to the information technology hub of the country should acquire assistance of leading IT firms to develop technologies like telemedicine to provide access to health services in remote locations. In areas where such technology may not be accessible, health services can be made available through mobile medical clinics

Policy HE3 Decentralized and participatory processes in health planning and monitoring

Strengthen the monitoring of health services through Panchayats and civil society. Currently the planning for social sector (education and public health) in the BMR is carried out primarily in the relevant State Government Department. As recommended in the Kasturangan Report on the Governance in the BMR region and BBMP, the Urban Local Bodies (ULBs) and the District Planning Committee (DPC) should be given the responsibility for social planning under the guidance of Metropolitan Planning Committee (MPC)

4.1.7 Heritage and Tourism

4.1.7.1 Heritage

4.1.7.1.1 Introduction

Art and culture of India are vast continuum which needs to be conserved and preserved. The country has rich, vast and diverse cultural heritage in the form of built heritage, archeological sites and remains since prehistoric times. Karnataka's cultural heritage and its contribution to the field of art, music, religion and philosophy is commendable. Mysore, Hampi, Shravanbelagola, Belur, Halebid and Bijapur are some of the important historic and cultural centres in Karnataka. Bangalore Metropolitan Region has many places of historical significance and tourist interest.

4.1.7.1.2 Overview of the BMR Structure Plan 2011

The previous structure plan has not considered heritage as a separate sector, however it provides for a policy for heritage conservation under the Environmentally Sensitive Areas section. The recommended policies call for implementing and enforcing area conservation policies that call for a buffer around heritage sites. Besides this, in the implementation modalities part, development controls for heritage buildings and zones are addressed. However, elements of heritage and cultural value at a regional scale are not addressed.

4.1.7.1.3 Existing situation

A review of the protected monuments in the state identifies very few structures which have been declared protected by the two authorities, Archaeological Survey of India and the State Department of Archaeology and Museums. Most of these structures are cultural sites. There are 32 monuments which are declared as protected monuments in this region and are taken care of by the Archaeological authorities; both national and state departments (see the Annexure-8). For the living heritage like temples, agencies like Muzrai are in charge of the temple activities.

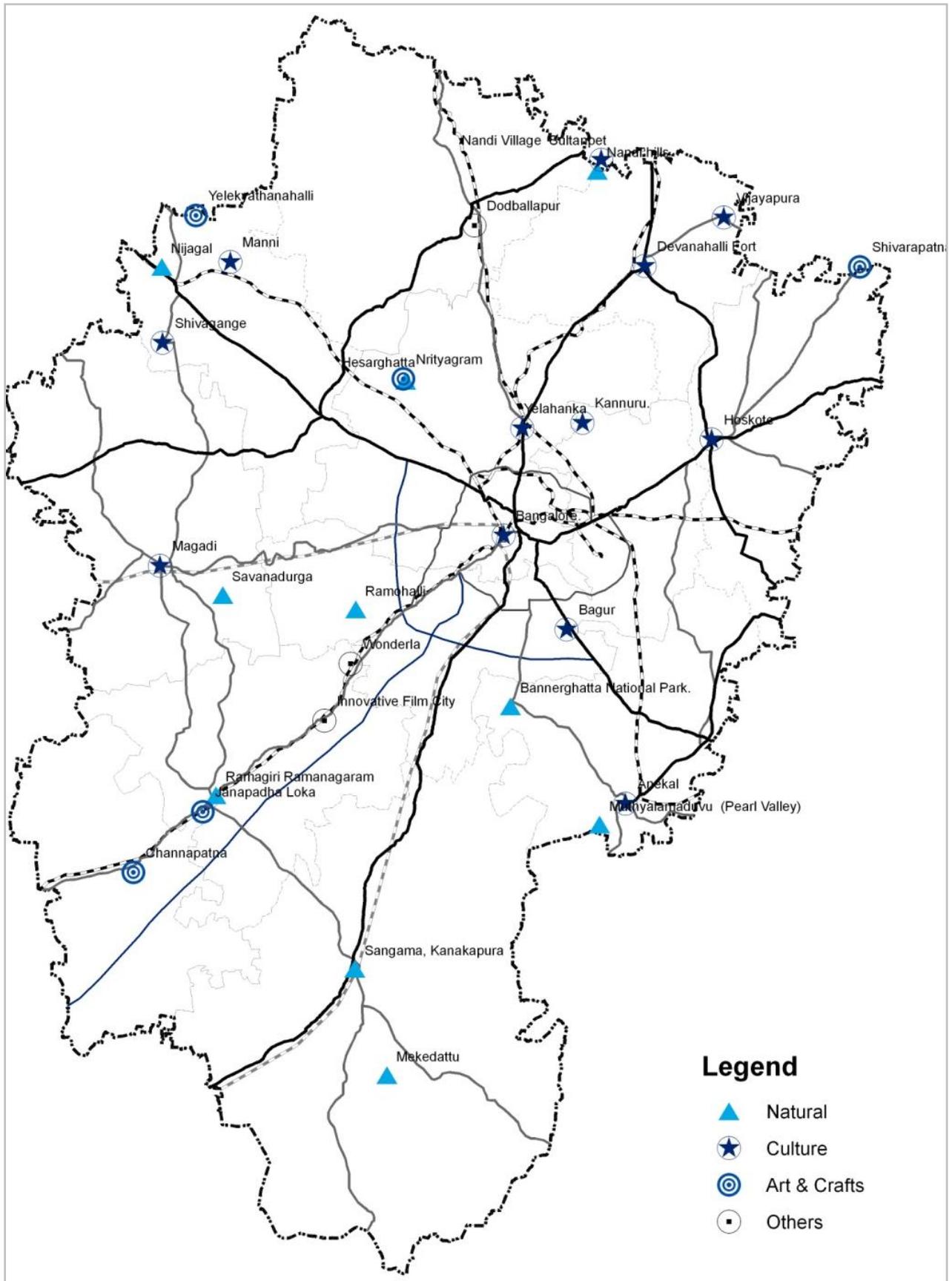


Figure 63: Heritage and Cultural Assets in BMR region

4.1.7.1.4 Emerging Issues and Opportunities

- Heritage not protected by the two archaeological authorities is vulnerable.
- Elements of heritage and cultural value have not been considered at the regional scale in the previous structure plan hence most of the heritage sites are under threat.
- Heritage, as areas of significance or buildings not identified
- Impact of unregulated development resulting in loss of character, loss of applicability and thus opportunities for the relevant traditional systems of construction.
- Unchecked growth on cultural places also resulting in loss or deformation of character/style. This provides an opportunity to provide guidelines for the conservation, preservation and promotion of unique heritage, customs and traditions of the State
- Exploitation/Impact of quarrying etc on the natural heritage
- Lack of resource protection/provision for the cultural heritage such as crafts
- Lack of guidelines for different/significant buildings.

4.1.7.1.5 Policies for Heritage

Policy HR1 Identification and updation of listing of Heritage areas

The entire heritage, built, cultural and intangible heritage in the region should be identified through the process of listing. Listing format as adopted by Indian National trust for Art and Cultural Heritage (INTACH) could form the basis for the listing of heritage. In case of crafts, the process including the resources will have to be identified in the listing. Any local level of construction systems will need to be listed. It is recommended that a detailed map with the location of the heritage (both tangible and intangible) should be prepared. The sample listing format is provided in Annexure-12. The same could be adapted for the respective areas.

Policy HR2 Earmark protected areas and Demarcation of Conservation Areas on the map

Areas of natural heritage to be earmarked as protected areas. Natural resources which are used by the craftsmen as raw material will be designated as protected areas¹⁰⁷. All activities such as quarrying, mining, deforestation should otherwise be prevented in these areas.

Areas with natural heritage, large number of heritage of specific style, cultural heritage should be designated as conservation areas and be clearly demarcated on the map, for eg- Devanahalli settlement within the fort or Shivaratna town. Similarly, Shivaganga, a religious town should be declared as a conservation area, with recognition of the living heritage such as rituals and

¹⁰⁷ For example tree from where the wood is sourced for the craft product in Channapatna or the stones for the crafts work from selected quarries even where the quarrying is banned will be designated as protected area

processions as part of the cultural landscape. Conservation plans with special regulations should be prepared for the development and preservation of these areas which will maintain the character of the place. In the conservation zone, a buffer zone should be demarcated around the all natural and cultural heritage areas and resources, including heritage buildings of specific style, and special regulations.

Policy HR3 Grading of heritage buildings

The individual buildings, within the settlements and conservation areas, listed as worthy of conservation should be then be graded in three different categories, Grade 1, Grade II and Grade III based on their significance. The graded buildings in each category should then have to comply with the rules framed for each Grade as follows:

Grade 1: No interventions be permitted either exterior or interior unless it is necessary in the interest of strengthening and prolonging the life of the building(s) or precincts or any part or features thereof. For this purpose, absolutely essential and minimal changes would be allowed, and they must be in accordance with the original.

Grade II: Internal changes and adaptive re-use and external changes may be allowed, but subjected to scrutiny by conservationists. Care would be taken to ensure the conservation of all special aspects for which it is included in this grade. In addition to the above, extension of additional building in the same plot or compound could in certain circumstances be allowed, provided that the extension/additional building is in harmony with the existing heritage building(s).

Grade III: External and internal changes and adaptive reuse would be allowed. Changes can include extensions and additional building(s) in the same plot or compound. However, any changes should be such that they are in harmony with and do not detract from the existing heritage building(s).

Policy HR 4 Formation of Heritage Cell

It is recommended that a heritage cell be created in the BMRDA.

- The heritage cell will assist the Local Planning Authorities in preparation of listing of heritage, preparation of conservation plans for conservation areas and framing of regulations which will be incorporated in the Local Area Plans.
- The heritage cell will scrutinise all proposals within protected areas, conservation areas and for graded buildings.
- The cell will also monitor the impact of the development on the heritage.
- The cell will assist in capacity building of people, involved in conserving heritage, at various levels from engineers to panchayat members to individual stakeholders so as to sensitively undertaking conservation which will not be detrimental to the character of the place or building. It will also assist in use of local technologies which will be adopted in the process of conservation.

4.1.7.2 Tourism

4.1.7.2.1 Overview of the BMR Structure Plan 2011

The Tourism sector has been broadly addressed in the BMR SP 2011. The focus of the sector is on open spaces, of various scales, for recreational activities; utilizing the opportunity of the International airport to showcase Bangalore and the national parks. However major issues with regards to tourism sector as in identifying and linking places of significance, access and basic amenities have not been addressed. While the International airport and its importance has been considered, the plan only focuses on the approach to the airport.

The need to identify strategic locations for tourist accommodation has been suggested, however no recommendations has been made for identifying basic circuits or links along which such facilities need to be created.

4.1.7.2.2 Existing situation

Tourism is one of the fastest growing sectors of the state's economy, with tourist arrivals increasing by 40% in 2006-07¹⁰⁸. Karnataka ranks fourth as a domestic tourism destination and fifth among tourist arrivals from abroad, with the share of foreign tourist arrivals to the State increasing from a mere 4% in 1991 to 15.7% in 2004¹⁰⁹. BMR doesn't have many tourist destinations points. Places like Nandi hills Banerghatta National park and Shivaganga are the few standalone tourist destinations in the region. However, there are a large number of tourists destinations outside the region such as Srirangapatna, Mysore and Coorg in the South-West direction and Belur, Halebidu and Shravanabelagola in the North- West region (refer map in annexure-12 for movement pattern of tourists towards tourist destinations at regional level). Chitradurga and Hampi are the destinations in the North Karnataka. As per the survey conducted by the Ministry of Tourism, Government of India, the Bangalore - Mysore stretch of Karnataka is one of the most visited destinations in India by foreign tourists. Karnataka is "Little India" as this state has everything that India has to offer in terms of tourism¹¹⁰.

4.1.7.2.3 Emerging Issues and Opportunities

- Only prominent places have been identified as tourist spots;
- Lack of amenities, information and signages at tourist spots;
- Places of interest in the BMR and surrounding areas are not connected as tourist circuits;
- Tourism sector in the region has the potential to create employment and generate income since it is labour intensive industry.

¹⁰⁸ Planning and Statistics Department, GoK

¹⁰⁹ Ministry of Tourism, Government of India

¹¹⁰ 11th five year plan, Karnataka

4.1.7.2.4 Policies

Policy TO1 Tourism destinations – Identification of nodes and circuits

The different tourists destinations need to be linked to form circuits. The circuits could be theme based or could offer a complete experience on various aspects from Nature to Pilgrimage. Important places along the route to major destinations outside the BMRDA region could be linked enroute.

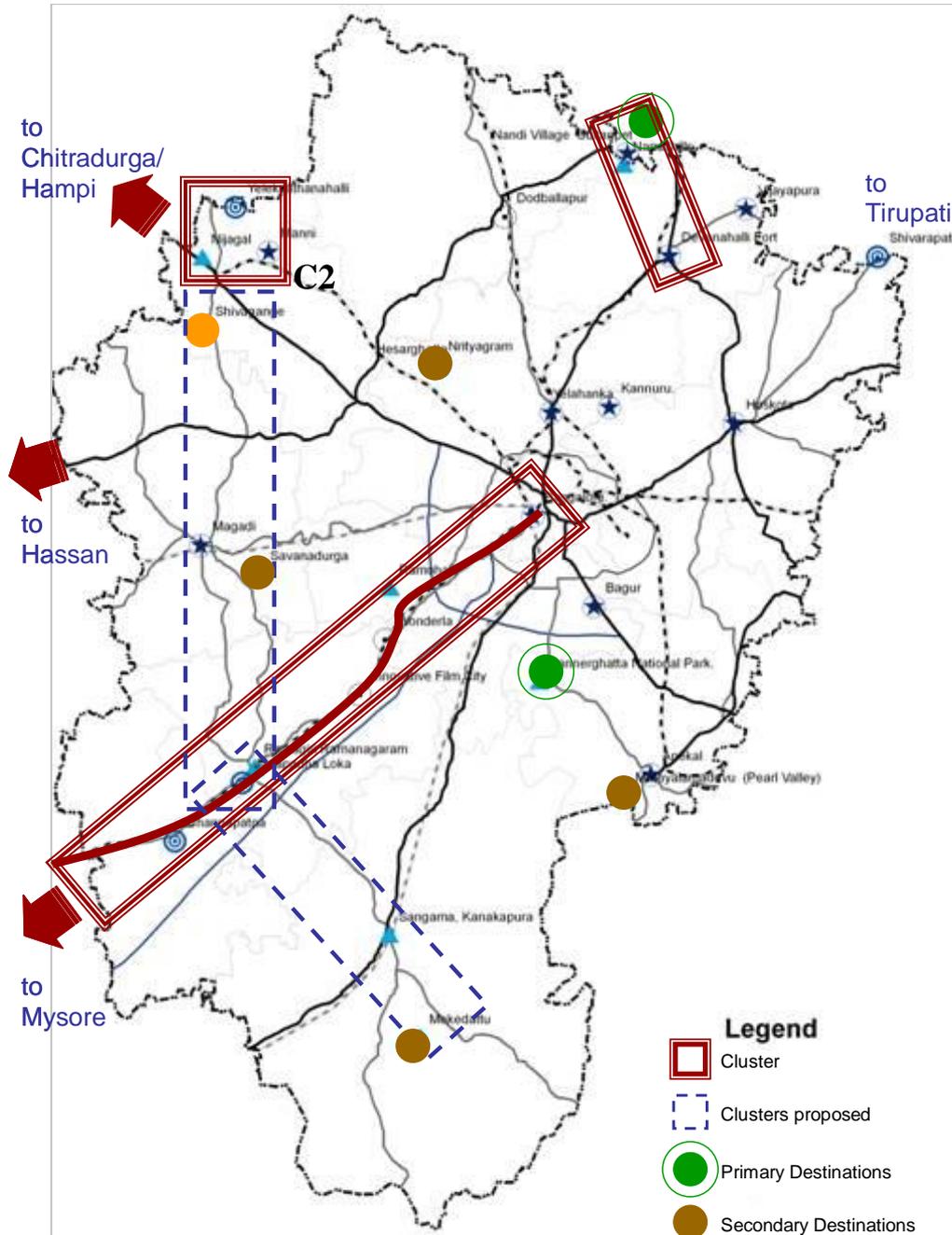


Figure 64: Primary and secondary tourist destinations

New circuits linking the major destination points and the secondary destinations such as Savanadurga, Pearl valley, Hessarghatta, Nrityagram and Shivganga are proposed in the BMR RSP 2031. The circuits identified are:

- Bangalore- Devanahalli Fort- Nandi Hills
- Ramanagram-Kanakpura- Mekedattu
- Ramanagaram-Savanadurga-Magadi-Shivganga

To connect the destinations outside BMR with the destinations within BMR , new circuits as under should be identified

- Bangalore- Ramanagaram-Channapatna-Ranganthittu Srirangapatna- Mysore (This is the most diverse circuit having places of interests varying from nature - cultural – crafts - bird sanctuary- monuments)
- Bangalore-zone C2- Chitradurga
- Ramanagaram- Magadi- Savanadurga- Hassan
- Bangalore- Shivarapatha- Kolar- Tirupati

Policy TO 2 Enhance accessibility and amenities

Tourism infrastructure such as good connectivity, accommodation facilities and amenities should be provided in the identified tourist circuits. As recommended in the Karnataka Tourism Policy 2002, plan should be prepared by the tourism department in order to improve connectivity with essential signages and wayside facilities to the tourist destinations in the State. Accessibility to people with disabilities should be considered while preparing this plan.

Accommodation for the various categories of tourists should be provided in the identified tourist circuits. The young class of tourists with marked preference for adventure trips to forests, caves and hills do not look for 5 star accommodation facilities, but for simple and clean accommodation facilities. The requirement of this class of tourists should be met through Panchayats and local bodies. A minimum standard should be mandated for all categories of accommodation so as to provide a good quality environment to the visitors.

Within the sites, walking or use of non polluting transportation forms should be provided. Parking facilities could be provided at various nodes and alternative transportation could be provided from thereon to complete the circuit. The tourist destinations within the region should have adequate signages and information centre. Trained tourist guides are to be made available at all major tourist locations.

All tourists locations should provide for basic amenities. Basic amenities such as Rest rooms for ladies, gents and people with disability, drinking water, garbage disposal, should be provided.

Every major nodes in the circuit, destination points or way side facilities need to be provided with basic amenities which besides the above also include eating joints, telecommunication facilities, cyber cafes, medical aid, souvenir shop and information centers.

Based on circuits identified above, new nodes for development of facilities are proposed as follows:
(these are clubbed wherever possible with heritage places so as to promote the same)

- T1-Ramanagaram (major node with change over facilities)
- T2-Hassan-(Magadi-Shivganga) intersection
- T3- Kanakpura
- T4- Bannerghatta National Park
- T5- Nandi Hills
- T6- Shivarapatna

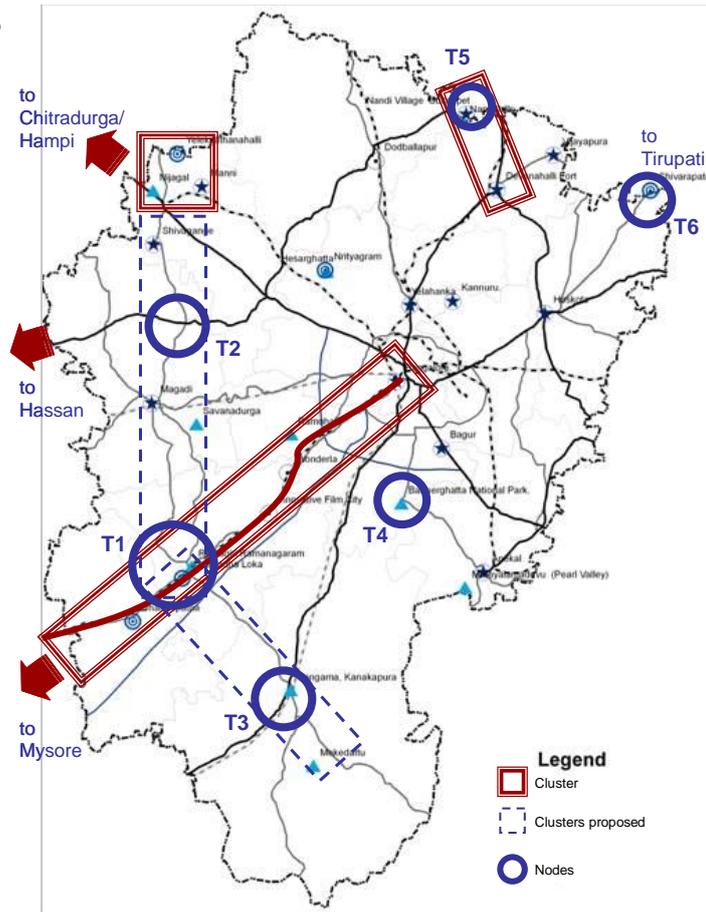


Figure 65: Nodes identified for development of amenities

5 PART V IMPLEMENTATION MODALITIES

5.1 Planning and Land Management tools

5.1.1 Land Development and Management in the BMA

5.1.1.1 The Context

- i. Contrary to popular perception, land is a scarce resource in India, despite its size. As population grows access to land gets scarcer and more competitive. Thus mapping the existing use of land as a base for projecting its appropriate usage over a period of time has emerged as a priority in state and even local level land development policy. This entails the mapping of all environmentally sensitive areas including lands considered to be of natural and manmade heritage before prescribing land uses at varying intensities for providing the built environment and for primary sector usages. This is for both municipal and panchayat areas, by enmeshing the positive constraints of conservation with the desired opportunities of development on the use of land.
- ii. The fact has to be underlined that the subject of land is primarily in the State List as is the subject of urban and regional development planning. Thus any policy on access to and the use of land has to cater to the varying ground realities of the States of the Union, and which today are gradually being governed through a Constitutional diktat of Local -State-Central equations rather than just a Central-State partnership based on sectoral expenditure and targets.
- iii. Policies on land since independence have emerged as being separate for urban and rural areas or more precisely for Municipalities and Panchayats, both based on the principle of socialisation of land. In rural India this has over a period of time led to fragmentation of holdings at near (and even below) subsistence levels where little or no revenue surplus is being generated to Government. On the other hand in urban India, the principle of accessing land and built space in the appropriate location, to the right quantum and at the right time and where land is not held back for speculative purposes has led to urban Master Plans being refined as land use and plotted/area development platforms. This has had limited success due to (interalia) absence of programmed development, conflicting regulations and lack of deterrent penalties for misuse. It is only now that spatial frameworks are emerging in the form of integrated, time bound and participatory Development Plans.
- iv. Also, latterly due to a fillip in inter state mobility of goods and people by road, air and rail and even water, India is growing through urban corridors and nodes amidst defined rural (regional) intercities. Thereby several Metropolitan Areas (in particular) are ripe for a common rur-urban land development policy. The BMA is one such entity, comprising of one urban district, one peri urban district, and one rural district under peri-Metropolitan stress.

5.1.1.2 Access to land and its development in the BMA

- i. The BMA comprises of three contiguous districts totaling 8006 sq.km. In this large area, land is not only owned by the State but also by private Companies /Institution/Developers; by Registered Trusts; by families and by individuals. As elsewhere in India, State holdings are ineffectively protected whereas most of the other types of ownerships get mutated or are otherwise in dispute. This makes the official land registry and cadastres unreliable and often redundant as reference points for development, especially in family and individual ownerships – both urban and rural. Efforts are now on especially in Karnataka to revive the registry of titles especially in Municipalities and Panchayat settlements, primarily for improving collection of property tax and other forms of revenue. Reducing transaction charges (stamp duty) helps in the cooperation of recording land titles. Also at time of applying for use of land and building permits, proof of title is now being sought. This has been facilitated through local area plans (LAPs) in the form of detailed Town Planning Schemes (TPs) as provided for in the State TCP Acts. The task however is huge despite improved technologies in mapping of land ownerships and related frequent and quicker update of land records.
- ii. Basically, therefore, access to land for development (and which includes conservation of heritage and natural resources) through lucid Development Plans offers a base on existing and future use of land with or without clear titles. Currently in Karnataka this exercise through master plans and ODP'S/CDP'S is weak and time consuming. It enables various sectoral areas of the government to function outside the process; its clauses for appeal are liberal and subject to misuse; and development control rules are ambiguous and overlap with byelaws and are therefore easily violated. Worse still, deterrent penalties for misuse hardly exist and coordination between the Development Authorities and Local Bodies is yet weak.
- iii. Thus changes in law for unambiguous interpretation (TCP, Municipalities and Panchayat Acts in particular) is important both in the enabling clauses of the law and its rules and regulations for proper land development. This has to be in keeping with the 73rd/74th CA Act '92. This consultancy addresses the process and on which basis the draft BMR-2031 Plan is a first step, to be bolstered by Settlement and Ward Plans.
- iv. In brief ,
 - a) Every holding in the BMA needs to be covered with a prescribed land use at
 - i. The regional level (by BMAPC), through a broad brush Structure Plan.
 - ii. Municipal and Panchayat level (by BBMP, ULB'S and VP'S) through programmed Development Plans.

- iii. Ward level (of each Municipality and Panchayat), through detailed Local Area Plans - LAPs
- b) Each level of Plans (20 yr perspective and 5 yr programmes) is to have a clear proposed land use map with a legend; a supportive matrix of uses disallowed in each land use Zone and a simplified Development Control Regulations (as distinct from building bye-laws) to be applied to all holdings.
 - c) Each Plan is to be updated once every 5 years and also as and when required through a transparent process through public knowledge and views/comments and where every change is mapped and Plans accordingly updated.
 - d) Each Plan needs to be called an ODP or equivalent when placed in the public domain for comments and a CDP or equivalent when the Plans are statutorily approved. The current practice of draft and final ODP followed by draft and final CDP as in Karnataka is time consuming and unsuited to BMA (and of the State) developmental dynamics.
- v. The approvals are to be only on the basis of the Development Plan by the BMAPC/BBMP for the BMA and by the Municipalities and Panchayats for their respective areas and wards. These bodies should be armed with overriding powers to remove misuse, prosecute and charge deterrent penalties. The Plan and its Regulations should apply uniformly to all those undertaking development, both Government and private sector alike with the onus to prove clear titles vesting with those proposing developments of the built space.
- vi. Government (central, state, local) are generally the major violators of access to and of the provision and use of built space on land. Therefore, except for a fast track process, Government, have to follow the statutory Plans in all respects, especially as the TCP Acts provide for the exemption of Operational Constructions (as strictly defined in TCP Acts) from stipulations of the Development Plan.
- vii. To ensure that compliance is facilitated, the Development Plan, its DC rules and other regulations are to be simplified so as to be easily understood and uniformly applied in a quick and transparent manner. Penalties are to be deterrent in nature and misuse rapidly removed.
- viii. The above are the main effective methods to ensure the integrated and programmed development of land in the BMA. Ideally this should be on the basis of land titles, but as these are not easily recordable, Development Plans are to primarily indicate how various parcels of lands are to be either conserved or used at the appropriate intensity and in a given time span.
- ix. Thus land tenure as a system of access to and control over land and natural resources is possible in the BMA through an urban policy as regulated by BMAPC through its BMPB.

This policy would Inter alia ensure that the various levels of integrated Plans cater to key issues, like inclusive societies where right to shelter and basic services are catered to especially for women and children; and where proper metropolitan agriculture and allied uses, ecological protection and conservation as well as integrated transport and services form the basis for the programmed use of land. This has to take into account the down-top system of governance through defined and non overlapping geographic areas of accountable Ward Councillors and others elected through the State Election Commission system and their interplay with the top down elected representatives through the National Election Commission System. Provisions to enable approved Environment Impact Assessments (EIAs) as also appropriate taxation as LSG matching contributions to central and state exchequer grants are also required so that financially viable Land Use Development Plans at regional, settlement and ward levels offer the basis for integrated growth in the BMA.

5.1.1.3 The Management of Land earmarked for development

- i. Generally, private sector lands are to be developed within a given time span. In any event, they are required to protect their own lands. The BMAPC/BMPB and the Municipalities and Panchayats are to ensure that privately owned lands are used and developed as per the plan and not held back for speculative purposes. Latterly a lot of private companies (or equivalent) are able to access land through the Land Acquisition Act 1894, with danger of long term developmental gestations on its usage apart from other forms of misuse. Strict monitoring for the time bound usage of such lands within the parameters of the Development Plan has now become necessary.
- ii. The management of land owned by Government and its parastatals on the other hand is not easy due to large holdings in several locations. Usurpation for squatting or otherwise of such land is common. Policing and removal of misuse of these lands is largely dependent on the revenue district system of law and order and which in the BMA may not be easy in terms of manpower. The military, operation use establishments like the Railways, Airport Authority and even providers of basic infrastructure (essential services) like processed water, power, telecom have their own policing in place as do Departments of Forests and the like. They too (with the possible exception of the military) would require assistance for land protection from the revenue district system. An assigned use on statutorily defined Development Plans is now increasingly minimizing land usurpations as Courts of Justice (at different levels) are having increasing faith in statutory Development Plans in their pronouncement of verdicts.
- iii. Apart from the policing of large tracts of land earmarked for future use, new lands are also to be accessed for public projects on basis of the Development Plan. Hitherto this has been

largely through the L.A. Act 1894 but with amendments as now made for reapplying the Act for acquired lands not being continuously used for three years, the revised cost of acquisition are making the application of this Act unproductive. This is especially so for large scale acquisition as done in Bangalore earlier (for HAL, etc). Also, the Land Bank System (as in Delhi) has proved counter productive with the DDA as a monolith land owner and developer. Accordingly other alternatives for accessing land are being sought for planned developments.

- iv. Among favoured alternatives to land Acquisition are TDR'S (Transfer of Development Rights) as in Mumbai; TPS (Town Planning Schemes) as in Gujarat and Land Reconstitution (in partnership with land owners) as an extension of TPS.
- v. Within the BMA, the TDR in a limited way could be considered in the BBMP area as a support to urban renewal. In Mumbai it is applicable to small parcels of land in the inner city required for tot lots or small green recreation areas, or for low income housing or for heritage conservation by allowing the owner to use or sell his unutilised FSI/FAR in selected other areas of the city with facilitative incentives. Even so, regulating this system is not easy.
- vi. TPS related to urban renewal in the BBMP and other municipalities could also be considered where through Local Area Plans (LAP'S) inner city footprints are respected but land owners are allowed to use FSI/FAR for organized insitu redevelopment. All owners have to agree to this exercise upfront and which could be possible in small areas, within defined electoral wards.
- vii. TPS in peri-urban or non-urban renewal areas is more feasible with all land owners agreeing to a reconstituted plotted layout where at least 50 percent of their original holdings are available to them for organized built space with proper access and facilities and resultant higher returns. In Ahmedabad, Surat and other large cities of Gujarat, this scheme is highly successful for medium-large layouts (upto 40 hectares). It does not however cater to the BPL within the layout and for whom at least 5 to 10 percent land would be required for development by ULB'S.
- viii. For larger areas (township or urban corridor or growth centre level) land reconstitution could have a greater chance of success in the BMA in new locations in designated areas (outside conservation Zones and prime agriculture lands). In this case, non-urban land holdings are pooled, a scheme prepared and about 15 percent of developed land and/or built space is given to the owners in locations of their choice (from 2 to 3 alternatives) for residential use and as per the layout plan. From the balance (about 85 percent) LSG and Bangalore Metropolitan Development Authority (BMDA) would provide all roads and services, open spaces, social infrastructure and low income housing including amenities from revenue

generated from the project. This is suited for lands in excess of 80 hectares and requires the agreement upfront of all original land owners. Project revenue could also provide LSG/BMDA revenue surplus to match Central/State Grants for infrastructure upgrading. However as most of this land is earmarked for development after 2031, a mechanism is to be processed, where agreements with landowners is signed at or around BMR RSP 2031 Plan approval date for implementation as and when required. In this period the present use should continue, irrespective of change in land titles.

- ix. For lands for essential services and priority Government projects, the LA Act 1894 through section 17 of the Act may have to be continued to be used.
- x. Thus for the BMA, access to land cannot be through large scale land acquisitions and which require several years to develop. Development has to be on the basis of a time bound programmed built environment in tandem with the integrated provision of transport and services as indicated in the Development Plans. These plans are to be in the form of down-top and top-down developmental actions with elected LSG members having accountable rolls. All Plans as rolling Development Plans have to have inbuilt flexibility for change as and when required. This however has to be within a transparent system in the public domain and through which the integrated growth of the BMA has to take place.

5.2 Jurisdictional Organisation and Administrative Modifications

5.2.1 The GoK Initiatives on Spatial Development Framework

As mentioned in section 1.4.1, the GoK has constituted the KRR Committee and the ABide Task Force to outline a new governance framework for Bangalore with the objective of facilitating not just the implementation of the decentralisation agenda but also a structure which will 'nurture the development of the city and the vibrancy of its economy'¹¹¹. The Expert Committee makes a series of recommendations which have been detailed out in section 1.4.1 as also in Annexure-2, section 2.2 & 2.3. Largely the recommendations pertain towards streamlining the governance in the region. However, the recommendations by various committees and studies need to be further streamlined in the context of emerging spatial dynamics to make them implementable. In this context, the BMR RSP 2031 attempts to judge the suitability of all major recommendations for jurisdictional reorganisation and administrative modifications in the context of emerging and proposed spatial development framework taking clue from the emerging issues identified in the previous section. Discussed in the following sections are the consolidated recommendations of the BMR RSP 2031 on jurisdictional reorganisation and administrative modifications and indicative governance framework for BMR.

¹¹¹ Report of the Expert Committee on the Governance in the Bangalore Metropolitan Region and the Bruhat Bangalore Mahanagara Palike, March 2008.

5.2.2 BMR RSP 2031 Recommendations

1. BMRDA jurisdiction to be notified as the Metropolitan Area in future

As a continuation of the BMR SP 2011, the committee suggests that the BMRDA jurisdiction to be notified as the metropolitan area in future. In this light it also recommends that the BMRDA acts as the technical secretariat of the newly designated BMA. The BMR RSP 2031 endorses this on account of the following:

- The formation of BBMP can be seen as a spatial reform which may serve the purpose of allowing a systematic inclusion of the CMC's and the TMC's in the local development plans and the provision of infrastructure. However, it also means exclusion of a large part of the BDA jurisdiction which is primarily rural, from the purview of the enlarged Corporation. Though it may be argued that the BDA can still continue to plan for its earlier jurisdiction, with the implementation of the decentralisation agenda and the BBMP emerging as the local body responsible for urban planning including town planning, the BMA jurisdiction is reduced to a mere 507 sq.km, including the existing Green Belt.
- It needs more than one municipality within a metropolitan area to fulfil the statutory requirement of constituting the MPC. However, in context of the recent formation of BBMP by amalgamating erstwhile BMP with 7 CMCs and 1 TMC within present BMA jurisdiction, the metropolitan area is left with one ULB i.e., BBMP and rest of rural areas and thus loses the functionality to constitute an MPC.

Furthermore, given the numerous human settlements within the BMR, it is important to capitalise on the combined economic potential of these settlements and their resources. In this context, the BMR - RSP 2031 endorses the recommendation of the committee to designate the BMR as the BMA with the BBMP as its core. This in turn calls for a major shift in the political and administrative make –up of the region.

2. MPC to be constituted for Bangalore Metropolitan Area

As pointed out in the previous section, Karnataka is yet to implement the 73rd and the 74th CAA in totality. Given the fast changing spatial context which is increasingly urban with its associated complexities of urban management, a streamlined governance structure capable of managing the region emerges as an imperative. The constitution of MPC with representation from elected representatives of Local Bodies as articulated in the KRR Committee report is perceived to be a useful instrument for achieving the decentralisation agenda. The relevant state acts already provide for constitution of MPC. The recent Gol initiatives of devolving more funds to ULBs through various programmes (like JNNURM, UIDSSMT) indicates the Central Govt's commitment to push the decentralisation whereas associated reform agendas send out a strong message to the states to implement the statutory requirements of 74th CAA in order to maintain ULBs eligibility to get central funds. In this context, it is strongly recommended by BMR RSP 2031 that MPC should be constituted for Bangalore metropolitan Area without any further delay.

In this context the KRR committee recommends legislative upgradation, primarily in its KTCP (1961) and the various LSG Acts to enable the planning and governance of the 8005 sq. kms. (covered by the three revenue districts of BUD, BRD and the RD) through a single MPC (Bangalore Metropolitan Planning Committee - BMPC)

The BMR RSP 2031 endorses this recommendation as it

1. Offers possibilities to the GOK that 3 of its metropolitan areas¹¹² to have MPCs and the rest of the districts to have DPCs for each of them;
2. Enables future State Vision Documents to now give credence to an interplay of MPC's and DPC's (ideally without jurisdictional overlaps) in projecting the states developmental vision along with LSG constitutionally mandated actions;
3. Lends clarity that MPCs and DPCs comprise of their own sets of Municipalities and Panchayats which would be preparing their own detailed Development Plans (20-yr perspective and 5 yearly Programme Plans) through a down top (Municipalities/Panchayats and their LAPs for electoral Wards) and top down (MPC/DPC + State Vision Plans) enmeshed interplay.

Thus an integrated sequence of spatial plans can be established comprising of

1. A State Vision Document
2. Metropolitan Regional Plans and District Regional Development Plans (by MPC / DPCs)
3. Municipal (Mun. Corp / CMC/ TMC / Nagar Panchayats) and Village Panchayat Development Plans and
4. Local Area Plans by the electoral Wards (Municipal and Panchayat) on which basis financially viable projects get credence.

Additionally, the Kasturirangan Committee recommends that the area of BUD be curtailed and made co-terminus with the area of the BBMP and Anekal TMC together. The remaining rural local bodies of the BUD are to be added in the Bangalore Rural or Ramanagaram district in an appropriate manner. In the process the Bangalore Urban district shall reflect its urban character with Bangalore as the primate city and will facilitate suitable interventions for both planning and administrative purpose over a homogeneous area at a district level. The BMR RSP 2031 endorses this recommendation as within the MPC.

The BUD would be a totally urbanised district with revenue district functions but with no DPC and Zilla Panchayats in place. Development Plans for the BUD would be for the BBMP area and the Anekal TMC area. BRD and RD on the other hand would have revenue district functions with both Municipalities and Zilla Panchayats.

With the proposed enlarged BMA (i.e. present BMR) coming under the umbrella of MPC, it will need technical support to perform the functions it is meant for. Also, MPC being a largely political platform, it would need a permanent office for its service. In this context, BMR RSP 2031 is in consensus with

¹¹² In the coming census, Mysore and Hubli – Dharwad are expected to emerge as metropolitan areas and therefore the need for MPC's for these areas.

KRR Committee recommendation of restructuring BMRDA to enable it to perform as the technical secretariat of MPC, with its working knowledge of the new metropolitan area jurisdiction. In terms of the constitution of the MPC, the BMR RSP 2031 endorses the overall structure and constitution of MPC along with the number of representatives recommended.

However, as pointed out earlier, the proposed method for deciding number of elected representative from ULBs based solely on population does not seem to work for proposed BMA jurisdiction in the present scenario. The reason is the supremacy of BBMP over the area with more than 93% urban population share. Taking cognisance of this, the BMR RSP 2031 recommends that the number of elected representatives from ULBs be based on the number of wards in respective ULBs. This will ensure a rational representation considering population, area and the size of electorate of ULBs as illustrated in the table below.

Table- : Representation from ULBs in MPC based on No of Wards				
SI no	ULB	No of Wards as on 2009	%_Share in total no of Wards	No of rep. in MPC
1	Nelamangala	18	3.99%	1
2	Dod Ballapur	31	6.87%	2
3	Devanahalli	23	5.10%	2
4	Hosakote	23	5.10%	2
5	Magadi	23	5.10%	2
6	Ramanagaram	31	6.87%	2
7	Channapatna	31	6.87%	2
8	Kanakapura	27	5.99%	2
9	Anekal	23	5.10%	2
10	Vijayapura	23	5.10%	2
11	BBMP	198	43.90%	14
	Total	451	100.00%	31

In a nutshell, the Committee recommends (purportedly for jurisdictional clarity and implementability with a minimal of overlapping developmental actions) that:-

- 1 The 3 District BMR be called the BMA (Bangalore Metropolitan Area)
- 2 The MPC for the new BMA be called the BMAPC (Bangalore Metropolitan Area Planning Committee).
- 3 The BMRDA function as the technical Secretariat to BMAPC and be called the BMPB (Bangalore Metropolitan Planning Board)
- 4 The BMAPC and the (new) BMPB be given powers (over-riding) for only jurisdictional policies, and spatial planning, regulations, implementation and monitoring but with no developmental powers.

The BMR RSP 2031 endorses these recommendations as they offer clarity to all BMA stakeholders and an implementable metropolitan region platform for all agents of development action with little or no overlaps in policies, planning, regulations and implementation decisions.

3. Organisational and Jurisdictional Alignment

The present framework of different jurisdictions of different parastatals, service providers and sector agencies create overlaps and gaps in the system. It is a hindrance for forward planning of any area / region with different agencies having different level of stakes, objectives and most importantly, data repository for different jurisdictions. In terms of organisation jurisdiction the KRR committee recommends

The present BDA be divested of its planning and regulatory functions and instead be restructured as a larger BMA implementing agency and called the Bangalore Metropolitan Development Authority (BMDA) with powers to execute projects under the Companies Act (if needed) and also to undertake projects for LSG (other than the BBMP area) and if required to do so;

Also crucial parastatals like the BWSSB and the BMTC to have jurisdictions co-terminus with the BMA (BMAPC/ BMPB) and be called the Bangalore Metropolitan Water and Sewerage Board (BMWSB) and the Bangalore Metropolitan Land Transport Authority (BMLTA) respectively.

The functions by the Karnataka Slum Clearance Board be passed on to the BBMP (in its jurisdiction) and to the BMPC (in the rest of the BMA) under the guidance of the BMAPC, so as to more effectively address the issue of inclusive neighborhoods , wards, and settlements within the BMA.

The BBMP should be in total charge of education- primary, higher and secondary, within its jurisdiction. They should also likewise be totally in charge of preventive health and SWM;

The BMR RSP 2031 endorses these recommendations particularly as it clearly demarcates functions between the BMAPC / BMPB, the BMDA and BBMP as well as the major parastatals of the BMA.

The KRR Committee also recommends larger powers to the BBMP under a new GBMC Act (Greater Bangalore Municipal Corporation Act) whereby;

1. The Mayor gets elected directly for 5 years and has executive powers.
2. Eight functional committees be created including one each for finance, projects, municipal/ social services, administration and planning) each under an elected Corporator.
3. A Chairman of the Council (in lieu of the separately elected Mayor) be elected from among the Corporator and
4. The State to have powers to dissolve the Corporation (under limited conditions)

The BMR RSP 2031 endorses the above recommendations, as refinement to the Mayor in Council system of Kolkata.

4. DPCs should not be constituted for BMR (i.e., proposed BMA)

In accordance with the last census (2001), the State of Karnataka is required to have just one metropolitan Planning Committee (MPC). While it is possible that the census of 2011 would show Mysore and even Hubli Dharwad as metropolitan cities (with the state then having 2 or 3 MPC's), at present the exercise is restricted to the Metropolitan Region comprising of Bangalore City Corporation and its region which is under intensive developmental pressures with Bangalore being the State Capital and a primate metro-pole of the state, with national and international linkages. This region is composed of three districts and thus, are eligible for having DPCs for each of them. At the state level, although the DPCs have been constituted in Karnataka, the initiative has largely remained on paper. In case of BMR (i.e. proposed BMA) while it may be argued that the DPC is needed for the following reasons i) as the region is a large area comprising of three districts, the MPC alone might not be adequate and ii) in the emerging urban spatial canvas with many more settlements within the BMR are converted to urban, it calls for a intermediate body between the ULBs and the MPC to integrate district level issues and thus DPCs for its constituents districts are required as a level below MPC for atleast two of its districts (i.e. for BUR and RD, barring BUD as it has the Metropolis itself and thus would directly come under the umbrella of MPC), the BMR RSP 2031 does not support this argument for the following reasons.

1. Given the largely political constitution proposed for both MPC and DPC¹¹³, there might emerge serious conflict of interests between the two bodies if they have functional mandate over a common area. The 73rd and 74th CAA have not given clarity on the relationship between these two strongly powerful bodies and thus, the DPCs might not have any constitutional liability to act as a body at a level below the MPC. Thus the two plans (the Metropolitan Region Development Plan and the District Development Plan) at different levels might not be aligned with each other. In this context, the conflict between these two bodies will be unavoidable which will in turn hamper achieving the objectives of decentralisation agenda. On the other hand, an MPC is simply unavoidable for the region as it is the direct hinterland of Bangalore metropolis and thus faces growing pressure of emerging urban dynamics in and around the metropolis.
2. There are instances where a metropolitan area cuts across districts and thus having a DPC and MPC together becomes unavoidable. However from jurisdictional point of view, BMR is in an advantageous position covering three full district area and not parts of them. Thus with a well thought out mandate and adequate official and technical strength, the MPC can serve the purpose of DPC for its constituent districts without having any jurisdictional conflict at district level.
3. Lastly, considering the necessity of making BMR as one common jurisdiction for parastatals / nodal agencies / service providers as recommended in this section earlier, having MPC and DPC together in BMR may lead to ambiguity in working relationship between the parastatals and the DPC/MPC. With both bodies being politically represented and constitutionally empowered, the parastatals might face divergent, if not conflicting, directions to follow which shall prove counter effective for the region in long run.

¹¹³ Refer Annexure-2, section 2.4 for Constitution of DPC as per Section 310 of The Karnataka Panchayati Raj Act, 1993

In this context, the BMR RSP 2031 endorses the Kasturirangan Committee’s recommendation of not having DPCs for BMR districts.

5. Urban planning including Town Planning - The domain of the LSG

Although a non-negotiable step towards implementing and realising the main objectives of 73rd and 74th CAA, this has largely remained on paper in many states including Karnataka. The glaring gap in capacities of ULBs to carry out planning tasks is also a fact. In this context, the BMR RSP 2031 recommends that planning functions to be devolved to all ULBs and Gram Panchayats with adequate technical and financial support while the existing LPA jurisdictions shall be abolished¹¹⁴. That way the local bodies can act as the nodal agencies for their respective jurisdictions as proposed in Plan Bengaluru 2020, Bengaluru Region Governance Act (BRGA), 2009 by ABIDE committee. Alternatively, the MPCs can be made adequately capable of assisting Local Bodies making their own plan. In that case, a revised organisational structure need to be worked out for BMRDA to adequately play the role of MPC secretariat with enhanced mandate. The workability of having district-wise subordinate offices for MPC (like present LPA offices under BMRDA) can be explored in this context.

5.2.3 Emerging Spatial development Canvas - The Restated Spatial Planning Process in the Proposed BMA

Based on the above recommendations, the proposed planning framework for BMR is illustrated in the diagram below:

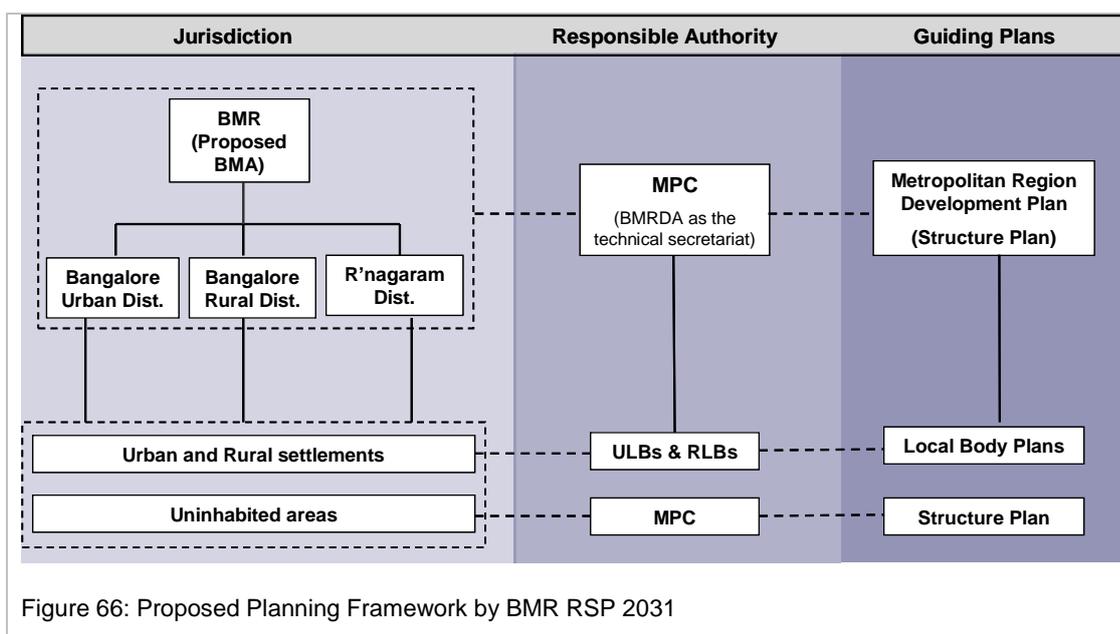


Figure 66: Proposed Planning Framework by BMR RSP 2031

The restated planning process would essentially mean the following:

- To tie up with the 73/74, C. A. Acts the spatial plans required for investments in the BMA and integrated in an hierarchal manner comprise of:-
 - The BMR Plan -2031 for the BMA (by the BMAPC/BMPB)

¹¹⁴ Also proposed by ABIDE committee in Plan Bengaluru 2020, Bengaluru Region Governance Act (BRGA), 2009. Refer Annexure-2, section 2.3 For details

- Plan for each settlement in the BMA i.e. for the BBMP area (BUD) the ten ULB's and the 134 village Panchayats (VP's) – in - by the concerned Municipalities and Panchayats .
 - Plans for each ward of the municipalities and Panchayats in the BMA by the concerned electoral Wards and through the participatory process
2. Each plan at all three levels are to comprise of :-
- A 20 year Perspective Development Plan -2031 (and not just a master plan with its stress on land use);
 - A 5 year Development Programme Plan based on annual budgets (and which enables the perspective plan to be upgraded every 5 years as a rolling plan);
 - Each plan to be called an Outline or Draft Development Plan (ODP/DDP) at start of the objections/suggestions process and a Comprehensive Development Plan (CDP) at the end of the process.
3. Apart from once in five years, each Plan can be revisited as and when required and updated but through a transparent mapped process of objections /suggestions, The emerging system of integrated planning as frameworks for investment in the BMA is explained schematically in three charts as enclosed.
4. Through this system the following terms /terminologies require a revisit
- The term Master Plans replaced by the term Development Plan
 - The term City Development Plan (CDP) of JNNURM gets expanded to incorporate ward level plans each with their own 5 year Development Programme based on annual budgets.
 - The term Development incorporates Conservation whereby each level of plan is to first map the positive constraints of environment and heritage before projecting the development opportunities of infrastructure including transport before prescribing land use and built-space through BMAPC approved projects;
 - With stress on its participatory contents through elected Municipalities and Panchayats and composed of electoral Wards, the terms town and village, urban and rural, urban agglomeration, outgrowth and census towns gets restated within defined LSG jurisdictions and their Wards, each with accountable Councilors or Panchs.
 - Each Development Plan comprises of a land use map with a clear legend and at a standard comparable scale with, a matrix of uses allowed within each land use zone; and a simple Development Control Regulation (DCR) chart. This DCR is not to be confused with Building Bye-Laws and which is an established LSG function in terms of health, building stability and fire safety.
 - The written statements are to be kept to the minimum and are to incorporate sections on demographic projections, economics, (industry, commerce, and the like) social infrastructure, recreational and heritage uses, transport and other services each as sub plans of the

Development Plan through land use trade offs and density controls in view of land being an increasingly scarce resource not only in the BBMP area but also the rest of the BMA.

- Projects whether for ecological / heritage conservation or for time-bound development or operational use get embedded within Wards/ and settlements and which in turn are within Metropolitan Area Regions. Clearly for the BMA no DPC is required as even village Panchayats are subject to urban / metropolitan stress for which the BMAPC / BMPB is to be legislatively strengthened to deal with. It is also for consideration whether state level institutions like Rural Development Agencies are required in the BMA as the large rural tracts within this area would be subject to peri-metropolitan pressure on uses and which the BMAPC / BMPB should be able to address through inclusive BMA land use trade-offs and where uses like metropolitan / urban agriculture and horticulture; wetlands and watersheds; metropolitan / urban forestry and orchards; areas of scenic significance, archaeological parks and the like get credence in metropolitan level developmental land use locations or re-locations in the context of the BMA's global, national, state and regional importance.

5.3 Recommendations for priority plans and projects

As indicated in the BMR RSP 2031 strategy the clusters and nodes are to become the focal points for development. These clusters and nodes will not be in conflict with the interconnected proposed regional green network and will be linked with a network of transportation corridors.

The form of development envisaged by the Preferred Strategy for the Draft BMR Structure Plan is to be promoted through:

- Institutional and policy innovations;
- Reciprocal institutional strengthening and capacity building to establish sustainable land use planning and management capabilities;
- Development initiatives designed to encourage growth in clusters and nodes where this is consistent with the strategy and discourage it where it is not; and
- Infrastructure investment measures to support growth.

These developments are to be concentrated (particularly during the initial years of strategy implementation) in the identified clusters and nodes within the BMR, and incorporates strategic corridors connecting Bangalore to other major towns. Given below is a summary of the programmes and projects that are recommended in order to implement the Preferred Strategy and associated BMR RSP 2031.

Table 17: BMR PLAN PROGRAMMES

Programme Title	Description
Plan Preparation, Capacity Building & Institutional Strengthening	
Upgrading of the Land Use Management and Resource Data and Geographic Information System	In order to make the BMR RSP 2031 strategy implementable from the perspective of the proposed land cover, zoning, cluster and nodal development and recommendations and projects it is imperative for the BMRDA to take up the task of creation of a comprehensive GIS data base in 1:5000 scale that incorporates a common database consisting of all types of spatial and non spatial data of BMR including parcels (survey numbers) of land on priority. The present plan has been prepared on a GIS database of scale 1:50,000.
Revising and up-dating the RMP 2015 and interim master plans of the LPAs within the framework of the BMR RSP 2031	In light of the emerging institutional organisational & restructuring prospects; the future updation of the master plan of Bangalore and of the local planning authorities is to be within the framework of the structure plan. In general, the master plan preparation process is to be taken up by the ULBs. In addition, for more effective co-ordination the plan for the BMA should also follow the same route. Currently the statutory Master Plan is prepared by the BDA's planning unit. In future this could mean the transfer of this unit to the BBMP and in parallel augmenting and strengthening its capabilities and capacities.
Institutional reorganising and requirement for training and capacity building	In total the plans necessary under the GoI's guidelines would comprise of only the Metropolitan Region Development Plan (Structure Plan) and the Local Body Plans (Master Plans). It is proposed that in continuation to the preparation of the BMR RSP 2031, Plans for preparation and implementation of management capacity building and institutional restructuring and strengthening follows the structure planning process. LPAs and other ULBs are the vehicles around which the programme would be organised.
Regional level facilities	

Center for Excellence in Education	Ramanagaram – Channapatna
Regional Park and Recreational Facilities	Bidadi - Harohalli
Fashion Hub & Regional Commercial Center	DodBallapur
Educational Complex	Anekal
Agri based Integrated Facility	Kanakapura
Agri based Processing Facility	Magadi
Dairy and Poultry Facility and Agri-based Processing Facility	Vijayapura

Table 18: BMR TRANSPORT PROGRAMMES

Programme Title	Description (Refer Transport recommendations map)
Roads and Transport	
IRR re-alignment (Feasibility to be studied)	The new alignment would result in the IRR joining the Devanahalli town ring road toward the NE and Anekal towards the SE. (Refer proposal map) The re-alignment of this road would reduce the length of the IRR to avoid close proximity between major roads.
PRR re- alignment (Feasibility to be studied)	The new alignment would result in the PRR joining the NICE peripheral road at its NW and SSE locations. The re-alignment of this road would avoid duplication of ring roads an close proximity to each other.
Development of major roads a) Peenya to Nelamangala to Tumkur (NH 4) b) Bangalore to Electronic city to Hosur (NH 7) c) Bangalore to Devanahalli (NH 7) d) Bangalore to Hosakote (NH 4) e) Bangalore to Channapatna (SH 17)	This proposal addresses all the major roads radiating out of Bangalore and would improve the connections between a number of towns around the BMA. The proposal includes increasing road capacity through effective ROW design and correction, road markings and service lane provision on major roads. Development of these roads is pertinent to connectivity not only between the core and towns in the BMR but also clusters and nodes and is to be upgraded on priority.
Public Transport	

<p>Development of Commuter rail service</p> <p>a. Bangalore – Peenya- Nelamangala - Tumkur</p> <p>The metro rail system upto Peenya can be extended to Nelamangala.</p> <p>b. Bangalore- Bommasandra- Hosur</p> <p>c. Bangalore – BIA- Devanahalli</p> <p>d. Bangalore- Bidadi- Ramnagaram- Chennapatna- Mysore</p>	<p>This proposal would upgrade the line from a single to a double track, and provide electrification which would increase the capacity of the railway line for both passenger and freight traffic.</p> <p>Rail connections to major towns already exist and doubling of the tracks is suggested on a priority basis</p>
<p>Bus Rapid Transit System</p> <p>a. Bangalore – Peenya- Nelamangala</p> <p>b. Bangalore- Bidadi</p> <p>c. Bangalore – Hoskote</p>	<p>This proposal could be used as feeder systems to the mass transit systems like CRS, Metro and Mono Rail. A proposal is in the pipeline to introduce BRTS system along the PRR. This system can be extended to routes that have high traffic.</p>
<p>Integrated multi modal interchange hubs</p> <p>a). Electronic City on Hosur Road</p> <p>b). Bidadi on Mysore Road</p> <p>c). Nelamangala on Tumkur Road</p> <p>d). BIAAPA area on Devanahalli Road</p> <p>e). Kondasapura on Kolar Road</p>	<p>This proposal is to have facilities ranging from parking of private vehicles to bus/ metro/ monorail or railway access. This ease of interchange of modes as well as commuter amenities is to be provided to allow for seamless, efficient and comfortable travel for the public.</p>
Freight transport Infrastructure	
<p>Freight hubs</p> <p>a. Nelamangala near Dobaspet</p> <p>b. Attibele near Hosur</p> <p>c. Bidadi near Ramnagaram</p> <p>d. Devanahalli - Near the International airport</p> <p>e. Kanakapura - Near Harohalli</p>	<p>This proposal is to have associated trans-shipment, warehousing and related facilities and services. The projects would reduce street parking of trucks within the BMA and release road space for use by other traffic.</p>

Table 19: BMR INFRASTRUCTURE PROGRAMMES

Programme Title	Description (Refer Transport recommendations map)
Economy	
Guidelines for land allocation	Comprehensive guidelines on land allocation for the BMR which elaborates on the type and location of various activities
Feasibility studies for regional level facilities	Detailed feasibility studies for developing the BMR as nodal area through the introduction of regional level facilities such as research, education, health, high tech industries, business tourism destinations etc
Local economic plans and cluster level economic studies	Local economic development plans to be taken up as part of local area development plans. Cluster level studies also needs to be taken up for economic development
Water Supply & Sanitation Infrastructure	
Implementation of water conservation measures	Rain water harvesting should be made mandatory for all public, commercial and private buildings having a built up area of 100sqm and above. Ground water recharge pits for borewells should be made binding so that rainwater is harvested at the borewell point.
Laying of water supply mains	This proposal indicates the provision of 'ring mains' along the peripheral ring road as well as 'radial mains' for the supply of water to areas outside BBMP.
Detailed engineering assessments	Detailed engineering assessments of requirements for augmentation of the sewerage systems in areas in the BMR that are yet to be covered are to be undertaken. Assessments to estimate the requirements for waste water treatment and well as the introduction of appropriate technologies. Reuse of treated water for non potable uses also needs to be encouraged.
Policy formulation	Developing a a regional or even state-wide policy on water extraction
Solid waste management Infrastructure	
Setting up of integrated solid waste management sites	Several sites have been authorised by the KSPCB within the BMR for the setting up of land fill sites. BMR RSP 2031 is in agreement with these proposals and recommends that they be converted to integrated solid waste management sites.
Housing	
Housing for the EWS	KSCB should earmark government land for group housing for the economically weaker sections and construction could be undertaken in joint venture with developers.
Assistance in land pooling	KHB to act as a facilitator in land pooling activities and further allocate to KSCB or infrastructure agencies like BDA for developing and construction of housing especially for the poor.
Programmes and surveys	Programmes to carry out regular housing needs surveys and maintenance of an appropriate housing management information system. Innovative housing solutions such as nano housing should also be encouraged.
Land use and Environment	
Development of waste lands	Development of wastelands and degraded landscapes for productive uses such as plantations, bio diversity parks and social forests.
Planning urban extensions as transition zones	Urban extension areas to be based on the Developable lands Map and land pooling to be used as a tool to integrate these transition zones. Refer to Policy LU2.
Relocation and decentralization plan	Develop a Relocation and Decentralization Plan for relocating and phasing out of activities including polluting industries, wholesale market, and the City bus terminus from the core to the rest of the BMR in a stipulated time frame.
Assessment of proposed conurbation areas	The proposed conurbation areas in the Interim Master plans and other sanctioned Development Plans need to be assessed to ensure more compact development.

Green belt management	To retain and conserve the remaining portion of the green belt, amendment of the RMP 2015 needs to be considered as per the KTCP Act 1961, to limit conversion of agricultural into non-agricultural uses and expansion of existing development. All new development is to be permitted in accordance with the development control regulations of the Conservation Zone -3 of the BMR RSP 2031.
Guidelines for natural resource extraction	Well-developed guidelines for monitoring, extraction, management and rejuvenation of natural resources are required. A proper accountability framework needs to be developed and adhered to, that holds the miner responsible for the safe and sustained use of the site and its resources, including measures for rehabilitation and rejuvenation of the natural environment.
Heritage	
Identification, listing and grading of heritage areas	The entire heritage, built, cultural and intangible heritage in the region should be identified through the process of listing. Listing format as adopted by Indian National trust for Art and Cultural Heritage (INTACH) could form the basis for the listing of heritage. Grading is to be based on significance.
Formation of a heritage cell	The heritage cell will assist the Local Planning Authorities in preparation of listing of heritage, preparation of conservation plans for conservation areas and framing of regulations which will be incorporated in the Local Area Plans.
Development of identified tourism destinations and routes	The various tourist destinations need to be linked to form circuits. The circuits could be developed on a theme or could offer a complete experience on various aspects from Nature to Pilgrimage. Enhanced accessibility and amenities need to be provided.

Annexure

ANNEXURE 1: INTRODUCTION

ANNEXURE 2: GOVERNANCE

ANNEXURE 3: LAND CAPABILITY ANALYSIS

ANNEXURE 4: DEMOGRAPHY

ANNEXURE 5: POPULATION DISTRIBUTION SCENARIOS

ANNEXURE 6: CLUSTERS AND GROWTH NODES

ANNEXURE 7: ECONOMY

ANNEXURE 8: TRANSPORT

ANNEXURE 9: HOUSING

ANNEXURE 10: PHYSICAL INFRASTRUCTURE

ANNEXURE 11: SOCIAL INFRASTRUCTURE

ANNEXURE 12: HERITAGE AND TOURISM

ANNEXURE 13: POPULATION RE-DISTRIBUTION

(As discussed with ABIDe committee)

ANNEXURE 1: INTRODUCTION**Section 1.1: 12th schedule of 74th Constitutional Amendment Act of India**

The 12th Schedule of the 74th Constitutional Amendment Act of India, defines 18 new tasks in the functional domain of the Urban Local Bodies, as follows:

- 1) Urban Planning including town planning.
- 2) Regulation of land use and construction of building.
- 3) Planning for economic and social development.
- 4) Roads and bridges.
- 5) Water supply for domestic, industrial and commercial purposes.
- 6) Public health, sanitation conservancy and solid waste management.
- 7) Fire services.
- 8) Urban forestry, protection of the environment and promotion of ecological aspects.
- 9) Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded.
- 10) Slum improvement and up gradation.
- 11) Urban poverty alleviation.
- 12) Promotion of cultural, educational and aesthetic aspects.

Section 1.2: Methodology Adapted for Preparation of BMR- RSP 2031

The BMRDA Structure Plan is to be prepared in two main stages which will be divided into a number of tasks. This report pertains to Stage 1 of the project and has been further elaborated as follows:

- STAGE - 1**
- Task 1: Project Initiation** - Work method, team mobilisation
 - Task 2: Data Collection** - Data collection, preliminary studies and interviews
 - Task 3: Validation of old data/ Review of earlier plans and proposals** - All plans and proposals prepared at State, regional, city, LPA and micro levels to be reviewed. Case studies will also be explored
 - Task 4: Preparation of the GIS Base Map** - Finalizing the detailed GIS architecture that will lead to the creation of the consolidated GIS database through assessment and compilation of all data collected
 - Task 5: Existing situation Analysis: Regional and LPAs** - This stage addresses the salient features of urban development, speculating on the future challenges of the region and its LPAs and presents the initial outlines of the development scenarios
 - Task 6: Land capability Analysis (LCA)** - LCA through a detailed methodology maps the environment, demography, transport and other sectors to bring out the potentials and conflicts of parcels in the BMR
 - Task 7: Formulating General Strategic Approach** - This stage shall synthesize the strategic approach towards formulation of the Vision, based on an understanding of the issues and potentials that the BMR poses
 - Task 8: Vision formulation** - Based on the understanding of the existing context, and the LCA, possible Vision for development of the BMR shall be delineated

Task 9: Scenario Development and Strategies - Strategic choices for spatial and non-spatial development will be made through several scenarios. Each shall be accompanied by hypothesis for the future, which illustrates the significance of each choice, direction of urban development and its spatial consequences to make the right urban planning choice

S T A G E - 2

Task 10: The BMRDA Structure Plan: Formulation of Policy, Zones,

Task 11: Priority plans and projects

Task 12: Adaptation of all spatial and non-spatial data on a GIS platform

Task 13: Suggested next steps

Task 14: Submission of preliminary report, drawings

Task 15: Project Completion: Submission of final report, drawing, GIS data base, all suggestions at the previous level duly incorporated

Section 1.3: Overview of BMR SP 2011 Policies

Land Resource Management - provide information on land cover and changes in the uses of land to the public through a land resource inventory.

Forest Resource Management - Protection, expansion and upgradation of forest lands is recommended

Agricultural Resource Management - Conservation of prime agricultural land for their high productivity value, upgrading of single cropped land were the policies recommended. In terms of agro economics the policies to prevent indiscriminate use of electricity and management of watershed development programmes have been recommended.

Water resource management- Protection of surface water bodies and induce new life for old water tanks. Discouragement of large water based activities and the prevention of over exploitation of ground water

Watershed management – Restriction of developments in aquifer recharge areas and along the waters

- **Environmentally sensitive areas** - Protection of environmentally sensitive areas and national parks. Area conservation policies for heritage sites

Wastelands Developments - Wasteland conversion and development

Mining and Quarrying- Controlled and monitored mining and quarrying with environmental protection parameter

Green belt management- Permission to land uses that help upgrade existing social facilities within village limits and outside the village limit uses will be permitted in accordance with structural plan policies

Development opportunities -Urban and industrial development to be encouraged more in the western segment rather than in the eastern segment due to water resource problems. Land for industry to be in key strategic locations accessible to major highways and rail networks. Ribbon development should be contained as focused 'nodal' development located at key strategic locations.

▪ **Economic Development Policies**

The policy guidelines recommended has given due importance to environmental aspects. Salient features of the recommended policies are:

- Strategic environmental guidelines for location of proposed industrial areas;
- Place of work and residence and public transit to be integrated with industrial development
- Industrial areas to have common day care facilities to facilitate better work participation by women

▪ **Transport Policies**

The policy guidelines to improve the regional accessibility by concentric arterial roads beyond conurbation area of BMA as well as facilities such as bus terminals have been recommended. Policies for enhancing rail and freight transportation facilities have also been given in the structure plan policy.

▪ **Infrastructure Policies**

The principle adopted in devising the policies in this sector has been to encourage decentralization from Bangalore City to BMR and other districts of SKR. These policies formed a framework for the development of infrastructure in the region.

▪ **Housing**

Policies prioritized access to housing in the growth centres and new urbanisable blocks. Provision of housing for the urban poor at subsidized prices, restructuring of Karnataka Housing Board (KHB) and programmes to carry out regular housing needs surveys were the other significant policy measures recommended

▪ **Tourism And Recreation**

Importance for recreational open spaces has been given as policy guidelines. It is recommended as a policy to identify within the BMR that are suitable for the development of visitor accommodation. Policy guidelines highlight the importance of establishing recreational open spaces that cater at the regional level. The policy also recommends development of tourism infrastructure and visitor accommodation.

Section 1.4: Case Studies

This section provides an overview of some of the regional plans prepared at the national and the international level. While there are a host of case studies available, attempts were made to narrow the focus to take some of the most relevant case studies; two in the Indian context and four international ones. These are elaborated further in this section. What emerges as a commonality in all these efforts is that the plan perspective focuses primarily on managing the growth and development in the region by keeping the ecological characteristics of the spatial unit as the underlying factor. Some of the common elements that emerge consistently in most of the plans are the following:

1. Management of growth and development of the region keeping protection of natural resources as the central concern. This requires the mapping of the ecological parameters and posing the same as positive constraints in the area.
2. Based on the above creating a green infrastructure and open space network spelling out conservation as the primary focus. Thus the regional form and character of the spatial unit is largely determined by the natural environment and other ecological parameters that exist.
3. Managing and developing the region through a hierarchy of urban centres and focal points

An insight into this literature not only broadened the perspective but also provides a framework for evolving the guiding principles and subsequently the vision and strategy for the revision of the plan.

1. National Case Studies

a) National Capital Region (NCR) ¹

The first regional plan for National Capital Region was prepared in 1981 by the TCPO. However, after the enactment of National Capital Region Planning Board Act in 1985 and consequent constitution of National Capital Region Planning Board, the NCR Plan - 2001 was the first regional plan approved under NCRPB Act. After subsequent revision of the 2001 Regional Plan, the next Regional Plan-2021 was prepared and was approved under NCRPB Act-1985 in 2005

Vision/ Goal

To promote growth and balanced development of the National Capital Region.

Objectives/ Principles

To harness the spread of developmental impulse and agglomeration economies generated by Delhi for harmonised balanced and environmentally sustainable spatio-economic development of the NCR with effective cooperation of the participating states.

¹ Source: MMRDA

Table 1 Statistical Details of NCR

Place	Area (SqKm)	Population in Millions	Horizon Year	Year of Planning
New Delhi, India	33578	13.8 (2001)	2021	2001
Policy Zones: 2021				
<ul style="list-style-type: none"> ▪ NCT Delhi ▪ Central National Capital Region (CNCR) ▪ Highway Corridor Zone ▪ Rest of NCR 				

Source: Regional Plan for NCR 2001 – 2021

Strategies

- Time bound and phased approach to stop piecemeal and ad hoc decisions: preparation of plan of action with estimates and dovetailing the same with 5 year plans
- Encouraging private sector participation
- Identifying institutional roles and responsibility for implementation of policies and identification of legal provisions for the same
- Strategies for management structure, resource mobilization

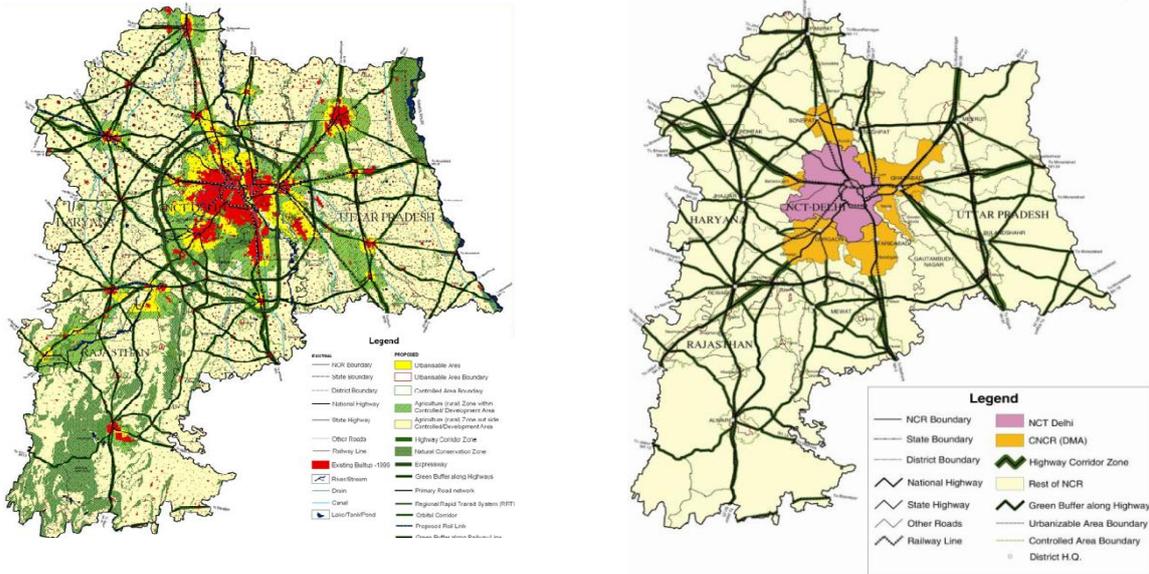


Figure 1 Regional Plan of NCR indicating built up areas and possible urbanisable areas²

Figure 2 Policy Zones within NCR (as per 2021 Plan)

b) Mumbai Metropolitan Region (MMR)³

The first Mumbai Metropolitan Region Plan (then known as Bombay Metropolitan Region) was prepared for the horizon year 1991. The plan included certain strategic considerations, but were overshadowed by the operative provisions of the law that concern only land use and development control. The Regional Plan for the MMR 1996-2011 attempts to respond to these imperatives.

Vision/ Goal

The overall goal of the Revised Regional Plan for the MMR 1996-2011 seeks to promote and sustain growth and social justice in a resource efficient manner.

It facilitated increased investment by the private sector in infrastructure and other developments; enabled appropriate structural changes in the regions’ economy; and permitted adoption of land use policies that respond to market potential.

³ Source: MMRDA

Table 2 Statistical Details of MMR

Place	Area (sqkm)	Population in Millions	Horizon Year	Year of Planning
Mumbai Metropolitan Region	4355	19.29 (2001)	2011	1996
		22.40 (2011)		
<ul style="list-style-type: none"> ▪ 4 Districts: Mumbai City and Mumbai Suburban, parts of Thane and Raigad ▪ 7 Municipal Corporations: Greater Mumbai, Thane, Kalyan, Navi Mumbai, Ulhasnagar and Mira-Bhayandar, Bhiwandi-Nizampur ▪ 13 Municipal Councils ▪ 17 Urban Centres ▪ 1003 Villages ▪ 40 Planning authorities 				

Source: Extract from Regional Plan for MMR 1996 – 2011

Objectives/ Principles

1. Facilitate and promote economic growth of the region;
2. Improve quality of life, particularly of the poor and deprived;
3. Minimise adverse environmental impact that may occur in the process of economic growth;
4. Improve the efficiency of existing methods of resource mobilisation;
5. Adopt innovative methods of resource mobilisation, and facilitate, attract and guide private investment in desired direction;
6. Promote effective citizen participation in the process of development through decentralisation of institutions.

Strategies

Creation of a poly-nucleated structure through development of growth centres. This strategy was adopted as multi-nodal or poly centric urban structures accommodates increased freedom of location, and allows a larger size of urban area rather than a mono-centric city; and that the development of the polycentric structure is associated with and helpful to large cities. Much efforts and investment have gone into development of the growth centres and the strategy continues to remain valid even in today's context in the MMR.

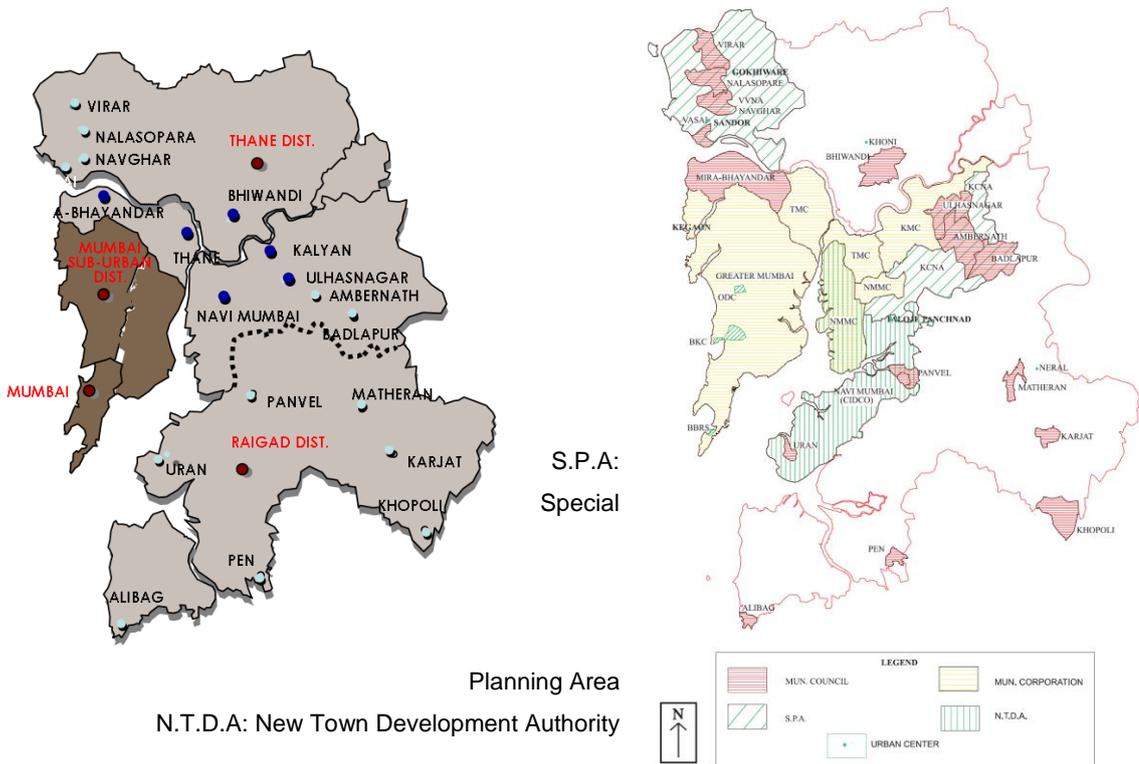


Figure 3 Map of MMR with Growth Centers⁴ (Left)

Figure 4 Map of MMR indicating various planning authorities (Right)

2 International Case Studies

a) Regional Plan for Central Puget Sound Region, USA (CPSR)⁵

The Regional Plan for Central Puget Sound Region aimed at linking urban design to regional long term planning in a way that would be useful to other regions and communities throughout Washington State. This was made possible through a grant awarded by the Washington State Department of Community Trade and Economic Development (CTED).

Vision/ Goal

To attain environmentally friendly and economically successful growth pattern that can be efficiently served by infrastructure, services, and amenities.

4 Source: MMRDA
5 Source: Regional Plan of CPSR

Table 3 Statistical Details of CPR

Place	Area (SqKm)	Population in Millions	Horizon Year	Year of Planning
Puget- (Pacific Northwest, USA)	16291	3.5 (2011)	2040	Adopted- 1995, Amendments-2005

Source: Regional Plan of CPSR

Objectives/ Principles

- Regional form and character are fundamentally based on the natural environment and the ecological processes that support it
- Issues can be better addressed in a holistic manner when a systems approach is employed that considers planning issues in a multidimensional, multidisciplinary manner
- From the site to the region design values needs to be reflected equally at all scales
- Transition needs to be from a landscape of competition to a landscape of cooperation.

Strategies

- Continue the development of a hierarchy of urban centers and focal points
- Create a green infrastructure and open space network
- Recycle Existing Urban Areas
- Transform industrialised estuaries and floodplains
- Protect threatened rural areas and resource lands
- Restructure portions of automobile-oriented suburban areas

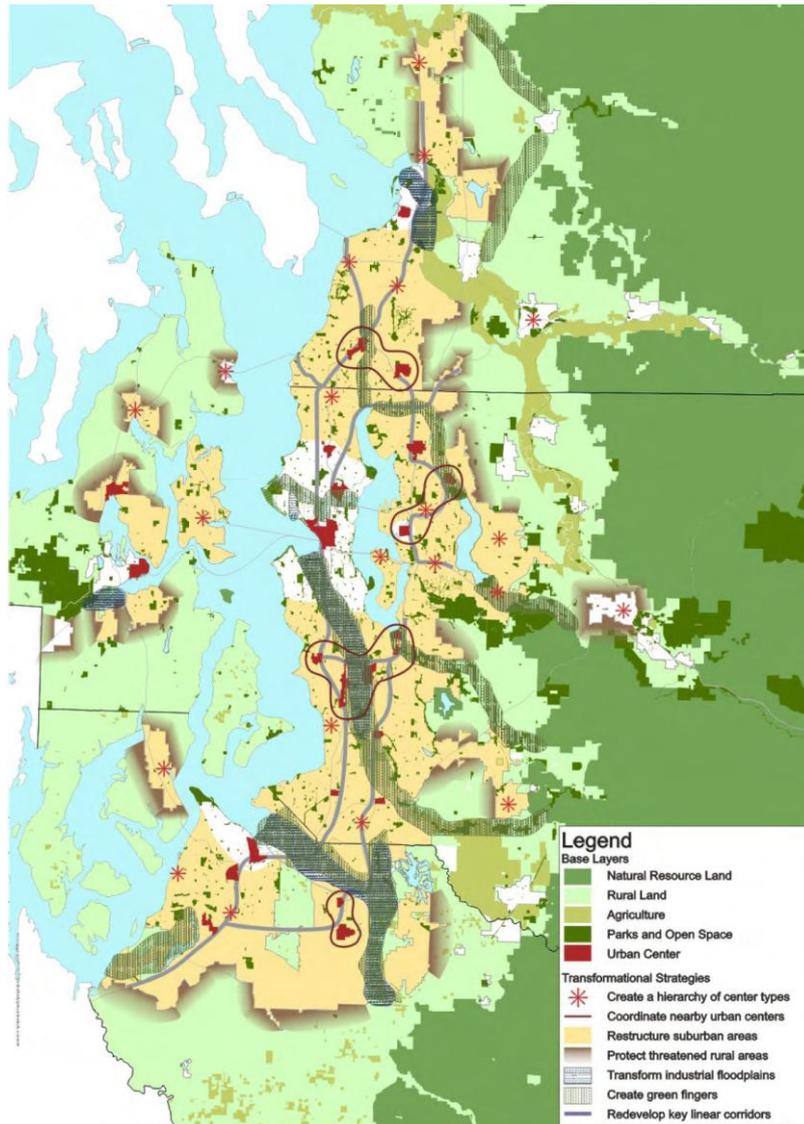


Figure 5 Pictorial representation of the Strategies employed in CPSR⁶

⁶ Source: Regional Plan of CPSR

b) Regional Plan for Portland, USA⁷

Portland's regional governing body Metro⁸ in 1992 made regional growth management its primary mission. The charter required adoption of the Future Vision and a long-term statement of the region's outlook and values. It also required a comprehensive set of regional policies on land use, transportation, water quality, natural areas and other issues of "regional significance" all of it articulated in the Regional Framework Plan.

Vision/ Goal

Management of growth, protection of natural resources and improvements to facilities and infrastructure while maintaining the region's quality of life is envisaged through the concepts of land use and transportation policies.

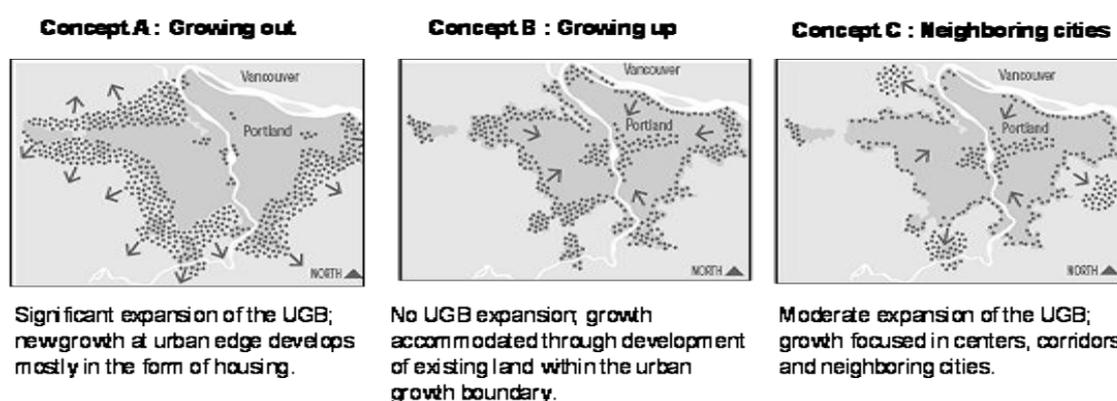


Figure 6 Growth Scenarios of Portland, USA

Table 4 Statistical Details for Regional Plan for Portland

Place	Area (SqKm)	Population (Millions)	Horizon Year	Year of Planning
Portland - USA	16291	3.5 (2011)	2040	Adopted- 1995, Amendments-2005

Source: Regional Plan of Portland, USA

Objectives/ Principles

- Accommodating projected growth in the local comprehensive plans
- Formulating a regional parking policy
- Management of water quality and floodplain
- Regulations for new large-scale retail developments
- Coordination with neighbouring cities
- Coordination of transportation and land-use planning
- Affordable housing program recommendations

⁷ Source: Regional Plan of Portland, USA

⁸ Metro: regional governing body, which provides a regional forum where cities, counties and citizens can resolve issues related to growth. Metro serves more than 1.4 million residents in Clackamas, Multnomah and Washington counties and the 25 cities in the Portland region.

Strategies

- Continue the development of hierarchy of urban centres and focal points
- Create a green infrastructure and open space network
- Recycle existing urban areas
- Transform industrialised estuaries and floodplains
- Protect threatened rural areas and resource lands

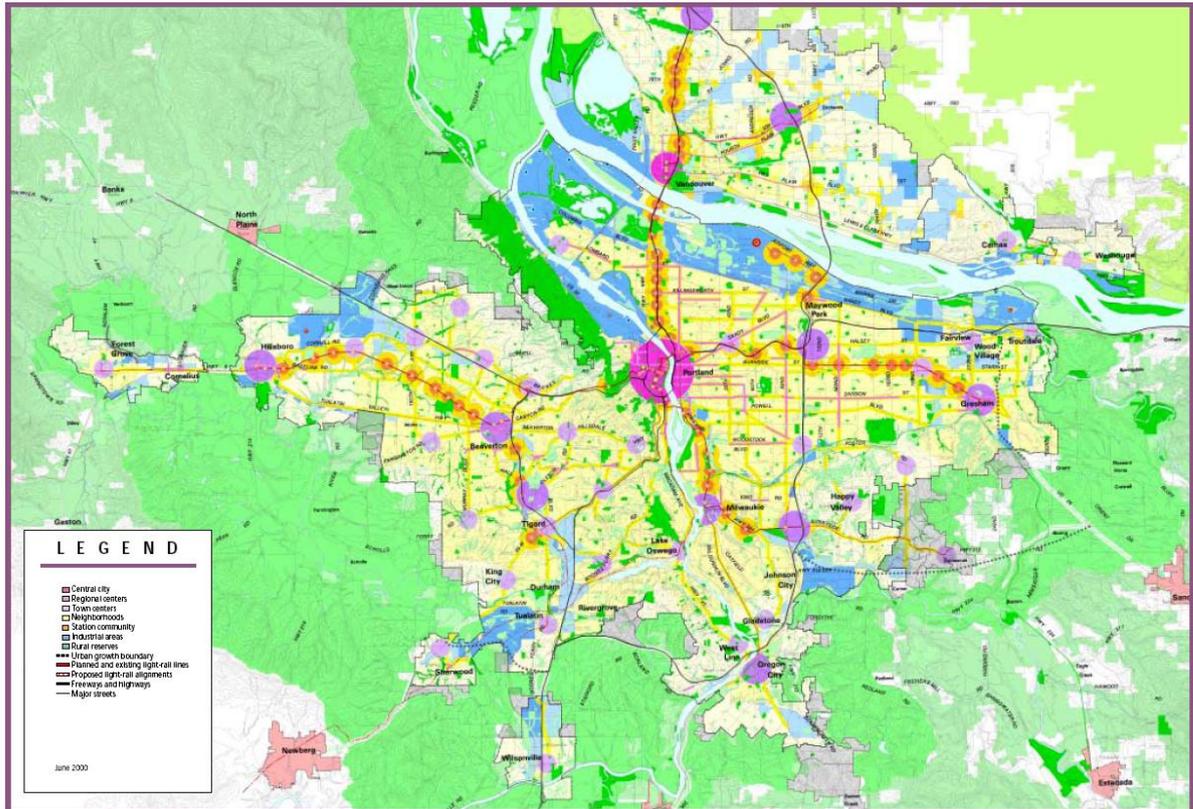


Figure 7 Concept Plan of Portland 2040 indicating growth centres and natural resources⁹

Source: Regional Plan of Portland, USA

⁹ Source: Regional Plan of Portland, USA

c) Structure Plan for Western Region, Sri Lanka (WRSP) ¹⁰

The Western Region Physical Structure Plan for Sri Lanka covers the three districts of the Western Province viz. Colombo, Gampaha and Kalutara with extents totalling 369,420 ha or 5.66% of the total land of Sri Lanka.

Vision/ Goal

'Sustainable Development' is the underlying concept in the preparation of the Western Region Structure Plan for Sri Lanka. Here, environmental sensitive ecological zones will be preserved and environmentally not so sensitive areas will be brought under planned urban development.

Table 5 Statistical Details for Western Province, Srilanka

Place	Area (SqKm)	Population in Millions	Horizon Year	Year of Planning
Western Province, Srilanka	3700	5 (2004) 6.5 (2010)	2030	2002

Source: Structure Plan for Western Region, Srilanka

Objectives/ Principles

The overall objective of the WRPSP is to design a Strategic Physical Plan and prepare an Action Program for the development of the region with a view to meet the aspirations and improving the quality of life of the people of the Western province of Sri Lanka.

Strategies

- Protection of low-lying areas and conservation of environmentally sensitive areas.
- Decentralization of economic activity from the Colombo Region
- New spatial structure including new urban configuration and planned settlement structure
- Development of new urban centers in order to increase housing supply
- Restructuring of land use pattern traffic management schemes
- Redevelopment of land by dividing land into
 - Environment and Ecological Areas (environmentally sensitive area)
 - Provisional Residential Areas (environmentally not-so-sensitive area)
 - Urban Areas.

The strategies will be furthered detailing in the development plans with appropriate detail zoning within the provisional residential areas and urban areas (Growth centers, regional centers, urban centers, town centers and service centers).

¹⁰ Source: Structure Plan for Western Region, Sri Lanka

Environmentally sensitive areas depicted in the Western Region Physical Structure Plan will be retained as environmental and ecological zones in each of the detail plans, taking into account the overall development pattern of the entire region and guidelines given in the Regional Physical Structure Plan.

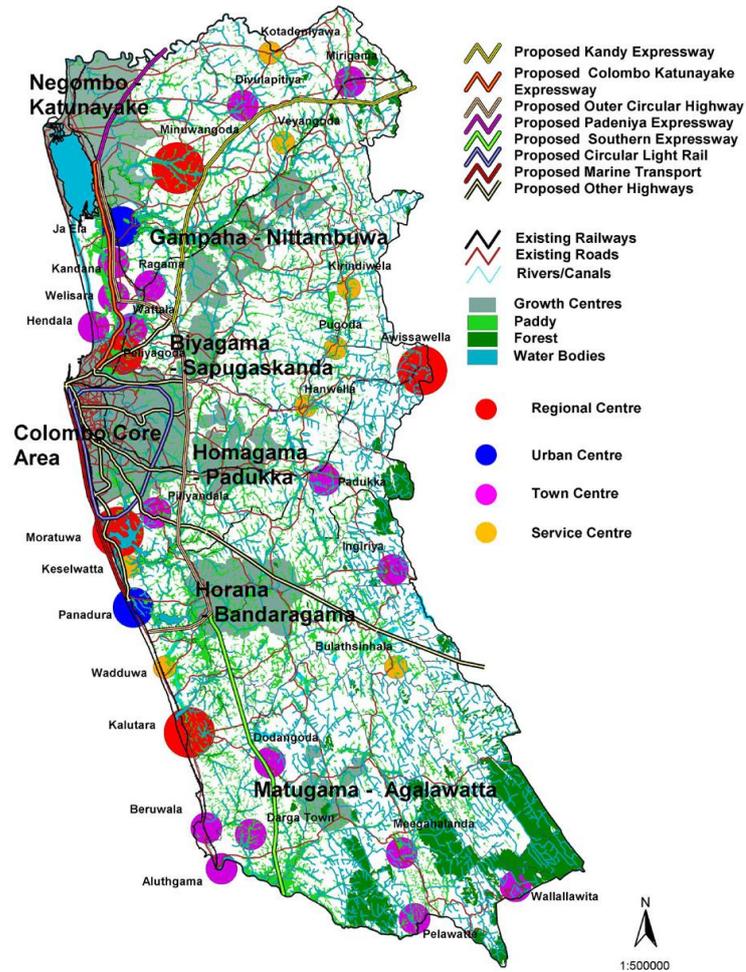


Figure 8 Western Region Physical Structure Plan ¹¹

¹¹ Source: Structure Plan for Western Region, Sri Lanka

d) Beijing Green Belts Plan, China¹²

The concept of the green belt formation was advocated in 1950 by Chinese scholars around Beijing in order to improve air quality and conserve water. Thereafter in 1958 the master plan of Beijing proposed the formation of two green belts, the inner greenbelt was planned to be located at the transition between the urban area and suburbs. The proposed outer greenbelt was planned to be located at the transition between the city and the rural area. Gradually the area under the green belt was opened to private commercial development causing fragmentation of greenbelts by urban development and industrialization. In 2003 Beijing Greenbelts Plan was developed by the Beijing Municipal Institute of City Planning and Design. According to the plan, three greenbelts are to be established in urban, suburb (plain), and mountain areas respectively.

Vision/Aim:

- To build a sound ecological basis for the city by developing more forested areas, hampering sandstorms and preventing air pollution through the provision of Green Belts

Table 6 Statistical Details for Beijing Green Belts Plan, China

Place	Area (SqKm)	Population in Millions	Horizon Year	Year of Planning
Beijing, China	16800	13.8 (2001) 16-20 (2020)	2020	2003

Source: Analysis of the Beijing Greenbelts Plan using GIS by Huifeng Peng

The Green Belts in the Beijing Green Belts plan comprises of the following:

- Green Wedges which includes Parks, Forest patches, Farmlands, Rivers and Wetlands.
- Community Parks
- Green Circles
- Green Ways

¹² Source: Analysis of the Beijing greenbelts plan using GIS by Huifeng Peng

Objectives/ Principles

To alleviate sandstorms and improve air quality through the formation and implementation of Green belts

Strategies

The basic strategy for the Beijing Green Belts Plan is the timely implementation of the Green Belts, recovering the areas that were covered by urbanization.

- The First Green Belt would cover the hilly regions in the western, northern and eastern counties of Beijing, a tree belt will expand the counties forest coverage to 70%.
- The Second Green Belts will comprise of trees planted along the banks of five major rivers, eight major highways and two major rail lines in Beijing, with a combined length of 1,000 kilometres.
- The Third Green Belt will be built between Beijing's third and fourth ring roads, and it will cover some 240 square kilometres.



Figure 9 Diagrammatic representation of three green belts as proposed in the Beijing Green Belts Plan, 2003¹³

Inference from the above case studies

While all the regional plans studied herewith situate environmental parameters as the main factors to determine growth, focus varies from case to case. The NCR plan emphasizes institutional and legal mechanisms to build coordination between sub-regions within states surrounding city of Delhi. The MMR plan focuses on promoting economic growth, social equity and private sector participation and investment. The Central Puget Sound Region Plan integrates city form and environment and focuses on transitioning the region from a landscape of competition to a landscape of cooperation. The Portland Regional Plan and the Beijing green plan are environment based plans. Implementation strategies for the Beijing plan hold much ground as an example.

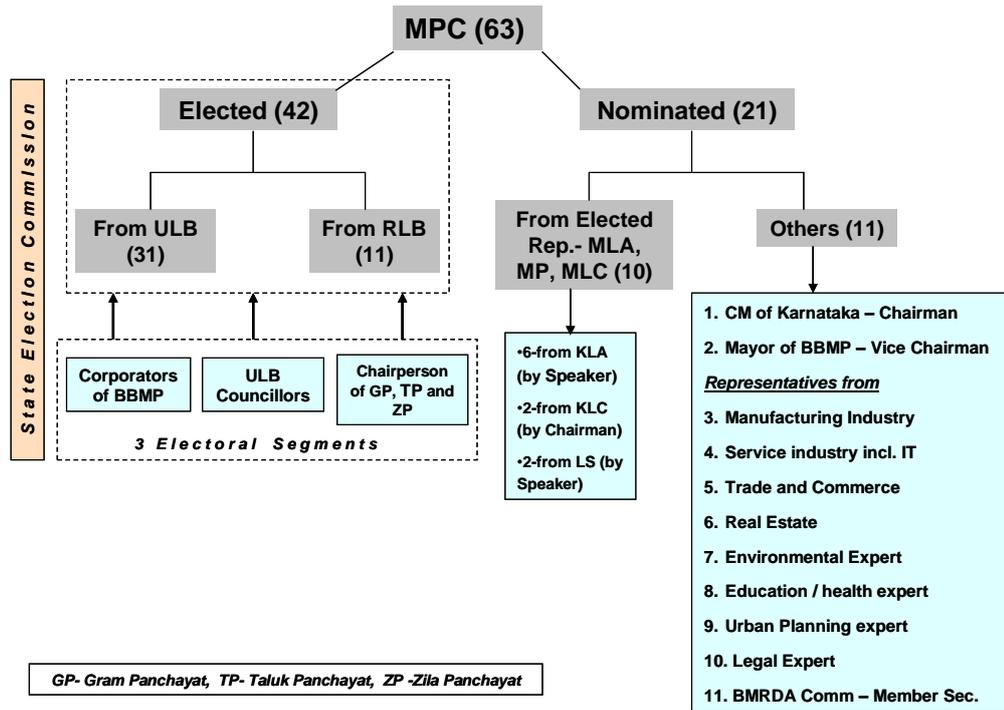
¹³ Source: Beijing Municipal Institute of City Planning and Design, 2003

ANNEXURE 2: GOVERNANCE**Section 2.1: Districts, Talukas and Local Bodies in BMR**

Jurisdiction	Area (Sq.Km.)
BMR	8,005.
Bangalore Urban District	2191
Nelamangala Taluka	506
Dodballapura Taluka	778
Devanahalli Taluka	431
Hoskote Taluka	544
Bangalore Rural District	3354
Bangalore North Taluka	902
Bangalore South Taluka	709
Anekal Taluka	528
Ramnagaram District	2460
Magadi Taluka	795
Ramnagaram Taluka	625
Channapatna Taluka	534
Kanakapura Taluka	1601
Local Governments	Nos
Villages	2551
Gram Panchayats	284
Corporation	1
CMCs	3 (Ramanagaram, Channapattana, Doddaballapur)
TMCs	7 (Devanahalli, Hosakote, Neelamangala, Vijayapura, Anekal, Kanakapura, Magadi)

Section 2.2: Recommendations of Kasturirangan Committee Report

1. The Committee recognizes that a paradigm policy shift from the previous focus on city level urban local government to a metropolitan level institution was a necessary first step for enabling better strategic planning and co-ordination, to address Bangalore's multiple challenges.
2. 74th CAA- Besides the traditional core functions of municipalities, the 12th schedule of the act includes development functions like planning for economic development and social justice, urban poverty alleviation programs and promotion of cultural, educational and aesthetic aspects. Whereas some of the states have included all the functions as enlisted in the Twelfth Schedule in their amended state municipal laws, some states including Karnataka have amended their municipal laws and added some of the additional functions in the list of municipal functions as suggested in the twelfth schedule.
3. Functions like planning for the social and economic development, urban forestry and protection of the environment and promotion of ecological aspects are discretionary functions for Karnataka ULBs
4. Constitutional provision for MPC- Article 243ZE of the Constitution of India
5. Section 503B of the Karnataka Municipal Corporations Act, 1976, provides for constitution of MPC. It also says that the Metropolitan Area to be specified by Governor of Karnataka. However, this part of the Act is yet to be notified and hence is not in force
6. Territorial jurisdiction - the committee suggests that the BMRDA jurisdiction to be notified as the metropolitan area in future
7. BMRDA to act as technical secretariat of MPC
8. Size and composition of MPC



As suggested by the committee, of the total 31 seats for ULB representatives, the no seats for each ULB including BBMP will be as per their population share as illustrated in the table below.

Sl.No	ULB	Pop_2001	Share of Pop	No. of Rep. in MPC
1	Nelamangala	25287	0.39 %	0.1
2	Dod Ballapur	71606	1.11%	0.3
3	Devanahalli	23406	0.36 %	0.1
4	Hosakote	36323	0.56 %	0.2
5	Magadi	25031	0.39 %	0.1
6	Ramanagaram	79394	1.23 %	0.4
7	Channapatna	63577	0.99 %	0.3
8	Kanakapura	47060	0.73 %	0.2
9	Anekal	33157	0.52 %	0.2
10	Vijayapura	29540	0.46 %	0.1
11	BBMP	6000000	93.25 %	28.9
		6434381	100.00 %	31

9. The MPC may have sectoral sub-committees on water and sanitation, environment, transport, rural-urban social sector issues in addition to constituting an Executive Board which will meet more frequently to review progress on all fronts and give its report on proposals to be examined and endorsed by the MPC.

10. Need for District Planning Committees:

The Kasturirangan report observes that in context of the wide and comprehensive mandate of MPC, need for constituting DPCs might not be necessary or can be reviewed.

11. The Committee feels that the Bangalore Urban District in order to reflect its urban character may be confined to the BBMP area and Anekal TMC and the rural local bodies be merged in Bangalore Rural or Ramanagaram district in an appropriate manner. This way, the Zilla Panchayats in the BMR can be reduced to two districts i.e. Bangalore Rural and Ramanagaram and the planning functions can be integrated to the MPC.
12. Issues to be addressed for creation of MPC for Bangalore Metropolitan Area
- i. To notify relevant portions of KMC Act, 1976
 - ii. To notify new territorial jurisdiction Territorial jurisdiction
 - iii. To select members and constitute MPC
 - iv. To set objectives and frame responsibilities / tasks
 - v. Restructuring of BMRDA to strengthen its mandate of strategic planning
13. Other major recommendations by the Committee:
- i. The Committee recommends that the power presently given to the Revenue Authorities in the BMR for authorizing conversion from agricultural land to non agricultural use should be vested in the Metropolitan Commissioner / Member Secretary, MPC.
 - ii. In rural areas the powers of the RLBs to grant development permissions must be restricted to the Gram Thana areas after a survey is conducted by the BMRDA to identify such areas. Further, in these areas as well as other rural areas the powers of the RLBs to grant development permissions should be regulated and restricted by the BMRDA. Section 81-B of KTCP Act, 1961 should be amended to empower BMRDA with the planning function for the entire BMA (now region) and the BDA which currently enjoys the regulatory / planning functions should be divested of this role. Other relevant laws such as the Karnataka Land Reforms Act and the Karnataka Panchayat Raj Act should also be amended to restrict or eliminate the scope of development permissions granted by rural local bodies or revenue authorities within the BMR. The BMRDA should establish a network of local planning offices in the various regions of the BMR.
 - iii. The power to create and enforce the Master Plan, within their respective jurisdictions, under the KTCP Act should be conferred on the BBMP and the other urban local bodies in the BMR. For the areas in the BMR which are governed by rural local bodies, this power may be conferred on the BMRDA which will be accountable to the MPC. This would mean that no further LPA's are necessary in the BMR. Further, Sections 14, 15, 16, 17 and 18 of the KTCP Act should be amended to confer enforcement powers on the ULBs and the BMRDA.
 - iv. For urban planning to be successful, the urban local government should be given overall control over the use of land within their territorial jurisdiction subject to the guidelines of the MPC and MDP.

- v. For land use planning to be successful and effective it must be aligned with the power to control land use. To enable the MPC to determine the overall land use in the metropolitan region, S 95 of the KLR Act needs to be amended to confer this power on the metropolitan level government.
- vi. Land acquisition for industrial purposes within the BMR should be within the regulatory domain of the MPC and necessary amendments should be incorporated in the KIADB Act to actualize this.
- vii. BWSSB's jurisdiction should be enlarged to cover the whole metropolitan region.
- viii. The BMLTA should be accountable to the MPC which would review its functioning periodically and endorse the plans prepared for integrated urban and peri-urban transport systems. The Committee would also recommend that the BMTC's jurisdiction be extended to cover the entire BMR to ensure efficient connectivity between the BBMP and emerging growth centres in the BMR such as townships, International airport etc., and provision of city services in other ULBs in the region
- ix. The two institutions in the BMR Region viz; the ULBs and the District Planning Committee (DPC) may be given overall responsibility for economic and social planning under the guidance of the MPC
- x. The ULBs in the BMR should prepare CDPs. The CDPs should be given a statutory basis and all parastatals operating in ULB jurisdiction should comply with these CDPs.
- xi. Planning for social and economic advancement in other areas of the BMR not falling within the jurisdiction of the ULBs insofar as it falls within the purview of the district sector, should be done by the concerned DPCs under District Planning guidelines, with the difference that these plans need to get integrated into the overall MDP which is prepared by the MPC.
- xii. Sectoral Planning cutting across the city level having regional implications will have to be carried out by the parastatal organizations and departments of government. However these plans will have to be overseen by the sectoral divisions within the BMRDA and approved by the MPC.
- xiii. The introduction of capital investment planning and budgeting is absolutely essential to establish a rational system to mobilize institutional resources on the one hand, and ensuring that capital creation matches income necessary to operate and maintain the investments, on the other. By requiring that the capital budgets of these institutions be approved by the MPC and empowering the MPC with the statutory authority to periodically monitor and enforce these plans, we will provide an institutional framework to streamline financial planning in the Bangalore metropolitan region¹⁴

14 The Manila Capital Investment Folio (CIF) uses this model to allow the MPA to be a financial authority.

Section 2.3 : Recommendations of ABide Task Force - Plan Begaluru 2020: Govern Bengaluru, Draft Version, 16.01. 2009**1. Introduction**

The Plan Bengaluru 2020 focuses on citizen centric governance for the city of Bengaluru and the Metropolitan Region of Bengaluru for which the Bengaluru Region Governance Act, 2009 has been formulated.

According to the Bengaluru Region Governance Act (BRGA), 2009 It is considered necessary to provide for a model of governance wherein the urban citizen will be the central focus of governance. The model will also provide for a structure of governance that is responsive, transparent, accountable and citizen centric.

The BRGA, 2009 proposes to enact a comprehensive new Bengaluru Legislation that supersedes/ encompasses all Bengaluru/Municipal body legislations like BWSSB Act, BBMP Act etc¹⁵ which is explained in detail in the following paragraphs.

2. Principles and objectives of Comprehensive new legislation for Bengaluru

The following paragraph enlists the structure along with the amendments where applicable regarding the jurisdictional definitions, plan documents that will be prepared, the changes the administrative boundaries of the municipal corporations, formulation of wards and neighborhood areas which together advocate the principle of decentralized governance and a citizen centric approach

2.1. Jurisdiction definitions and Planning Agencies

The Jurisdiction structure and the respective planning authorities and nodal agencies according to the new legislation by the BRGA, 2009 is depicted in Figure 1

15 If governance restructuring isn't done, the current scheme of various agencies and split accountability will need complete restructuring to bring accountability.

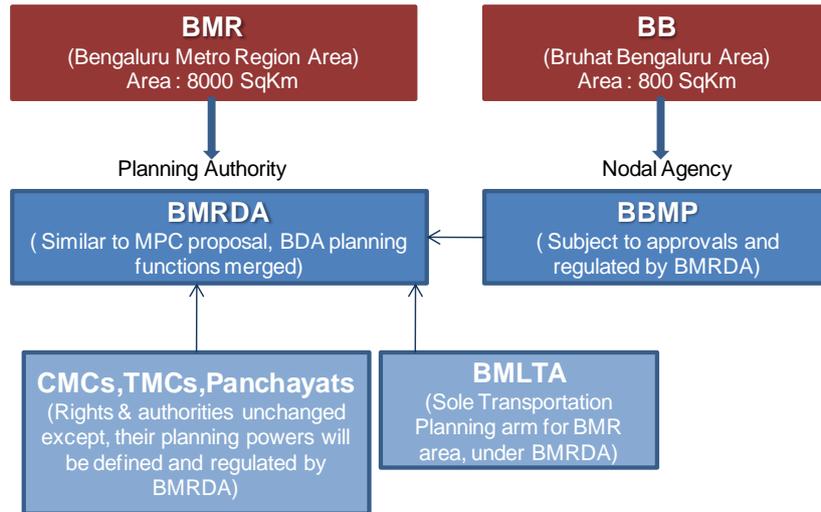


Figure 10 Jurisdiction definition and Planning Agencies

According to Plan Bengaluru, BMR will become the Local Planning area for Bengaluru and all the previous LPAs will be abolished.

2.2. Plan documents

- For BMR Area – BMR regional Development Plan (BMRDP) and all City Master Plans (CMP) for each CMC, TMC, Private Township. Review and updation once every 5 years. Current BDA plans to be absorbed into BMRDP.
- For BB Area – City Master Plan 2015 – derived from BMA City master Plan 2015. To be reviewed and new releases every Five years.

2.3. Governance and accountability to citizens ¹⁶

- Directly elected Mayor for 5 year term.
- Or Mayor-in-Council for 5 year term with council drawn from non-elected specialists as well as elected corporators.

2.4. City municipal agencies and Development agencies

- BBMP to be the nodal agency for BB Area.
- CMCs, TMCs, ZPs and Private Township agencies to be responsible in BMR Area
- Jurisdictions for BWSSB, BMTC, Bescom to be re-drawn to extend to the BMR Area

3. Common planning tools and framework

¹⁶ If governance restructuring isn't done, the current scheme of various agencies and split accountability will need complete restructuring to bring accountability.

- There will be ONE common shared Spatial Database which will be a basis for all planning in BMR Area and will reflect BMRDP and all Master Plans for which BMRDA will be responsible
- KSCRCA will be the sole technology custodian and maintenance of these tools and information. Information integrity will be KSCRCA's responsibility.
- Wards will be smallest and minimum unit for Planning in BB Area. All plans for BB must have ward wise planning.
- Neighborhood Areas (NAs) will be smallest legal, spatial unit under the act. NA's will be notified as a schedule and can be reviewed and notified every 5 years.
- Description on Wards and Neighborhood Areas (NAs) is given below :
- Wards:
- BB Area will be delimited into 147 wards as of 2009 and as notified from time to time by GoK.
- BBMP will be responsible for developing a detailed ward development plan and budget each year



Figure 11 Specifications per Ward

- Ward office will be the administrative center for all municipal services and be headed by a Ward-in-Charge Engineer
- Ward committees to be chaired by corporators consisting of Elected and nominated members from the ward will be political unit for each ward.

Neighborhood Areas (NAs):

- The concept of Neighborhood area and Neighborhood Area Committees will be empowering the citizen and allowing him/her to participate in the nature of development of his/her neighborhood.
- Each Neighborhood area will have a Neighborhood Area Committee (NAC).
- The NAC will have right to approve or veto a specific set of issues that impact their NA.

Section 2.4: Constitution of DPC as per Section 310 of The Karnataka Panchayati Raj Act,**1993**

The Government shall constitute in every district a District Planning Committee to consolidate the plans prepared by the Zilla Panchayats, Taluk Panchayats, Grama Panchayats, ¹[Town Panchayat]¹, Municipal Council and Municipal Corporations in the district and to prepare a draft development plan for the district as a whole.

1. Substituted by Act 29 of 1997 w.e.f. 20.10.1997.

(2) The District Planning Committee shall consist of,-

- (a) members of the House of People who represent the whole or part of the district;
- (b) members of the Council of State who are registered as electors in the district;
- (c) Adhyaksha of the Zilla Panchayat;
- (d) Mayor or the President of the Municipal Corporation or the Municipal Council respectively, having jurisdiction over the head quarters of the district;
- (e) such number of persons, not less than four-fifth of the total number of members of the Committee as may be specified by the Government, elected in the prescribed manner from amongst the members of the Zilla Panchayat, [Town Panchayat], and Councillors of the Municipal Corporation and Municipal Councils in the district, in proportion to the ratio between the population of the rural areas and of the urban areas in the district.

ANNEXURE 3: LAND CAPABILITY ANALYSIS

Section 3.1: Land Capability Analysis Classification with Maps

The following tables indicate the classifications and their ranking used to identify the natural resource potential of the region. The maps of the various layers are attached below

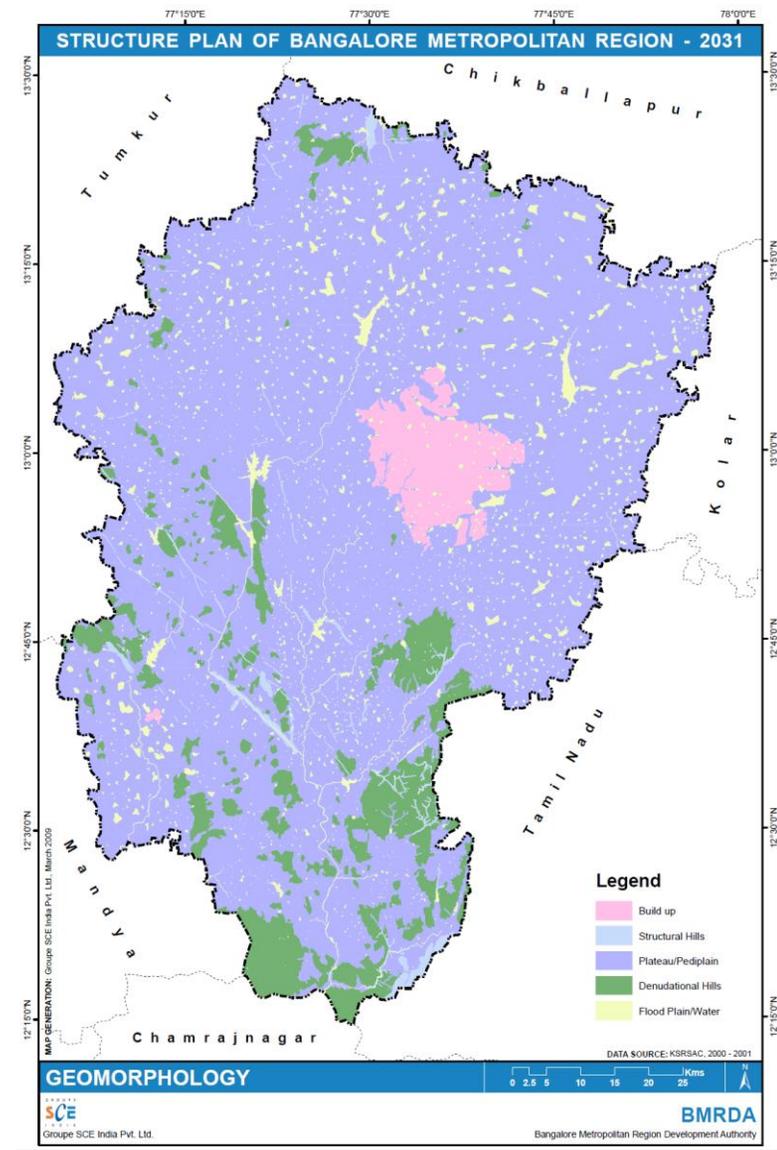
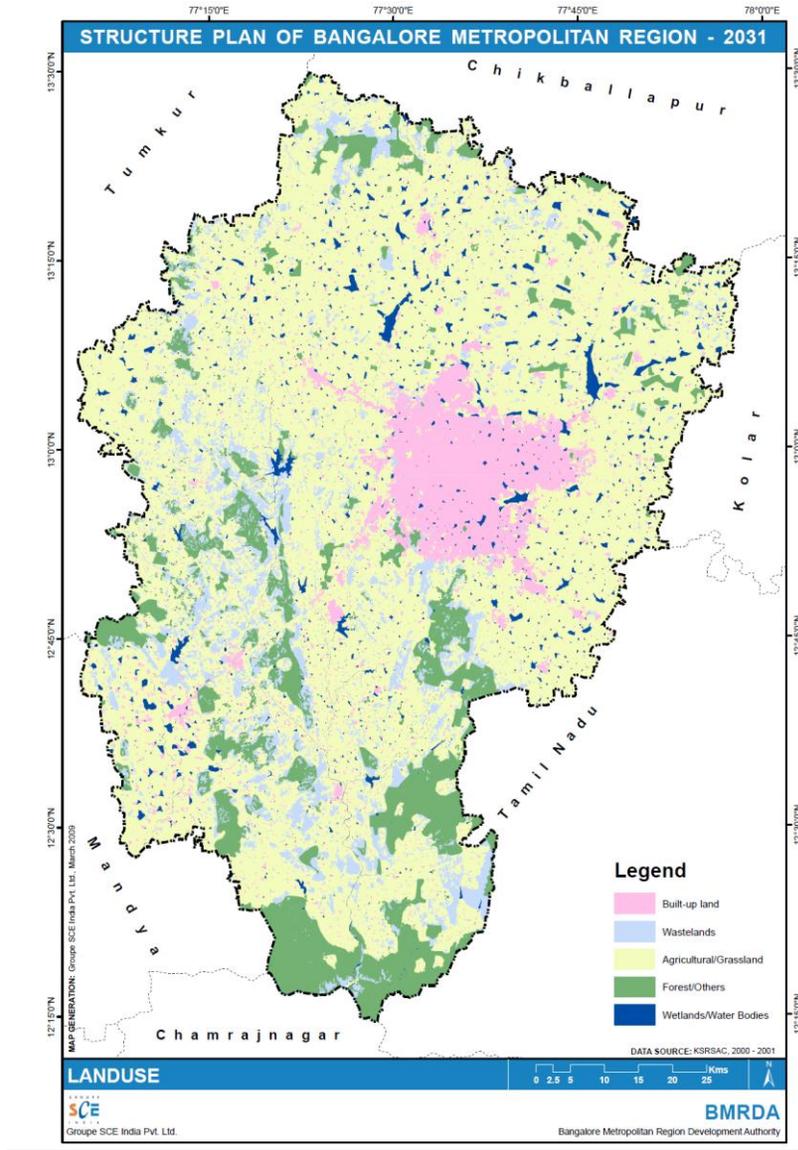
Layer	Weightage
Landuse / Cover	
Waterbody	5
Wetlands	5
Forest	4
Others	4
Grassland	3
Agriculture	3
Wasteland	2
Built-up	1
Reserved / Protected Forest	
Protected Forest	2
Reserved Forest	1
Slope	
Very Steep slope	5
Strong(Steep) slope	4
Moderately Steep slope	3
Moderate slope	3
Gentle slope	2
Very Gentle slope	1
Almost level(flat)	1
Geo Morphology	
Waterbody	5
Floodplain	5
Denudational Hills	4
Pediplain	3
Plateau	3
Structural Hills	2
Settlement	1
Ground Water	
Very good to Good	5
Water mask	5
Good	4
Good to Moderate	3
Moderate	3

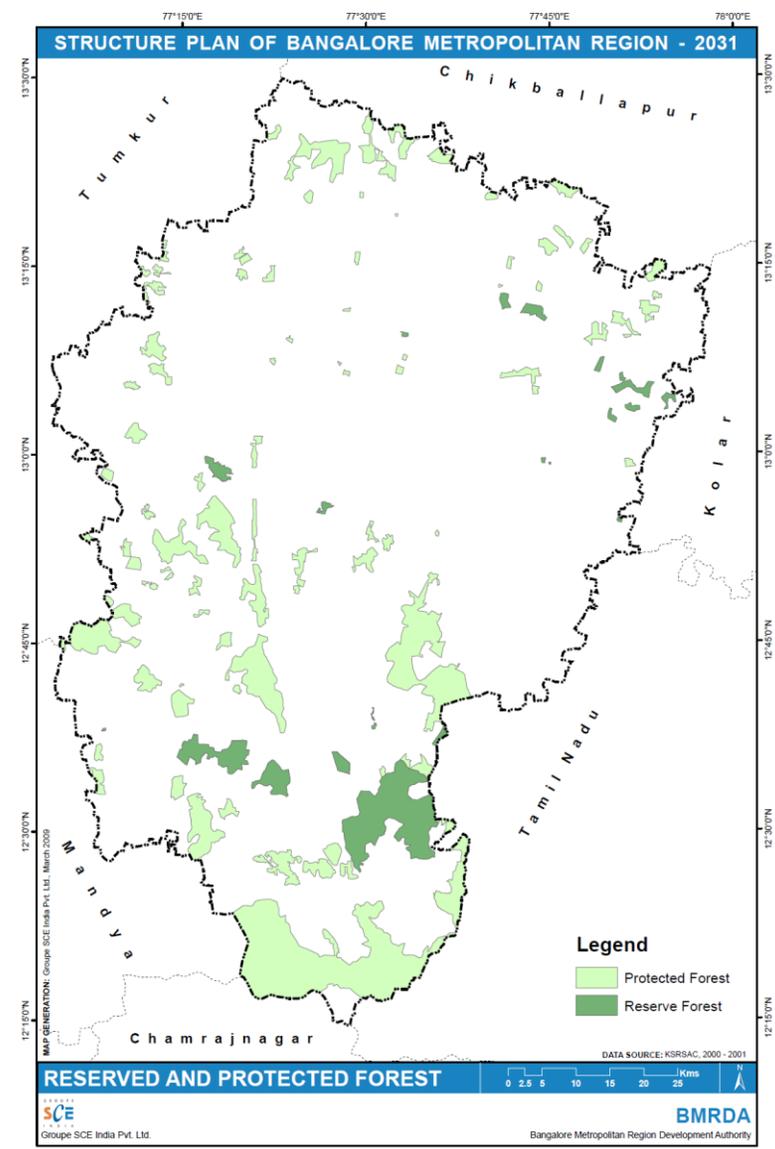
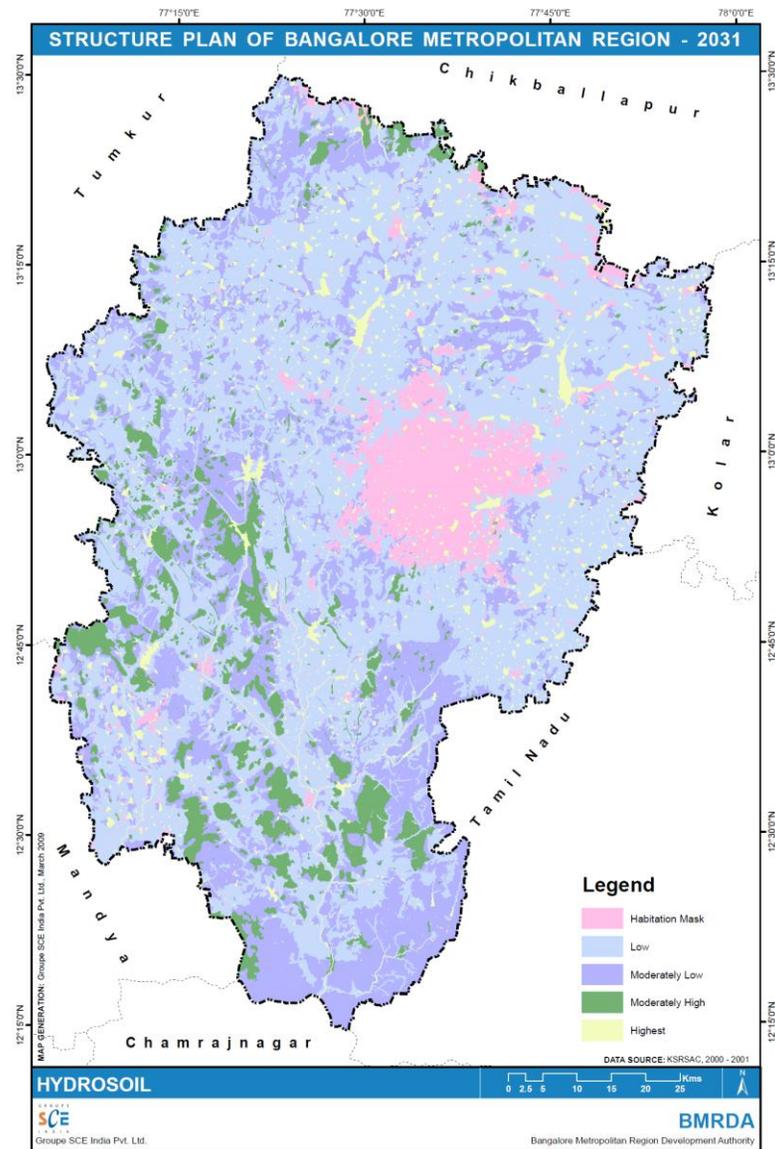
	Moderate to Poor	2
	Poor	1
	Poor to Nil	1
	Habitation mask	1
	Hydro Soil	
	Highest	5
	Water mask	5
	Moderately high	4
	Moderately low	3
	Low	2
	Habitation mask	1
	Soil Texture	
	Very fine	5
	Fine	5
	Dykes / Ridges	5
	Water mask	5
	Fine loamy	4
	Loamy	4
	Loamy skeletal	3
	Clayey skeletal	3
	Clayey	2
	Sandy skeletal	2
	Rocky outcrops	1
	Habitation mask	1
	Soil Irrigation	
	Water mask	5
	Very Severe Soil limitations	4
	Severe Soil limitations	3
	Moderate Soil limitations	2
	Not suited for Irrigation	1
	Habitation mask	1
	Wasteland	
	Degraded Forest Scrub domain	5
	Gullied and / or Ravinous (medium)	5
	Gullied and / or Ravinous (shallow)	5
	Agricultural land inside Notified forest	4
	Degraded land under plantation crops	4
	Sands (Tank / river bed)	3
	Land without scrub	2
	Land with scrub	2
	Barren rocky/Stony waste area	1
	Industrial wastelands	1
	Mining wastelands	1

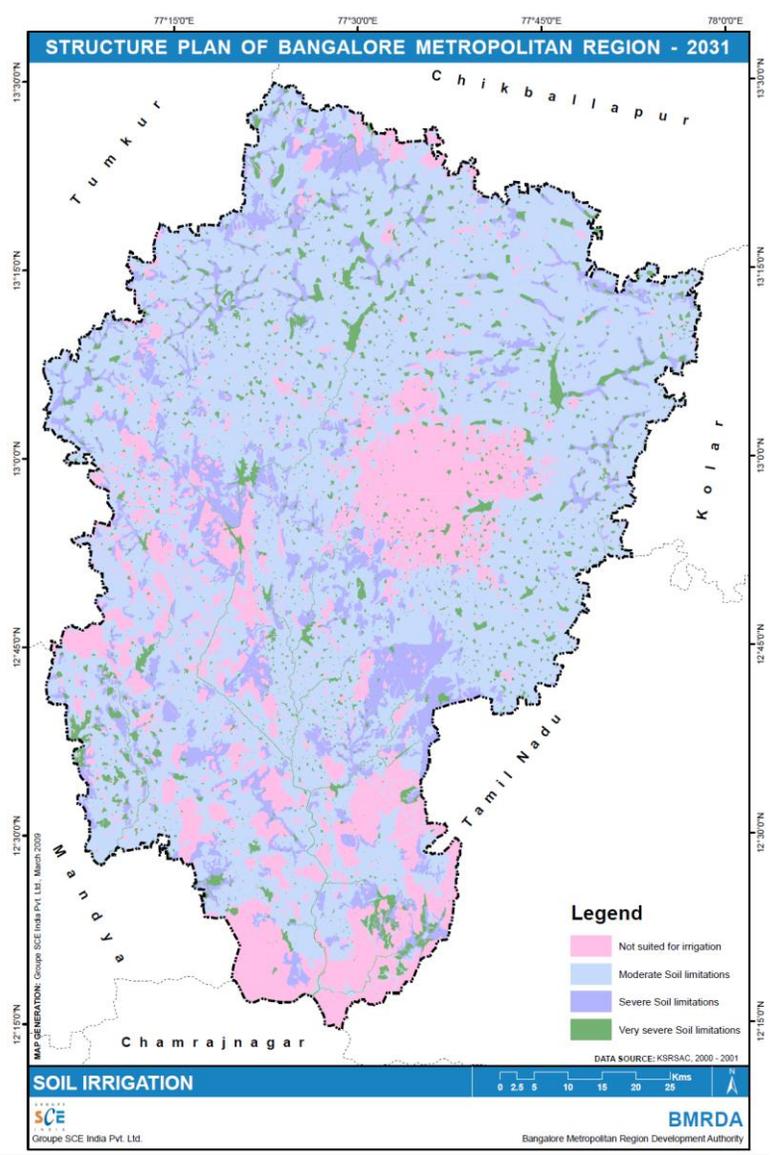
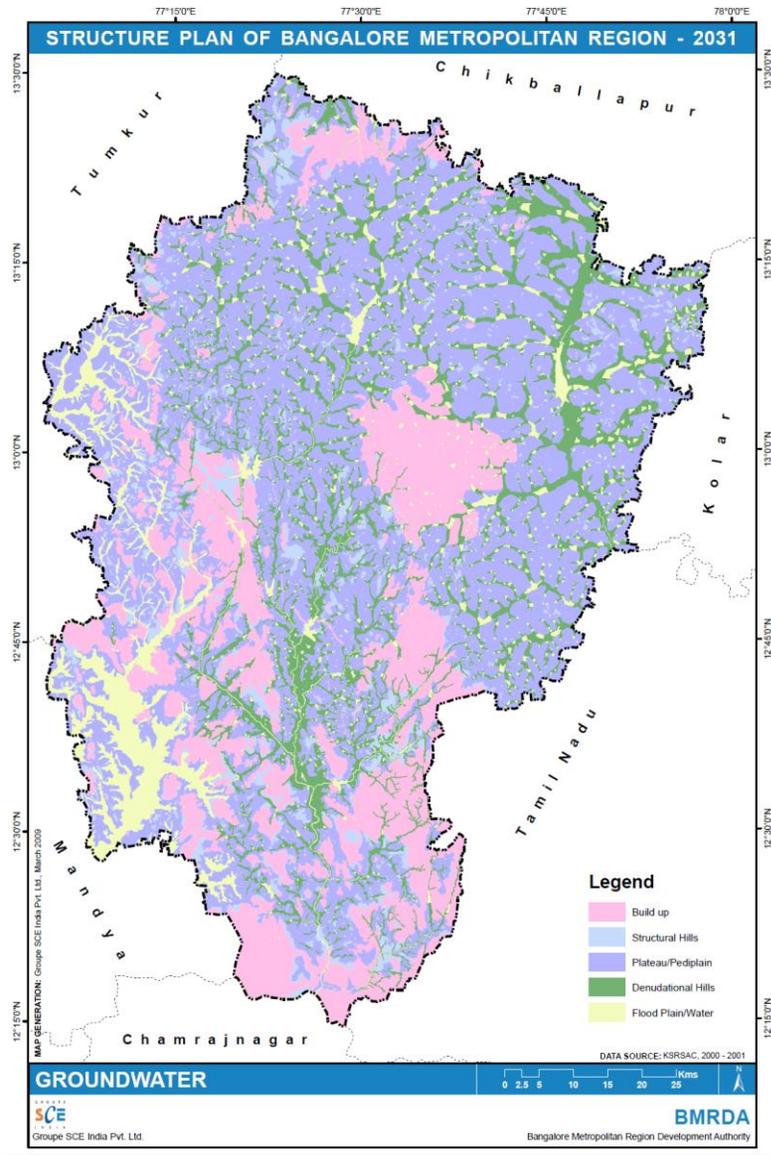
	Forest types	
	Dry Deciduous – 10 – 25%	5
	Dry Deciduous – 25 – 40%	5
	Dry Deciduous < 10%	5
	Forest Blank	5
	Forest Plantation – Others	5
	Grass Land	5
	Scrub forest	5
	Scrub land	5
	Agricultural plantation	4
	Bamboo plantation	4
	Crop land	4
	Mixed plantation	4
	Teak plantation	4
	Scrub forest with Eucalyptus plantation	3
	Marshy / Swampy land	3
	Waterbody	3
	Acacia auriculiformis Plantation	2
	Acacia plantation	2
	Eucalyptus Plantation	2
	Eucalyptus plantation with Scrub	2
	Barren rocky	1
	Built up land	1
	Mining / Quarrying area	1
	Quarry area	1
	Salt affected land	1
	Stone quarry / Mining area	1

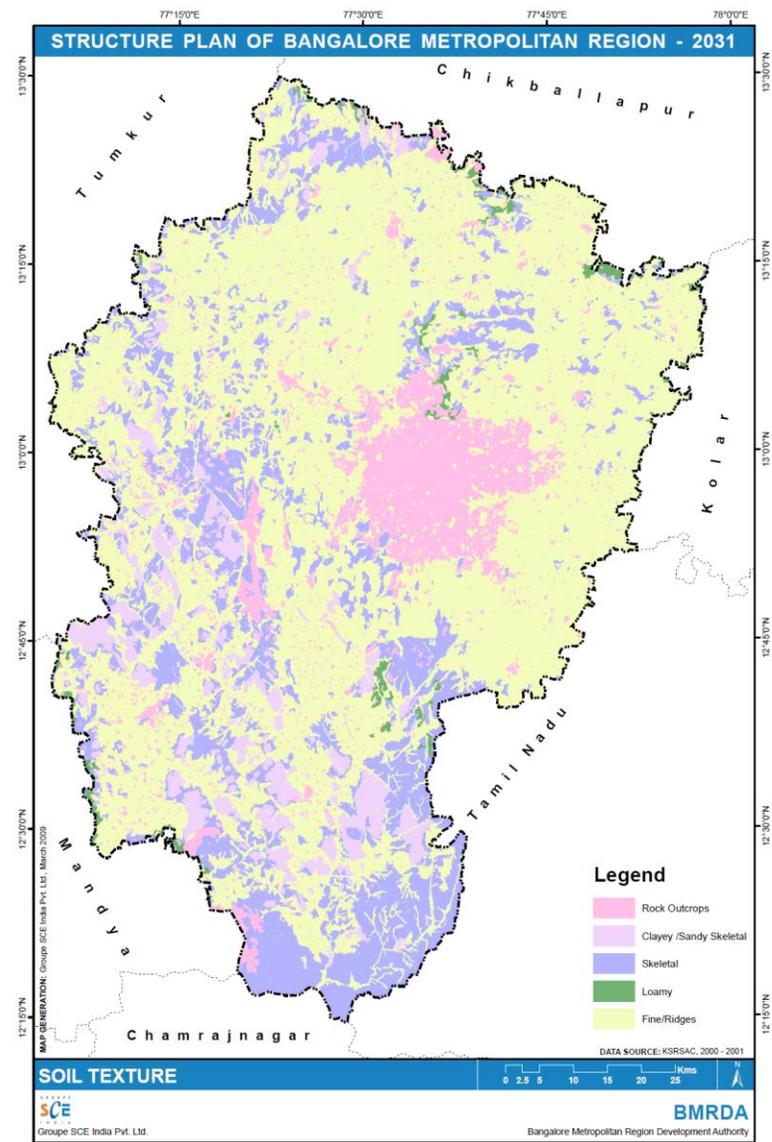
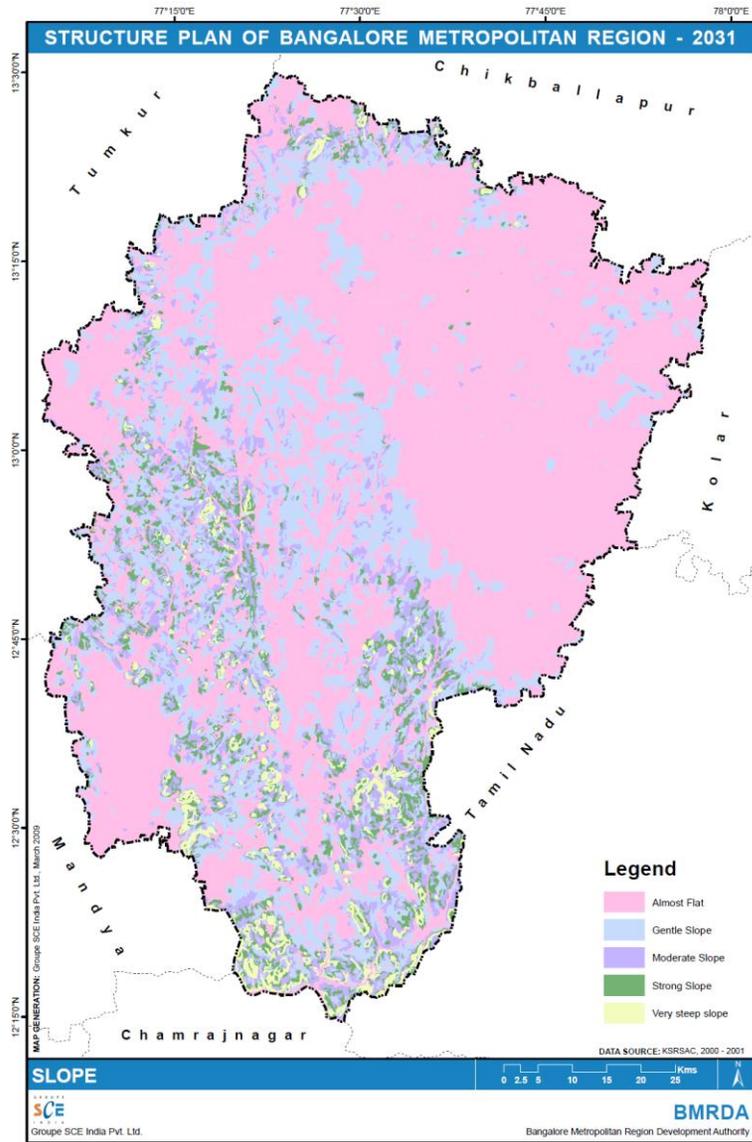
All the parameters are in turn taken together and graded with a relative ranking of priority and criticality.

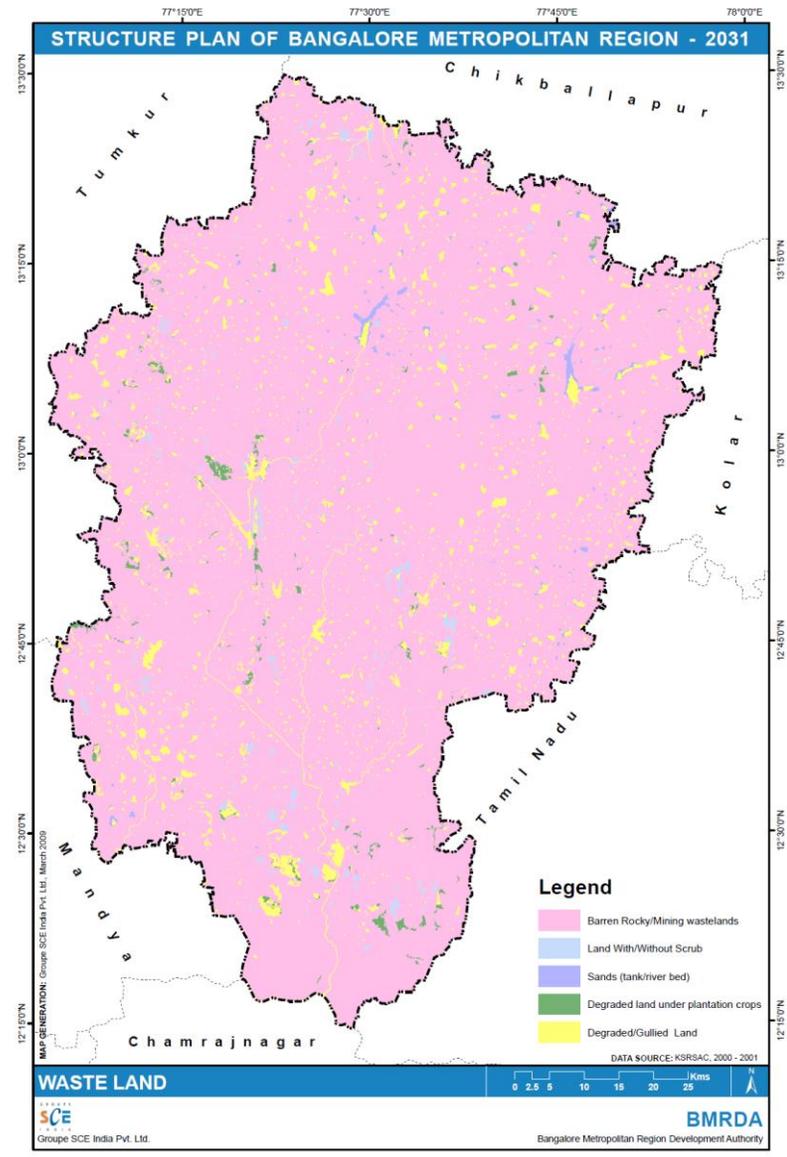
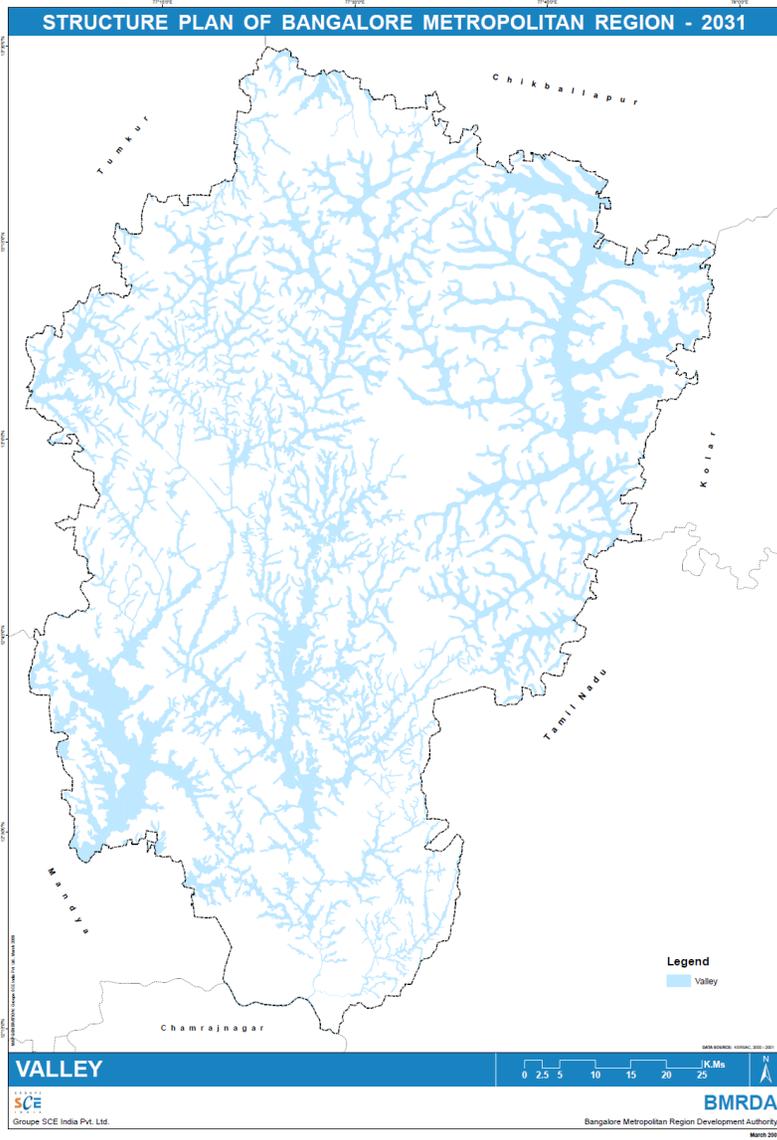
No.	Particulars of the Layer	New Weightage
1	Ground water	20
2	Forest types	15
3	Waste land	13
4	Landuse	11
5	Slope	10
6	Geo-morphology	10
7	Hydro soil	7
8	Soil irrigation	7
9	Soil (Texture)	7

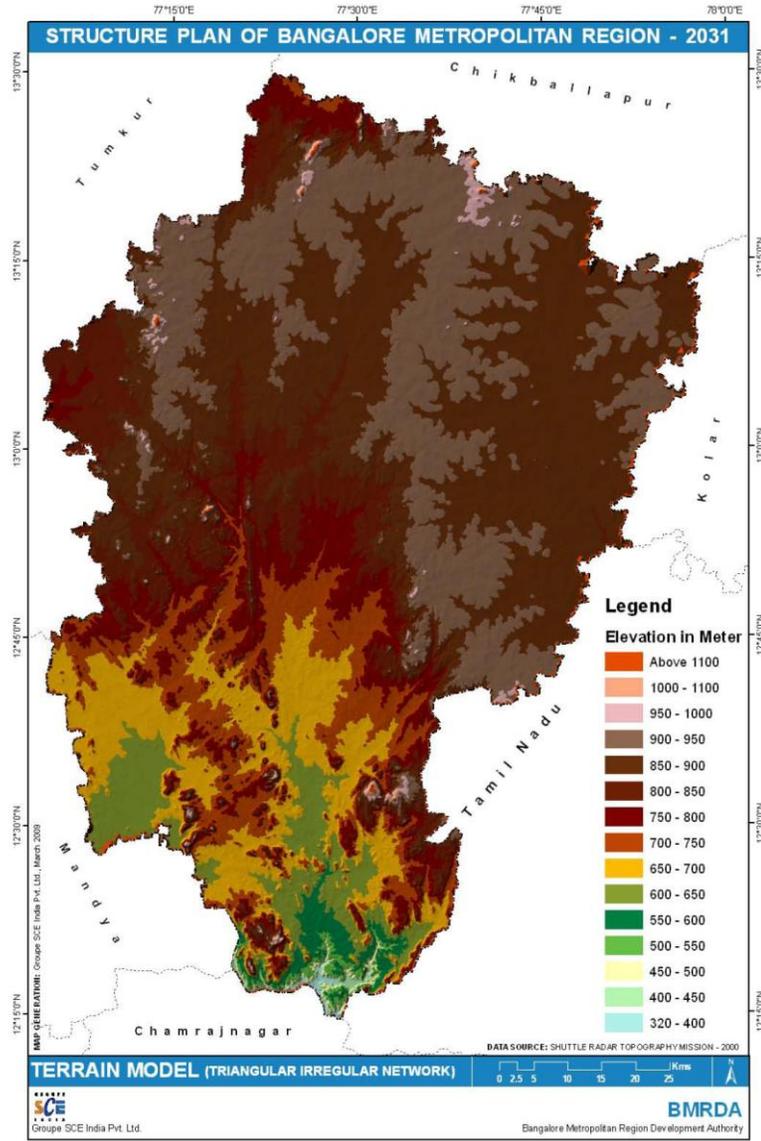
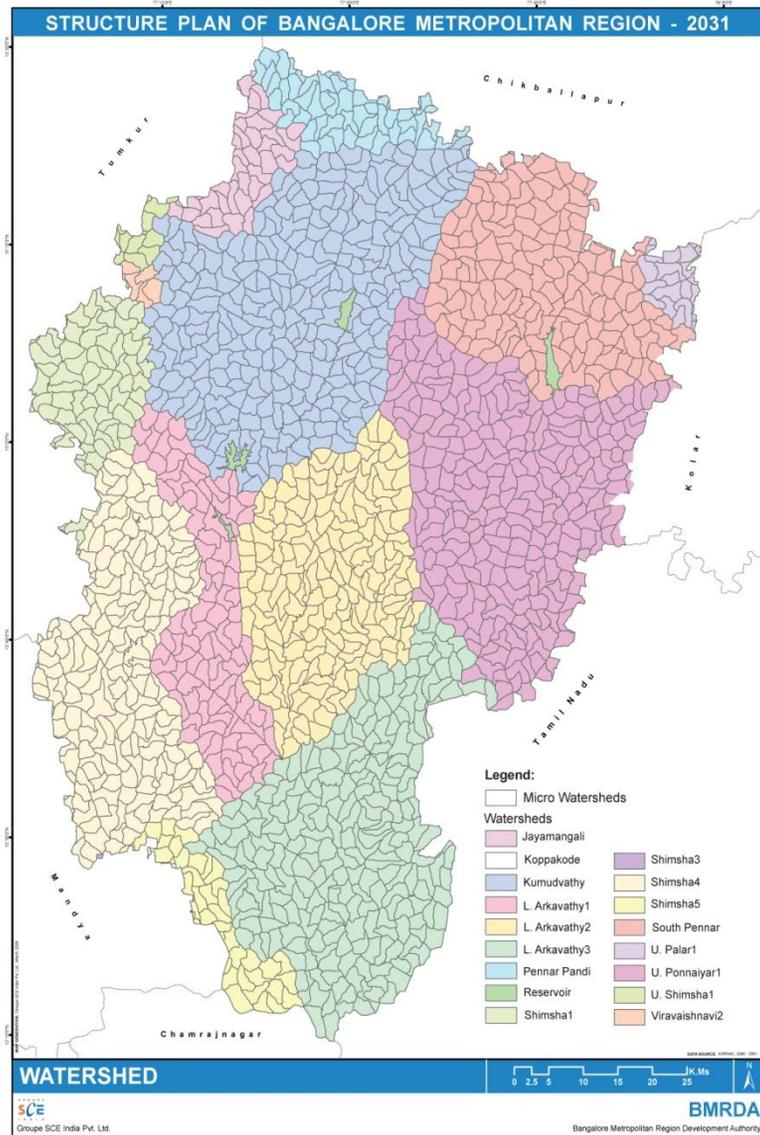


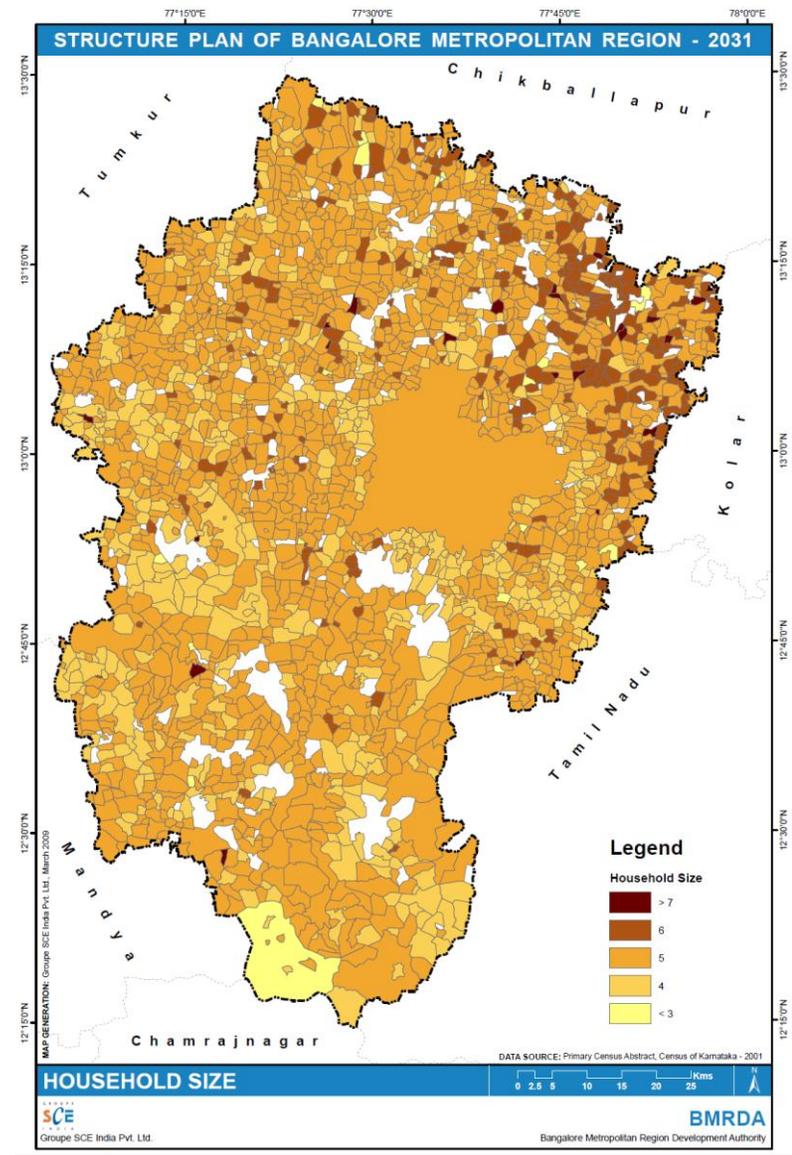
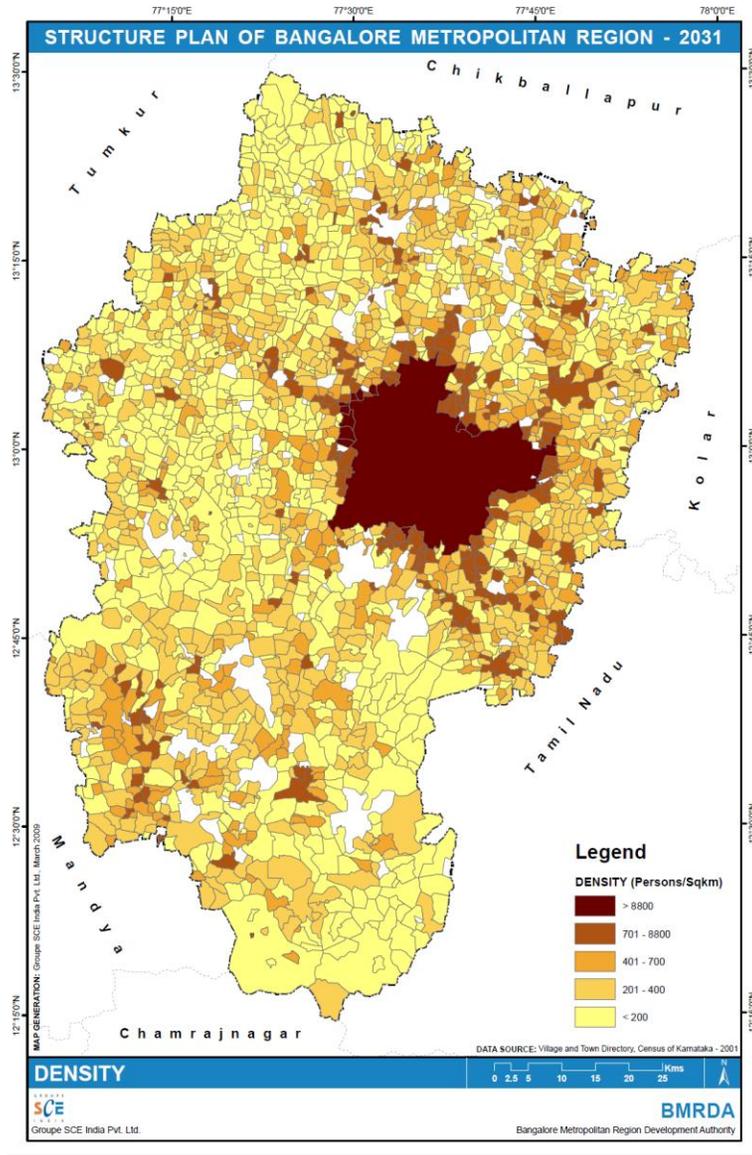


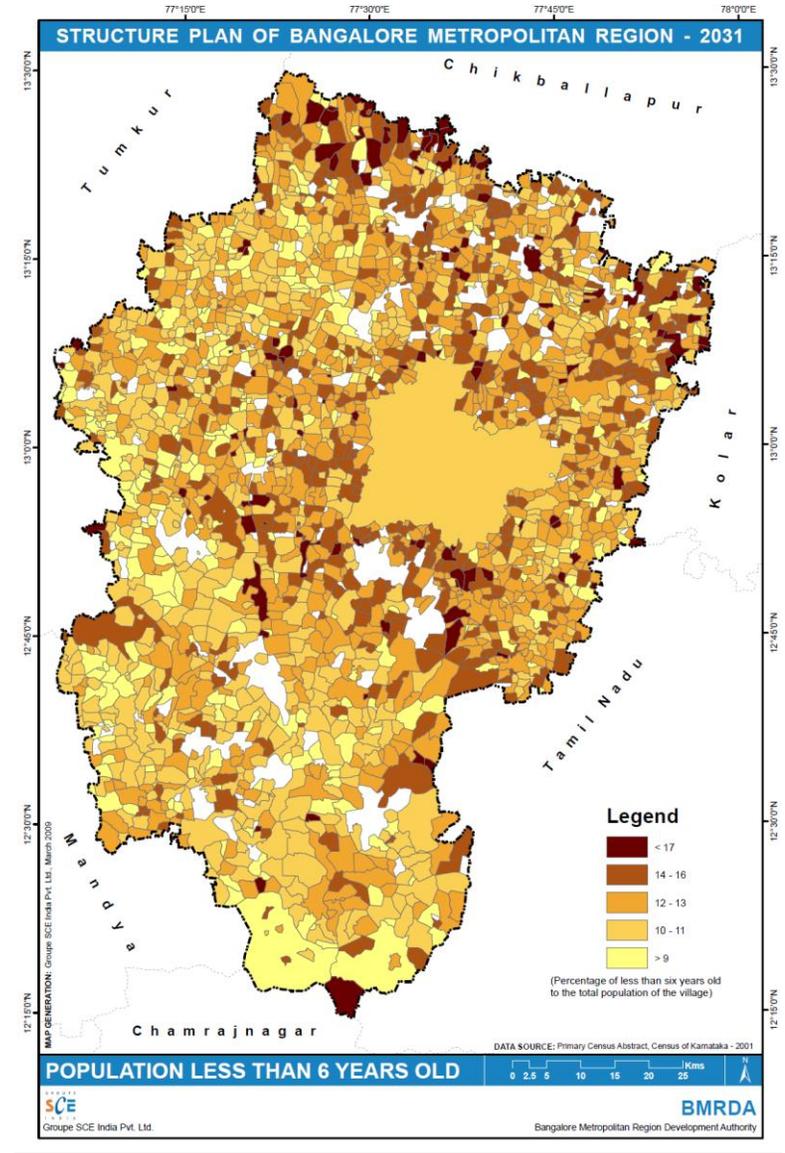
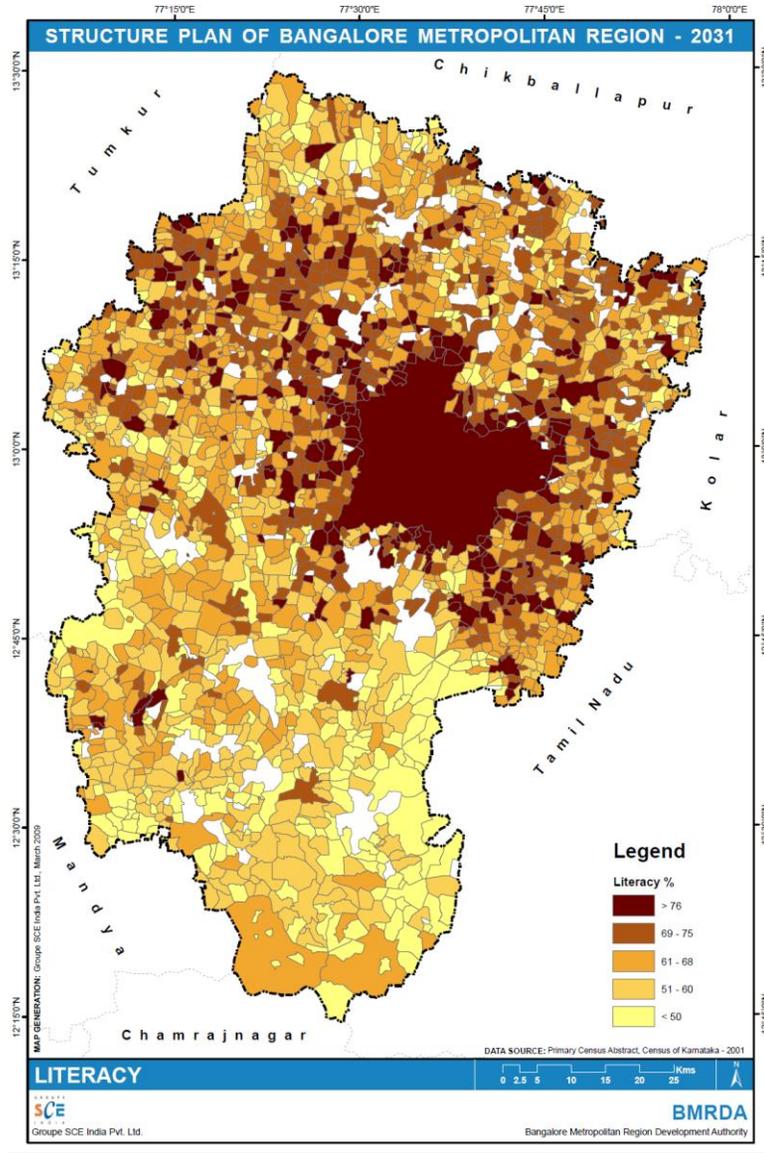


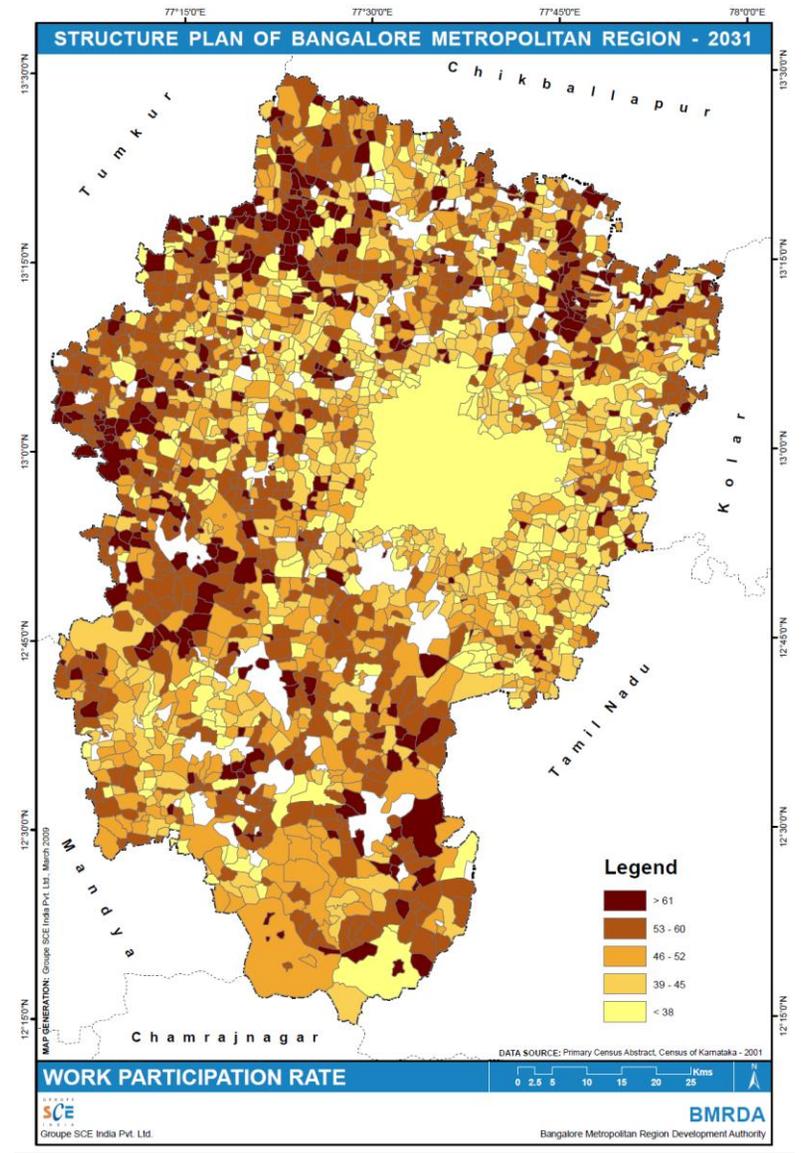
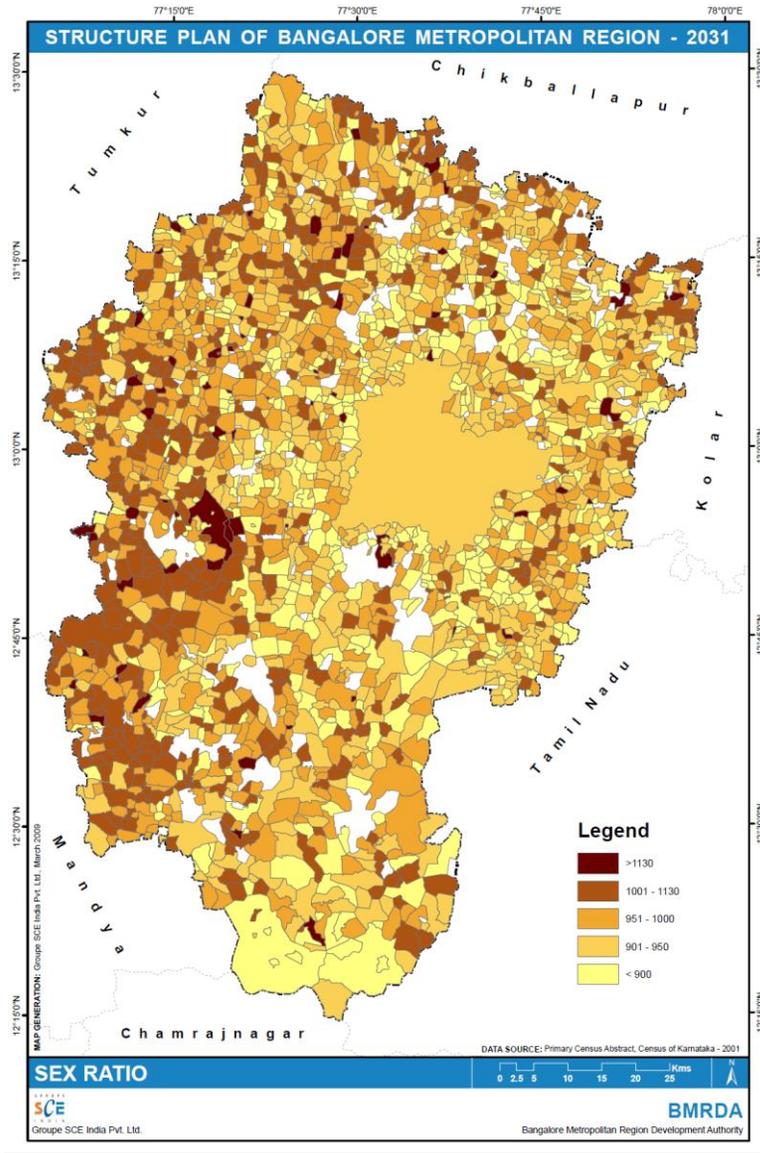


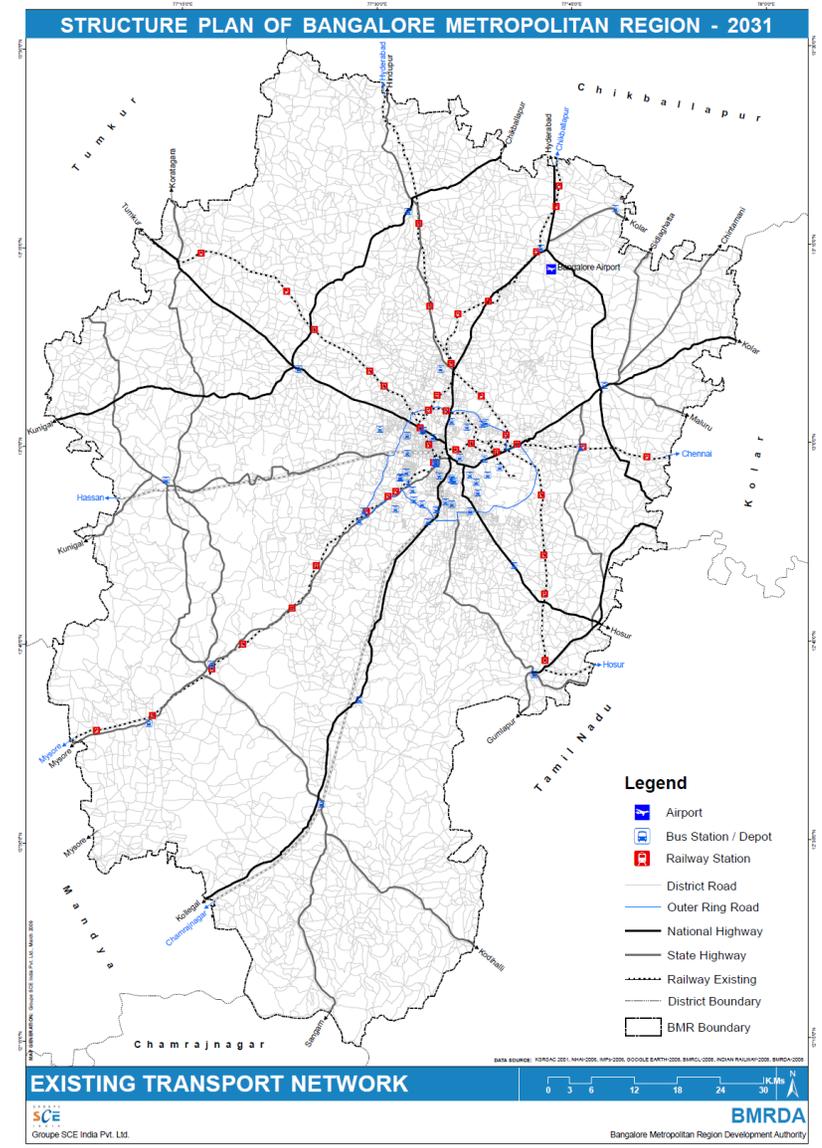
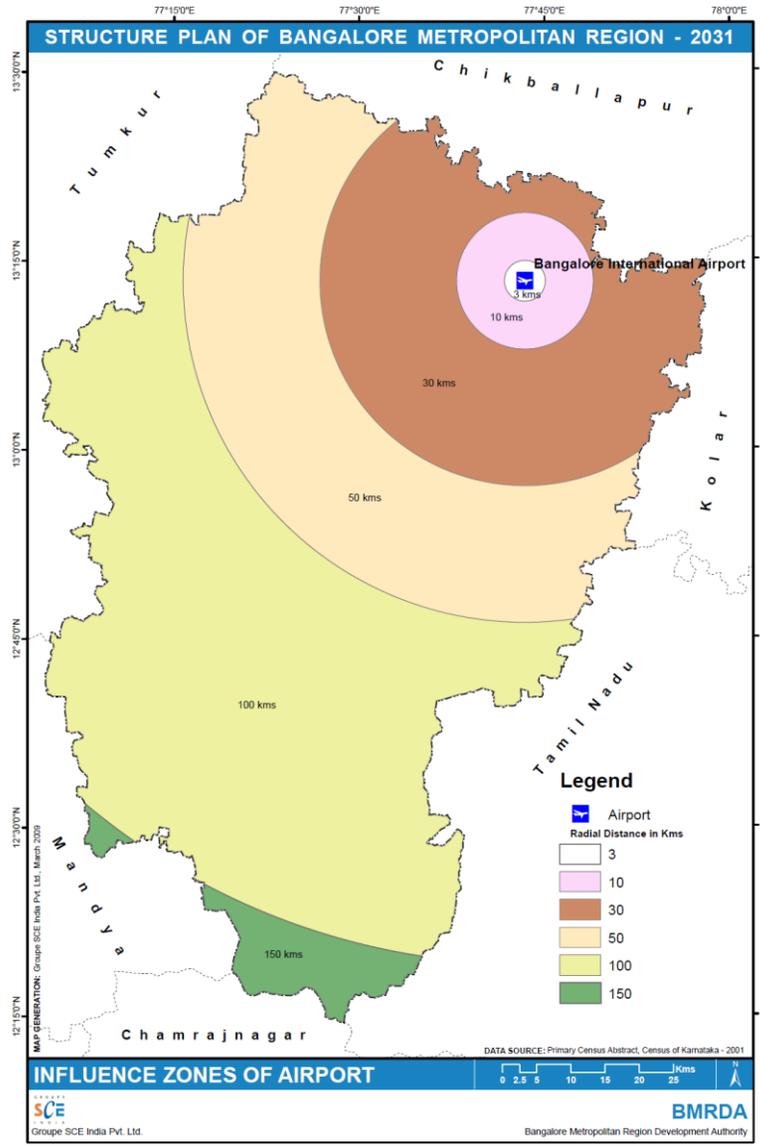


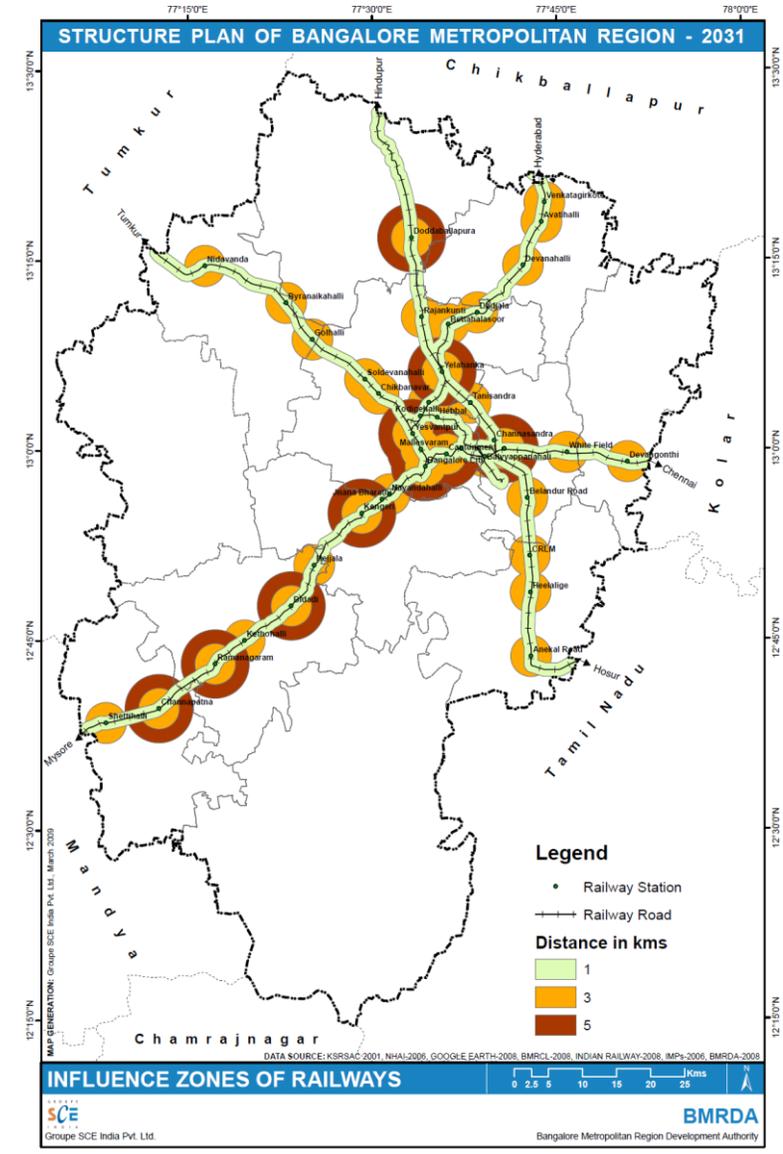
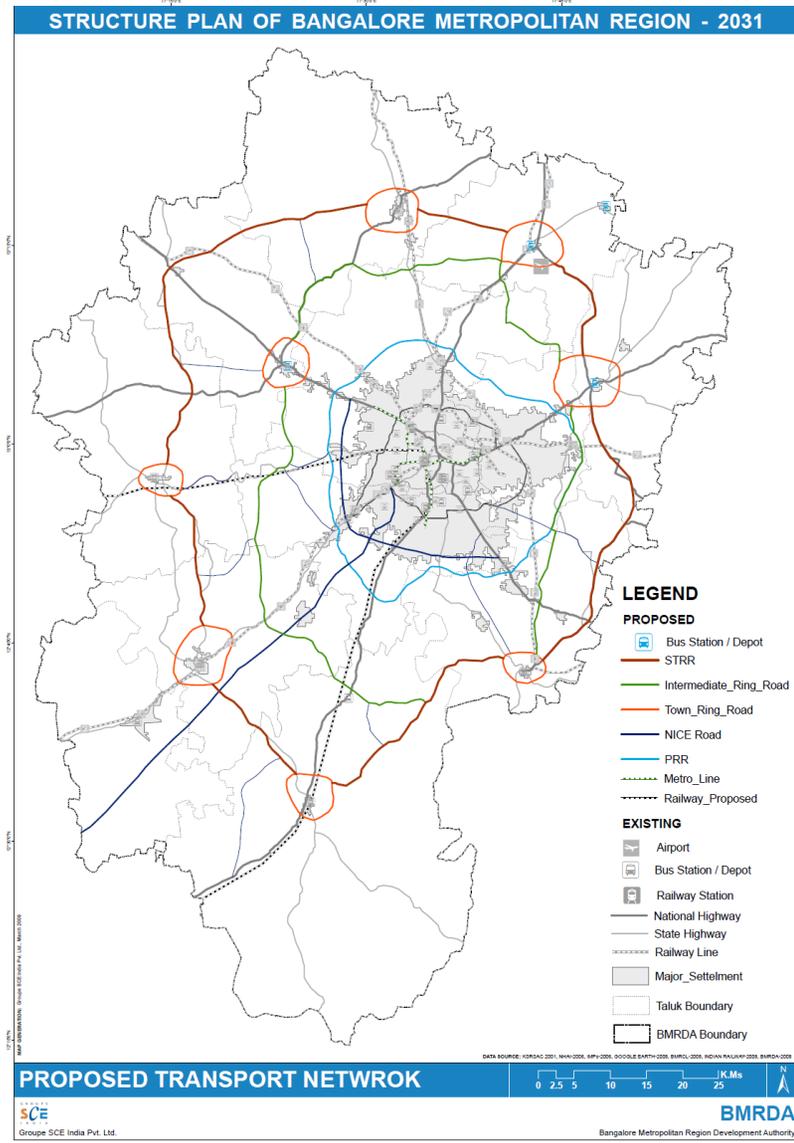


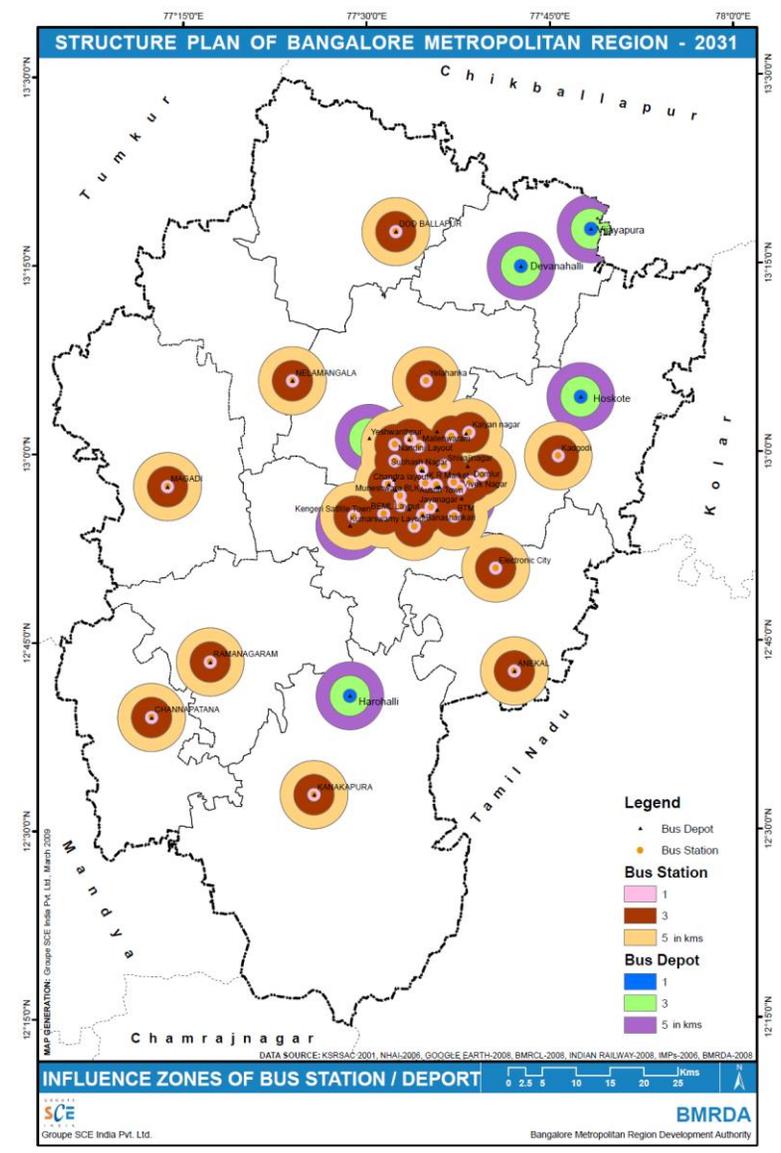
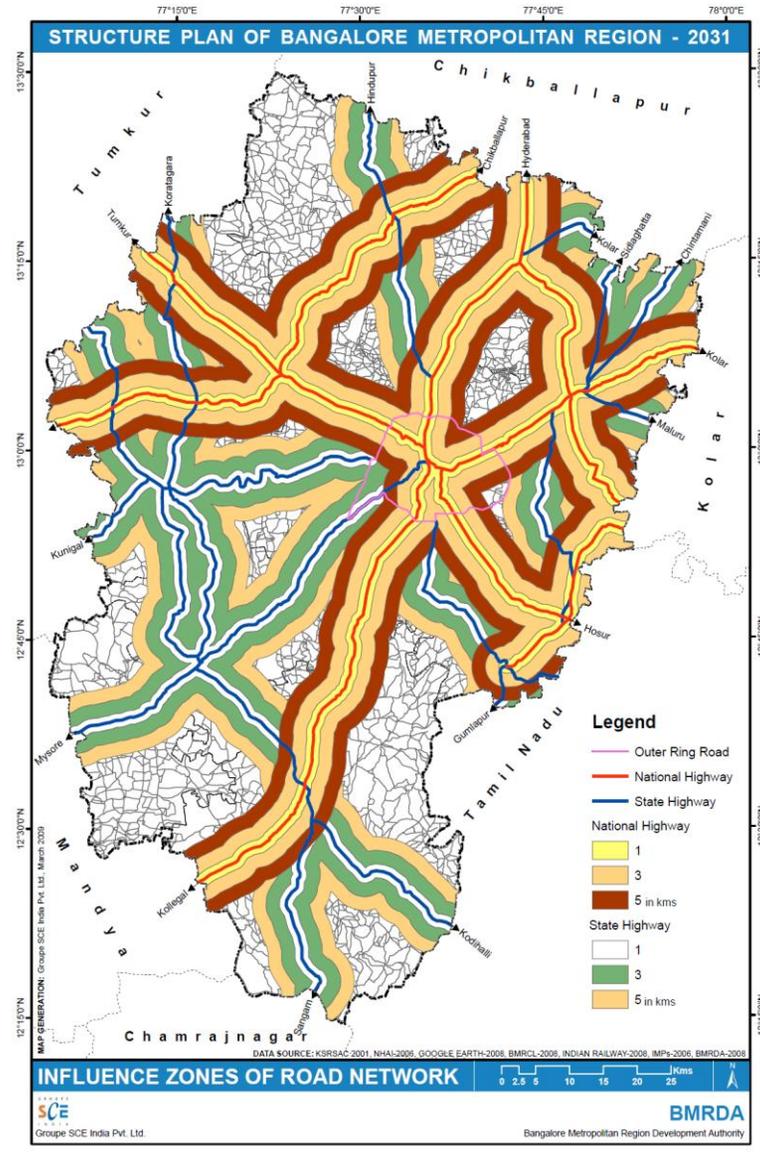




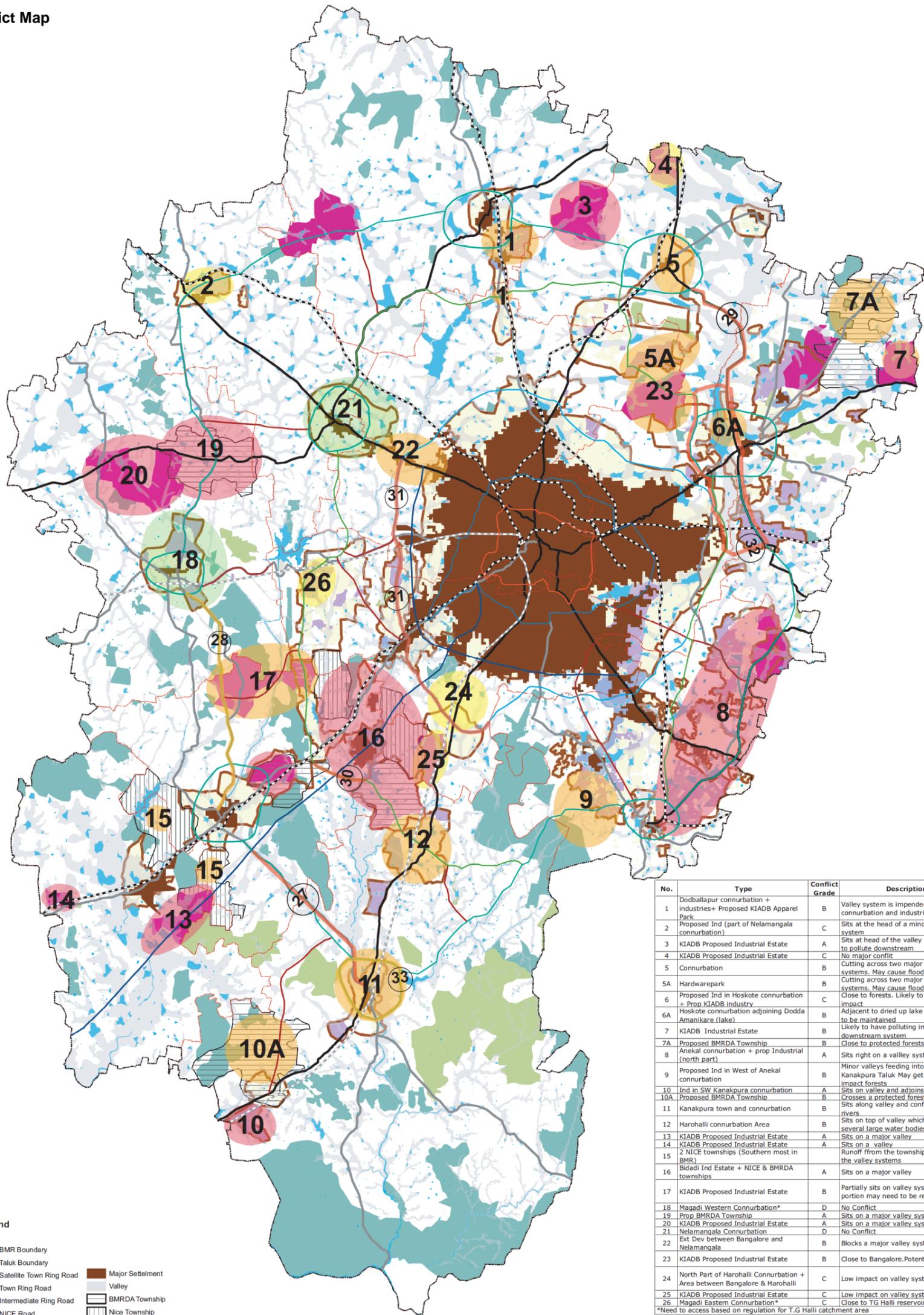








Conflict Map



Legend

- BMR Boundary
- Taluk Boundary
- Satellite Town Ring Road
- Town Ring Road
- Intermediate Ring Road
- NICE Road
- Peripheral Ring Road
- Radial Road
- Inner Ring Road
- Outer Ring Road
- Railway
- Railway Proposed
- NH
- SH
- Major Settlement
- Valley
- BMRDA Township
- NICE Township
- Conurbation
- Water Body
- KIADB_Existing_Estate
- KIADB_Upcoming_Estate
- Industrial
- Residential
- Protected Forest
- Reserve Forest

Grade	Risk
	Critical + Stringent Management Mechanism
	A / Relocate
	B Moderate + Management Mechanisms
	C Low + Management Mechanisms
	D No conflict

No.	Type	Conflict Grade	Description
1	Dodballapur conurbation + Industries+ Proposed KIADB Apparel Park	B	Valley system is impeded by conurbation and industries
2	Proposed Ind (part of Nelamangala conurbation)	C	Sits at the head of a minor valley system
3	KIADB Proposed Industrial Estate	A	Sits at head of the valley systems likely to pollute downstream
4	KIADB Proposed Industrial Estate	C	No major conflict
5	Conurbation	B	Cutting across two major valley systems. May cause flooding
5A	Hardwarepark	B	Cutting across two major valley systems. May cause flooding
6	Proposed Ind in Hoskote conurbation + Prop KIADB industry	C	Close to forests. Likely to have negative impact
6A	Hoskote conurbation adjoining Dodda Amanikare (lake)	B	Adjacent to dried up lake which needs to be maintained
7	KIADB Industrial Estate	B	Likely to have polluting impact on the downstream system
7A	Proposed BMRDA Township	B	Close to protected forests
8	Anekal conurbation + prop Industrial (north part)	A	Sits right on a valley system
9	Proposed Ind in West of Anekal conurbation	B	Minor valleys feeding into forests in Kanakpura Taluk May get polluted and impact forests
10	Ind in SW Kanakpura conurbation	A	Sits on valley and adjoins residential
10A	Proposed BMRDA Township	B	Crosses a protected forest area
11	Kanakpura town and conurbation	B	Sits along valley and confluence of two rivers
12	Harohalli conurbation Area	B	Sits on top of valley which includes several large water bodies
13	KIADB Proposed Industrial Estate	A	Sits on a major valley
14	KIADB Proposed Industrial Estate	A	Sits on a valley
15	2 NICE townships (Southern most in BMR)	B	Runoff from the township may impact the valley systems
16	Bidadi Ind Estate + NICE & BMRDA townships	A	Sits on a major valley
17	KIADB Proposed Industrial Estate	B	Partially sits on valley system. Eastern portion may need to be relocated
18	Magadi Western Conurbation*	D	No Conflict
19	Prop BMRDA Township	A	Sits on a major valley system
20	KIADB Proposed Industrial Estate	A	Sits on a major valley system
21	Nelamangala Conurbation	D	No Conflict
22	Ext Dev between Bangalore and Nelamangala	B	Blocks a major valley system
23	KIADB Proposed Industrial Estate	B	Close to Bangalore. Potential for flooding
24	North Part of Harohalli Conurbation + Area between Bangalore & Harohalli	C	Low impact on valley system
25	KIADB Proposed Industrial Estate	C	Low impact on valley system
26	Magadi Eastern Conurbation*	C	Close to TG Halli reservoir*
*Need to access based on regulation for T.G Halli catchment area			
Transport			
27	Stretch of STRR between Kankapura & Ramnagar	A	Running along a major valley. Possible deve along corridor may have negative impact (Flooding, Ground Water & Water body pollution, forest reserves impact)
28	Stretch of STRR between Ramnagar & Magadi	B	Crosses a forest reserve area
29	D'Halli - Hoskote Dommasandra	A	Runs through a major valley system
30	From Ramanagar Proposed township to Bidadi township	A	Cuts across several valleys
31	Portion parallel to NICE on West	A	Runs through several valley system
32	IRR & STRR in North - East	A	Access Proximity
33	Kanakpura town RR	B	Sits on a valley

Grade	Risk
	Critical + Stringent Management Mechanism
	A / Relocate
	B Moderate + Management Mechanisms
	C Low + Management Mechanisms
	D No conflict

Section 3.2: LCA Grades and implications of the grades of conflict

Grades	Risks and recommendations
A	<p>Critical + Stringent Management Mechanism / Relocate Developments where the long term damage to the region's environment is deemed critical and the proposed development needs to be questioned for its validity and need. If already committed in terms of land acquisition or are already existing, stringent mechanisms need to be proposed to ensure that the natural features are completely protected and conserved.</p>
B	<p>Moderate + Management Mechanisms Developments that have a moderate level of conflict with the natural environment, which can be managed by proposing a series of caveats to ensure that the existing or proposed development will not be counter-productive to the benefits of the larger ecological services of the regional environment. The caveats may include directions to manage water consumption and waste disposal, and regulations for site planning to cause minimal disruption to the natural environment.</p>
C	<p>Low + Management Mechanisms Developments that have a low level of conflict with the natural environment, which can be managed by proposing a few caveats to ensure that the existing or proposed development will not be counter-productive to the benefits of the larger ecological services of the regional environment. The caveats may include directions to manage water consumption and waste disposal, and regulations for site planning to cause minimal disruption to the natural environment.</p>
D	<p>No conflict Developments that show no conflict with the natural environment and can be continued as proposed.</p>

ANNEXURE 4: DEMOGRAPHY**Section – 4.1a: Major Demographic Features of BMR and its Constituent Districts and Talukas and Erstwhile BMP- 2001 Census**

Taluk	Total pop	Total male	Total female	Sex Ratio	Pop< 6years	% of < 6 pop of total	Total SC	% SC of total pop	Total ST	% ST of total pop	Total literates	% of literates	Total households	Avg_HH Size
Bangalore Rural District														
Nelamangala	174880	89473	85407	955	20662	11.81%	39820	22.77%	6310	3.61%	111500	72.30%	36957	4.7
Rural	149593	76350	73243	959	17744	11.86%	36166	24.18%	5662	3.78%	92166	69.90%	31358	4.8
Urban	25287	13123	12164	927	2918	11.54%	3654	14.45%	648	2.56%	19334	86.43%	5599	4.5
Dod Ballapur	268332	137541	130791	951	34152	12.73%	54728	20.40%	11609	4.33%	161902	69.14%	55774	4.8
Rural	190554	97344	93210	958	24095	12.64%	47241	24.79%	10593	5.56%	109689	65.90%	39459	4.8
Urban	77778	40197	37581	935	10057	12.93%	7487	9.63%	1016	1.31%	52213	77.10%	16315	4.8
Devanahalli	185326	95288	90038	945	23440	12.65%	43288	23.36%	18093	9.76%	110358	68.17%	36013	5.1
Rural	132380	67946	64434	948	16447	12.42%	35245	26.62%	15648	11.82%	76508	65.99%	25201	5.3
Urban	52946	27342	25604	936	6993	13.21%	8043	15.19%	2445	4.62%	33850	73.66%	10812	4.9
Hosakote	222430	115187	107243	931	29047	13.06%	48766	21.92%	7658	3.44%	133790	69.18%	42613	5.2
Rural	186107	96325	89782	932	24378	13.10%	44930	24.14%	6787	3.65%	108875	67.32%	34956	5.3
Urban	36323	18862	17461	926	4669	12.85%	3836	10.56%	871	2.40%	24915	78.71%	7657	4.7
District Average / Total	850968	437489	413479	945	107301	12.61%	186602	21.93%	43670	5.13%	517550	69.59%	171357	5.0
District Average / Total- Rural	658634	337965	320669	949	82664	12.55%	163582	24.84%	38690	5.87%	387238	67.23%	130974	5.0
District Average / Urban	192334	99524	92810	933	24637	12.81%	23020	11.97%	4980	2.59%	130312	77.71%	40383	4.8
Ramnagaram														
Magadi	202417	101820	100597	988	23059	11.39%	38347	18.94%	5636	2.78%	112412	62.67%	43534	4.6
Rural	177386	89078	88308	991	19856	11.19%	35690	20.12%	4951	2.79%	95741	60.78%	38314	4.6
Urban	25031	12742	12289	964	3203	12.80%	2657	10.61%	685	2.74%	16671	76.37%	5220	4.8
Ramanagaram	238347	122083	116264	952	29036	12.18%	44605	18.71%	5312	2.23%	134910	64.45%	50062	4.8
Rural	158953	80991	77962	963	18439	11.60%	31009	19.51%	4763	3.00%	85503	60.85%	34500	4.6
Urban	79394	41092	38302	932	10597	13.35%	13596	17.12%	549	0.69%	49407	71.82%	15562	5.1
Channapatna	252574	127071	125503	988	28481	11.28%	44036	17.43%	1165	0.46%	138883	61.98%	53496	4.7
Rural	188997	94940	94057	991	20528	10.86%	34874	18.45%	599	0.32%	95929	56.94%	41036	4.6
Urban	63577	32131	31446	979	7953	12.51%	9162	14.41%	566	0.89%	42954	77.22%	12460	5.1
Kanakapura	337208	173720	163488	941	37741	11.19%	64089	19.01%	5772	1.71%	167572	55.96%	72259	4.7
Rural	290148	149103	141045	946	32204	11.10%	58481	20.16%	5330	1.84%	136870	53.06%	62381	4.7
Urban	47060	24617	22443	912	5537	11.77%	5608	11.92%	442	0.94%	30702	73.94%	9878	4.8
District Average / Total	1030546	524694	505852	964	118317	11.48%	191077	18.54%	17885	1.74%	553777	60.71%	219351	4.7
District Average / Total- Rural	815484	414112	401372	969	91027	11.16%	160054	19.63%	15643	1.92%	414043	57.15%	176231	4.6
District Average / Urban	215062	110582	104480	945	27290	12.69%	31023	14.43%	2242	1.04%	139734	74.42%	43120	5.0
Bangalore Urban District														
Bangalore North	830061	440822	389239	883	107318	12.93%	117202	14.12%	19138	2.31%	575267	79.59%	192937	4.3
Rural	223031	115614	107417	929	28611	12.83%	49539	22.21%	7446	3.34%	139790	71.90%	47526	4.7
Urban	607030	325208	281822	867	78707	12.97%	67663	11.15%	11692	1.93%	435477	82.43%	145411	4.2
Bangalore South	1009924	532611	477313	896	129033	12.78%	165867	16.42%	14251	1.41%	691862	78.54%	230859	4.4
Rural	312946	163438	149508	915	41810	13.36%	70576	22.55%	5715	1.83%	191561	70.65%	67474	4.6
Urban	696978	369173	327805	888	87223	12.51%	95291	13.67%	8536	1.22%	500301	82.05%	163385	4.3
Anekal	299428	159024	140404	883	38653	12.91%	79539	26.56%	5417	1.81%	183606	70.41%	67450	4.4
Rural	241160	127149	114011	897	31089	12.89%	73473	30.47%	4914	2.04%	143180	68.16%	53445	4.5
Urban	58268	31875	26393	828	7564	12.98%	6066	10.41%	503	0.86%	40426	79.73%	14005	4.2
Rest of Bangalore Urban District	4397711	2294142	2103569	917	497536	11.31%	488439	11.11%	47212	1.07%	3331830	85.43%	969451	4.5
Urban	4397711	2294142	2103569	917	497536	11.31%	488441	11.11%	47214	1.07%	3331832	85.43%	969453	4.5
District Average / Total	6537124	3426599	3110525	908	772540	11.82%	851047	13.02%	86018	1.32%	4782565	82.96%	1460697	4.5
District Average / Total- Rural	777137	406201	370936	913	101510	13.06%	193588	24.91%	18075	2.33%	474531	70.24%	168445	4.6
District Average / Urban	5759987	3020398	2739589	907	671032	11.65%	657461	11.41%	67945	1.18%	4308036	84.65%	1292254	4.5
Total BMR	8418638	4388782	4029856	918	998158	11.86%	1228726	14.60%	147573	1.75%	5853892	78.89%	1851405	4.5
District Average / Total- Rural	2251255	1158278	1092977	944	275201	12.22%	517224	22.97%	72408	3.22%	1275812	64.56%	475650	4.7
District Average / Urban	6167383	3230504	2936879	909	722959	11.72%	711504	11.54%	75167	1.22%	4578082	84.09%	1375757	4.5
BMP	4301326	2242835	2058491	918	484982	11.28%	477924	11.11%	45585	1.06%	3265702	85.57%	947169	4.5

Section 4.1b: Trend of population, density, urbanization in BMR, its Constituent Districts and Talukas - 2001 Census

TALUKA	2001								1991						
	Area (Sq.Km.)	Pop	Decadal increase	Decadal growth rate (%)	Density (p/sq.km.)	% Urban pop	% Rural pop	%_tot pop_BMR	Pop	Decadal increase	Decadal growth rate (%)	Density (p/sq.km.)	% Urban pop	% Rural pop	%_tot pop_BMR
Bangalore Rural District															
Nelamangala	506	174880	31184	21.70%	346	14.5%	85.5%	2.1%	143696	-21410	-12.97%	282	12.2%	87.8%	2.2%
Rural		149593	23464	18.60%					126129	-26403	-17.31%	249			
Urban		25287	7720	43.95%					17567	4993	39.71%	6164			
Dod Ballapur	778	268332	43685	19.45%	345	29.0%	71.0%	3.2%	224647	33359	17.44%	284	24.3%	75.7%	3.4%
Rural		190554	20516	12.07%					170038	25918	17.98%	218			
Urban		77778	23169	42.43%					54609	7441	15.78%	4181			
Devanahalli	431	185326	24643	15.34%	430	28.6%	71.4%	2.2%	160683	-15291	-8.69%	358	26.4%	73.6%	2.5%
Rural		132380	14109	11.93%					118271	-22504	-15.99%	274			
Urban		52946	10534	24.84%					42412	7213	20.49%	2459			
Hosakote	544	222430	33931	18.00%	409	16.3%	83.7%	2.6%	188499	-15095	-7.41%	344	13.5%	86.5%	2.9%
Rural		186107	23141	14.20%					162966	-23090	-12.41%	299			
Urban		36323	10790	42.26%					25533	7995	45.59%	8184			
District Average / Total	2260	850968	133443	18.60%	377	22.6%	77.4%	10.1%	717525	-18437	-2.51%	312	19.5%	80.5%	11.0%
District Average / Total - Rural		658634	81230	14.07%					577404	-46079	-7.39%				
District Average / Total - Urban		192334	52213	37.26%					140121	27642	24.58%				
Ramnagaram															
Magadi	795	202417	8365	4.31%	255	12.4%	87.6%	2.4%	194052	-9863	-4.84%	243	10.1%	89.9%	3.0%
Rural		177386	2980	1.71%					174406	-11886	-6.38%	219			
Urban		25031	5385	27.41%					19646	2023	11.48%	7276			
Ramanagaram	625	238347	32391	15.73%	381	33.3%	66.7%	2.8%	205956	33573	19.48%	327	24.5%	75.5%	3.2%
Rural		158953	3434	2.21%					155519	27141	21.14%	249			
Urban		79394	28957	57.41%					50437	6432	14.62%	10169			
Channapatna	534	252574	13371	5.59%	473	25.2%	74.8%	3.0%	239203	21140	9.69%	440	23.1%	76.9%	3.7%
Rural		188997	5003	2.72%					183994	16656	9.95%	344			
Urban		63577	8368	15.16%					55209	4484	8.84%	6557			
Kanakapura	1601	337208	20750	6.56%	211	14.0%	86.0%	4.0%	316458	44021	16.16%	197	12.0%	88.0%	4.9%
Rural		290148	11563	4.15%					278585	36309	14.99%	174			
Urban		47060	9187	24.26%					37873	7712	25.57%	10208			
District Average / Total	3555	1030546	74877	7.84%	290	20.9%	79.1%	12.2%	955669	88871	10.25%	269	17.1%	82.9%	14.7%
District Average / Total - Rural		815484	22980	2.90%					792504	68220	9.42%				
District Average / Total - Urban		215062	51897	31.81%					163165	20651	14.49%				
Bangalore Urban District															
Bangalore North	902	830061	-102690	-11.01%	920	73.1%	26.9%	9.9%	932751	605086	184.67%	1167	78.3%	21.7%	14.3%
Rural		223031	20758	10.26%					202273	96032	90.39%	366			
Urban		607030	-123448	-16.90%					730478	509054	229.90%	2958			
Bangalore South	709	1009924	-15240	-1.49%	1424	69.0%	31.0%	12.0%	1025164	649874	173.17%	1177	72.8%	27.2%	15.7%
Rural		312946	34530	12.40%					278416	124303	80.66%	417			
Urban		696978	-49770	-6.66%					746748	525571	237.62%	3683			
Anekal	528	299428	78269	35.39%	567	19.5%	80.5%	3.6%	221159	55619	33.60%	413	14.4%	85.6%	3.4%
Rural		241160	51940	27.45%					189220	42947	29.36%	358			
Urban		58268	26329	82.44%					31939	12672	65.77%	4299			
Rest of Bangalore Urban District	51	4397711	1737623	65.32%	86230	100.0%	0.0%	52.2%	2660088	183733	7.42%	#DIV/0!	100.0%	0.0%	40.8%
Urban		4397711	1737623	65.32%					2660088	183733	7.42%	#DIV/0!			
District Average / Total	2190	6537124	1697962	35.09%	2985	88.1%	11.9%	77.7%	4839162	1494312	44.68%	2210	86.2%	13.8%	74.3%
District Average / Total - Rural		777137	107228	16.01%					669909	263282	64.75%				
District Average / Total - Urban		5759987	1590734	38.15%					4169253	1231030	41.90%				
Total BMR	8005	8418638	1906282	29.27%	1052	73.3%	26.7%	100.0%	6512356	1564746	31.63%	810	68.7%	31.3%	100.0%
Total BMR_Rural		2251255	211438	10.37%					2039817	285423	16.27%				
Total BMR_Urban		6167383	1694844	37.89%					4472539	1279323	40.06%				

Note : The negative decadal population growth of Bangalore North and South are due to change in jurisdiction

Continued.....

Section 4.1b: Continued

TALUKA	1981							1971						
	Pop	Decadal increase	Decadal growth rate (%)	Density	% Urban pop	% Rural pop	%_tot pop_BMR	Pop	Decadal increase	Decadal growth rate (%)	Density	% Urban pop	% Rural pop	%_tot pop_BMR
Bangalore Rural District														
Nelamangala	165106	30221	22.41%	248.31704	7.6%	92.4%	3.3%	134885	125465	16.35%	206.53039	11.3%	88.7%	4.0%
Rural	152532	32922	27.52%					119610	110731	14.88%				
Urban	12574	-2701	-17.68%					15275	14734	29.22%				
Dod Ballapur	191288	36652	23.70%	241.58626	24.7%	75.3%	3.9%	154636	134002	18.60%	195.64271	23.0%	77.0%	4.6%
Rural	144120	25084	21.07%					119036	107616	15.54%				
Urban	47168	11568	32.49%					35600	26386	30.11%				
Devanahalli	175974	45496	34.87%	294.32012	20.0%	80.0%	3.6%	130478	117763	26.66%	218.48292	18.0%	82.0%	3.9%
Rural	140775	33825	31.63%					106950	95990	25.43%				
Urban	35199	11671	49.60%					23528	21773	32.57%				
Hosakote	203594	49853	32.43%	300.90748	8.6%	91.4%	4.1%	153741	140365	22.50%	230.53081	7.9%	92.1%	4.6%
Rural	186056	44478	31.42%					141578	128964	21.66%				
Urban	17538	5375	44.19%					12163	11401	33.19%				
District Average / Total	735962	162222	28.27%	269.4647	15.3%	84.7%	14.9%	573740	517595	20.83%	211.89984	15.1%	84.9%	17.0%
District Average / Total - Rural	623483	136309	27.98%					487174	78391	19.18%				
District Average / Total - Urban	112479	25913	29.93%					86566	20504	31.04%				
Ramnagaram														
Magadi	203915	31401	18.20%	219.2163	8.6%	91.4%	4.1%	172514	150842	9.11%	188.89084	7.7%	92.3%	5.1%
Rural	186292	27127	17.04%					159165	140130	8.30%				
Urban	17623	4274	32.02%					13349	10712	19.68%				
Ramanagaram	172383	36162	26.55%	273.36346	25.5%	74.5%	3.5%	136221	118358	23.13%	315.54552	23.1%	76.9%	4.0%
Rural	128378	23599	22.52%					104779	88387	12.50%				
Urban	44005	12563	39.96%					31442	29971	79.75%				
Channapatna	218063	45073	26.06%	400.04219	23.3%	76.7%	4.4%	172990	156811	17.22%	318.87558	18.8%	81.2%	5.1%
Rural	167338	26936	19.18%					140402	126649	15.92%				
Urban	50725	18137	55.66%					32588	30162	23.13%				
Kanakapura	272437	52616	23.94%	171.30093	11.1%	88.9%	5.5%	219821	190044	10.70%	137.89662	9.2%	90.8%	6.5%
Rural	242276	42752	21.43%					199524	171929	8.46%				
Urban	30161	9864	48.60%					20297	18115	39.04%				
District Average / Total	866798	165252	23.56%	234.50423	16.4%	83.6%	17.5%	701546	616055	14.09%	201.50103	13.9%	86.1%	20.8%
District Average / Total - Rural	724284	120414	19.94%					603870	58687	10.76%				
District Average / Total - Urban	142514	44838	45.90%					97676	27965	40.12%				
Bangalore Urban District														
Bangalore North	327665	143627	78.04%	846.24225	67.6%	32.4%	6.6%	184038	220942	48.92%	521.97515	35.0%	65.0%	5.5%
Rural	106241	-13354	-11.17%					119595	233934	208.37%				
Urban	221424	156981	243.60%					64443	-12992	-24.01%				
Bangalore South	375290	173425	85.91%	653.13261	58.9%	41.1%	7.6%	201865	258050	137.38%	394.36771	12.4%	87.6%	6.0%
Rural	154113	-22713	-12.84%					176826	261373	212.00%				
Urban	221177	196138	783.33%					25039	-3323	-11.72%				
Anekal	165540	35940	27.73%	309.18939	11.6%	88.4%	3.3%	129600	115567	15.40%	242.74209	13.4%	86.6%	3.9%
Rural	146273	33977	30.26%					112296	99978	15.06%				
Urban	19267	1963	11.34%					17304	15589	17.63%				
Rest of Bangalore Urban District	2476355	901629	57.26%	30838.792	100.0%	0.0%	50.1%	1574726	1259905	43.97%	9723.532	100.0%	0.0%	46.8%
Urban	2476355	901629	57.26%					1574726	480928	43.97%				
District Average / Total	3344850	1254621	60.02%	2120.3487	87.8%	12.2%	67.6%	2090229	1854464	47.75%	1339.6328	80.4%	19.6%	62.1%
District Average / Total - Rural	406627	-2090	-0.51%					408717	215665	111.71%				
District Average / Total - Urban	2938223	1256711	74.74%					1681512	459841	37.64%				
Total BMR	4947610	1582095	47.01%	618.06	64.5%	35.5%	100.0%	3365515	2988114	34.38%	434.28802	55.4%	44.6%	100.0%
Total BMR Rural	1754394	254633	16.98%					1499761	352743	30.75%				
Total BMR Urban	3193216	1327462	71.15%					1865754	508310	37.45%				

Section 4.2: Workforce Details of BMR, its Constituent Districts and Talukas – 2001 Census

Taluk	Total workforce	Work participation rate	Main workforce	Marginal workforce	% of main Work force	% of Margn Work force	Total_CL	Total_AL	Total_HH	Tot al Others	% CL_of Total	% AL_of Total	% HH_of Total	% OTH_of Total	Non workers	% of Non workers
Bangalore Rural District																
Nelamangala	78078	44.65%	64511	13567	36.89%	7.76%	32003	14049	4053	27973	18.30%	8.03%	2.32%	16.00%	96802	55.35%
Rural	69228	46.28%	56174	13054	37.55%	8.73%	31851	13922	3080	20375	21.29%	9.31%	2.06%	13.62%	80365	53.72%
Urban	8850	35.00%	8337	513	32.97%	2.03%	152	127	973	7598	0.60%	0.50%	3.85%	30.05%	16437	65.00%
Dod Ballapur	127843	47.64%	105989	21854	39.50%	8.14%	48596	23954	11339	43954	18.11%	8.93%	4.23%	16.38%	140489	52.36%
Rural	97212	51.02%	76872	20340	40.34%	10.67%	48357	23657	3055	22143	25.38%	12.41%	1.60%	11.62%	93342	48.98%
Urban	30631	39.38%	29117	1514	37.44%	1.95%	239	297	8284	21811	0.31%	0.38%	10.65%	28.04%	47147	60.62%
Devanahalli	88533	47.77%	74971	13562	40.45%	7.32%	31210	24193	1845	31285	16.84%	13.05%	1.00%	16.88%	96793	52.23%
Rural	67918	51.31%	55603	12315	42.00%	9.30%	29170	21394	1144	16210	22.04%	16.16%	0.86%	12.25%	64462	48.69%
Urban	20615	38.94%	19368	1247	36.58%	2.36%	2040	2799	701	15075	3.85%	5.29%	1.32%	28.47%	32331	61.06%
Hosakote	101754	45.75%	86136	15618	38.72%	7.02%	36100	22603	3729	39322	16.23%	10.16%	1.68%	17.68%	120676	54.25%
Rural	88457	47.53%	73392	15065	39.44%	8.09%	34998	21308	2856	29295	18.81%	11.45%	1.53%	15.74%	97650	52.47%
Urban	13297	36.61%	12744	553	35.09%	1.52%	1102	1295	873	10027	3.03%	3.57%	2.40%	27.61%	23026	63.39%
District Average / Total	396208	46.56%	331607	64601	38.97%	7.59%	147909	84799	20966	142534	17.38%	9.97%	2.46%	16.75%	454760	53.44%
District Average / Total- Rural	322815	49.01%	262041	60774	39.79%	9.23%	144376	80281	10135	88023	21.92%	12.19%	1.54%	13.36%	335819	50.99%
District Average / Urban	73393	38.16%	69566	3827	36.17%	1.99%	3533	4518	10831	54511	1.84%	2.35%	5.63%	28.34%	118941	61.84%
Ramnagaram																
Magadi	105259	52.00%	73017	32242	36.07%	15.93%	56864	20686	6450	21259	28.09%	10.22%	3.19%	10.50%	97158	48.00%
Rural	94778	53.43%	63712	31066	35.92%	17.51%	56443	19881	4059	14395	31.82%	11.21%	2.29%	8.12%	82608	46.57%
Urban	10481	41.87%	9305	1176	37.17%	4.70%	421	805	2391	6864	1.68%	3.22%	9.55%	27.42%	14550	58.13%
Ramanagaram	110690	46.44%	95150	15540	39.92%	6.52%	40818	16394	3264	50214	17.13%	6.88%	1.37%	21.07%	127657	53.56%
Rural	79101	49.76%	67337	11764	42.36%	7.40%	39856	15700	1549	21996	25.07%	9.88%	0.97%	13.84%	79852	50.24%
Urban	31589	39.79%	27813	3776	35.03%	4.76%	962	694	1715	28218	1.21%	0.87%	2.16%	35.54%	47805	60.21%
Channapatna	114666	45.40%	98539	16127	39.01%	6.39%	44596	25278	7059	37733	17.66%	10.01%	2.79%	14.94%	137908	54.60%
Rural	90962	48.13%	77561	13401	41.04%	7.09%	44166	24757	2144	19895	23.37%	13.10%	1.13%	10.53%	98035	51.87%
Urban	23704	37.28%	20978	2726	33.00%	4.29%	430	521	4915	17838	0.68%	0.82%	7.73%	28.06%	39873	62.72%
Kanakapura	165708	49.14%	128339	37369	38.06%	11.08%	78915	35040	4712	47041	23.40%	10.39%	1.40%	13.95%	171500	50.86%
Rural	148095	51.04%	111677	36418	38.49%	12.55%	78414	34626	3123	31932	27.03%	11.93%	1.08%	11.01%	171500	59.11%
Urban	17613	37.43%	16662	951	35.41%	2.02%	501	414	1589	15109	1.06%	0.88%	3.38%	32.11%	171500	36.43%
District Average / Total	496323	48.16%	395045	101278	38.33%	9.83%	221193	97398	21485	156247	21.46%	9.45%	2.08%	15.16%	534223	51.84%
District Average / Total- Rural	412936	50.64%	320287	92649	39.28%	11.36%	218879	94964	10875	88218	26.84%	11.65%	1.33%	10.82%	431995	52.97%
District Average / Urban	83387	38.77%	74758	8629	34.76%	4.01%	2314	2434	10610	68029	1.08%	1.13%	4.93%	31.63%	273728	127.28%
Bangalore Urban District																
Bangalore North	356390	42.94%	315091	41299	37.96%	4.98%	28692	22583	12679	292436	3.46%	2.72%	1.53%	35.23%	473671	57.06%
Rural	102546	45.98%	81631	20915	36.60%	9.38%	26999	20762	3721	51064	12.11%	9.31%	1.67%	22.90%	120485	54.02%
Urban	253844	41.82%	233460	20384	38.46%	3.36%	1693	1821	8958	241372	0.28%	0.30%	1.48%	39.76%	353186	58.18%
Bangalore South	420931	41.68%	382298	38633	37.85%	3.83%	28152	20970	10889	360920	2.79%	2.08%	1.08%	35.74%	588993	58.32%
Rural	137827	44.04%	118317	19510	37.81%	6.23%	26294	18355	4696	88482	8.40%	5.87%	1.50%	28.27%	175119	55.96%
Urban	283104	40.62%	263981	19123	37.88%	2.74%	1858	2615	6193	272438	0.27%	0.38%	0.89%	39.09%	413874	59.38%
Anekal	130682	43.64%	109863	20819	36.69%	6.95%	24196	19334	5587	81565	8.08%	6.46%	1.87%	27.24%	168746	56.36%
Rural	105040	43.56%	85813	19227	35.58%	7.97%	23853	18849	3334	59004	9.89%	7.82%	1.38%	24.47%	136120	56.44%
Urban	25642	44.01%	24050	1592	41.27%	2.73%	343	485	2253	22561	0.59%	0.83%	3.87%	38.72%	32626	55.99%
Rest of Bangalore Urban District	1658911	37.72%	1570928	87983	35.72%	2.00%	4714	4215	40106	1609876	0.11%	0.10%	0.91%	36.61%	2738800	62.28%
Urban	1658911	37.72%	1570928	87983	35.72%	2.00%	4714	4215	40106	1609876	0.11%	0.10%	0.91%	36.61%	2738802	62.28%
District Average / Total	2566914	39.27%	2378180	188734	36.38%	2.89%	85754	67102	69261	2344797	1.31%	1.53%	1.57%	53.32%	3970210	60.73%
District Average / Total- Rural	345413	44.45%	285761	59652	36.77%	7.68%	77146	57966	11751	198550	9.93%	0.89%	0.18%	3.04%	431724	55.55%
District Average / Urban	2221501	38.57%	2092419	129082	36.33%	2.24%	8608	9136	57510	2146247	0.15%	1.18%	7.40%	276.17%	3538486	61.43%
Total BMR	3459445	41.09%	3104832	354613	36.88%	4.21%	454856	249299	111712	2643578	5.40%	2.96%	1.33%	31.40%	4959193	58.91%
Rural	1081164	48.02%	868089	213075	38.56%	9.46%	440401	233211	32761	374791	19.56%	10.36%	1.46%	16.65%	1199538	53.28%
Urban	2378281	38.56%	2236743	141538	36.27%	2.29%	14455	16088	78951	2268787	0.23%	0.26%	1.28%	36.79%	3931155	63.74%

Section 4.3: Major Demographic Features of BMR towns outside BMA

Town	Area (sq.km.)	ULB status	Total pop. 1991	Total pop. 2001	Density	Decadal Growth rate (%)	no of HH 1991	no of HH 2001	Avg HH Size 1991	Avg HH Size 2001	Total workforce 1991	Total Workforce 2001	WPR 1991	WPR 2001
Nelamangala	2.85	TP	17567	25287	8873	43.95%	3459	5599	5.1	4.5	5059	8850	28.80%	35.00%
Dod Ballapur	13.37	CMC	54609	71606	5356	31.12%	10177	14917	5.4	4.8	18736	28122	34.31%	39.27%
Devanahalli	15.94	CMC	18253	23406	1468	28.23%	3368	4801	5.4	4.9	6256	9336	34.27%	39.89%
Hosakote	14.28	TMC	25533	36323	2544	42.26%	4708	7657	5.4	4.7	8519	13297	33.36%	36.61%
Magadi	4.98	TMC	19646	25031	5026	27.41%	3709	5220	5.3	4.8	7480	10481	38.07%	41.87%
Ramanagaram	12.39	CMC	50437	79394	6408	57.41%	9265	15562	5.4	5.1	16987	31589	33.68%	39.79%
Channapatna	8.42	CMC	55209	63577	7551	15.16%	9961	12460	5.5	5.1	17942	23704	32.50%	37.28%
Kanakapura	7.20	TMC	37873	47060	6536	24.26%	7336	9878	5.2	4.8	13037	17613	34.42%	37.43%
Anekal	5.00	TMC	24938	33157	6631	32.96%	4240	7127	5.9	4.7	8248	12508	33.07%	37.72%
Vijayapura	14.55	TMC	24159	29540	2030	22.27%	4421	6011	5.5	4.9	8552	11279	35.40%	38.18%
Total	98.98		328224	434381	4389	32.34%	60644	89232	5.4	4.9	110816	166779	33.76%	38.39%

Section 4.4: Area and Population Details of Various Local Area Plans within BMR

IMP Projections¹⁷	Area¹⁸ (sq.km.)	Pop 2001 (Actual)	Pop 2011 (natural growth)	Pop 2021¹⁹ (all figures incl. induced pop)
Anekal LPA	406	185396	287200	1078750
<i>CAGR (%) 2001-21</i>				9.20
Magadi LPA	501	130806		426114
<i>CAGR (%) 2001-21</i>				6.08
Hoakote LPA	591	231204	277554	333172
<i>CAGR (%) 2001-21</i>				1.84
Kanakapura LPA	879	170338	502794	1122744
<i>CAGR (%) 2001-21</i>				9.89
BIAAPA	985	405292	498339	1500000
<i>CAGR (%) 2001-21</i>				6.76
Nelamangala LPA	750	235000	329000	500000
<i>CAGR (%) 2001-21</i>				3.85
RCUDA (Ramnagaram+Bidadi)	62.5	N.A.	750000.00	1100000
<i>CAGR (%) 2001-21</i>				N.A.
BMA (RMP-2015)	1240.69	6170000	8015000	9968000
<i>CAGR (%) 2001-21</i>				
Total BMR	8005.45	8400000	10659887	16028780
<i>CAGR (%) 2001-21</i>				3.28

17 Population Source : Respective Local Area Plan Documents (Interim Master Plans), RMP-2015 for Bangalore

18 Area Source : Official Website of BMRDA

19 This calculation does not include IZ population and BMICPA population due to non-availability of data

Section 4.5: Population Trend of BMA – 1961-2001

Census Year	Population ²⁰ (million)	Decadal Growth Rate (%)	CAGR (%)
1961	1.21		
1971	1.66	37.86	3.26
1981	2.91	75.06	5.76
1991	4.30	47.61	3.97
2001	6.17	43.49	3.68

Section 4.6: Population Trend of BMR – 1961-2001

Census Year	Population (million)	Decadal Growth Rate (%)	CAGR (%)
1961	2.50		
1971	3.37	34.38	3.00
1981	4.95	47.01	3.93
1991	6.51	31.63	2.79
2001	8.42	29.27	2.60

²⁰ There are discrepancies regarding 1991 and previous BMA population in various documents namely CDP-1995, Structure Plan-2011 and RMP-2015. The 4.13 million population quoted in RMP-2015 for 1991 BMA seems to be the population of BUA (Refer 1991 Census). To eliminate the anomalies, a rationalisation exercise has been done based on populations and growth rates available from different sources / documents and this indicates that 1991 BMA population was approximately 4.3 million in all probability. However, most other contemporary documents like JNNURM CDP for Bangalore have adhered to the RMP population for BMA 1991 (4.13 million) and this gives a CAGR of about 8.4% during 1991-2001. For the purpose of this analysis however, we are taking 1991 BMA population as 4.3 million which seems more realistic from all aspects.

Section 4.7: Population Trend Assessment in BMR – BMR SP 2011 Target Vs Current Trend

SP-2011					CURRENT TREND*					
Area	Pop_1996	Pop_2011 Projtd	Pop_2011 Induced	Pop_2011 Target	Area	2001 Actual	2008 Estd.	2011 Projtd.	2021 Projtd.	2031 Projtd.
APZ-1: (R'nagar+C'patna+K'pura)	0.83	1.14	0.23	1.37	APZ-1:3 Talukas (R'nagar+C'patna+K'pura)	0.83	0.89	0.92	1.01	1.09
APZ-2 : (Nelamangala)	0.16	0.21	0.10	0.31	APZ-2 : (N'mangala)	0.17	0.18	0.19	0.21	0.23
Magadi Interstitial Zone	0.21	0.31	0.02	0.33	Magadi Taluka	0.20	0.22	0.22	0.24	0.25
Total Western Segment	1.19	1.66	0.35	2.01	Total Western Segment	1.21	1.29	1.34	1.45	1.57
APZ-3 : (Devanahalli + Doddaballapur)	0.42	0.59	0.08	0.67	APZ-3 : 2 Talukas (D'halli + D'ballapur)	0.45	0.50	0.51	0.61	0.74
APZ-4 : (Hoskote)	0.21	0.28	0.02	0.30	APZ-4 :1 Taluka (Hoskote)	0.22	0.23	0.23	0.25	0.26
APZ-5 : (Anekal)	0.24	0.33	0.04	0.37	APZ-5 : 1 Taluka (Anekal)	0.30	0.36	0.39	0.52	0.67
Total Eastern Segment	0.87	1.20	0.14	1.34	Total Eastern Segment	0.98	1.09	1.14	1.38	1.67
% Distribution between Western : Eastern segment	58:42			60:40	% Distribution between Western : Eastern segment	55:45		54:46		

* Note: The projected population shown in the current trends are natural trend without any strategic intervent

Section 4.8: Population Rationalisation for BBMP

The formation of BBMP is a fairly new move and the actual population of BBMP over the years (including 2001) is not available at hand. The JNNURM CDP for Bangalore, which is the other most contemporary document, has considered BBMP population as a total of erstwhile BMP, 7 CMCs and 1 TMC covering a total area of about 561 sq.km and a population of 5.68 mill. This excludes 110 peripheral villages coming under BBMP jurisdiction and thus would not be able to give the actual growth rates for all of the newly added areas. On the other hand, BMA covers an area pf 1307 sq.km. and a population of 6.17 mill. It is noted that although the area difference between the BMA and BBMP is more than 500 sq.km., in reality the population difference would not be much in all probability and it would be anywhere between 5.68 mill to 6.17 mill. This is due to presence of the Green Belt which is less inhibited and covers a large portion of the area which is outside BBMP and inside BMA. Thus, for the purpose of this analysis, 1991 and 2001 BBMP population are represented by BMA population. this might give a little higher population for BBMP in absolute numbers but would at least give a realistic growth rate for the newly added rural and urban areas within BBMP. Refer Annexure-4.9 for rationalized BBMP (i.e. BMA) population.

Section 4.9: BBMP population projection

Area	Area in sq.km.	1991 (in mil)	2001 (in mil)	CAGR (%) 1991-2001	Decadal growth (%) 1991-2001	CAGR (%) 2001 - 11	Decadal growth (%) 2001 -11	2011 (in mil)	CAGR (%) 2011-21	Decadal growth (%) 2011-21	2016 (in mil)	2021 (in mil)	CAGR (%) 2021-31	Decadal growth (%) 2021-31	2031 (in mil)
BMP	226.2	3.30	4.30	2.69	30.39%	1.80	19.52%	5.14	0.78	8.08%	5.35	5.56	0.00	0.00%	5.56
Added area:case-1	573.8	1.00	1.87	6.44	86.70%	6.05	79.85%	3.36	5.78	69.17%	4.43	5.89	4.39	53.66%	9.05
BBMP	800	4.30	6.17	3.68	43.49%	3.26	37.78%	8.50	2.83	32.21%	9.77	11.24	2.51	28.13%	14.40

Section 4.10: Projected Population alternatives for BMR

Method	Population					
	2001	2011	2016	2021	2031	
2nd order polynomial	8.44	10.68	11.88	13.21	16.04	Minimum range
3rd order polynomial	8.41	10.15	10.87	11.63	12.64	
Exponential method	8.68	11.82	13.78	16.08	21.88	
As a total of projected district populations	8.42	10.81	12.12	13.59	16.85	Maximum range
As a total of projected Taluka populations	8.42	10.77	12.02	13.44	16.47	
As a total of Local area plan populations	8.42	11.61	13.64	16.00	22.06	
Average of all above	8.42	10.97	12.39	13.99	17.66	Medium range

Section 4.11: Population projection scenarios for BMR

From the above alternatives, three alternatives (Minimum, Maximum and Medium range) were finally selected for further detailed assessment and scenario building as presented below:

BMR Population Scenario – 1: Minimum Range

Census year	Karnataka ²¹	Pop_BMR	State:BMR	CAGR (%)_BMR	Pop_BBMP	Pop_(BMR-BBMP)	BBMP : Rest of BMR
1901	13.05						
1911	13.53						
1921	13.38						
1931	11.63						
1941	16.26						
1951	19.40	1.35	14.37				
1961	23.59	2.50	9.43	6.36	1.21	1.29	48.28%
1971	29.30	3.37	8.71	3.02	1.66	1.70	49.45%
1981	37.04	4.95	7.48	3.94	2.91	2.04	58.85%
1991	44.81	6.51	6.88	2.78	4.30	2.21	66.05%
2001	52.85	8.42	6.28	2.61	6.17	2.25	73.28%
2011	59.00	10.15	5.81	1.89	8.50	1.65	83.73%
2016	61.69	10.87	5.68	1.37	9.77	1.10	89.92%
2021	64.50	11.63	5.55	1.36	11.24	0.39	96.66%
2031	69.00	12.64	5.46	0.84	14.40	-1.76	113.92%

Assessment:

1. This scenario is supported in long term by the water scenario which indicates a regional population limit of 20 million at any point of time considering all its water resources
2. The proportion with state population conforms to past declining trend but represent a much slower pace
3. Population of BMR becomes lesser than BBMP which makes it an impossible scenario

²¹ Source of Karnataka past and projected population : Census of India and Karnataka State Five Year plan – 2007-12

BMR Population Scenario – 2 : Maximum Range

Census year	Karnataka	Pop_BMR	State:BMR	CAGR(%)_BMR	Pop_BBMP	Pop_(BMR-BBMP)	BBMP : Rest of BMR
1901	13.05						
1911	13.53						
1921	13.38						
1931	11.63						
1941	16.26						
1951	19.40	1.35	14.37				
1961	23.59	2.50	9.43	6.36	1.21	1.29	48.28%
1971	29.30	3.37	8.71	3.02	1.66	1.70	49.45%
1981	37.04	4.95	7.48	3.94	2.91	2.04	58.85%
1991	44.81	6.51	6.88	2.78	4.30	2.21	66.05%
2001	52.85	8.42	6.28	2.61	6.17	2.25	73.28%
2011	59.00	11.61	5.08	3.26	8.50	3.11	73.24%
2016	61.69	13.63	4.53	3.26	9.77	3.85	71.73%
2021	64.50	16.00	4.03	3.26	11.24	4.76	70.24%
2031	69.00	22.06	3.13	3.26	14.40	7.66	65.29%

Assessment:

1. This scenario is not supported in long term by the water scenario which indicates a regional population limit of 20 million at any point of time considering all its water resources
2. The proportion with state population conforms to past declining trend but represent a much faster pace. Holding 1/3th of Karnataka population in BMR in 2031 seems too optimistic
3. The proportion of core:rest of BMR falls below the present share by 2031 which is an unlikely case given the continuing primacy of Bangalore

BMR Population Scenario – 3 : Medium Range

Census year	Karnataka	Pop_BMR	State:BM R	CAGR(%)_BMR	Pop_BBP	Pop_(BMR-BBMP)	BBMP : Rest of BMR
1901	13.05						
1911	13.53						
1921	13.38						
1931	11.63						
1941	16.26						
1951	19.40	1.35					
1961	23.59	2.50		6.36	1.21	1.29	48.28%
1971	29.30	3.37		3.02	1.66	1.70	49.45%
1981	37.04	4.95	7.48	3.94	2.91	2.04	58.85%
1991	44.81	6.51	6.88	2.78	4.30	2.21	66.05%
2001	52.85	8.42	6.28	2.61	6.17	2.25	73.28%
2011	59.00	10.97	5.38	2.68	8.50	2.47	77.47%
2016	61.69	12.39	4.98	2.45	9.77	2.61	78.92%
2021	64.50	13.99	4.61	2.47	11.24	2.75	80.32%
2031	69.00	17.66	3.91	2.35	14.40	3.26	81.55%

Assessment:

1. This scenario is supported in long term by the water scenario which indicates a regional population limit of 20 million at any point of time considering all its water resources
2. The proportion with state population conforms to past declining trend and maintains a moderate pace
3. The share of the core supports past trend

Section 4.12: Urban population projection details of BMR and density²² analysis

Item / Jurisdiction	Area (sq.km.)	2001	2011	2016	2021	2031
URBAN POPULATION IN BMR						
% Urban population ²³		73.3%	80.9%	82.5%	84.0%	85.8%
Urban pop in Million		6.17	8.90	10.31	11.93	15.45
CAGR (%)			3.74	2.97	2.97	2.62
URBAN POPULATION DISTRIBUTION AND DENSITY CALCULATION (Assuming 75:25 population share between the core i.e., BBMP and the rest of BMR)						
BMP	226.20	4.30	5.14	5.35	5.35	5.35
Density		19023	22737	23637	23637	23637
Additional area	573.80	1.87	3.11	4.03	5.30	8.15
Density		3254	5415	7020	9242	14209
BBMP pop @ 75% of total BMR pop	800.00	5.74	8.25	9.38	10.65	13.50
Density		7175	10313	11719	13313	16875
Urban pop outside BBMP (only 10 ULB areas)	98.98	0.43	0.65	0.93	1.28	1.95
Density		4389	6589	9418	12934	19715
Urban pop outside BBMP (10 ULB areas+4 NICE townships)	130.15	0.43	0.65	0.93	1.28	1.95
Density		3338	5011	7163	9837	14993
Urban pop outside BBMP (10 ULB areas+4 NICE townships+ 5 BMRDA townships)	376.15	0.43	0.65	0.93	1.28	1.95
Density		1155	1734	2478	3404	5188
Urban pop outside BBMP (only proposed Conurbations incl ext ULBs)	925.00	0.43	0.65	0.93	1.28	1.95
Density		470	705	1008	1384	2110
Urban pop outside BBMP (only proposed Conurbations incl ext ULBs and excl. industries)	561.00	0.43	0.65	0.93	1.28	1.95
Density		774	1162	1662	2282	3478
Urban pop outside BBMP (10 ULB areas+4 NICE townships +conurbations+ 5 BMRDA townships)	1171.00	0.43	0.65	0.93	1.28	1.95
Density		371	557	796	1093	1666
Urban pop outside BBMP (Identified Urbanisable parcels incl. ext ULBs)	1561.00	0.43	0.65	0.93	1.28	1.95
Density		278	418	597	820	1250

22 All densities are in persons/ sq.km.

23 The urban population growth rate in BMR is going to experience a sudden increase between 2001-11 due to formation of BBMP and subsequent conversion of 110 villages to urban settlements. this have been considered while projecting urban population and thus a higher growth rate has been assumed between 2001-11.

Section 4.13: Population allocation in Clusters and Growth Nodes

Name	Area (sq.km.)	2001	2011	2016	2021	2031
Cluster-1						
Ramanagaram	12.39	79394	103721	117865	133895	169726
Channapatna	8.42	63577	83058	94384	107220	135913
Malur	10.93	6175	8067	9167	10414	13201
Honganur	6.12	7043	9201	10456	11878	15056
2 NICE towns	15				200000	200000
Cluster-1 Total (mill)	52.86	0.16	0.20	0.23	0.46	0.53
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Herohalli	5.71	18069	23606	26825	30473	38627
Cluster-2 Total (mill)	15.00	0.02	0.02	0.03	0.23	0.24
Cluster-3						
Nelamangala	2.85	25287	33035	37540	42646	54058
Cluster-3 Total (mill)	2.85	0.03	0.03	0.04	0.04	0.05
Cluster-4						
Thyamagondlu	3.48	8186	10694	12153	13805	17500
Cluster-4 Total (mill)	3.48	0.01	0.01	0.01	0.01	0.02
Cluster-5						
Dodballapur	13.37	71606	93547	106303	120761	153077
Dargajoginahalli	0.11	6172	8063	9163	10409	13194
Cluster-5 Total (mill)	13.48	0.08	0.10	0.12	0.13	0.17
Cluster-6						
Devanahalli	15.94	23406	30578	34748	39473	50037
Kadigenahalli	1.93	5474	7151	8126	9232	11702
Hunasamaranahalli	6.37	7380	9641	10956	12446	15777
Cluster-6 Total (mill)	24.24	0.04	0.05	0.05	0.06	0.08
Cluster-7						
Hoskote	14.28	36323	47453	53924	61257	77650
Cluster-7 Total (mill)	14.28	0.04	0.05	0.05	0.06	0.08
Cluster-8						
Hebbagodi	3.41	12296	16064	18254	20737	26286
Bommasandra	4.65	7614	9947	11303	12841	16277
Cluster-8 Total (mill)	8.06	0.02	0.03	0.03	0.03	0.04
GROWTH NODES						
1 - Anekal	5.00	33157	43317	49224	55918	70882
2 - Kanakapura	7.20	47060	61480	69863	79365	100603
3 - Magdi	4.98	25031	32701	37160	42214	53510
4 - Vijayapura	14.55	29540	38591	43854	49818	63150
Total	32	0.16	0.20	0.23	0.26	0.29
Cluster + Growth Nodes (In Mill)		0.53	0.70	0.79	1.30	1.50
Remaining Urban pop outside BBMP *						0.46

* The remaining urban population will be absorbed in the villages which will get converted to urban by 2031. Refer Annexure-3.12 for list of emerging urban settlements

Section 4.14 – Emerging Urban Settlements

Emerging urban settlements are the villages and Census Towns which have the potential to be upgraded to urban status in near future. Presented below an indicative list of such villages which are not part of any of the proposed clusters. These settlements shall constitute a share of total urban population outside BBMP in future. However, the list is only indicative and not all inclusive. The actual number is likely to be higher as this list is based on 2001 census only and thus shall accommodate a larger share of urban population. The projected population is based on the proportion of village population with BMR population.

Name	Area	Status as on June '09	2001	2011	2016	2021	2031
Sulibele	5.75	Village	8205	10719	12181	13837	17540
Chikkabanavara	3.36	Village	5229	6831	7763	8819	11178
Hesaraghatta	6.30	Village	7186	9388	10668	12119	15362
Dommasandra	4.50	Village	9165	11973	13606	15456	19593
Kaggalipura	9.39	Village	6907	9023	10254	11648	14766
Sathanur	5.87	Village	5285	6904	7846	8913	11298
Bidadi	1.74	Village	6267	8187	9304	10569	13397
Madanaiyakanahalli	2.28	Village	5913	7725	8778	9972	12641
Budigere	3.85	Village	5063	6614	7516	8539	10824
Attibele	4.34	Village	10559	13794	15675	17807	22573
Jigani	7.61	Village	7871	10283	11685	13274	16826
Sarjapura	7.47	Village	8620	11261	12797	14537	18428
Konappana Agrahara	3.38	Village	11038	14420	16387	18615	23597
Hesaraghatta	6.30	Village	7186	9388	10668	12119	15362
Malur	10.93	Village	6175	8067	9167	10414	13201
TOTAL	83.07		110669	144579	164295	186639	236585

Section 4.15: Demographic Analysis : Other Major Indicators

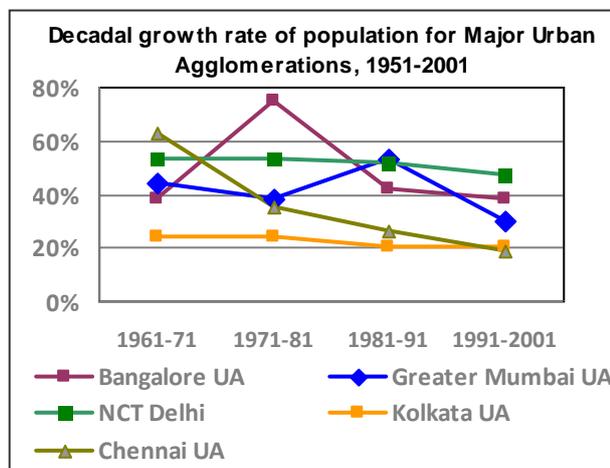
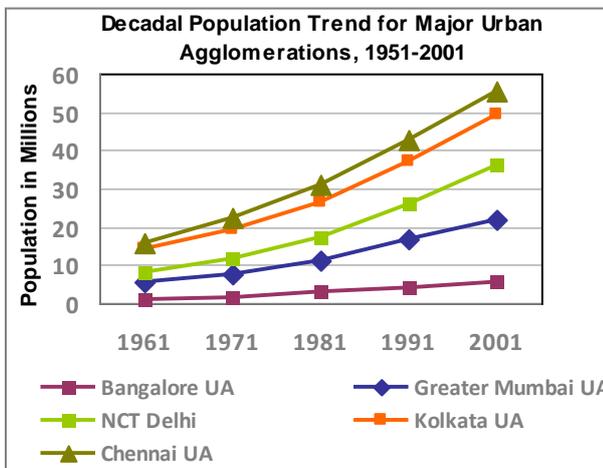


Fig 1: Decadal Population Trends for BMR, Source: Census of India and SCE Analysis

Fig 1: Decadal Population Trends for BMR, Source: Census of India and SCE Analysis

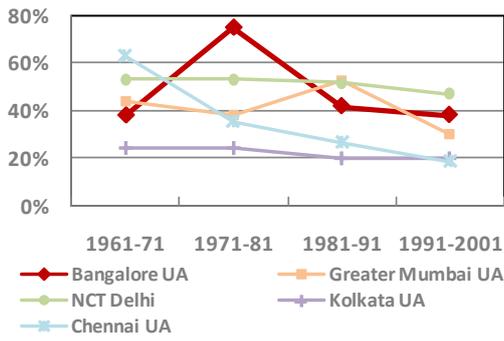
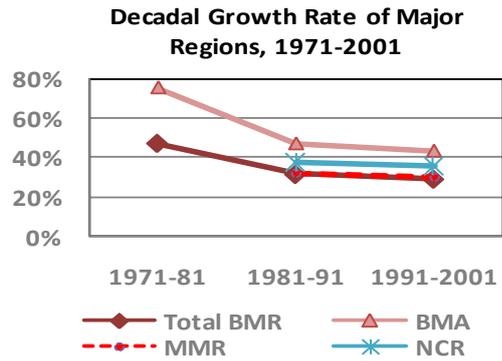
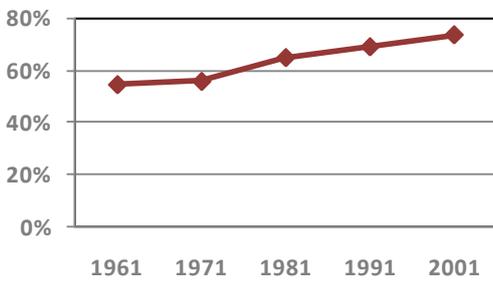


Figure 1: Decadal Population Growth Rate of BUA and Other Major Urban Agglomerations in India

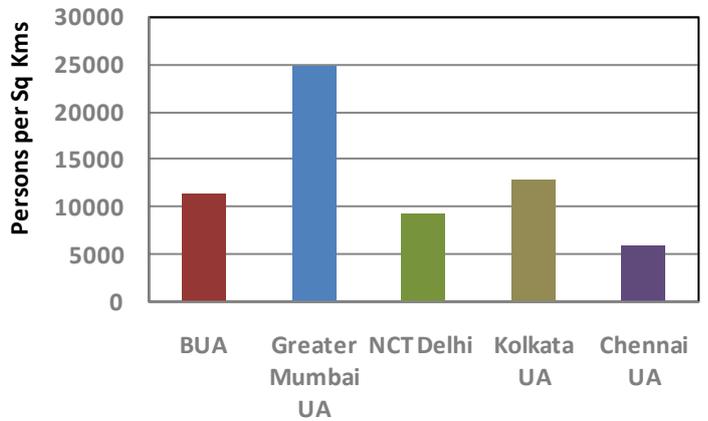
Source: Census of India and SCE Analysis



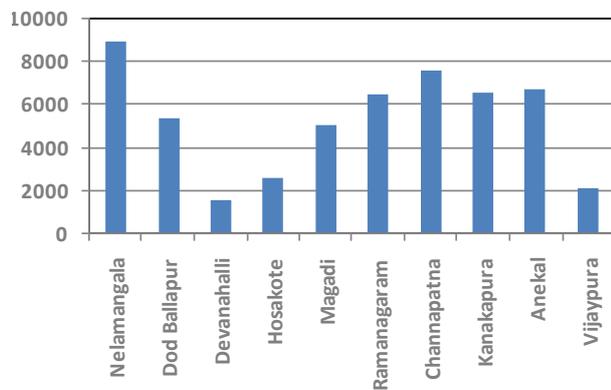
Urbanisation Trend of BMR, 1961-2001



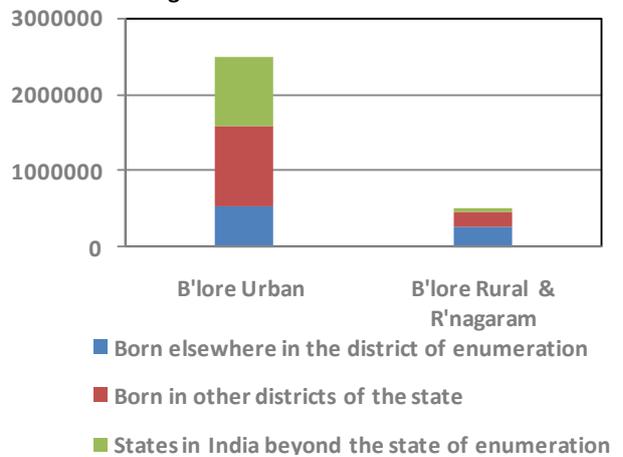
Density for BMR and other Regions in India, 2001



Density of BMR Towns, 2001



Migration Pattern in BMR Districts



ANNEXURE 5: POPULATION DISTRIBUTION SCENARIOS**A) Population Scenarios with Strategic Intervention****Note:**

- I. The latest census figure available is of 2001 and thus rest are projections after that. For 2011, in all likelihood the share of core has increased from 73% of 2001. However, in absence of actual data, the same share between the core and rest of region has been considered to be continuing.
- II. To achieve any particular population share between the core and the region, the effective time period is 20 years and the CAGR has been applied accordingly.

Assumption:

Erstwhile BMP shall grow as projected by RMP-2015 and shall get saturated by 2016.

Alternative-1 : Core : Rest of BMR = 75:25

YEAR		2001	2011	2016	2021	2031
CAGR (%)		1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)						
Population		8.42	11.00	12.50	14.20	18.00
CAGR (%)		2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)						
Population		6.17	8.03	9.38	10.65	13.50
CAGR (%)		3.68	2.67	3.15	2.58	2.40
Density		7713	10038	11719	13313	16875
% of total BMR Pop		73%	73%	75%	75%	75%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015						
Population		4.30	5.14	5.35	5.35	5.35
CAGR (%)		2.69	1.80	0.78	0.00	0.00
Density		19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)						
Population		1.87	2.89	4.03	5.30	8.15
CAGR (%)		6.44	4.46	6.89	5.65	4.39
Density		3254	5031	7020	9242	14209
Rest of BMR (Outside BBMP- 7205 sq.km.)						
Population		2.25	2.97	3.13	3.55	4.50
CAGR (%)		2.25	2.82	1.02	2.58	2.40
Density		312	412	434	493	625
% of total BMR Pop		27%	27%	25%	25%	25%

Observation:

- I. Steady and realistic CAGR for BBMP newly added areas.
- II. Steady and realistic CAGR for rest of the region outside BBMP.

Alternative-2 : Core : Rest of BMR = 70:30

YEAR		2001	2011	2016	2021	2031
CAGR (%)		1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)						
Population		8.42	11.00	12.50	14.20	18.00
CAGR (%)		2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)						
Population		6.17	8.03	8.99	10.06	12.60
CAGR (%)		3.68	2.67	2.28	2.28	2.28
Density		7713	10038	11234	12573	15750
% of total BMR Pop		73%	73%	72%	71%	70%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015						
Population		4.30	5.14	5.35	5.35	5.35
CAGR (%)		2.69	1.80	0.78	0.00	0.00
Density		19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)						
Population		1.87	2.89	3.64	4.71	7.25
CAGR (%)		6.44	4.46	4.75	5.29	4.41
Density		3254	5031	6345	8212	12641
Rest of BMR (Outside BBMP- 7205 sq.km.)						
Population		2.25	2.97	3.51	4.14	5.40
CAGR (%)		2.25	2.82	3.41	3.35	2.69
Density		312	412	488	575	749
% of total BMR Pop		27%	27%	28%	29%	30%

Observation:

- I. Steady and realistic CAGR for BBMP newly added areas.
- II. CAGR outside BBMP for rest of the region is a little fluctuating but not unrealistic. However the increase in growth rate in rest of the region after 2011 needs to be justified and validated

Alternative-3 : Core : Rest of BMR = 60:40

YEAR	BMP (erstwhile)	2001	2011	2016	2021	2031
CAGR (%)		1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)						
Population		8.42	11.00	12.50	14.20	18.00
CAGR (%)		2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)						
Population		6.17	8.03	8.65	9.31	10.80
CAGR (%)		3.68	2.67	1.49	1.49	1.49
Density		7713	10038	10809	11641	13500
% of total BMR Pop		73%	73%	69%	66%	60%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015						
Population		4.30	5.14	5.35	5.35	5.35
CAGR (%)		2.69	1.80	0.78	0.00	0.00
Density		19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)						
Population		1.87	2.89	3.30	3.97	5.45
CAGR (%)		6.44	4.46	2.72	3.74	3.24
Density		3254	5031	5753	6912	9504
Rest of BMR (Outside BBMP- 7205 sq.km.)						
Population		2.25	2.97	3.85	4.89	7.20
CAGR (%)		2.25	2.82	5.34	4.87	3.95
Density		312	412	535	678	999
% of total BMR Pop		27%	27%	31%	34%	40%

Observation:

- I. Unrealistic CAGR for BBMP newly added areas. It will be difficult to justify a huge drop in CAGR in the newly added areas of BBMP when the area is being upgraded in terms of infrastructure and services and is actually growing fast due to speculative development also.
- II. CAGR outside BBMP for rest of the region witnesses a huge jump after 2011. It will be difficult to justify such growth rate with a cluster and growth node based development model which promotes a spontaneous growth of local economy and population with facilitation.

B) Population Distribution Outside BBMP in Clusters and Growth Nodes**a) Approach – 1 : Cluster and Growth Node Population as a Ratio of Total Urban Population Outside BBMP****Assumption:**

- I. The population of settlements within clusters and growth nodes maintains the same ratio with the total urban population outside BBMP (i.e., in rest of BMR) in future years also. Thus as the total population share for rest of the region increases, the population in clusters and growth nodes also increases (i.e., cluster and growth node population is a function of population share between the core and rest of BMR) Steady and realistic CAGR for rest of the region outside BBMP.

Alternative-1 : Core : Rest of BMR = 75:25

Name	Area	2001	2011	2016	2021	2031
Cluster-1		sq.km				
Ramanagaram	12.39	79394	162015	173174	237826	362500
Ratio	0.18577					
Channapatna	8.42	63577	129738	138674	190446	290282
Ratio	0.14876					
Malur (Village)	10.93	6175	12601	13469	18497	28194
Ratio	0.01445					
Honganur (Village)	6.12	7043	14372	15362	21097	32157
Ratio	0.01648					
2 NICE towns	15				200000	200000
Ratio	0.00000					
Cluster-1 Total	52.86	156189	318727	340680	667866	913134
Density		2955	6030	6445	12635	17275
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Ratio	0.00000					
Herohalli (CT)	5.71	18069	36872	39412	54126	82500
Ratio	0.04228					
TOTAL	15.00	18069	36872	39412	254126	282500
Density		1205	2458	2627	16942	18833
Cluster-3						
Nelamangala	2.85	25287	51602	55156	75748	115456
Ratio	0.05917					
TOTAL	2.85	25287	51602	55156	75748	115456
Density		8873	18106	19353	26578	40511
Cluster-4						
Thyamagondlu (Village)	3.48	8186	16705	17855	24521	37376
Ratio	0.01915					
TOTAL	3.48	8186	16705	17855	24521	37376
Density		2352	4800	5131	7046	10740
Cluster-5						
Dodballapur	13.37	71606	146123	156187	214497	326942
Ratio	0.16755					

Dargajoginahalli (CT)	0.11	6172	12595	13462	18488	28180
<i>Ratio</i>	0.01444					
TOTAL	13.48	77778	158717	169650	232985	355122
Density		5770	11774	12585	17284	26344
Cluster-6						
Devanahalli	15.94	23406	47763	51053	70113	106868
<i>Ratio</i>	0.05477					
Kadigenahalli (CT)	1.93	5474	11171	11940	16397	24993
<i>Ratio</i>	0.01281					
Hunasamaranahalli (CT)	6.37	7380	15060	16097	22107	33696
<i>Ratio</i>	0.01727					
TOTAL	24.24	36260	73994	79090	108617	165557
Density		1496	3053	3263	4481	6830
Cluster-7						
Hoskote	14.28	36323	74122	79228	108806	165845
<i>Ratio</i>	0.08499					
TOTAL	14.28	36323	74122	79228	108806	165845
Density		2544	5191	5548	7619	11614
Cluster-8						
Hebbagodi (CT)	3.41	12296	25092	26820	36833	56142
<i>Ratio</i>	0.02877					
Bommasandra	4.65	7614	15537	16608	22808	34764
<i>Ratio</i>	0.01782					
TOTAL	8.06	19910	40629	43428	59641	90906
Density		2470	5041	5388	7400	11279
TOTAL of All 8 Clusters	134	378002	771369	824499	1532310	2125896
Average density		2816	5746	6142	11414	15835
Share of pop in clusters out of total BMR pop		4.49%	7.01%	6.60%	10.79%	11.81%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	67662	72322	99322	151390
<i>Ratio</i>	0.07758					
2 - Kanakapura	7.20	47060	96033	102647	140969	214868
<i>Ratio</i>	0.11011					
3 - Magdi	4.98	25031	51079	54598	74981	114288
<i>Ratio</i>	0.05857					
4 - Vijayapura	14.55	29540	60281	64433	88487	134875
<i>Ratio</i>	0.06912					
TOTAL	32	134788	275055	294000	403759	615420
Average density		4248	8669	9266	12725	19396
Share of pop in growth nodes out of total BMR pop		1.60%	2.50%	2.35%	2.84%	3.42%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	1046423	1118499	1936069	2741317
CAGR (%)			7.39%	1.34%	11.60%	3.54%
Average density		3089	6305	6739	11664	16516
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	9.51%	8.95%	13.63%	15.23%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	1923577	2006501	1613931	1758683
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	17.49%	16.05%	11.37%	9.77%
CAGR (%)			-1.64%	-1.70%	-6.67%	-1.50%

Observation:

- I. The population in clusters and growth nodes exceeds previously projected total urban population outside BBMP because there are 8 CTs and 1 village within the clusters which are not considered within the urban population at present but likely to become urbanised in future once the cluster and growth node based development strategy is put in place Steady and realistic CAGR for rest of the region outside BBMP.
- II. The share of population cluster and growth nodes grows from 6% to 15% which is not totally unrealistic with suitable strategies in place
- III. The share of population outside the core and outside the cluster and growth nodes experiences a huge decrease from 21% to 10% with negative CAGR. This is highly unrealistic and undesirable as it indicates a huge fall in the share of rural farming population.

Alternative-2 : Core : Rest of BMR = 70:30

Name	Area	2001	2011	2016	2021	2031
Cluster-1						
	sq.km					
Ramanagaram	12.39	79394	162015	245196	347665	529691
Ratio	0.18577					
Channapatna	8.42	63577	129738	196348	278403	424165
Ratio	0.14876					
Malur (Village)	10.93	6175	12601	19071	27040	41198
Ratio	0.01445					
Honganur (Village)	6.12	7043	14372	21751	30841	46989
Ratio	0.01648					
2 NICE towns	15				200000	200000
Ratio	0.00000					
Cluster-1 Total	52.86	156189	318727	482366	883949	1242043
Density		2955	6030	9125	16722	23497
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Ratio	0.00000					
Herohalli (CT)	5.71	18069	36872	55803	79124	120551
Ratio	0.04228					
TOTAL	15.00	18069	36872	55803	279124	320551
Density		1205	2458	3720	18608	21370
Cluster-3						
Nelamangala	2.85	25287	51602	78095	110731	168707
Ratio	0.05917					
TOTAL	2.85	25287	51602	78095	110731	168707
Density		8873	18106	27402	38853	59195
Cluster-4						
Thyamagondlu (Village)	3.48	8186	16705	25281	35846	54614
Ratio	0.01915					
TOTAL	3.48	8186	16705	25281	35846	54614
Density		2352	4800	7265	10301	15694
Cluster-5						
Dodballapur	13.37	71606	146123	221144	313562	477732
Ratio	0.16755					

Dargajoginahalli (CT)	0.11	6172	12595	19061	27027	41178
<i>Ratio</i>	0.01444					
TOTAL	13.48	77778	158717	240206	340589	518910
Density		5770	11774	17819	25266	38495
Cluster-6						
Devanahalli	15.94	23406	47763	72286	102495	156157
<i>Ratio</i>	0.05477					
Kadigenahalli (CT)	1.93	5474	11171	16906	23971	36521
<i>Ratio</i>	0.01281					
Hunasamaranahalli (CT)	6.37	7380	15060	22792	32317	49237
<i>Ratio</i>	0.01727					
TOTAL	24.24	36260	73994	111984	158782	241915
Density		1496	3053	4620	6550	9980
Cluster-7						
Hoskote	14.28	36323	74122	112178	159058	242335
<i>Ratio</i>	0.08499					
TOTAL	14.28	36323	74122	112178	159058	242335
Density		2544	5191	7856	11139	16970
Cluster-8						
Hebbagodi (CT)	3.41	12296	25092	37974	53844	82035
<i>Ratio</i>	0.02877					
Bommasandra	4.65	7614	15537	23515	33342	50798
<i>Ratio</i>	0.01782					
TOTAL	8.06	19910	40629	61489	87186	132833
Density		2470	5041	7629	10817	16481
TOTAL of All 8 Clusters	134	378002	771369	1167402	2055265	2921908
Average density		2816	5746	8696	15309	21765
Share of pop in clusters out of total BMR pop		4.49%	7.01%	9.34%	14.47%	16.23%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	67662	102400	145194	221213
<i>Ratio</i>	0.07758					
2 - Kanakapura	7.20	47060	96033	145338	206075	313969
<i>Ratio</i>	0.11011					
3 - Magdi	4.98	25031	51079	77304	109610	166999
<i>Ratio</i>	0.05857					
4 - Vijayapura	14.55	29540	60281	91230	129355	197081
<i>Ratio</i>	0.06912					
TOTAL	32	134788	275055	416272	590235	899262
Average density		4248	8669	13119	18602	28341
Share of pop in growth nodes out of total BMR pop		1.60%	2.50%	3.33%	4.16%	5.00%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	1046423	1583674	2645499	3821170
CAGR (%)			7.39%	8.64%	10.81%	3.75%
Average density		3089	6305	9541	15939	23022
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	9.51%	12.67%	18.63%	21.23%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	1923577	1929024	1495773	1578830
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	17.49%	15.43%	10.53%	8.77%
CAGR (%)			-1.64%	-2.47%	-7.35%	-1.81%

Observation:

- I. The population in clusters and growth nodes exceeds previously projected total urban population outside BBMP because there are 8 CTs and 1 village within the clusters which are not considered within the urban population at present but likely to become urbanised in future once the cluster and growth node based development strategy is put in place
- II. The share of population cluster and growth nodes grows from 6% to 21% which is quite a high growth rate to achieve
- III. The share of population outside the core and outside the cluster and growth nodes experiences a huge decrease from 21% to 9% with negative CAGR. This is highly unrealistic and undesirable as it indicates a huge fall in the share of rural farming population.

Alternative-3 : Core : Rest of BMR = 60:40

Name	Area	2001	2011	2016	2021	2031
Cluster-1						
	sq.km					
Ramanagaram	12.39	79394	162015	308313	486277	864073
Ratio	0.18577					
Channapatna	8.42	63577	129738	246890	389400	691931
Ratio	0.14876					
Malur (Village)	10.93	6175	12601	23980	37821	67205
Ratio	0.01445					
Honganur (Village)	6.12	7043	14372	27350	43137	76651
Ratio	0.01648					
2 NICE towns	15				200000	200000
Ratio	0.00000					
Cluster-1 Total	52.86	156189	318727	606533	1156635	1899861
Density		2955	6030	11474	21881	35941
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Ratio	0.00000					
Herohalli (CT)	5.71	18069	36872	70168	110670	196651
Ratio	0.04228					
TOTAL	15.00	18069	36872	70168	310670	396651
Density		1205	2458	4678	20711	26443
Cluster-3						
Nelamangala	2.85	25287	51602	98198	154879	275207
Ratio	0.05917					
TOTAL	2.85	25287	51602	98198	154879	275207
Density		8873	18106	34455	54344	96564
Cluster-4						
Thyamagondlu (Village)	3.48	8186	16705	31789	50138	89091
Ratio	0.01915					
TOTAL	3.48	8186	16705	31789	50138	89091
Density		2352	4800	9135	14407	25601
Cluster-5						
Dodballapur	13.37	71606	146123	278070	438576	779314
Ratio	0.16755					
Dargajoginahalli (CT)	0.11	6172	12595	23968	37803	67172
Ratio	0.01444					

TOTAL	13.48	77778	158717	302038	476379	846486
Density		5770	11774	22406	35340	62796
Cluster-6						
Devanahalli	15.94	23406	47763	90893	143358	254736
<i>Ratio</i>	0.05477					
Kadigenahalli (CT)	1.93	5474	11171	21257	33527	59576
<i>Ratio</i>	0.01281					
Hunasamaranahalli (CT)	6.37	7380	15060	28659	45201	80319
<i>Ratio</i>	0.01727					
TOTAL	24.24	36260	73994	140809	222087	394631
Density		1496	3053	5809	9162	16280
Cluster-7						
Hoskote	14.28	36323	74122	141054	222473	395316
<i>Ratio</i>	0.08499					
TOTAL	14.28	36323	74122	141054	222473	395316
Density		2544	5191	9878	15579	27683
Cluster-8						
Hebbagodi (CT)	3.41	12296	25092	47749	75311	133822
<i>Ratio</i>	0.02877					
Bommasandra	4.65	7614	15537	29568	46635	82866
<i>Ratio</i>	0.01782					
TOTAL	8.06	19910	40629	77317	121946	216688
Density		2470	5041	9593	15130	26884
TOTAL of All 8 Clusters	134	378002	771369	1467906	2715207	4513931
Average density		2816	5746	10934	20225	33623
Share of pop in clusters out of total BMR pop		4.49%	7.01%	11.74%	19.12%	25.08%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	67662	128760	203082	360860
<i>Ratio</i>	0.07758					
2 - Kanakapura	7.20	47060	96033	182749	288236	512171
<i>Ratio</i>	0.11011					
3 - Magdi	4.98	25031	51079	97204	153311	272421
<i>Ratio</i>	0.05857					
4 - Vijayapura	14.55	29540	60281	114714	180928	321494
<i>Ratio</i>	0.06912					
TOTAL	32	134788	275055	523426	825557	1466946
Average density		4248	8669	16496	26018	46232
Share of pop in growth nodes out of total BMR pop		1.60%	2.50%	4.19%	5.81%	8.15%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	1046423	1991332	3540764	5980877
CAGR (%)			7.39%	13.73%	12.20%	5.38%
Average density		3089	6305	11997	21332	36034
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	9.51%	15.93%	24.93%	33.23%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	1923577	1861128	1346664	1219123
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	17.49%	14.89%	9.48%	6.77%
CAGR (%)			-1.64%	-3.17%	-8.63%	-3.31%

Observation:

- I. The population in clusters and growth nodes exceeds previously projected total urban population outside BBMP because there are 8 CTs and 1 village within the clusters which are not considered within the urban population at present but likely to become urbanised in future once the cluster and growth node based development strategy is put in place
- II. The share of population cluster and growth nodes grows from 6% to 33% which is too high a growth rate to achieve
- III. The share of population outside the core and outside the cluster and growth nodes experiences a huge decrease from 21% to 9% with negative CAGR. This is highly unrealistic and undesirable as it indicates a huge fall in the share of rural farming population.

b) Approach – 2 : Cluster and Growth Node Population as a Ratio of Total Population Outside BBMP

Assumptions:

- I. The population of settlements within clusters and growth nodes maintains the same ratio with the total population outside BBMP (i.e., in rest of BMR) in future years also. Thus as the total population share for rest of the region increases, the population in clusters and growth nodes also increases (i.e., cluster and growth node population is a function of population share between the core and rest of BMR)
- II. The discrepancy in CAGR between 2016-2021 is due to coming up of NICE townships by 2021 and a resulting jump in cluster population

Alternative-1 : Core : Rest of BMR = 75:25

Name	Area	2001	2011	2016	2021	2031
Cluster-1						
	sq.km					
Ramanagaram	12.39	79394	104800	110269	125266	158788
Ratio	0.03529					
Channapatna	8.42	63577	83922	88301	100310	127154
Ratio	0.02826					
Malur (Village)	10.93	6175	8151	8576	9743	12350
Ratio	0.00274					
Honganur (Village)	6.12	7043	9297	9782	11112	14086
Ratio	0.00313					
2 NICE towns	15				200000	200000
Ratio	0.00000					
Cluster-1 Total	52.86	156189	206169	216929	446432	512378
Density		2955	3900	4104	8446	9693
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Ratio	0.00000					
Herohalli (CT)	5.71	18069	23851	25096	28509	36138
Ratio	0.00803					
TOTAL	15.00	18069	23851	25096	228509	236138

Density		1205	1590	1673	15234	15743
Cluster-3						
Nelamangala	2.85	25287	33379	35121	39897	50574
Ratio	0.01124					
TOTAL	2.85	25287	33379	35121	39897	50574
Density		8873	11712	12323	13999	17745
Cluster-4						
Thyamagondlu (Village)	3.48	8186	10806	11369	12916	16372
Ratio	0.00364					
TOTAL	3.48	8186	10806	11369	12916	16372
Density		2352	3105	3267	3711	4705
Cluster-5						
Dodballapur	13.37	71606	94520	99453	112978	143212
Ratio	0.03182					
Dargajoginahalli (CT)	0.11	6172	8147	8572	9738	12344
Ratio	0.00274					
TOTAL	13.48	77778	102667	108025	122716	155556
Density		5770	7616	8014	9104	11540
Cluster-6						
Devanahalli	15.94	23406	30896	32508	36929	46812
Ratio	0.01040					
Kadigenahalli (CT)	1.93	5474	7226	7603	8637	10948
Ratio	0.00243					
Hunasamaranahalli (CT)	6.37	7380	9742	10250	11644	14760
Ratio	0.00328					
TOTAL	24.24	36260	47863	50361	57210	72520
Density		1496	1975	2078	2360	2992
Cluster-7						
Hoskote	14.28	36323	47946	50449	57310	72646
Ratio	0.01614					
TOTAL	14.28	36323	47946	50449	57310	72646
Density		2544	3358	3533	4013	5087
Cluster-8						
Hebbagodi (CT)	3.41	12296	16231	17078	19400	24592
Ratio	0.00546					
Bommasandra	4.65	7614	10050	10575	12013	15228
Ratio	0.00338					
TOTAL	8.06	19910	26281	27653	31414	39820
Density		2470	3261	3431	3897	4940
TOTAL of All 8 Clusters	134	378002	498963	525003	996403	1156004
Average density		2816	3717	3911	7422	8611
Share of pop in clusters out of total BMR pop		4.49%	4.54%	4.20%	7.02%	6.42%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	43767	46051	52314	66314
Ratio	0.01474					
2 - Kanakapura	7.20	47060	62119	65361	74250	94120
Ratio	0.02092					
3 - Magdi	4.98	25031	33041	34765	39493	50062
Ratio	0.01112					

4 - Vijayapura	14.55	29540	38993	41028	46608	59080
Ratio	0.01313					
TOTAL	32	134788	177920	187206	212666	269576
Average density		4248	5607	5900	6702	8496
Share of pop in growth nodes out of total BMR pop		1.60%	1.62%	1.50%	1.50%	1.50%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	676883	712208	1209069	1425580
CAGR (%)			2.82%	1.02%	11.17%	1.66%
Average density		3089	4078	4291	7284	8589
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	6.15%	5.70%	8.51%	7.92%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	2293117	2412792	2340931	3074420
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	20.85%	19.30%	16.49%	17.08%
CAGR (%)			0.10%	-1.53%	-3.11%	0.36%

Observation:

- I. The population in clusters and growth nodes is lesser than previously projected total urban population outside BBMP because there are settlements outside the clusters and growth nodes which will become urbanised in future and thus contribute to total urban population. Steady and realistic CAGR for rest of the region outside BBMP.
- II. The share of population cluster and growth nodes grows from 6% to 8% which is realistic
- III. The share of population outside the core and outside the cluster and growth nodes experiences a small decrease from 21% to 17% but with positive overall CAGR. This is realistic and achievable

Alternative-2 : Core : Rest of BMR = 70:30

Name	Area	2001	2011	2016	2021	2031
Cluster-1	sq.km					
Ramanagaram	12.39	79394	104800	123950	146130	190546
Ratio	0.03529					
Channapatna	8.42	63577	83922	99256	117018	152585
Ratio	0.02826					
Malur (Village)	10.93	6175	8151	9640	11365	14820
Ratio	0.00274					
Honganur (Village)	6.12	7043	9297	10996	12963	16903
Ratio	0.00313					
2 NICE towns	15				200000	200000
Ratio	0.00000					
Cluster-1 Total	52.86	156189	206169	243842	487476	574854
Density		2955	3900	4613	9222	10875

Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Ratio	0.00000					
Herohalli (CT)	5.71	18069	23851	28209	33257	43366
Ratio	0.00803					
TOTAL	15.00	18069	23851	28209	233257	243366
Density		1205	1590	1881	15550	16224
Cluster-3						
Nelamangala	2.85	25287	33379	39478	46542	60689
Ratio	0.01124					
TOTAL	2.85	25287	33379	39478	46542	60689
Density		8873	11712	13852	16331	21294
Cluster-4						
Thyragondlu (Village)	3.48	8186	10806	12780	15067	19646
Ratio	0.00364					
TOTAL	3.48	8186	10806	12780	15067	19646
Density		2352	3105	3672	4330	5646
Cluster-5						
Dodballapur	13.37	71606	94520	111791	131796	171854
Ratio	0.03182					
Dargajoginahalli (CT)	0.11	6172	8147	9636	11360	14813
Ratio	0.00274					
TOTAL	13.48	77778	102667	121427	143156	186667
Density		5770	7616	9008	10620	13848
Cluster-6						
Devanahalli	15.94	23406	30896	36541	43080	56174
Ratio	0.01040					
Kadigenahalli (CT)	1.93	5474	7226	8546	10075	13138
Ratio	0.00243					
Hunasamaranahalli (CT)	6.37	7380	9742	11522	13583	17712
Ratio	0.00328					
TOTAL	24.24	36260	47863	56609	66739	87024
Density		1496	1975	2335	2753	3590
Cluster-7						
Hoskote	14.28	36323	47946	56707	66855	87175
Ratio	0.01614					
TOTAL	14.28	36323	47946	56707	66855	87175
Density		2544	3358	3971	4682	6105
Cluster-8						
Hebbagodi (CT)	3.41	12296	16231	19197	22632	29510
Ratio	0.00546					
Bommasandra	4.65	7614	10050	11887	14014	18274
Ratio	0.00338					
TOTAL	8.06	19910	26281	31083	36646	47784
Density		2470	3261	3857	4547	5929
TOTAL of All 8 Clusters	134	378002	498963	590137	1095737	1307205
Average density		2816	3717	4396	8162	9737
Share of pop in clusters out of total BMR pop		4.49%	4.54%	4.72%	7.72%	7.26%

GROWTH NODES (Independent urban settlements)

1 - Anekal	5.00	33157	43767	51765	61028	79577
Ratio	0.01474					
2 - Kanakapura	7.20	47060	62119	73470	86617	112944
Ratio	0.02092					
3 - Magdi	4.98	25031	33041	39078	46071	60074
Ratio	0.01112					
4 - Vijayapura	14.55	29540	38993	46118	54370	70896
Ratio	0.01313					
TOTAL	32	134788	177920	210431	248086	323491
Average density		4248	5607	6632	7819	10195
Share of pop out of total BMR pop		1.60%	1.62%	1.68%	1.75%	1.80%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	676883	800567	1343824	1630696
CAGR (%)			2.82%	3.41%	10.91%	1.95%
Average density		3089	4078	4823	8096	9825
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	6.15%	6.40%	9.46%	9.06%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	2293117	2712131	2797449	3769304
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	20.85%	21.70%	19.70%	20.94%
CAGR (%)			0.10%	0.80%	-1.91%	0.61%

Observation:

- I. The population in clusters and growth nodes is lesser than previously projected total urban population outside BBMP because there are settlements outside the clusters and growth nodes which will become urbanised in future and thus contribute to total urban population. The share of population cluster and growth nodes grows from 6% to 8% which is realistic
- II. The share of population cluster and growth nodes grows from 6% to 9% which is realistic and achievable
- III. The share of population outside the core and outside the cluster and growth nodes maintains the same proportion at around 21% with positive overall CAGR. This is realistic and achievable

Alternative-3 : Core : Rest of BMR = 60:40

Name	Area	2001	2011	2016	2021	2031
Cluster-1		sq.km				
Ramanagaram	12.39	79394	104800	135939	172459	254061
Ratio	0.03529					
Channapatna	8.42	63577	83922	108857	138101	203446
Ratio	0.02826					
Malur (Village)	10.93	6175	8151	10573	13413	19760
Ratio	0.00274					

Honganur (Village)	6.12	7043	9297	12059	15299	22538
Ratio	0.00313					
2 NICE towns	15				200000	200000
Ratio	0.00000					
Cluster-1 Total	52.86	156189	206169	267427	539272	699805
Density		2955	3900	5059	10202	13239
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Ratio	0.00000					
Herohalli (CT)	5.71	18069	23851	30938	39249	57821
Ratio	0.00803					
TOTAL	15.00	18069	23851	30938	239249	257821
Density		1205	1590	2063	15950	17188
Cluster-3						
Nelamangala	2.85	25287	33379	43297	54928	80918
Ratio	0.01124					
TOTAL	2.85	25287	33379	43297	54928	80918
Density		8873	11712	15192	19273	28392
Cluster-4						
Thyamagondlu (Village)	3.48	8186	10806	14016	17782	26195
Ratio	0.00364					
TOTAL	3.48	8186	10806	14016	17782	26195
Density		2352	3105	4028	5110	7527
Cluster-5						
Dodballapur	13.37	71606	94520	122604	155542	229139
Ratio	0.03182					
Dargajoginahalli (CT)	0.11	6172	8147	10568	13407	19750
Ratio	0.00274					
TOTAL	13.48	77778	102667	133172	168949	248890
Density		5770	7616	9879	12533	18464
Cluster-6						
Devanahalli	15.94	23406	30896	40076	50842	74899
Ratio	0.01040					
Kadigenahalli (CT)	1.93	5474	7226	9373	11891	17517
Ratio	0.00243					
Hunasamaranahalli (CT)	6.37	7380	9742	12636	16031	23616
Ratio	0.00328					
TOTAL	24.24	36260	47863	62085	78764	116032
Density		1496	1975	2561	3249	4787
Cluster-7						
Hoskote	14.28	36323	47946	62192	78900	116234
Ratio	0.01614					
TOTAL	14.28	36323	47946	62192	78900	116234
Density		2544	3358	4355	5525	8140
Cluster-8						
Hebbagodi (CT)	3.41	12296	16231	21053	26709	39347
Ratio	0.00546					
Bommasandra	4.65	7614	10050	13037	16539	24365
Ratio	0.00338					
TOTAL	8.06	19910	26281	34090	43248	63712
Density		2470	3261	4230	5366	7905

TOTAL of All 8 Clusters	134	378002	498963	647217	1221092	1609606
Average density		2816	3717	4821	9096	11990
Share of pop in clusters out of total BMR pop		4.49%	4.54%	5.18%	8.60%	8.94%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	43767	56772	72023	106102
<i>Ratio</i>	0.01474					
2 - Kanakapura	7.20	47060	62119	80576	102223	150592
<i>Ratio</i>	0.02092					
3 - Magdi	4.98	25031	33041	42858	54372	80099
<i>Ratio</i>	0.01112					
4 - Vijayapura	14.55	29540	38993	50579	64166	94528
<i>Ratio</i>	0.01313					
TOTAL	32	134788	177920	230785	292785	431322
Average density		4248	5607	7273	9227	13593
Share of pop out of total BMR pop		1.60%	1.62%	1.85%	2.06%	2.40%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	676883	878001	1513877	2040928
CAGR (%)			2.82%	5.34%	11.51%	3.03%
Average density		3089	4078	5290	9121	12296
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	6.15%	7.02%	10.66%	11.34%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	2293117	2974458	3373550	5159072
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	20.85%	23.80%	23.76%	28.66%
CAGR (%)			0.10%	2.68%	-0.03%	1.89%

Observation:

- I. The population in clusters and growth nodes exceeds previously projected total urban population outside BBMP because there are 8 CTs and 1 village within the clusters which are not considered within the urban population at present but likely to become urbanised in future once the cluster and growth node based development strategy is put in place
- II. The share of population cluster and growth nodes grows from 6% to 11% which is not totally unrealistic having suitable strategies in place
- III. The share of population outside the core and outside the cluster and growth nodes experiences quite an increase from 21% to 29%. This indicates quite a high CAGR for a predominantly

c) Approach – 3 : Cluster and Growth Node Population grow as per 1991-2001 growth rates

Assumptions:

- I. For the CTs and Villages having a growth rate more than 100% (which is unlikely to continue for future years) or N.A., the highest growth rate below 100, i.e., 68.68% for Bommasandra has been adopted
- II. The population of settlements within clusters and growth nodes maintains the same ratio with the total population outside BBMP (i.e., in rest of BMR) in future years also. Thus as the total population share for rest of the region increases, the population in clusters and growth nodes also increases (i.e., cluster and growth node population is a function of population share between the core and rest of BMR)
- III. The discrepancy in CAGR between 2016-2021 is due to coming up of NICE townships by 2021 and a resulting jump in cluster population
- IV. This method gives same result for all 3 scenarios because same growth rates for cluster and growth node towns are taken for all 3 scenarios and thus the projected population of cluster and growth nodes are not function of population share between the core and rest of BMR. Rather they are totally dependent on 1991-2001 growth rates

Alternative-1: Core : Rest of BMR = 75:25

Name	Area	2001	2011	2016	2021	2031
Cluster-1						
	sq.km					
Ramanagaram	12.39	79394	124976	160852	196727	309673
Growth rate % (1991-2001)	57.41%					
Channapatna	8.42	63577	73213	78762	84310	97089
Growth rate % (1991-2001)	15.16%					
Malur (Village)	10.93	6175	10416	13992	17569	29634
Growth rate % (1991-2001)	68.68%					
Honganur (Village)	6.12	7043	11880	15959	20038	33800
Growth rate % (1991-2001)	68.68%					
2 NICE towns	15				200000	200000
Growth rate % (1991-2001)						
Cluster-1 Total	52.86	156189	220485	269565	518644	670196
Density		2955	4171	5100	9812	12679
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Growth rate % (1991-2001)						
Herohalli (CT)	5.71	18069	30478	40943	51409	86714
Growth rate % (1991-2001)	68.68%					
TOTAL	15.00	18069	30478	40943	251409	286714
Density		1205	2032	2730	16761	19114
Cluster-3						
Nelamangala	2.85	25287	36400	44398	52396	75422
Growth rate % (1991-2001)	43.95%					
TOTAL	2.85	25287	36400	44398	52396	75422

Density		8873	12772	15578	18385	26464
Cluster-4						
Thyamagondlu (Village)	3.48	8186	13808	18549	23290	39285
Growth rate % (1991-2001)	68.68%					
TOTAL	3.48	8186	13808	18549	23290	39285
Density		2352	3968	5330	6693	11289
Cluster-5						
Dodballapur	13.37	71606	93893	108505	123118	161438
Growth rate % (1991-2001)	31.12%					
Dargajoginahalli (CT)	0.11	6172	7136	7694	8251	9540
Growth rate % (1991-2001)	15.62%					
TOTAL	13.48	77778	101030	116199	131369	170978
Density		5770	7495	8620	9745	12684
Cluster-6						
Devanahalli	15.94	23406	30014	34250	38487	49352
Growth rate % (1991-2001)	28.23%					
Kadigenahalli (CT)	1.93	5474	6687	7428	8169	9979
Growth rate % (1991-2001)	22.16%					
Hunasamaranahalli (CT)	6.37	7380	12448	16723	20997	35417
Growth rate % (1991-2001)	68.68%					
TOTAL	24.24	36260	49149	58401	67653	94748
Density		1496	2028	2409	2791	3909
Cluster-7						
Hoskote	14.28	36323	51673	62591	73509	104573
Growth rate % (1991-2001)	42.26%					
TOTAL	14.28	36323	51673	62591	73509	104573
Density		2544	3619	4383	5148	7323
Cluster-8						
Hebbagodi (CT)	3.41	12296	20740	27862	34984	59009
Growth rate % (1991-2001)	68.68%					
Bommasandra (CT)	4.65	7614	12843	17253	21663	36540
Growth rate % (1991-2001)	68.68%					
TOTAL	8.06	19910	33583	45115	56647	95549
Density		2470	4167	5597	7028	11855
TOTAL of All 8 Clusters	134	378002	536605	655761	1174917	1537464
Average density		2816	3997	4885	8752	11452
Share of pop in clusters out of total BMR pop		4.49%	4.88%	5.25%	8.27%	8.54%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	44085	51349	58614	77932
Growth rate % (1991-2001)	32.96%					
2 - Kanakapura	7.20	47060	58476	65568	72660	90286
Growth rate % (1991-2001)	24.26%					
3 - Magdi	4.98	25031	31892	36263	40634	51771
Growth rate % (1991-2001)	27.41%					
4 - Vijayapura	14.55	29540	36120	40142	44165	54001
Growth rate % (1991-2001)	22.27%					
TOTAL	32	134788	170572	193322	216073	273991
Average density		4248	5376	6093	6810	8635
Share of pop in growth nodes out of total BMR pop		1.60%	1.55%	1.55%	1.52%	1.52%

TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	707176	849083	1390989	1811455
CAGR (%)			3.27%	3.73%	10.38%	2.68%
Average density		3089	4261	5116	8380	10914
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	6.43%	6.79%	9.80%	10.06%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	2262824	2275917	2159011	2688545
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	20.57%	18.21%	15.20%	14.94%
CAGR (%)			-0.03%	-2.41%	-3.54%	-0.18%

Observation:

- I. The population in clusters and growth nodes is lesser than previously projected total urban population outside BBMP because there are settlements outside the clusters and growth nodes which will become urbanised in future and thus contribute to total urban population.
- II. The share of population cluster and growth nodes grows from 6% to 10% which is realistic and achievable
- III. The share of population outside the core and outside the cluster and growth nodes experiences a small decrease from 21% to 15% with negative CAGR. This is not totally unrealistic but undesirable to an extent as it indicates a fall in the share of rural farming population.

Alternative-2: Core : Rest of BMR = 70:30

Name	Area	2001	2011	2016	2021	2031
Cluster-1	sq.km					
Ramanagaram	12.39	79394	124976	160852	196727	309673
<i>Growth rate % (1991-2001)</i>	57.41%					
Channapatna	8.42	63577	73213	78762	84310	97089
<i>Growth rate % (1991-2001)</i>	15.16%					
Malur (Village)	10.93	6175	10416	13992	17569	29634
<i>Growth rate % (1991-2001)</i>	68.68%					
Honganur (Village)	6.12	7043	11880	15959	20038	33800
<i>Growth rate % (1991-2001)</i>	68.68%					
2 NICE towns	15				200000	200000
<i>Growth rate % (1991-2001)</i>						
Cluster-1 Total	52.86	156189	220485	269565	518644	670196
Density		2955	4171	5100	9812	12679
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
<i>Growth rate % (1991-2001)</i>						
Herohalli (CT)	5.71	18069	30478	40943	51409	86714
<i>Growth rate % (1991-2001)</i>	68.68%					

TOTAL	15.00	18069	30478	40943	251409	286714
Density		1205	2032	2730	16761	19114
Cluster-3						
Nelamangala	2.85	25287	36400	44398	52396	75422
Growth rate % (1991-2001)	43.95%					
TOTAL	2.85	25287	36400	44398	52396	75422
Density		8873	12772	15578	18385	26464
Cluster-4						
Thyamagondlu (Village)	3.48	8186	13808	18549	23290	39285
Growth rate % (1991-2001)	68.68%					
TOTAL	3.48	8186	13808	18549	23290	39285
Density		2352	3968	5330	6693	11289
Cluster-5						
Dodballapur	13.37	71606	93893	108505	123118	161438
Growth rate % (1991-2001)	31.12%					
Dargajoginahalli (CT)	0.11	6172	7136	7694	8251	9540
Growth rate % (1991-2001)	15.62%					
TOTAL	13.48	77778	101030	116199	131369	170978
Density		5770	7495	8620	9745	12684
Cluster-6						
Devanahalli	15.94	23406	30014	34250	38487	49352
Growth rate % (1991-2001)	28.23%					
Kadigenahalli (CT)	1.93	5474	6687	7428	8169	9979
Growth rate % (1991-2001)	22.16%					
Hunasamaranahalli (CT)	6.37	7380	12448	16723	20997	35417
Growth rate % (1991-2001)	68.68%					
TOTAL	24.24	36260	49149	58401	67653	94748
Density		1496	2028	2409	2791	3909
Cluster-7						
Hoskote	14.28	36323	51673	62591	73509	104573
Growth rate % (1991-2001)	42.26%					
TOTAL	14.28	36323	51673	62591	73509	104573
Density		2544	3619	4383	5148	7323
Cluster-8						
Hebbagodi (CT)	3.41	12296	20740	27862	34984	59009
Growth rate % (1991-2001)	68.68%					
Bommasandra (CT)	4.65	7614	12843	17253	21663	36540
Growth rate % (1991-2001)	68.68%					
TOTAL	8.06	19910	33583	45115	56647	95549
Density		2470	4167	5597	7028	11855
TOTAL of All 8 Clusters	134	378002	536605	655761	1174917	1537464
Average density		2816	3997	4885	8752	11452
Share of pop in clusters out of total BMR pop		4.49%	4.88%	5.25%	8.27%	8.54%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	44085	51349	58614	77932
Growth rate % (1991-2001)	32.96%					
2 - Kanakapura	7.20	47060	58476	65568	72660	90286
Growth rate % (1991-2001)	24.26%					
3 - Magdi	4.98	25031	31892	36263	40634	51771

Growth rate % (1991-2001)	27.41%					
4 - Vijayapura	14.55	29540	36120	40142	44165	54001
Growth rate % (1991-2001)	22.27%					
TOTAL	32	134788	170572	193322	216073	273991
Average density		4248	5376	6093	6810	8635
Share of pop out of total BMR pop		1.60%	1.55%	1.55%	1.52%	1.52%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	707176	849083	1390989	1811455
CAGR (%)			3.27%	3.73%	10.38%	2.68%
Average density		3089	4261	5116	8380	10914
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	6.43%	6.79%	9.80%	10.06%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	2262824	2663616	2750283	3588545
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	20.57%	21.31%	19.37%	19.94%
CAGR (%)			-0.03%	0.71%	-1.89%	0.29%

Observation:

- I. The population in clusters and growth nodes is lesser than previously projected total urban population outside BBMP because there are settlements outside the clusters and growth nodes which will become urbanised in future and thus contribute to total urban population.
- II. The share of population cluster and growth nodes grows from 6% to 10% which is realistic and achievable
- III. The share of population outside the core and outside the cluster and growth nodes experiences a small decrease from 21% to 15% with negative CAGR. This is not totally unrealistic but undesirable to an extent as it indicates a fall in the share of rural farming population.

Alternative-3: Core : Rest of BMR = 60:40

Name	Area	2001	2011	2016	2021	2031
Cluster-1	sq.km					
Ramanagaram	12.39	79394	124976	160852	196727	309673
Growth rate % (1991-2001)	57.41%					
Channapatna	8.42	63577	73213	78762	84310	97089
Growth rate % (1991-2001)	15.16%					
Malur (Village)	10.93	6175	10416	13992	17569	29634
Growth rate % (1991-2001)	68.68%					
Honganur (Village)	6.12	7043	11880	15959	20038	33800
Growth rate % (1991-2001)	68.68%					
2 NICE towns	15				200000	200000
Growth rate % (1991-2001)						
Cluster-1 Total	52.86	156189	220485	269565	518644	670196
Density		2955	4171	5100	9812	12679
Cluster-2						
2 NICE Towns	15		0	0	200000	200000
Growth rate % (1991-2001)						
Herohalli (CT)	5.71	18069	30478	40943	51409	86714

Growth rate % (1991-2001)	68.68%					
TOTAL	15.00	18069	30478	40943	251409	286714
Density		1205	2032	2730	16761	19114
Cluster-3						
Nelamangala	2.85	25287	36400	44398	52396	75422
Growth rate % (1991-2001)	43.95%					
TOTAL	2.85	25287	36400	44398	52396	75422
Density		8873	12772	15578	18385	26464
Cluster-4						
Thyamagondlu (Village)	3.48	8186	13808	18549	23290	39285
Growth rate % (1991-2001)	68.68%					
TOTAL	3.48	8186	13808	18549	23290	39285
Density		2352	3968	5330	6693	11289
Cluster-5						
Dodballapur	13.37	71606	93893	108505	123118	161438
Growth rate % (1991-2001)	31.12%					
Dargajoginahalli (CT)	0.11	6172	7136	7694	8251	9540
Growth rate % (1991-2001)	15.62%					
TOTAL	13.48	77778	101030	116199	131369	170978
Density		5770	7495	8620	9745	12684
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Growth rate % (1991-2001)	28.23%					
Kadigenahalli (CT)	1.93	5474	6687	7428	8169	9979
Growth rate % (1991-2001)	22.16%					
Hunasamaranahalli (CT)	6.37	7380	12448	16723	20997	35417
Growth rate % (1991-2001)	68.68%					
TOTAL	24.24	36260	49149	58401	67653	94748
Density		1496	2028	2409	2791	3909
Cluster-7						
Hoskote	14.28	36323	51673	62591	73509	104573
Growth rate % (1991-2001)	42.26%					
TOTAL	14.28	36323	51673	62591	73509	104573
Density		2544	3619	4383	5148	7323
Cluster-8						
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Growth rate % (1991-2001)	68.68%					
Bommasandra (CT)	4.65	7614	12843	17253	21663	36540
Growth rate % (1991-2001)	68.68%					
TOTAL	8.06	19910	33583	45115	56647	95549
Density		2470	4167	5597	7028	11855
TOTAL of All 8 Clusters	134	378002	536605	655761	1174917	1537464
Average density		2816	3997	4885	8752	11452
Share of pop in clusters out of total BMR pop		4.49%	4.88%	5.25%	8.27%	8.54%
GROWTH NODES (Independent urban settlements)						
1 - Anekal	5.00	33157	44085	51349	58614	77932
Growth rate % (1991-2001)	32.96%					
2 - Kanakapura	7.20	47060	58476	65568	72660	90286
Growth rate % (1991-2001)	24.26%					

3 - Magdi	4.98	25031	31892	36263	40634	51771
Growth rate % (1991-2001)	27.41%					
4 - Vijayapura	14.55	29540	36120	40142	44165	54001
Growth rate % (1991-2001)	22.27%					
TOTAL	32	134788	170572	193322	216073	273991
Average density		4248	5376	6093	6810	8635
Share of pop out of total BMR pop		1.60%	1.55%	1.55%	1.52%	1.52%
TOTAL of 8 Clusters + 4 Growth Nodes	166	512790	707176	849083	1390989	1811455
CAGR (%)			3.27%	3.73%	10.38%	2.68%
Average density		3089	4261	5116	8380	10914
TOTAL share of 8 Clusters + 4 Growth Nodes out of total BMR pop		6.09%	6.43%	6.79%	9.80%	10.06%
Remaining population outside (BBMP+Cluster + Growth Node) population		1737210	2262824	3003377	3496439	5388545
% share of remaining population outside (BBMP+Cluster + Growth Node) population		20.63%	20.57%	24.03%	24.62%	29.94%
CAGR (%)			-0.03%	3.15%	0.49%	1.97%

Observation:

- I. The population in clusters and growth nodes is lesser than previously projected total urban population outside BBMP because there are settlements outside the clusters and growth nodes which will become urbanised in future and thus contribute to total urban population
- II. The share of population cluster and growth nodes grows from 6% to 10% which is realistic and achievable
- III. The share of population outside the core and outside the cluster and growth nodes experiences a small decrease from 21% to 15% with negative CAGR. This is not totally unrealistic but undesirable to an extent as it indicates a fall in the share of rural farming population.

Considering all pros and cons, the second method, i.e., cluster and growth node population as a ratio of total population outside the core, seems to be the most realistic and achievable within the specified time horizon of 2031.

Summary of population distribution in clusters and growth nodes under preferred population scenario (70:30 between core : rest of BMR)

ITEM	Area	2001	2011	2016	2021	2031
Cluster-1		1.56	2.06	2.44	4.87	5.75
Cluster-2		0.18	0.24	0.28	2.33	2.43
Cluster-3		0.25	0.33	0.39	0.47	0.61
Cluster-4		0.08	0.11	0.13	0.15	0.20
Cluster-5		0.78	1.03	1.21	1.43	1.87
Cluster-6		0.36	0.48	0.57	0.67	0.87
Cluster-7		0.36	0.48	0.57	0.67	0.87
Cluster-8		0.20	0.26	0.31	0.37	0.48
Total pop in Clusters		3.78	4.99	5.90	10.96	13.07
% of pop in clusters out of total pop in BMR		4.49%	4.54%	4.72%	7.72%	7.26%
% of pop in clusters out of total pop outside BBMP		16.80%	16.80%	16.80%	26.46%	24.21%
Total pop in Growth Nodes		1.35	1.78	2.10	2.48	3.23
% of pop in clusters out of total pop in BMR		1.60%	1.62%	1.68%	1.75%	1.80%
% of pop in clusters out of total pop outside BBMP		5.99%	5.99%	5.99%	5.99%	5.99%
Total population in Clusters and Growth Nodes		5.13	6.77	8.01	13.44	16.31
% of pop in clusters & growth nodes out of total pop in BMR		6.09%	6.15%	6.40%	9.46%	9.06%
% of pop in clusters & growth nodes out of total pop outside BBMP		22.79%	22.79%	22.79%	32.45%	30.20%
Pop outside (BBMP+CLUSTERS+GROWTH NODES)- predominantly rural		17.37	22.93	27.12	27.97	37.69
% of predominantly rural pop outside the core out of total BMR pop		20.63%	20.85%	21.70%	19.70%	20.94%

ANNEXURE 6: CLUSTERS AND GROWTH NODES

Section 6.1: Green Belt Encroachment

Green belt encroachment

The current trends of development have encouraged encroachment of the green belt and conversion of prime agricultural lands for development at a regional level. Accurate data to substantiate this fact is currently unavailable; As per The Hindu, Statistics available with the Government indicate that in just over a year (2004-05), about 6,295 acres of land were converted from agricultural to industrial and housing purposes (mainly layouts) in the five taluks of Bangalore Urban district. In Anekal taluk, 2,174.33 acres of agricultural land were converted followed by Bangalore North Additional 1,382.28 acres, Bangalore South 1080.21 acres, Bangalore East 909.5 acres and Bangalore North 748.19 acres. In all, 153.36 acres of agricultural land were converted for industrial purposes in three taluks — Anekal (49.14 acres), Bangalore North (6.07 acres) and Bangalore East (98.15 acres). About 11,126.27 acres of agricultural land were converted for housing and 600.17 acres for other purposes during the last three years in the Bangalore Urban district alone. During this time, on an average, 1,041 properties were registered in the sub-registries in the city.²⁴

A study of land use and environment of Bangalore, by the IISc using ISRO's remote sensing data, has revealed that from 2000 to 2006 the green cover in the city has been declining at an average rate of 30 sq.kms. per annum. The built-up area has increased from 180.42 sq.kms to 301.27 sq.kms (61.6%). Bangalore has lost 23.7% of its water bodies, which are a part of the city's green cover, at an annual rate of 1.7 sq.kms. However, the forest patches in the urban district (7.49%) remain and need to be preserved.²⁵

Land use	In 2000	In 2006	% change
Built-up	186.42	301.27	+ 61.6
Vegetation	859.24	684.85	- 20.30
Water bodies	42.03	32.05	- 23.7

Section 6.2: Factors Analyzed for Clusters and Growth Nodes

1. Location of settlements in terms of proximity to
 - major towns, and other services
 - places of cultural heritage / tourism interest
 - major institutions

²⁴ THE HINDU: <http://www.thehindu.com/2005/10/14/stories/2005101405140500.htm>

²⁵ Times of India, 2008

2. Growth potential of settlements
 - population trends
 - Decadal growth rate
 - Potential densities

3. The primary economic activity
 - Product based (manufacturing)
 - service based (maintenance and support activity)
 - contribution to overall regional economy
 - FDI / GDP

4. Employment trends
 - Workforce participation rate

5. Connectivity to other parts of the region
 - Road, rail, air transport accessibility
 - logistics - in bound (for resources) and out bound (for distribution and marketing) including APMC yards, warehousing / storage, freight and cargo movement and terminals)
 - Transport hubs – truck terminals, bus depots

6. Infrastructure facilities
 - Roads, water, power, telecom etc.
 - Education, health, parks and other social amenities
 - Marketing and sales facility
 - R&D facilities / training institutes

7. Government interventions
 - Investments with respect to industries (KIADB Industrial Estates.)
 - Proposed road and rail network
 - Proposed townships
 - Other infrastructure investments / projects

8. Private interventions
 - Private institutions
 - Private industries (including SEZs)

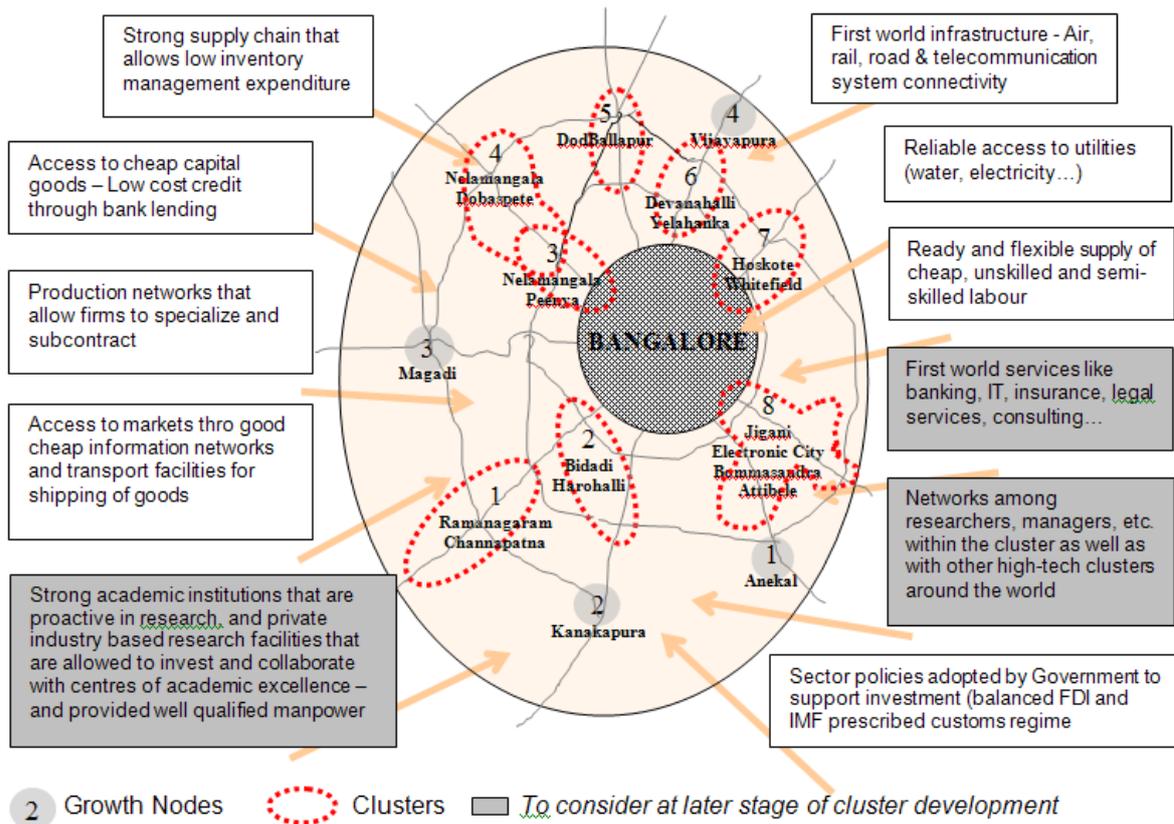
9. Planning efforts impacting development
 - Plans for IMPs and the RMP 2015 for Bangalore
 - Previous Structure plan policies
 - Recent sector policies (includes SEZ, Industries, Agriculture, Textile, IT and BT)

- Government reforms, schemes / incentive programmes
- Directions of other planning efforts (Vision 2020, ABIDE visions etc)

10. Resource availability

- Financial capacity of local body (budget, revenue raising reforms)
- Human resources, i.e. local body capacities (application of technology for creating network of services, reforms, training etc)

Section 6.3: Detailed Description for Clusters and Growth Nodes



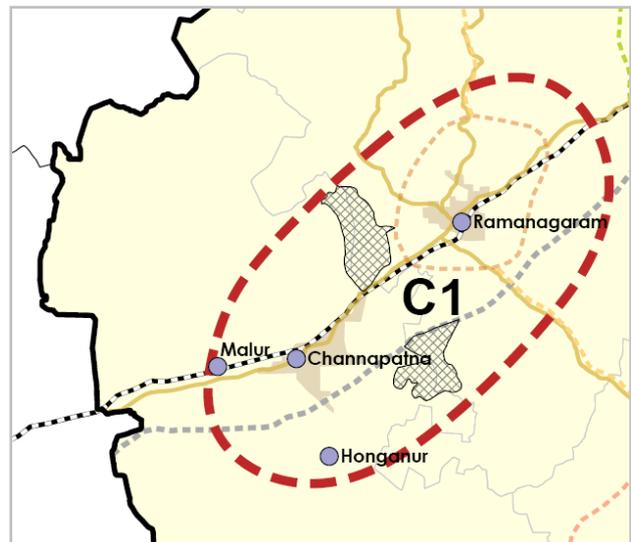
CLUSTERS:

CLUSTER 1–Ramanagaram - Channapatna

This cluster is located in the SW part of the region along the Bangalore-Mysore corridor. It consists of 2 major towns - Ramanagaram and Channapatna and 2 smaller settlements of Malur and Honganur. In the vicinity of these towns/settlements are two proposed townships, one industrial and the other with a heritage theme, by the Nandi Infrastructure Corridor Enterprise. In addition, three proposed Industrial Areas by the KIADB also are part of this cluster. The two towns are interdependent for they share workforce, and some educational and social services.

Economy: The economy of the major towns is mainly a product-based secondary sector economy which includes agro-based textile industry, tobacco products, toys and wooden products, and related trading activities. Specifically, the following are the economic activities of the cluster:

- Sericulture / manufacturing and twisting of raw silk are predominant activities in both Ramanagaram and Channapatna²⁶.
- Traditional and advanced small scale industries – wooden toys, lacquerware products, door curtains, powder boxes and napkin rings and jewellery (CH) About 5-10% of the total manufacturing from the region is toys Other products catering to the export market include car seat covers, salt & pepper shakers, napkin rings. Informal estimates peg export revenue from Rs 1 to 8 crore²⁷. Lacquerware Craft Complex established by Karnataka State Handicraft Development Corporation Limited has a manufacturing centre in the town with 32 turning lathe machines rented out to individual craftsmen on a monthly rent.
- Tourism is a potential economic draw for this cluster as it has several important natural and traditional features of attraction. This includes:
 - Janapadaloka located 3kms from Ramanagaram (RM, CH)
 - Seven hills of Shivaramagiri, Yatira-jagiri, Somagiri, Krishn-agiri, Revannas-iddeshwara Betta, Jalasiddeshwara Betta and Sidilakallu Betta that dot the landscape (RM)
 - Toy industry (CH)
 - Kanva Reservoir with automatic siphon system (13 kms from CH), Kanva Maharshi Math and Brahmanya Theertha Brundavan (6KM from CH)
 - Mallur Aprameya Swamy Templ, Kengal Aanjaneya Swamy Temple (CH)
- Automobile engineering (RM), Coconut production (CH), Brick making, carpentry, black smith work, masonry, coir products making – local occupations (RM) are subsidiary occupations in this area.



Connectivity: The cluster is accessed by SH 17 which connects it to Bangalore (about 50-60 kms) in the NE and Mysore (80-100 kms) in the SW. SH 3 cuts through Ramanagaram and links the cluster to Magadi (34 kms) in the North and Kanakapura (30.5 kms) in the SE. The proposed NICE expressway further improves the connectivity with Bangalore and Mysore cities in the future.

Population and growth rate: Ramanagaram, owing to its proximity to Bangalore city and increased investments by the Government, has a high growth rate of 57.4%, while Channapatna is growing at a rate of 15.7%.

Workforce: Toy making is a major source of livelihood for majority of the community in Channapatna. This art and craft demands dedicated craftsmanship and labour from stage one, that of procuring of the wood,

²⁶ In 1913, the Department of Sericulture was formed and a Silk Farm was established in Channapatna in 1914.

²⁷ WOODEN WONDERS: Toys of Channapatna, Economic Times dt. 31.12.07

subsequently seasoning the same and then cutting these pieces into desired sizes, pruning and carving into desired shape and finally colouring with artistic designs by the artists, polishing and presenting the same with attractive finish as finished product into the market. The industry has nearly six thousand people directly or indirectly engaged in manufacturing and trade²⁸.

Malur is located 2 kms West of Channapatna and Honganur is 5 kms South of Channapatna. Both these settlements have a workforce participation rate of 44-45 % each which support the economic activities in this cluster. Ramangaram has a WPR of 39.8% while Channapatna has about 37%.

Infrastructure facilities: The cluster is well equipped with a water treatment plant serving the twin towns of Ramanagaram and Channapatna, transmission mains, two intermediate pumping stations, one ground level reservoir and five overhead reservoirs; and new water distribution systems in the towns of Ramanagaram, and Channapatna. A secondary sewage treatment plant in Ramanagaram; new sewage pumping stations; trunk sewers; and branch sewer lines address the sewerage problems in the major towns. In Channapatna the total length of roads is 108.20 km. and total water supply is 70.50 LPCD. In Ramanagaram the water supply is 100.76 LPCD and the source is backwash water of BWSSB line at TKhalli

Institutions:

- Artisan Training Institute (ATI) – for toy making
- Maya Organic vocational training centre - training, streamlining of the entire supply chain for Channapatna toys, new product development and marketing
- Govt. Polytechnic, Channapatna - 571 501, Bangalore Rural District (AICTE approved) – offers courses in Automobile Engg., Civil Engineering, Computer Science & Engg., Electrical & Electronics Engineering, Electronics & Communication Engg., and Mechanical Engg. And has a total intake of 315 students annually.

Resources: Locally available 'Aale mara' or 'Doodi Ki Lakdi' (ivory wood) and in rare cases rosewood and sandalwood was used for toy making. Today rubber wood, silver wood, fine wood, nepal wood, psychamora, red seedar, pinewood and teakwood are also used for the wooden craft work²⁹.

Capacity building: Channapatna is one of the 57 cities in Karnataka under the Nirmala Nagara - Municipal eGovernance project since Aug. 15th 2005. Government built quarters with working sheds developed with financial assistance from Dutch Govt., and under the State's 'Vishwa Scheme.'

Market: Products are marketed by KSHDC through its retail outlets in different parts, though the individual craftsmen have the liberty to procure orders on their own. To compete with the international market, craftsmen running individual units have corporate clientele and they deal with them through agents. Bharath Arts and Crafts manufactures various household items and wooden jewellery for export and is considered to be one of

28 The Milli Gazette, Vol_6 No_01, MG119 (1-15 Jan 05).htm

29 ibid

the top profit making entities in Channapatna, supplying to companies in Italy, France and the US³⁰. Units also make a variety of articles based on export orders from agents in Bangalore, Delhi and Mumbai³¹.

Regional facilities to be introduced in Ramanagaram – Channapatna cluster

With the presence of two major and two minor settlements as well as two proposed townships of NICE and the proposed KIADB ts, the demand for quality education, industrial training and health and research facilities arises. As per census 2001 Ramnagaram and Chennapatna have the highest percentage of population in the < 6 yrs category in the BMR region (13.35% and 12.51% respectively). The population growth rates are also high at 57.4% and 15.7% respectively. A proposal to set up the Rajiv Gandhi health university at Ramnagaram also exists.

To prevent the decline of Ramnagaram and Channapatna as centers of economic, intellectual and social activity, it is imperative to focus energies on creating an urban cluster that attracts human capital and investment rather than in perpetuating the traditional 'rural' economy. The towns are at present interdependent for they share workforce, and some educational and social services. Consolidation of the existing trends of the cluster, the proposals for education, and future requirements of the resident population into one large regional facility will enable the nodes in the Cluster to access and share this common facility. Rural population could also be trained for nonagricultural employment to actively promote the growth of the non agricultural sectors. This will also give an institutional backing to upgrade the existing labor market thereby bridging the gaps between the needs of industry and the skills generated locally.

The cluster is also easy accessible at the regional level due to the presence of the SH 17 and the upcoming NICE Corridor. The potential for attracting foreign direct investment to strengthen the existing local economies also increases when a region has availability of a robust educational and medical system.

The proposed Educational Facility could have the following components:

- a) Institute for higher learning that has a state or a national presence such as the proposal of the Rajiv Gandhi health university and other technical courses.
- b) Research and Development Centre (R & D) The fields addressed at present are R & D in toy making and could be extended to wooden products as well as silk textile works and laquerware to be able to improve the quality of the products and to help access a larger international market
- c) Industrial Training Institutes (ITI) for upgrading skills in silk textile weaving and wood and laquer works
- d) Incubation center to inculcate the spirit of entrepreneurship engrained in the creative culture of craftsmen and designers so that their ideas get transformed into new products or services capable of being marketed and sold to a larger market. This will also enable craftsmen to access clientele without having to go through a series of agents.
- e) Museum for art and craft of the region which could display the local craft of toys, wooden products, laquerware, silk etc. and could be a tourist attraction as well as a market for products

³⁰ ibid

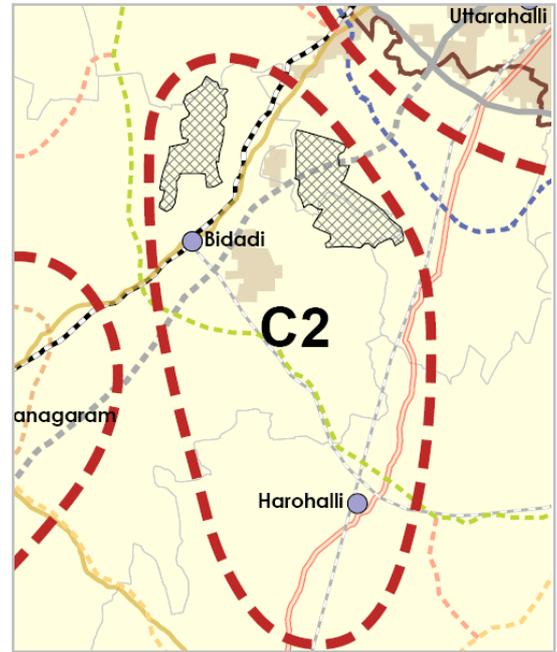
³¹ WOODEN WONDERS: Toys of Channapatna, *Economic Times* dt. 31.12.07

CLUSTER 2 – Bidadi - Harohalli

This cluster is located to the SE of the region almost adjoining the core of Bangalore. It consists of 2 minor towns of Bidadi and Harohalli as well as existing and proposed KIADB industrial areas (I.A). In the vicinity of these towns/settlements are two proposed townships by the Nandi Infrastructure Corridor Enterprise, one for corporate uses and the other with a commercial theme. The Toyota factory inside the Bidadi Industrial area is a major generator of activities, encouraging more industries to locate in this area. The existing Industrial area at harohalli covers almost 1000 acres.

Economy: Product-based economy with manufacturing industries located in the existing Bidadi Industrial area and Harohalli Industrial area. Existing Toyota factory and its extension is one of the major industrial activity in this cluster. Wonderla, innovative film city, Eagleton resorts add to recreational activities of the cluster.

Connectivity: The cluster is accessed by NH-209 and SH-17. Harohalli is connected by NH-207 and its nearest city is Bangalore (40 kms) in the NE and Kanakapura town (17 kms) is towards south. Bidadi is connected by SH 17 which connects it to Bangalore (about 30 kms) in the NE and Mysore (114kms) in the SW. Ramanagaram is 20 kms in the SW and Magadi is 35 kms in NW direction to Bidadi town.



Population and growth rate:

Harohalli, owing to its proximity to Bangalore city and increased investments by the Government as well as private sector it has a very high growth rate of 315.67%. Similarly Bidadi is also growing rapidly because of industrial estate, recreational facilities as well as the ongoing development activities because of by NICE corridor.

Workforce:

Harohalli has 39.86 % and Bidadi has 38.95% workforce as (2001 census). Most of the investments and development activities (like existing KIADB industrial area and its extension, wonderla, innovative film city, NICE corridor, proposed NICE townships, etc) are happening in the recent years so above 2001 figures may not give true current picture.

Environmental concerns:

A major valley runs through this cluster and urbanisation on the lands between Bidadi town and Harohalli town needs to be curtailed to preserve this valley. This is a large catchment area for the Vrishbhavati River and if built upon, can result in flooding.

Regional facilities to be introduced in Bidadi – Harohalli cluster

With its proximity to Bangalore, this cluster is easily accessed by NH-209 and SH-17. The presence of Eagleton resorts and golf course and Wonder La makes it the ideal destination for visitors and tourists as a get away from the busy city. The Sports Authority of India also has its sports facilities in this area. The presence of a major valley which is the catchment area for the Vrishbhavati River serves as a natural constraint to urbanization but also serves as a potential both in terms of its inherent nature as well as location and connectivity for a regional park and recreational facility.

The setting up of a regional park will help to conserve the rich bio diversity of the region which will have several long term economic, aesthetic and recreational value benefits. The regional park so located in the existing major valley will not only preserve the major catchments of the river but will also assign an economic use for the same. This park will also connect up through the proposed green network as arrived at through the land capability analysis to other regional park facilities like the Bannerghatta National Park and Wildlife Sanctuary.

Sports and recreational facilities could be favorably set up in this cluster as it is in proximity to large educational institutions and the existing SAI facility. Water based recreational activities could also be located close to the valley areas as these are naturally water rich areas and the activities hence proposed should not intrude or harm the ecologically sensitive nature of the area.

The present Bidadi industrial estate, Toyota plant and proposed extensions to the KIADB estates will also require an organized transport and logistics hub in this area in addition to the existing railway station present in Bidadi.

The proposed Regional Park and Recreational Facilities and Logistics Hub could have the following components:

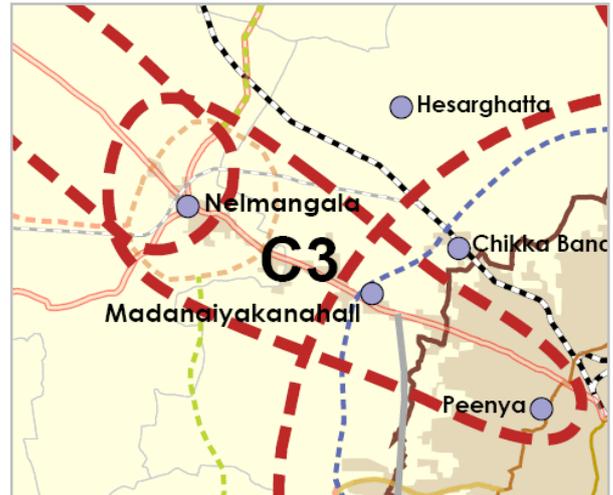
- a) Regional park could contain bio diversity conservation parks the setting up and management of which includes demarcating of forest lands, bird and animal sanctuaries and botanical gardens
- b) Sports facilities and water based activities could contain the Global Sports Village which has been envisaged by the Government to house sports facilities as per international standards such as an Olympics sized swimming pool.
- c) Logistics hub could consist of container depots; storage godowns, truck parking facilities
- d) Transport hub could contain an integrated inter modal transport interchange.

CLUSTER 3 - Nelamangala – Peenya

Located in the NW part of the region, along the Bangalore Tumkur road, this cluster consists of one major town Nelamangala and two minor settlements Madanaiyakanahalli and Chikka Banavara. Existing Peenya Industrial area and its extension also form part of this cluster. Since the Tumkur Road was upgraded, the entire corridor from Peenya to Nelamangala (and even beyond) have seen an increase in the numbers of industries locating along it. With Peenya at one end, and Nelamangala at the other, this stretch is a cluster in the making.

Economy: Product based manufacturing with textiles and other small and medium scaled manufacturing industries in the Peenya Industrial Estates. Other products contributing to the economy are horticulture and tobacco products

Connectivity: The cluster is accessed by NH-4 which connects it to Bangalore (about 30 kms) in the SE and Dobbaspet, Tumkur (42 kms) in the NW. NH-207 connects Nelamangala with Dodballapur (30 kms) in the NE and further to Hoskote and Hosur. NH-48 connects Nelamangala to Hassan (156 kms) in the west.



Population and growth rate:

Increasing pressure on NH-4 (which connects Mumbai and Chennai via Bengaluru) has led to rapid growth of Nelamangala town which has recorded 343.95% (between 1991-2001 census). Surrounding smaller towns are also registered higher growth rate.

Workforce:

Nelamangala has 35% and Madanaiyakanahalli has 45.61% workforce. Industrial areas at Peenya as well as Micro Small and Medium Enterprises around Madanaiyakanahalli and along the NH-4 corridor may push higher WPR in the coming years.

Infrastructure facilities:

It depends on ground water through bore wells for water supply.

Regional facilities to be introduced Nelamangala – Peenya

The main feature of this cluster is its good connectivity and predominance of small and medium scaled industries. Introduction of a well connected integrated inter modal transport facility that has good public transport connectivity with the rest of the region will allow for labor pool to have access to employment from a much wider region.

The proposed Transport Hub could have the following components:

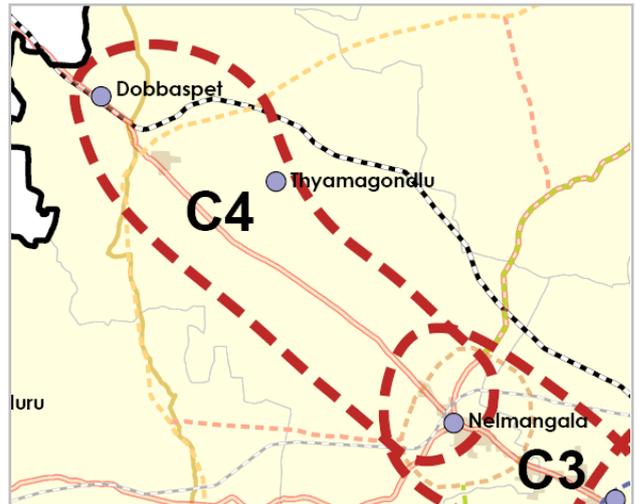
a) Transport hub could consist of an integrated inter modal transport interchange which allows for public transport such as KSRTC or BMTc buses to adequately service the area. The transport hub could also be made to accommodate the proposed metro which could be extended from its present alignment upto Peenya.

CLUSTER 4: Dobbaspete – Nelamangala

This cluster is located in the NW part of the region and it overlaps with Cluster 3. This cluster consists of one major town Nelamangala (also included in CLUSTER 3) and two minor settlements Dobbaspet and Thymagondlu. The existing KIADB Dobbaspet Industrial area and its extension also form part of this cluster. In Sompura, and Thyamagondlu area KIADB has proposed a total of 5093 acres for future industrial development. Some of this is along the Dobbaspete – DodBallapur Road.

Economy: Product based manufacturing with textiles and manufacturing: (iron, steel), plastic, bio tech, electronic and electrical and ancillary automobile in the KIADB Industrial Estate

Connectivity: Dobbaspeta in this cluster is accessed by NH-4 which connects it to Bangalore (about 54 kms) in the SE and Tumkur (21 kms) in the NW. Major district roads connects Dobbaspeta with Dodballapur (35 kms) to its NE is Nelamangala and links the cluster to Dodballapur (30 kms) in the NE and Magadi (37 kms) in the south. Dobbaspeta is also linked to Bangalore and Tumkur by a railway line, with the closest stations at Nidavanda and Tumkur (20 kms).



It depends on ground water through bore wells for water supply. A landfill of 100 acres is located outside Dobbaspeta.

Regional facilities to be introduced Dobbaspeta – Nelamangala

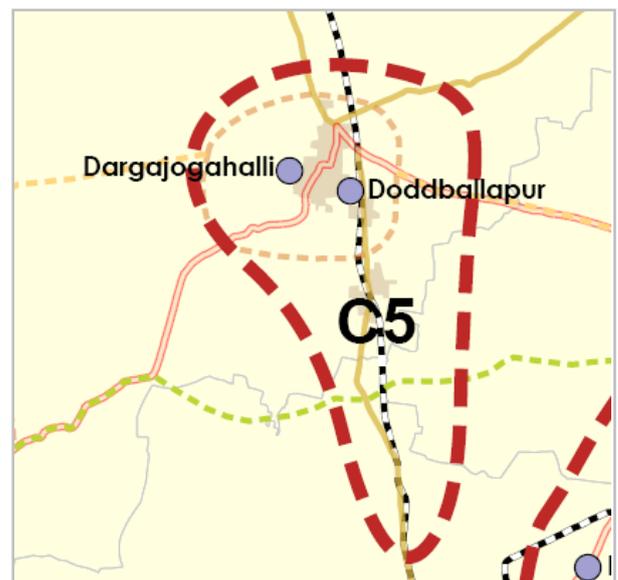
This cluster is well connected to Bangalore and Tumkur and is an upcoming industrial hub with existing industrial estates as well as enormous proposals for industrial development by KIADB. The potential industrial development of the area makes it pertinent to allow for a logistics hub to come up in this largely manufacturing oriented cluster.

The proposed Logistics hub could have the following components:

- a) Logistics hub could consist of container depots; storage godowns and truck parking facilities

CLUSTER 5: DodBallapur

This cluster is located in the Northern part of the region and is comprised of one major town, that of DodBallapur, and one smaller settlement of Dargajoganahalli. The existing KIADB Industrial estate of 360 acres, consisting of general and chemical industries and the existing Apparel park Phase I and II of 452 acres make up this cluster. In addition the KIADB has proposed 738 acres for phase III of the Apparel park. The concentration of industries related to textiles and weaving, in the vicinity of the DodBallapur town, makes this a unique cluster.



Economy: Product based economy dominated by the textile industry (silk weaving) and apparel parks. Other economies include floriculture, wine industry and food processing.

Connectivity: Dodballapur is well connected to Bangalore by rail as well as road (SH 9). It is connected to Nelamangala (30 kms) by NH 207 and is just 27 kms away from the Bengaluru International Airport at Devenahalli. To its north is the town of ChikBallapur about 30 kms away.

Population and growth rate:

Dodballapur has registered 31.12% growth rate

Workforce:

Dodballapur has 39.27% WPR. Existing IA (ind. area), appareal park and its extension as well as proximity to Devanahalli (BIAL) might have further pushed the WPR.

Infrastructure facilities:

DodBallpur and the related Apparel Parks in its vicinity face a dire shortage of water. Town depends on ground water through bore wells for water supply.

Water supply for the Illrd Phase of the KIADB apparel park is planned to be drawn from Yelahanka which is 25 kms away.

Regional facilities to be introduced DodBallapur

This cluster has a unique concentration of industries related to textiles and weaving as well as Apparel Parks set up by KIADB. A further proposal for Phase III of an apparel park indicates a dominant textile oriented economy with an advantageous proximity to the new international airport making it an ideal cluster to develop as a regional commercial and fashion hub (IT/ITES, Fashion, Design, etc.). This would form a low polluting second category commercial hub, which will be for creative industry.

The proposed Regional Commercial & Fashion Hub could have the following components:

- a) Fashion Hub related to textiles and silk for designers to come together and exhibit their designs at an official forum. This could also function as tourist destinations and as incubation centers to inculcate the spirit of entrepreneurship to convert ideas into products and services capable of being marketed and sold. The fashion hubs should also provide sourcing and warehousing facilities and raw material depots.
- b) Readymade garment units which is low capital and high labor intensive especially for women.
- b) Research and development center which provides amenities like testing laboratories, design center, training center, trade and exhibition center, and explores local capabilities in design technology and quality standards.
- c) Industrial Training Institutes (ITI) to meet the requirement of quality training for specialized and skilled manpower as well as in establishing institutional linkages for the placement of trained manpower
- d) Common amenities such as common effluent treatment plants and hazardous waste disposal facility also needs to be provided

CLUSTER 6: Devanahalli – Yelahanka

This cluster is located in the Northern part of the region and consists of the major settlement of Devanahalli and Yelahanka. Devanahalli is the location of the Bengaluru International Airport while Yelahanka is a small town located inside Bangalore. Besides these towns, this cluster includes Kadigenahalli, Hunasamaranahalli, Begalur, Budigere, and one proposed KIADB estate. An IT Park of about 1029 acres is also under consideration along with a 900 acres Aerospace park and 970 acres of Hardware Park to the South of the Airport. The Race Course that is to be moved from the city core is likely to locate in this cluster, in the vicinity of the Airport. The corridor between Yelahanka and Devanahalli is dotted with small industries including ITC. Several SEZs have been under consideration (not yet approved) to the South of the town. Yelahanka has an Industrial Estate with the Wheel and Axle plan, Escorts and the KEB gas turbine area.

Economy: Product based manufacturing and textile industry with the proposed Hardware Park and Aerospace Park. Airport related freight and logistics services and horticultural activities are also dominant.

Connectivity: This town links with Bangalore by road (39 kms) on the NH 7 and with ChikBallapur about 20 kms in the north. SH 96 connects it with Vijayapura. Hoskote is about 28 kms away from Devanahalli on NH-207, while DodBallapur (25 kms) is also linked to this town.

Population and growth rate:

Devanahalli (28.23%) and surrounding areas have registered growth rate between 20-30%. BIAL acted as a great pull factor in this cluster and it's hard to predict the growth rate till the next census figures arrive.

Workforce:

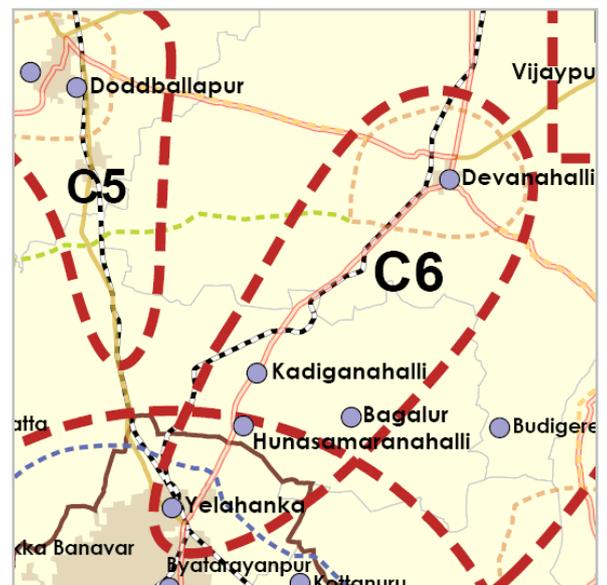
Devanahalli has 39.89% workforce whereas its surrounding smaller towns have between 38-45%

Infrastructure facilities:

Devanahalli town depends on ground water through bore wells for water supply.

Regional facilities to be introduced Devanahalli – Yelahanka

Due to the presence of the new international airport in this cluster there are several proposals for regional facilities ranging from an Aerospace Park and the Race Course. The proposal of high end services in this area will also encourage the north-eastern existing industrial zones to re-densify their existing areas. Proposals such as high end malls, fashion convention centers and exhibition halls can be reserved for this cluster. Due to the presence of several industries, airport related freight and logistics services the need for a transport and logistics hub is pertinent.

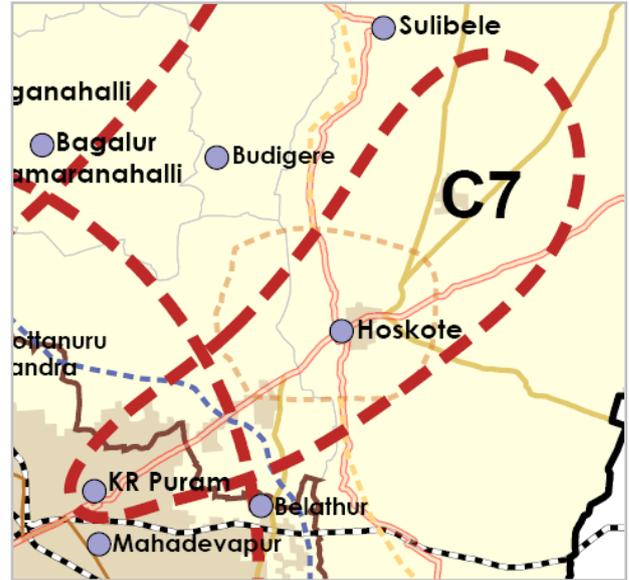


The proposed Logistics and Transport hub could have the following components:

- a) Logistics hub could consist of container depots; storage godowns, truck parking facilities
- b) Transport hub could contain an integrated inter modal transport interchange.

CLUSTER 7: Hoskote – KR Puram

This cluster is located in the NE part of the region and consists of the town of Hoskote, an existing industrial area and a proposed KIADB industrial area. BPL, Bengal lamps and several other manufacturing units are dispersed along the NH 7 linking it to the industrial area in KR Puram, which includes the ITI and the Tin Factory. United Motors & Heavy Equipment Pvt Ltd located at KIADB Industrial Area is one of the major hi-tech engineering industry manufacturing spares of heavy earthmoving machineries. Bell Ceramics Limited, located at Chokkahalli village and the manufacturing unit of Volvo are also located in this area.



Economy: Product based manufacturing with a concentration of heavy engineering industries in the KIADB estate at Hoskote, and textile, tobacco products. Oil refineries and silk manufacturing also dominate the economy of this area.

Connectivity:

Hosakote is accessed by NH-4 which connects to Bangalore (25 kms) in the SW and further connected to Tumkur and Mumbai, Kolar is located (44 kms) in the east and further connects to Chennai. SH-82 connects the town to Chintamani (50 kms) in the NE while SH-35 connects to Sidlaghatta (40 kms) in the North whereas SH-85 connects to Malur in the SE.

Population and growth rate:

Hoskote registered 42.26% growth rate.

Workforce:

Hoskote has 36.61% WPR

Infrastructure facilities:

Hosakote town depends on ground water through bore wells/open wells for water supply

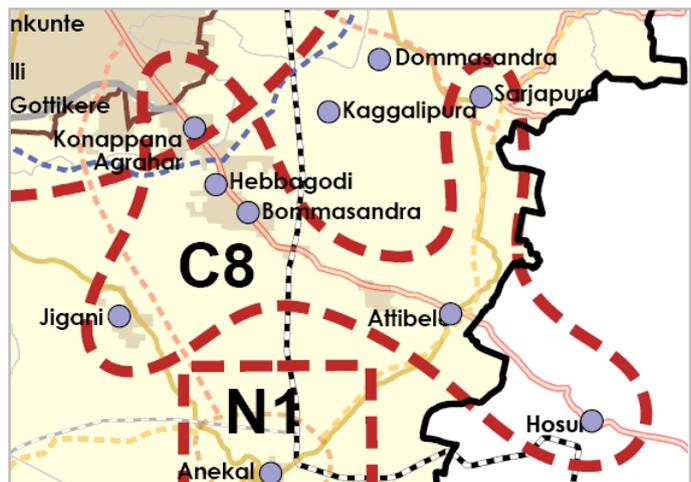
Regional facilities to be introduced Hoskote – KR Puram

This clusters manufacturing, industrial and textile base along with its proximity to the new international airport has prompted several regional level facilities to be planned here by various departments such as the world trade center and an integrated food park.

CLUSTER 8: Jigani – Electronic City – Bommasandra – Attibele

This cluster located in the SE part of the region, along Hosur Road consists of several small towns. The major attraction in this cluster that has caused industries to agglomerate in this region is the Electronic City in Bangalore. Industries along the entire stretch along NH- 7, from Electronic City to Attibele, and beyond, to Hosur in Tamil Nadu form this cluster. Attibele, located at the TN State border, Jigni, Bommasandra, Hebbagodi, Chandapura and Sarjapur are part of this cluster. The industrial areas of Attibele, Bommasandra and the Jigani-Bommasandra industrial area covering --- acres contribute to the cluster. The industries concentrating around Sarjapur town and a few scattered ones along the Sarjapur-Attibele Road also form a part of this cluster. Adjacent areas such as Hebbagodi, Dommasandra, Chandapura (a market town), and parts around Jigani and Anekal town serve as a residential base for the cluster. This cluster has the internationally known multi-speciality hospital – Narayana Hrudalaya.

Economy: Product based secondary sector manufacturing and textile industry with the KIADB Industrial areas. Attibele is home for most manufacturing and textile industries. Automobile giants of India - TVS Motors and Ashok Leyland are very near this town. Attibele, Bommasandra and the Jigani-Bommasandra Industrial areas consist of manufacturing industries.



Connectivity:

Attibele is 35 km from Bangalore and 5 km from Hosur on NH 7. The towns of Bommasandra, Hebbagodi, and Electronic City area are well connected by both BMTC buses (Routes 360 and 360B with a 10 minutes frequency) from Bangalore and TNSTC town buses (Routes 6A, 6B, 41, 42, 35, 35A, 10 with a 5 minutes frequency) from Hosur, Many private buses from both the cities also ply on this route. Attibele is about 14 kms from Electronic City and Sarjapur and Attibele are located about 10 kms apart on the SH 35. Bommasandra is only 8 kms away from Jigani and is connected by Bommasandra-Jigni link road. This cluster is in proximity to the major settlement of Anekal (Attibele to Anekal is 12 kms on SH-35, Jigani to Anekal is 8 kms), identified as a growth node and Hosur a major settlement in Tamil Nadu. In addition, there is a Heelalige railway station close to Chandapura on the NH 7 that provides access to this cluster. The proximity and high level of connectivity of all these towns makes access and transport of goods and materials easy, thereby contributing to the notion of a cluster.

Population and growth rate:

Hebbagodi and Bommasandra registered high growth rates 113.18 and 68.68% respectively. Electronic city, Bommasandra and Attibele IAs have added (compounded with other factors) to the higher growth rates in this cluster.

Regional facilities to be introduced Jigani – Electronic City – Bommasandra – Attibele

The presence of the Electronics city in this cluster has caused several industries to agglomerate here that have a strong manufacturing base. It forms a well connected, serviced and economically sustainable cluster.

GROWTH NODES

The following are the four growth nodes identified in the BMR:

- 1) Anekal - Product based textile industry with Agro-based industries
- 2) Kanakapura - Manufacturing of silk and agro-based products
- 3) Vijayapura - Product based textile industries
- 4) Magadi - Manufacturing of silk and agro-based products

All the four growth nodes are TMCs and their population as of 2001 ranges between 25,000 (Magadi) and 47,000 (Kanakapura). Vijayapura is the largest in terms of area (14.5 sq kms), however, its population (2001) is only 29540, while Magadi and Anekal are only 5 sq.kms with populations of 25,031 and 33,157 respectively. Kanakapura which is 7 sq.kms has a population of 47,060, the highest of the four growth nodes. The following table indicates the population and workforce participation ratios of each town identified as growth nodes.

TOWNS (ULBs+CTs)	Population	Area (Sq.km.)	Density	Decadal Growth rate	WPR
Kanakapura	47060	7.20	6536	24.26%	37.43%
Anekal	33157	5.00	6631	32.96%	37.72%
Vijayapura	29540	14.55	2030	22.27%	38.18%
Magadi	25031	4.98	5026	27.41%	41.87%

Of the four growth nodes, Anekal shows the highest decadal growth rate (33%) while Vijayapura the lowest (22%). This is possibly because Anekal is just 36 kms away from Bangalore on NH 7, and is linked with three major employment hubs - the Jigani Industrial area, Bommasandra Industrial area and the IT industries in Electronic City in Bangalore.

GROWTH NODE 1: Anekal

This node is located in the SE part of the region, about 36 kms from Bangalore, close to the Tamil Nadu border. Linked via rail to Baiyappanahalli and Yelahanka in Bangalore and Dharmapuri in Tamil Nadu, it's closest local railway station is Anekal Road.

Anekal and its surrounding areas serve as a residential base for the workforce employed in the IT, ITES and manufacturing companies located in the cluster formed by Jigani, Attibele, Bommasandra, Hebbagoddi and Electronic City in Bangalore. Many of these towns are themselves growing fast; Hebbagoddi's decadal growth

rate is 113% and Bommasandra's is 69%, which is spurring Anekal's growth. Anekal is about 13 kms away from both Jigani and Attibele, both towns having manufacturing units. It is close to the Bannerghatta National Park, a regional and national tourist attraction. Shirdi Sai Engineering College and the Regional Theology Extension Center, Jnanajyothi are some institutions that serve the population of this town. It depends on ground water through bore wells for water supply.

The economy of the town is product based textile industry with Agro-based industries. Anekal is known for its Silk industry and is home to a number of skilled weavers.

Regional facilities : Anekal

This cluster serves as a residential base for the workforce employed in the surrounding nodes. High potential for employment opportunities around Anekal as well as areas for recreation and its large resident population makes it pertinent to strengthen the existing educational base of the town. The proposal of a regional level educational facility will allow the existing labour market to upgrade and improve their skills, bridging the gaps between the needs of industry and the skills generated locally and to avail skilled jobs available in proximity to this node. This kind of an intervention also allows Anekal to establish forward and backward linkages with its surrounding nodes to strengthen and diversify its own economic base. The presence of an existing reputed medical hospital adds to the economical attractiveness of this growth node.

The proposed Educational Facility could have the following components:

- a) Institute for higher learning that has a state or a national presence such as Indian Institute of Technology (IIT), National Institute of Technology (NIT previously known as REC) could be encouraged to set up their branches.
- b) Research and Development Centre (R & D) The fields addressed could be diverse ranging from IT to silk technology
- c) Industrial Training Institutes (ITI) for upgrading skills in silk textile weaving and also in the manufacturing sectors

GROWTH NODE 2: Kanakapura

The major economy of this town located on NH 209, about 56 kms South of Bangalore, is Sericulture (textiles) and agro-based products including tobacco. The other closest towns are Harohalli (16 kms) and Sathnur (15 kms) along this highway. Kanakapura is linked with Ramanagarm, about 30 kms away, via SH-3. NH 209 links the town to Mysore, which is 97 kms away, via Malavalli. This town is highly dependant on its hinterland for its agro-based economy and is not in proximity to any major towns. It is located in an ecologically sensitive area and the agricultural lands that serve as a resource base for this town needs to be conserved. The growth rate of this town is 24% and the water capacity is about 14 LPCD. The workforce participate rate of 17.5% is fairly high. The Central Silk Board's Silk exchange unit is located in this town and there is one artisan training institute. It taps the BWSSB gravity main for water supply.

Regional facilities : Kanakapura

This growth node is not located in proximity to the primate city of Bangalore or to any of the other major towns. Its agro based economy relies heavily on its agricultural hinterland. Several food products such as gherkin, potato and tomato have surplus production in this area due to favorable climatic conditions.

Its predominant silk textile and food product base as well as its ecologically sensitive location near river catchments and forest land makes it an ideal location for setting up of an Agri based Integrated Complex. A regional facility of this nature will ensure that the main resource base of this town is conserved as well as benefiting local farmers who will have a much wider market access as well as a huge export potential. The hinterland of the town is fairly rural and has sufficient scope for dairy development and sericulture. There is also great scope for growing and processing mulberry in this region.

The proposed Agri based Integrated Facility could have the following components:

- a) Food Park which provides services that range from soil testing, nursery, farm machinery, fertilizers, crop protection, storage and processing to market linkages, farm credit and exports.
- b) Research and development (R & D) which will include a product development center, market research & development centre, agricultural research, education and training for know how transfer
- c) Secondary processing and storage infrastructure for value addition to agricultural produce through proper post harvest processing, grading, packing, transportation and storage.
- d) Warehouse for incoming and finished goods
- e) Community threshing yards and commodity and terminal markets
- f) Upgrading APMC's (Agricultural Produce Marketing Committee Yards)
- g) Common amenities like effluent treatment plant, water, electricity and diesel powered generator
- h) Poultry and dairy activity for procurement, processing, marketing, dairy farming including facilities like slaughter houses

GROWTH NODE 3: Magadi

Magadi, located to the West of Bangalore, is 40 kms away along SH-17E road. The economy of this town is mostly textile and agro-based products including tobacco, similar to the growth node of Kanakapura. This town is growing at a rate of 27% and has a population of about 25,000. It is connected with Ramanagaram (30 kms) in the South by SH-3 road and Solur (18 kms) in the North via SH-3 road. To its West, is the major settlement of Hassan, however it is 140 kms away, not close enough to impact its development. Similar to Kanakapura, this town relies heavily on its hinterland for its agro-based economy and sericulture industry. The town has a 13 acre KSSIDC industrial area. No major investments, in terms of new industries, have been made in the recent years except for a 920 acre area proposed for future industries by the KSSIDC, along Magadi road (about 15 kms away). It draws water from Manchanbele reservoir for water supply.

Regional facilities : Magadi

With its predominantly agro based economy that relies heavily on its agricultural hinterland and lack of new investments this node will benefit greatly from the introduction of an agro processing facility. This will help to conserve its agricultural hinterland and help farmers have a much wider market access as well as a huge export potential.

The proposed Agri based Processing Facility could have the following components:

- a) Secondary processing and storage infrastructure for value addition to agricultural produce through proper post harvest processing, grading, packing, transportation and storage.
- b) Warehouse for incoming and finished goods
- c) Community threshing yards and commodity and terminal markets
- d) Upgrading APMC's (Agricultural Produce Marketing Committee Yards)
- e) Common amenities like effluent treatment plant, water, electricity and diesel powered generator
- f) Poultry and dairy activity for procurement, processing, marketing, dairy farming including facilities like slaughter houses
- g) Research and development (R & D) which will include a product development center, market research & development centre, agricultural research, education and training for know how transfer

GROWTH NODE 4: Vijayapura

Vijayapura is an independent town located in the NE of Bangalore along the SH 96. Similar to Kanakapura and Magadi, this town subsists mostly textile and agro-based products including tobacco. It relies on its hinterland for its agriculture produce and is a centre for milk supply to Bangalore. The town is connected with Devanahalli (12 kms) and Kolar to the East (40 kms). The immediate town to its North is Sidlaghatta, which is a centre for cocoon production and silk thread making. Although close to the Bengaluru International Airport, Vijayapura has not seen major industrial / manufacturing investment in the recent years. It is identified as a growth node that needs to have compact growth, while retaining the surrounding agricultural base. It depends on ground water through bore wells for water supply

Regional facilities : Vijayapura

This node has a predominantly agro based economy that relies heavily on its agricultural hinterland for agricultural produce as well as the production of milk. The node although being in proximity to the New International airport has not harnessed its locational potential and could form linkages to other nodes through the provision of a regional facility like that of an Agri based Processing Facility and Dairy and Poultry Facility. The gradual establishment of forward and backward linkages with its surrounding nodes will eventually strengthen and diversify its own economic base.

The proposed Agri based Processing Facility and Dairy and Poultry Facility could have the following components:

- a) Secondary processing, warehouses and storage infrastructure for value addition to agricultural produce through proper post harvest processing, grading, packing, transportation and storage.
- b) Strengthening poultry and dairy activity for procurement, processing, marketing, dairy farming including facilities like slaughter houses

ANNEXURE 7: ECONOMY

Section 7.1: National Economic Scenario and its effect on Local Economy of BMR National Economic Scenario

Creating investment climate through infrastructure provision, fiscal and spatial incentives and attracting FDIs have been the main policies of economic growth during the decade starting 2000 in India. The fast growing tide of economic growth has been slowed down by the global recession and the growth rate of the economy has shown a slow down (The Economist: 2009). However, India continues to experience the second highest growth rate in the world, next to China even during the current global recession. This has been attributed to strong infrastructure investments by the Government through its flagship programmes such as JNNURM, UDSSMT, NREGS, UEP, and other direct Centrally sponsored infrastructure programmes such as for Water Supply and Sanitation, kept the investment climate and hence the employment at the local level comparatively stable as compared to other countries. However, formal sector employment showed a decline both at the National level and at the State and local level. Due to global recession, export oriented industries such as Software producers and textile producers faced severe constraints in their expansion plans. This affected other industries too such as Real estate sector that has been a symbol of growth for Bangalore during the period of 2000-2007.

To support the Micro and Small and Medium Enterprises (MSMEs), many schemes were launched by the Government of India such as National Manufacturing Competitiveness Programme (NMCP) to improve the quality and productivity of these enterprises. Similarly to improve the entrepreneurial ability in rural and urban areas a special programme to identify and assist talented youth called 'Rajiv Gandhi Udyami Mitra has been launched. These programmes would surely be more beneficial to entrepreneurs in Rural Bangalore Districts in the long run in boosting the employment opportunities. All these programmes are being operated through District Industrial Centers.

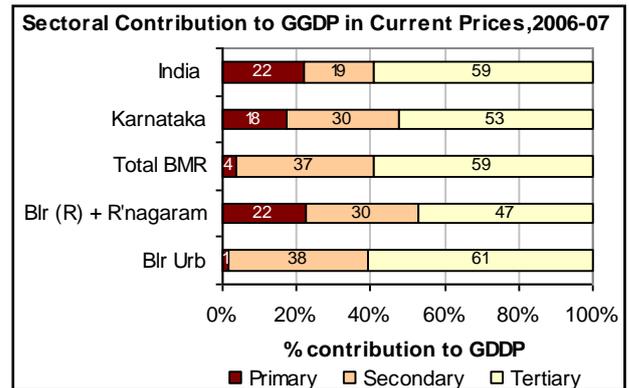
To support the Micro and Small and Medium Enterprises (MSMEs), many schemes were launched by the Government of India such as National Manufacturing Competitiveness Programme (NMCP) to improve the quality and productivity of these enterprises. Similarly to improve the entrepreneurial ability in rural and urban areas a special programme to identify and assist talented youth called 'Rajiv Gandhi Udyami Mitra has been launched. These programmes would surely be more beneficial to entrepreneurs in Rural Bangalore Districts in the long run in boosting the employment opportunities. All these programmes are being operated through District Industrial Centers.

Taking in to account the commitments made by the Government of India towards Global Agenda initiated by UNCHS, UNEP and UNDP in the areas of environment, basic services including Local Economic Development and considering the Eleventh Five Year Plans of the Centre and the State, agriculture needs to be given proper attention on two counts in the land use plans of the future. One, urban agriculture provides food security for most of the population which otherwise would be marginalized. Two, it provides Local Economic Development and keeps the environment under control as per Local Agenda 21.

Thus, the economic development needs to be carefully balanced and planned with the available and potential natural and other resources of BMR and in line with the broader policy objectives at the national and the state level to make it sustainable.

▪ Effect of National Policies on Local level

As in the case of India, Karnataka's economy too is undergoing structural changes, where in Service Sector dominates the development process in the GDP. The composition of GDP has undergone changes over the years and the trend is moving towards Service Sector or Tertiary Sector (Refer Figure alongside). Bangalore being its capital, naturally will attract most of the commercial ventures and/or the service sector venture as it has done so during the transition period of 1990-



2000. It is imperative that the future land use plan needs to the growing commercialization of Bangalore and address the future land requirement for this in a consistent way. Though not measured in concrete terms, within the tertiary sector, unorganized sector dominates the scene not merely in Government of India has passed the Bill to facilitate the growth of this sector.

Two flagship schemes of Gol namely TUFSS and SITP are expected to facilitate modernisation of textile industries in Bangalore. A policy resolution for setting up of Information Technology Investment Regions (ITIRs) was approved in May 2008. This will promote investment in IT, ITES and Electronic Hardware Manufacturing (EHM) in identified regions. Bangalore is identified under this scheme. The Information Technology (Amendment) Act, 2008 was enacted considering the need to strengthen legislation pertaining to information security. Moreover the push towards e-governance by setting up 'Common Service Centers' (CSCs) and State Wide Area Network (SWAN) through PPP mode

As observed by the Economic Survey (2008-2009), 'the large pool of scientific manpower and research labs, especially in the public domain, provide a potential for innovation that could create such products which can open up new market segments' This will ensure sustained economic development and employment. However, for innovation to become a key driver of growth, and become a cluster, there should be a facilitative policy, especially land and fiscal policy that can push the industry forward in the desired direction. Since mid 1990s, government of Karnataka followed an Industrial friendly investment policy, which promoted the innovative clusters, especially in IT and ITES. One hopes that these policy initiatives will continue due to the peer pressures from other States and Cities.

The peer pressure to compete and attract more investment also made the Karnataka Government, especially the Bangalore Municipal Corporation to generate more revenues through traditional as well as innovative means. Property tax reforms, fiscal prudence and other fiscal measures made the local economy grow in a sustained way.

The growth of the Service sector at the National level saw the emergence of Bangalore too as a service sector capital. Administrative functions associated with the Capital city, along with the emergence of a global city saw Bangalore, turning into a financial center too.

The flaship programme of Urban transportation under JNNURM, saw the commitment of Rs.4581 crores for acquiring new bus services for Bangalore by the Central Government. Similarly an amount of Rs.6395 Crs has been earmarked through PPP mode for the metro rail project for Bangalore.

Section 7.2: Macro and Micro Economic Overview – Important Indicators

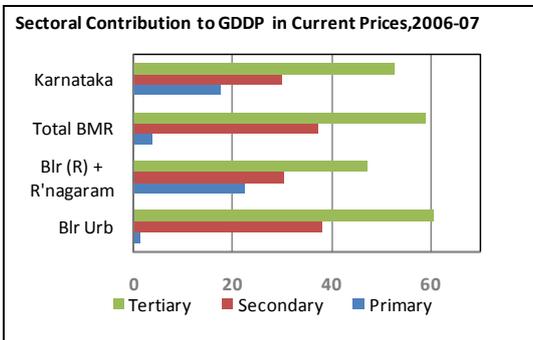


Figure 1: Sectoral Contribution to GDDP for BMR, 2006-07
Source: Census of India and SCE Analysis

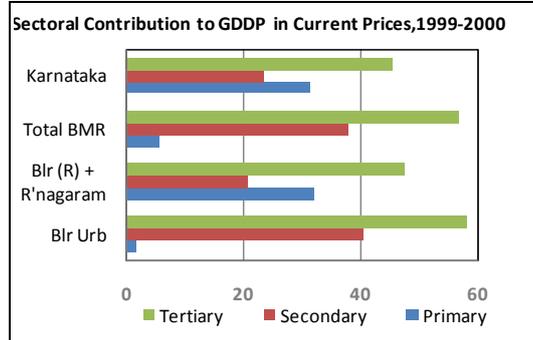


Figure 2: Sectoral Contribution to GDDP– BMR ,1999-2000
Source: Census of India and SCE Analysis

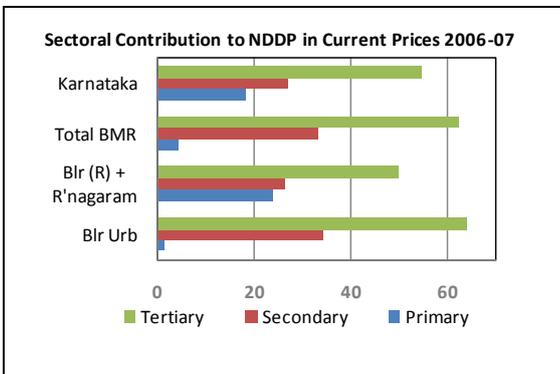


Figure 3: Sectoral Contribution to NDDP for BMR, 2006-07
Source: Census of India and SCE Analysis

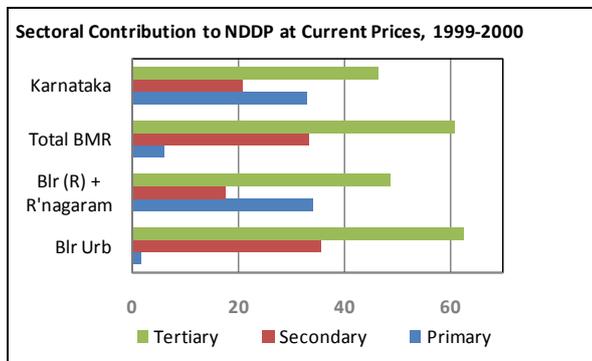


Figure 4: Sectoral Contribution to NDDP for BMR, 1999-2000
Source: Census of India and SCE Analysis

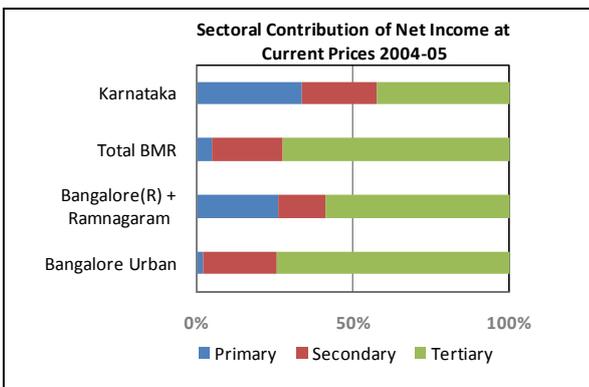


Figure 5: Sectoral Contribution to Net Income for BMR, 2004-05
Source: Census of India and SCE Analysis

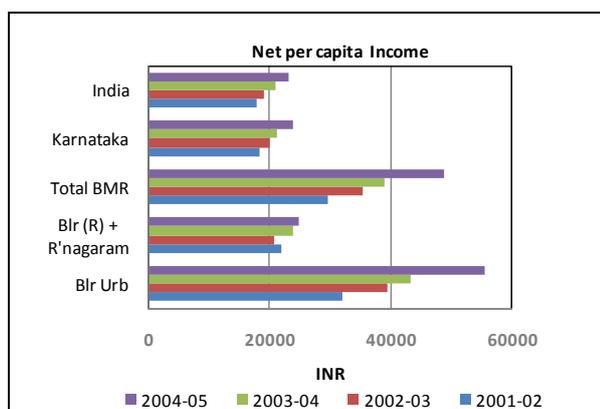


Figure 6: Net Per Capita Income over the years for BMR
Source: Census of India and SCE Analysis

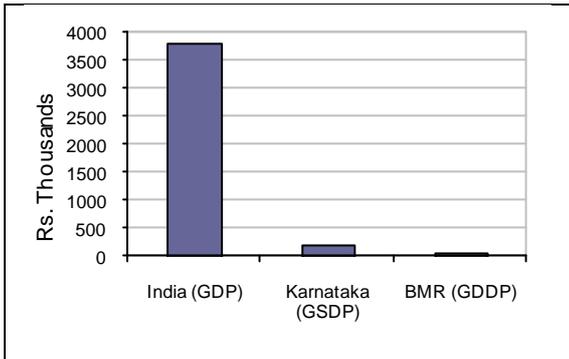


Figure 8: GDP Of BMR at 2006-07 Prices
Source: Census of India and SCE Analysis

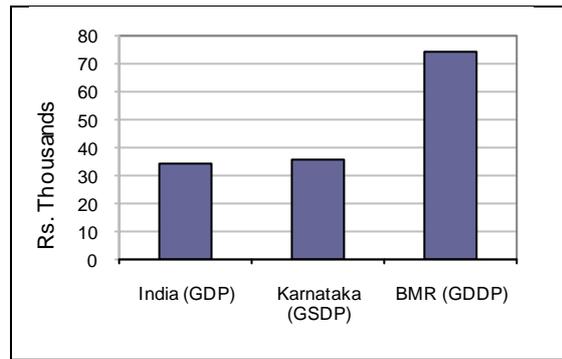


Figure 7: Per Capita GDP At 2004-05 Prices – BMR, Karnataka and India
Source: Census of India and SCE Analysis

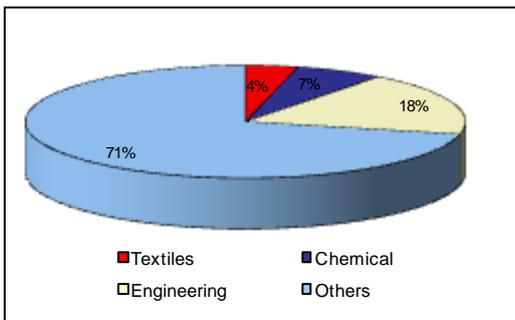


Figure 9: Productive Recentage Share from Factories in BMR
Source: Census of India and SCE Analysis

Section 7.3: Local Economy of BMR Towns

For the 10 ULBs in BMR which are outside Bangalore, most of the towns have a secondary sector based economy combined with primary sector in their rural fringe land. In these towns, manufacturing is dominated by Small and Medium enterprises with clustering taking place. For example, towns in South and South-East of Bangalore is dominated by Textile and silk products, while in South-West, it is wooden products and agro based industries.

For the towns which have been included recently within the Corporation area after formation of the BBMP, most are dominated by secondary or tertiary sector. Again textile industry combined with certain heavy industries (cement, steel, iron, machinery etc.), electronic goods plays the major role there.

Based on the local economy of towns and their hinterland, a pattern can be derived from the map shown in Figure 1 It shows that the 5 towns in the North and North-East have dominance of textile industry combined with agro-based / horticulture based economy. The towns in the South and South-West (Kanakapura, Ramanagaram and Channapatna) again has a combination of Textile and ago-based economy. Magadi and nelamangala in between has a larger manufacturing base. Particularly Nelamangala shows dominance of heavy industries. It is to be understood that the whole region is surrounded by rich agricultural belt of Karnataka inducing the agro-based industries in the BMR.

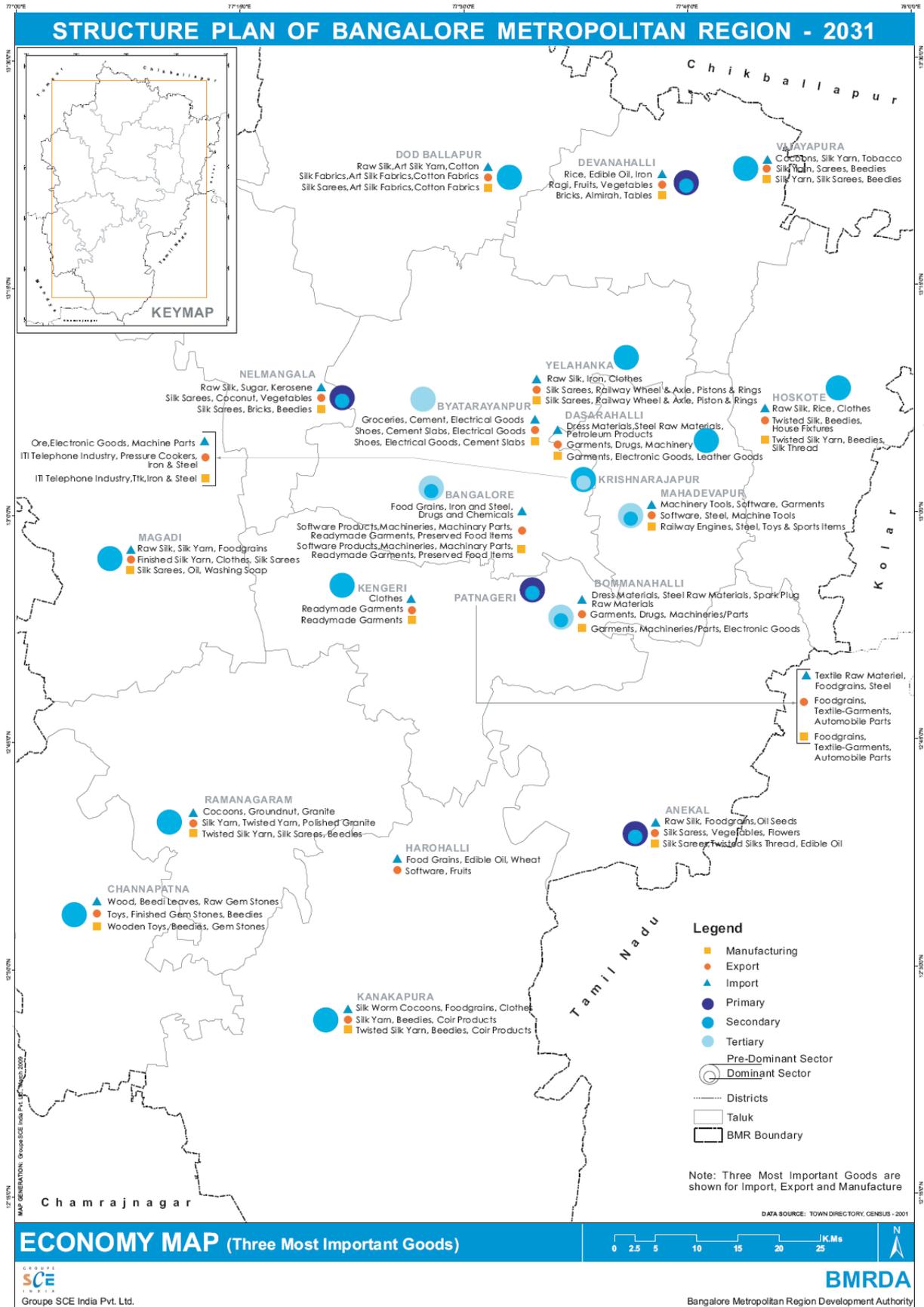


Figure 1 Economy of Towns in BMR

Section 7.4 Workforce Data Analysis – Census of India, 2001

Taluk	Total workforce	Work participation rate	Main workforce	Marginal workforce	% of main Work force	% of Margn Work force	Tot_CL	Tot_AL	Tot_HH	Tot_Others	% of Tot_CL	% of Tot_AL	% of Tot_HH	% of Tot_Oth	Non workers	% of Non workers
Bangalore Rural District																
Nelamangala	78078	44.65%	64511	13567	36.89%	7.76%	32003	14049	4053	27973	18.30%	8.03%	2.32%	16.00%	96802	55.35%
Rural	69228	46.28%	56174	13054	37.55%	8.73%	31851	13922	3080	20375	21.29%	9.31%	2.06%	13.62%	80365	53.72%
Urban	8850	35.00%	8337	513	32.97%	2.03%	152	127	973	7598	0.60%	0.50%	3.85%	30.05%	16437	65.00%
Dod Ballapur	127843	47.64%	105989	21854	39.50%	8.14%	48596	23954	11339	43954	18.11%	8.93%	4.23%	16.38%	140489	52.36%
Rural	97212	51.02%	76872	20340	40.34%	10.67%	48357	23657	3055	22143	25.38%	12.41%	1.60%	11.62%	93342	48.98%
Urban	30631	39.38%	29117	1514	37.44%	1.95%	239	297	8284	21811	0.31%	0.38%	10.65%	28.04%	47147	60.62%
Devanahalli	88533	47.77%	74971	13562	40.45%	7.32%	31210	24193	1845	31285	16.84%	13.05%	1.00%	16.88%	96793	52.23%
Rural	67918	51.31%	55603	12315	42.00%	9.30%	29170	21394	1144	16210	22.04%	16.16%	0.86%	12.25%	64462	48.69%
Urban	20615	38.94%	19368	1247	36.58%	2.36%	2040	2799	701	15075	3.85%	5.29%	1.32%	28.47%	32331	61.06%
Hosakote	101754	45.75%	86136	15618	38.72%	7.02%	36100	22603	3729	39322	16.23%	10.16%	1.68%	17.68%	120676	54.25%
Rural	88457	47.53%	73392	15065	39.44%	8.09%	34998	21308	2856	29295	18.81%	11.45%	1.53%	15.74%	97650	52.47%
Urban	13297	36.61%	12744	553	35.09%	1.52%	1102	1295	873	10027	3.03%	3.57%	2.40%	27.61%	23026	63.39%
District Average / Total	396208	46.56%	331607	64601	38.97%	7.59%	147909	84799	20966	142534	17.38%	9.97%	2.46%	16.75%	454760	53.44%
District Average / Total- Rural	322815	49.01%	262041	60774	39.79%	9.23%	144376	80281	10135	88023	21.92%	12.19%	1.54%	13.36%	335819	50.99%
District Average / Urban	73393	38.16%	69566	3827	36.17%	1.99%	3533	4518	10831	54511	1.84%	2.35%	5.63%	28.34%	118941	61.84%
Ramnagaram																
Magadi	105259	52.00%	73017	32242	36.07%	15.93%	56864	20686	6450	21259	28.09%	10.22%	3.19%	10.50%	97158	48.00%
Rural	94778	53.43%	63712	31066	35.92%	17.51%	56443	19881	4059	14395	31.82%	11.21%	2.29%	8.12%	82608	46.57%
Urban	10481	41.87%	9305	1176	37.17%	4.70%	421	805	2391	6864	1.68%	3.22%	9.55%	27.42%	14550	58.13%
Ramanagaram	110690	46.44%	95150	15540	39.92%	6.52%	40818	16394	3264	50214	17.13%	6.88%	1.37%	21.07%	127657	53.56%
Rural	79101	49.76%	67337	11764	42.36%	7.40%	39856	15700	1549	21996	25.07%	9.88%	0.97%	13.84%	79852	50.24%
Urban	31589	39.79%	27813	3776	35.03%	4.76%	962	694	1715	28218	1.21%	0.87%	2.16%	35.54%	47805	60.21%
Channapatna	114666	45.40%	98539	16127	39.01%	6.39%	44596	25278	7059	37733	17.66%	10.01%	2.79%	14.94%	137908	54.60%
Rural	90962	48.13%	77561	13401	41.04%	7.09%	44166	24757	2144	19895	23.37%	13.10%	1.13%	10.53%	98035	51.87%
Urban	23704	37.28%	20978	2726	33.00%	4.29%	430	521	4915	17838	0.68%	0.82%	7.73%	28.06%	39873	62.72%
Kanakapura	165708	49.14%	128339	37369	38.06%	11.08%	78915	35040	4712	47041	23.40%	10.39%	1.40%	13.95%	171500	50.86%
Rural	148095	51.04%	111677	36418	38.49%	12.55%	78414	34626	3123	31932	27.03%	11.93%	1.08%	11.01%	171500	59.11%
Urban	17613	37.43%	16662	951	35.41%	2.02%	501	414	1589	15109	1.06%	0.88%	3.38%	32.11%	171500	364.43%
District Average / Total	496323	48.16%	395045	101278	38.33%	9.83%	221193	97398	21485	156247	21.46%	9.45%	2.08%	15.16%	534223	51.84%
District Average / Total- Rural	412936	50.64%	320287	92649	39.28%	11.36%	218879	94964	10875	88218	26.84%	11.65%	1.33%	10.82%	431995	52.97%
District Average / Urban	83387	38.77%	74758	8629	34.76%	4.01%	2314	2434	10610	68029	1.08%	1.13%	4.93%	31.63%	273728	127.28%
Bangalore Urban District																
Bangalore North	356390	42.94%	315091	41299	37.96%	4.98%	28692	22583	12679	292436	3.46%	2.72%	1.53%	35.23%	473671	57.06%
Rural	102546	45.98%	81631	20915	36.60%	9.38%	26999	20762	3721	51064	12.11%	9.31%	1.67%	22.90%	120485	54.02%
Urban	253844	41.82%	233460	20384	38.46%	3.36%	1693	1821	8958	241372	0.28%	0.30%	1.48%	39.76%	353186	58.18%
Bangalore South	420931	41.68%	382298	38633	37.85%	3.83%	28152	20970	10889	360920	2.79%	2.08%	1.08%	35.74%	588993	58.32%
Rural	137827	44.04%	118317	19510	37.81%	6.23%	26294	18355	4696	88482	8.40%	5.87%	1.50%	28.27%	175119	55.96%
Urban	283104	40.62%	263981	19123	37.88%	2.74%	1858	2615	6193	272438	0.27%	0.38%	0.89%	39.09%	413874	59.38%
Anekal	130682	43.64%	109863	20819	36.69%	6.95%	24196	19334	5587	81565	8.08%	6.46%	1.87%	27.24%	168746	56.36%
Rural	105040	43.56%	85813	19227	35.58%	7.97%	23853	18849	3334	59004	9.89%	7.82%	1.38%	24.47%	136120	56.44%
Urban	25642	44.01%	24050	1592	41.27%	2.73%	343	485	2253	22561	0.59%	0.83%	3.87%	38.72%	32626	55.99%
Bangalore (all urban)	1658911	37.72%	1570928	87983	35.72%	2.00%	4714	4215	40106	1609876	0.11%	0.10%	0.91%	36.61%	2738800	62.28%
Rural																
Urban	1658911	37.72%	1570928	87983	35.72%	2.00%	4714	4215	40106	1609876	0.11%	0.10%	0.91%	36.61%	2738802	62.28%
District Average / Total	2566914	39.27%	2378180	188734	36.38%	2.89%	85754	67102	69261	2344797	1.31%	1.53%	1.57%	53.32%	3970210	60.73%
District Average / Total- Rural	345413	44.45%	285761	59652	36.77%	7.68%	77146	57966	11751	198550	9.93%	0.89%	0.18%	3.04%	431724	55.55%
District Average / Urban	2221501	38.57%	2092419	129082	36.33%	2.24%	8608	9136	57510	2146247	0.15%	1.18%	7.40%	276.17%	3538486	61.43%
Total BMR	3459445	41.09%	3104832	354613	36.88%	4.21%	454856	249299	111712	2643578	5.40%	2.96%	1.33%	31.40%	4959193	58.91%
Rural	1081164	48.02%	868089	213075	38.56%	9.46%	440401	233211	32761	374791	19.56%	10.36%	1.46%	16.65%	1199538	53.28%
Urban	2378281	38.56%	2236743	141538	36.27%	2.29%	14455	16088	78951	2268787	0.23%	0.26%	1.28%	36.79%	3931155	63.74%

Section 7.5 : Workforce Data Analysis – Census of India, 1991

Taluk	Total Workers	Work participation rate	Main workforce	Marginal workforce	% of main Work force	% of Margn Work force	Tot_CL	Tot_AL	Tot_HH	Tot_Oth	% of Tot_CL	% of Tot_AL	% of Tot_HH	% of Tot_Oth	Non workers	% of Non workers
Bangalore Urban Agglomeration	1362113	32.98%	1352808	9305	32.75%	0.43%	10336	10409	18168	1309949	0.25%	0.25%	0.22%	31.72%	2758870	66.80%
Bangalore Rural District																
Nelamangala	54843	38.17%	48973	5870	34.08%	8.01%	28099	7962	1167	11131	19.55%	5.54%	0.47%	7.75%	88853	61.83%
Rural	49784	39.47%	43938	5846	34.84%	9.11%	27795	7857	793	6992	22.04%	6.23%	0.38%	5.54%	76345	60.53%
Urban	5059	28.80%	5035	24	28.66%	0.26%	304	105	374	4139	1.73%	0.60%	1.16%	23.56%	12508	71.20%
Dod Ballapur	96212	42.83%	83699	12513	37.26%	10.84%	40076	14562	4827	23535	17.84%	6.48%	0.55%	10.48%	128435	57.17%
Rural	77476	45.56%	65578	11898	38.57%	13.66%	39351	14257	935	10438	23.14%	8.38%	0.62%	6.14%	92562	54.44%
Urban	18736	34.31%	18121	615	33.18%	2.17%	725	305	3892	13097	1.33%	0.56%	0.34%	23.98%	35873	65.69%
Devanahalli	72093	44.87%	63365	8728	39.43%	10.58%	25644	20667	780	12214	15.96%	12.86%	3.97%	7.60%	88590	55.13%
Rural	57285	48.44%	48872	8413	41.32%	13.89%	23431	17097	510	4125	19.81%	14.46%	4.84%	3.49%	60986	51.56%
Urban	14808	34.91%	14493	315	34.17%	1.44%	2213	3570	270	8089	5.22%	8.42%	1.52%	19.07%	27604	65.09%
Hosakote	82079	43.54%	70168	11911	37.22%	12.25%	29229	19961	2353	14357	15.51%	10.59%	4.27%	7.62%	106420	56.46%
Rural	73560	45.14%	61878	11682	37.97%	13.89%	28338	18641	1833	9007	17.39%	11.44%	4.68%	5.53%	89406	54.86%
Urban	8519	33.36%	8290	229	32.47%	1.74%	891	1320	520	5350	3.49%	5.17%	1.67%	20.95%	17014	66.64%
District Average / Total	305227	42.54%	266205	39022	37.10%	10.59%	123048	63152	9127	61237	17.15%	8.80%	2.27%	8.53%	412298	57.46%
District Average / Total- Rural	258105	44.70%	220266	37839	38.15%	12.79%	118915	57852	4071	30562	20.59%	10.02%	2.57%	5.29%	319299	55.30%
District Average / Urban	47122	33.63%	45939	1183	32.79%	1.63%	4133	5300	5056	30675	2.95%	3.78%	1.05%	21.89%	92999	66.37%
Ramnagaram																
Magadi	89647	46.20%	71926	17721	37.07%	18.00%	46157	9428	2351	12747	23.79%	4.86%	1.21%	6.57%	104405	54.28%
Rural	82167	47.11%	65093	17074	37.32%	19.34%	45349	8926	1818	7881	26.00%	4.60%	1.04%	4.52%	92239	52.89%
Urban	7480	38.07%	6833	647	34.78%	6.37%	808	502	533	4866	4.11%	2.56%	2.71%	24.77%	12166	61.93%
Ramanagaram	87680	42.57%	80856	6824	39.26%	6.41%	35971	14947	1136	25490	17.47%	14.04%	0.55%	12.38%	118276	57.43%
Rural	70693	45.46%	63924	6769	41.10%	8.43%	35287	14465	619	10590	22.69%	18.02%	0.40%	6.81%	84826	54.54%
Urban	16987	33.68%	16932	55	33.57%	0.21%	684	482	517	14900	1.36%	1.84%	1.03%	29.54%	33450	66.32%
Channapatna	175540.73	73.39%	87770	87770.734	36.69%	71.81%	37159	22560	3203	20570	15.53%	18.46%	1.34%	8.60%	135978	56.85%
Rural	140738.76	76.49%	70369	70369.765	38.25%	74.95%	36297	21348	1308	7485	19.73%	22.74%	0.71%	4.07%	98711	53.65%
Urban	34802.63	63.04%	17401	17401.63	31.52%	61.44%	862	1212	1895	13085	1.56%	4.28%	3.43%	23.70%	37267	67.50%
Kanakapura	133777	42.27%	116286	17491	36.75%	10.62%	67006	22675	2117	19766	21.17%	13.77%	0.67%	6.25%	182681	57.73%
Rural	120740	43.34%	103581	17159	37.18%	11.83%	66107	21798	1386	9952	23.73%	15.03%	0.50%	3.57%	157845	56.66%
Urban	13037	34.42%	12705	332	33.55%	1.69%	899	877	731	9814	2.37%	4.46%	1.93%	25.91%	24836	65.58%
District Average / Total	486644.73	50.92%	356838	129806.73	37.34%	26.39%	186293	69610	8807	78573	19.49%	14.15%	0.92%	8.22%	541340	56.65%
District Average / Total- Rural	414338.76	52.28%	302967	111371.76	38.23%	27.33%	183040	66537	5131	35908	23.10%	16.33%	0.65%	4.53%	433621	54.72%
District Average / Urban	72306.63	44.32%	53871	18435.63	33.02%	21.86%	3253	3073	3676	42665	1.99%	3.64%	2.25%	26.15%	107719	66.02%
Bangalore Urban District																
Bangalore North	328305	35.20%	321973	6332	34.52%	0.68%	30711	19056	4274	259357	3.29%	8.86%	0.46%	27.81%	604446	64.80%
Rural	80342	39.72%	75823	4519	37.49%	2.23%	27345	15631	755	26724	13.52%	7.73%	0.37%	13.21%	121931	60.28%
Urban	247963	33.95%	246150	1813	33.70%	0.25%	3366	3425	3519	232633	0.46%	0.41%	0.48%	31.85%	482515	66.05%
Bangalore South	712280.69	69.48%	356140	356140.69	34.74%	34.74%	35951	31475	3626	275125	3.51%	3.07%	0.35%	26.84%	165694	16.16%
Rural	213118.77	76.55%	106559	106559.77	38.27%	38.27%	30807	25046	1343	43453	11.07%	4.13%	0.48%	15.61%	495112	177.83%
Urban	499162.67	66.84%	249581	249581.67	33.42%	33.42%	5144	6429	2283	231672	0.69%	0.86%	0.31%	31.02%	247585.33	33.16%
Anekal	91639	41.44%	89349	2290	40.40%	1.04%	28160	24022	1280	31431	12.73%	7.68%	0.58%	14.21%	129520	58.56%
Rural	80982	42.80%	78804	2178	41.65%	1.15%	27141	23054	2163	11806	14.34%	12.18%	1.14%	6.24%	108238	57.20%
Urban	10657	33.37%	10545	112	33.02%	0.35%	1019	968	610	7830	3.19%	0.32%	1.91%	24.52%	21282	66.63%
Bangalore (all urban)										0						
Rural										0						
Urban										0						
District Average / Total	1040585.7	47.75%	678113	364762.69	31.12%	31.64%	94822	74553	9180	565913	4.35%	3.42%	0.42%	25.97%	899660	41.29%
District Average / Total- Rural	372264.77	55.57%	860495	113256.77	128.45%	32.23%	85293	63731	4261	81983	12.73%	9.51%	0.64%	12.24%	725281	108.27%
District Average / Urban	757670.67	50.20%	1356226	251506.67	89.87%	31.39%	9529	10822	6412	472135	0.63%	0.72%	0.42%	31.28%	751382.33	49.79%
Total BMR	1412219	21.69%	1301156	113353	19.98%	1.74%	404163	207315	14086	872469	6.21%	3.18%	0.22%	13.40%	1194874	20.74%
Rural	867779	42.54%	1383728	85538	67.84%	4.19%	387248	188120	7767	137242	18.98%	9.22%	0.38%	6.73%	1328631	15.78%
Urban	610116	13.64%	1456036	4142	32.56%	0.09%	16915	19195	9305	711637	0.38%	0.43%	0.21%	15.91%	1519413	67.49%

Abbreviations

CL	Cultivators
AL	Agricultural Labourers
LF	Livestock, forestry, fishing, hunting and plantation orchards and allied activities
MQ	Mining and quarrying
HH	Manufacturing, Processing, Servicing and Repairs in Household
OHH	Manufacturing, Processing, Servicing and Repairs in Other than Household
CO	Construction
TC	Trade and Commerce
SC	Transport, Storage and Communications
OS	Other Services
OTH	Others

Note: In 1991 workforce table, OHH, CO, TC, SC and OS have been added to get OTH

Section 7.6 : Observations from Workforce Data Analysis

Following observations can be made from the workforce data analysis which indicates the shifting of economy towards a more manufacturing & service industry base:

- Among districts, Ramanagaram and Bangalore Urban has shown the highest and lowest growth of WPR respectively between 1981-2001
- Among talukas, Magadi has the highest WPR (52%) as on 2001.
- In general, the WPR among rural population is higher than that of urban population (Refer Fig-alongside).
- Growth of main WF has been 2 folds for BMR during 1981-2001
- The share of Cultivators and Agricultural labourers has decreased during this period
- The share of Other workers have seen a huge growth

Section 7.7: List of Ongoing and Proposed Investment in BMR

(Note: This list is indicative only and covers only those investments which are likely to have an impact at regional level)

Proposed major investment in the region³²				
Proposed development	Location	Investment proposed in Rs. Crores	Land (Acre)	Source
A	Industrial development			
	Industrial Areas			Data obtained for KIADB
	APPAREL PARK-DB PURA	389	129	
	APPAREL PARK-II PHASE	331	150	
	ATTIBELE	106	237	
	BIDADI	1291	749	
	BMS-JIGANI LINK ROAD	1550	624	
	BOMMASANDRA	371	841	
	BOMMASANDRA IV PHASE	614	156	
	DOBASPET I PHASE	83	245	
	DOBASPET II PHASE	44	58	
	DODDABALLAPURA	206	317	
	DODDANEKKUNDI I PHASE	132	165	
	DODDANEKKUNDI II PHASE	14	156	
	DYAVASANDRA I PHASE	0.14	60	

³² This list is not all inclusive and only indicative and limited to major investments which are likely to have impact at regional scale

	DYAVASANDRA II PHASE		3	56	
	ELECTRONIC CITY II PHASE		1097	289	
	ELECTRONIC CITY III PHASE		41	95	
	EOIZ		32	11	
	EPIP I PHASE		515	230	
	EPIP II PHASE		686	241	
	HAROHALLI I PHASE		301	169	
	HAROHALLI II PHASE		28	20	
	HOSKOTE		333	359	
	JIGANI I PHASE		1823	331	
	JIGANI II PHASE		333	211	
	KADUGODI		90	66	
	KUMBALGODU I PHASE		61	125	
	KUMBALGODU II PHASE		30	69	
	PEENYA I PHASE		36	166	
	PEENYA II PHASE		63	387	
	PEENYA III PHASE		515	167	
	PEENYA IV PHASE		49	291	
	SADARMANGALA		28	95	
	SOMPURA		98	72	
	VEERASANDRA		40	98	
	Approved KIADB Industrial Areas		11333		KAIDB
	Aerospace and Aircraft components Manufacturing Project	BIAL- Devanahalli, Bangalore North Taluk	6000	1000	http://www.kumbangalore.com/uploads/investment/Infrastructure.pdf
	SEZs				
	Devanahalli It/Ites S E Z Project (Tata Consultancy Services Ltd.)	Devanahalli	500		Centre for Monitoring Indian Economy (CMIE) (as on 7th May, 2008)

	Devanhalli It/Ites S E Z Project (Blue Hill Informatics Pvt. Ltd.)	Devanahalli	500		
	Devanhalli It/Ites S E Z Project (Itasca Software Devp. Pvt. Ltd.)	Devanahalli	1130		
	Bangalore Sez Project (Golden Gate Properties Ltd.)		500		
	Vikas Telecom Limited	Outer Ring Road	980	36	
	Cessna Garden Developers Pvt. Ltd.	Kadubeesanahalli Vill, Varthur Hobli, District Banglore, Karnataka	1500	19	
	Manyata Promoters Pvt. Ltd.	Rachenhalli & Nagavara Vill., Banglore Distt., Karnataka	1616	22	
	Tanglin Development Limited	Pattengere/Mylasandra Villages, Karnataka	942	27	
	Suzlon Infrastructure Limited	Nadasalu, Nandikooru, Polimaru and Hejamadi villages in Udupi Taluk	1316	259	SEZ India website
	Total		37650	8798	
B	Infrastructure Development				
	STRR		5340	364 Kms	http://www.hindu.com/2007/02/23/stories/2007022305170400.htm

	IRR		2000	150 Kms	
	PRR		550		http://www.bdabangalore.org/engineerin_gdept.htm
	BMIC		3000	111 Kms	http://www.projectsmonitor.com/detailnews.asp?newsid=3718
	Railways				
	Bangalore-Ramanagaram-Mysore Doubling		88		
	Bidar-Gulbarga Railway project		20		
	Bangalore Metro Rail Project		5450	33 Kms	http://www.kumbangalore.com/uploads/investment/Infrastructure.pdf
	99 km long Elevated Light Rail System		3000		http://www.projectsmonitor.com/detailnews.asp?newsid=3718
	Bangalore Mysore Monorail Project		1700		Centre for Monitoring Indian Economy (CMIE) (as on 7th May, 2008)
	Road Development in BMR under JNNURM		683		http://www.bmrda.kar.nic.in/
	High Speed Rail Link (HSRL)	Devanahalli	5767	34 Kms	Centre for Monitoring Indian Economy (CMIE) (as on 7th May, 2008)
	Nelamangla Hassan Highway Project	Nelamangala-Bangalore	620		Centre for Monitoring Indian Economy (CMIE) (as on 7th May, 2008)
	Nelamangla Bangalore Motorway Project	Nelamangala-Bangalore	710		
	Power				
	Areva T&D India (manufacturing of circuit breakers and instrument transformers for power transmission)	Hosur	100		http://www.ibef.org/artdisplay.aspx?cat_id=653&art_id=18919

	Bidadi Combined Cycle Power Plant (1400 MW)	Bidadi	3750		http://www.karnatakapower.com/projects.asp
	Bangalore Electricity Distribution Project (BESCOM)		563		
	270 MW Hydro Electricity Project	Shivanasamudra, Mandya District	600		http://www.thehindubusinessline.com/2009/01/06/stories/2009010652020300.htm
	Total		33341		
C	Townships/ Real Estate Projects				
	Integrated townships				
	Bibadi		3500		
	Nandagudi		6600		
	Sathnur		6000		
	Ramnagaram		1500		
	Solur		4500	60961	http://www.bmrda.kar.nic.in/
	NICE Townships				
	Bond Real Estates Private Limited		1602		http://www.hindu.com/2009/01/29/stories/2009012959420600.htm
	Goel Ganga Real Estate (Villas)		200		
	Golden Gate Properties (Townships)	Whitefield, Hebbal, Yeshwantpur, Hosur Road, Sarjapur and Kanakapura Road	1700		http://www.ibef.org/artdisplay.aspx?cat_id=653&art_id=18919
	Sobha Global Mall Project	Bommasandra Jigani Link Road, Bangalore South	1500		
	Bangalore Software Campus Project (Infosys)	Bangalore City	1500		

	Technologies Ltd.)				
	Bangalore Mixed Use Township Project (Nitesh Estates Pvt. Ltd.)	Kanakpura Road	1000	20	http://propertybytes.indiaproperty.com/?p=1684
	Total		29602		
D	Other regional level facilities				
	Education				
	Health				
	Sports				
	Trade & commerce				
	Hinduja Group - International Convention Centre	Yelahanka	805		http://www.karnataka.com/advantage/
	Mega City project				
	Continental Car Parts Manufacturing Project		220		http://www.ibef.org/artdisplay.aspx?cat_id=653&art_id=18919
	Global Apprael Village	Ramanagara m		500	
	Bidadi Compact Car Project (Toyota Kirloskar Motor Pvt. Ltd.)		1400		
	Hardware Park	BIAL- Devanahalli, Bangalore North Taluk		1200	
	Total		2425		
	GRAND TOTAL		103018	71479	

ANNEXURE 8: TRANSPORT

Section 8.1: Vehicular population and composition in BMR

The vehicular composition is dominated by two wheelers at 72% followed by cars and jeeps at 18%. The CAGR was over 10%, and the growth rate of two wheelers, in particular, was around 17%. BMTC operates a fleet of about 4,185 buses undertaking 60,621 trips, to service over 40% of the trips (35 lakh passenger trips) daily in the metropolitan area.

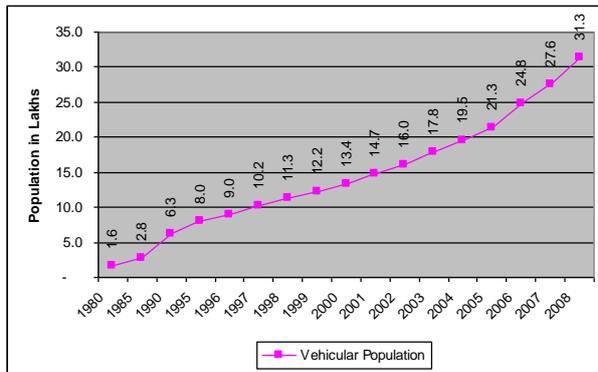


Figure 1 Vehicular Population in BMR³³

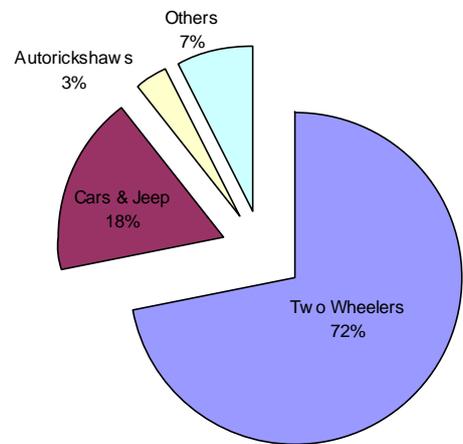


Figure 2 Composition of Vehicles in BMR³⁴

Table1: Traffic Handled by CONCOR ICD at Whitefield, Bangalore

Year	International (TEU)	Domestic (TEU)	Total (TEU)
2005-06	67,718	19,985	87,703
2006-07	79,702	19,547	99,249

33 Annual Report 2007-2008, Transport Department, GoK

34 Annual Report 2007-2008, Transport Department, Government of Karnataka

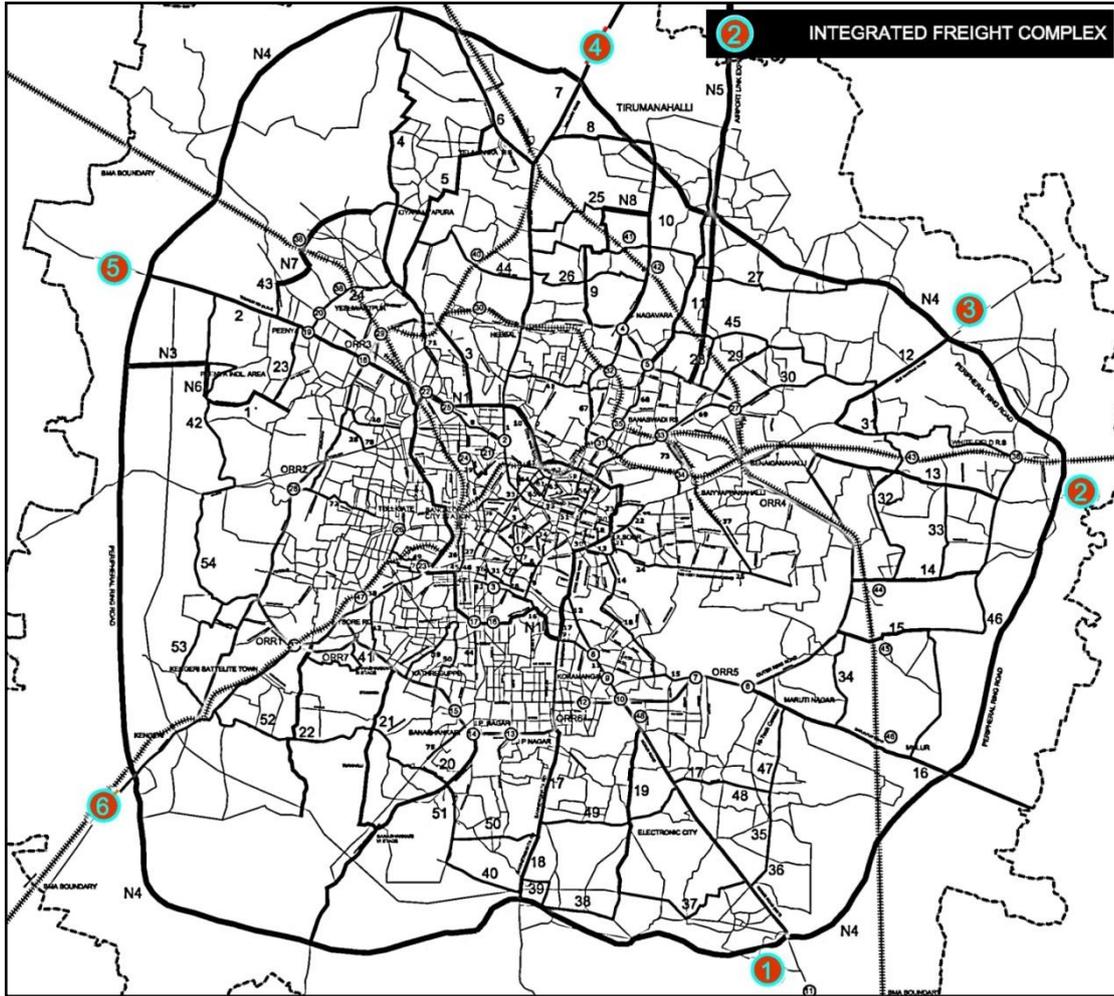


Figure 3 Locations of the Proposed Truck Terminals around Bangalore

ANNEXURE 9: HOUSING

Section 9.1: Housing Condition

63% of the houses are in good condition, 34% are livable and 3% are dilapidated in Bangalore urban district as compared to 37%, 57% & 6% for Bangalore rural district and 57%, 39% & 4% for the entire region respectively (Refer figure 1).

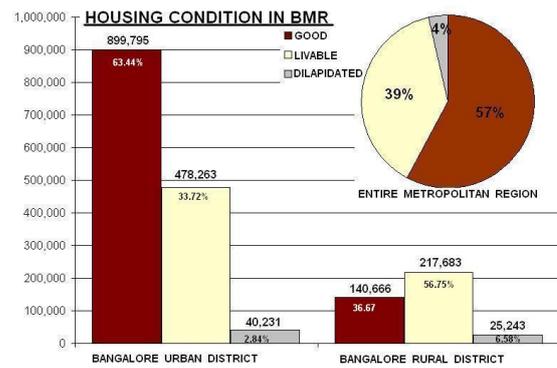


Figure 1: Housing Condition³⁶

District	Total number of households	Type of census houses			
		Permanent	Semi-permanent	Temporary	Unclassified
Bangalore Urban	14,18,289	12,72,498	1,20,899	24,776	116
Bangalore Rural	1,67,677	99,019	50,603	18,042	13
Ramanagaram	2,15,915	1,17,997	62,248	35,637	33
TOTAL	18,01,881	14,89,514	2,33,750	78,455	162

Source: Groupe SCE India, Data Source: 'H - 4 Appendix : Distribution of Households', Housing Series , Census of India 2001

In BMR region 83% of households live in permanent houses (1.5 million HHs), 13% live in semi-permanent (0.233 million HHs) and 4% live in temporary houses (78 thousand HHs). These 1.8 million HHs are distributed in the percentage of 78.71% in Bangalore urban district, 9.31% in Bangalore rural and 11.98% in Ramanagaram districts

Section 9.2: House Ownership

45% houses are owned, 51% are rented and 4% are other type in Bangalore urban district as compared to 84%, 14% and 2% for Bangalore rural district and 54%, 43% & 3% for the entire region respectively (Refer figure -2).

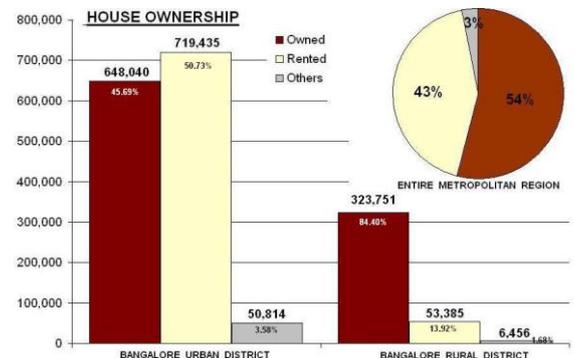


Figure 2: Housing Ownership³⁷

35 Most of the data is available at district level only thus it was difficult to analyse the service level for Ramanagaram district separately and is shown as part of Bangalore rural district.

36 Groupe SCE India, Data Source: 'H - 2 Appendix : Distribution of Households by the Condition of Census Houses Occupied by them', Housing Series , Census of India 2001

37 Groupe SCE India, Data Source: 'H - 6 : Distribution of Households', Housing Series , Census of India 2001

Section 9.3: Source of Drinking water

77% houses have tap, 13% have tubewell, 6% have handpump, 3% have well and 1% have other means as the main source of drinking water in Bangalore urban district as compared to 70%, 10%, 17%, 2% & 1% for Bangalore rural district and 76%, 12%, 8%, 3% and 1% for the entire region respectively. When it comes to the location of water source 61% have within household premises, 28% near their premises and 11% away from their household premises in Bangalore urban district as compared to 19%, 60% and 21% in Bangalore rural district and 52%, 35% and 13% for the entire region respectively (Refer figure-3 and figure 4).

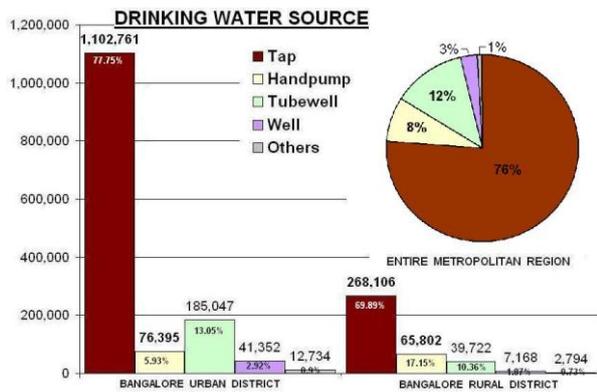


Figure 3: Drinking Water Source³⁸

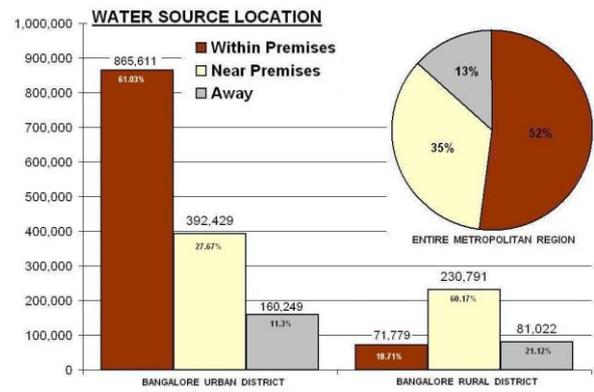


Figure 4: Water Source Location³⁹

Section 9.4 : Source of Domestic lighting & cooking fuel

95% of the houses use electricity, 5% use kerosene and less than 1% use other means for domestic lighting purpose in Bangalore urban district as compared to 86%, 13% & less than 1% for Bangalore rural district and 93%, 7% & less than 1% for the entire region respectively (Refer figure-5 and figure-6). This clearly shows the need for improving access to electricity especially to the lower sections of the society either in rural areas or slums of urban areas

38 Groupe SCE India, Data Source: 'H - 8 : Distribution of Households by Source of Drinking Water and its Location', Housing Series , Census of India 2001

39 Groupe SCE India, Data Source: 'H - 8 : Distribution of Households by Source of Drinking Water and its Location', Housing Series , Census of India 2001

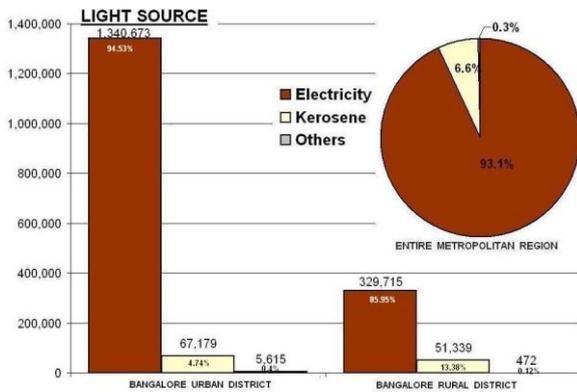


Figure 5: Lighting Source⁴⁰

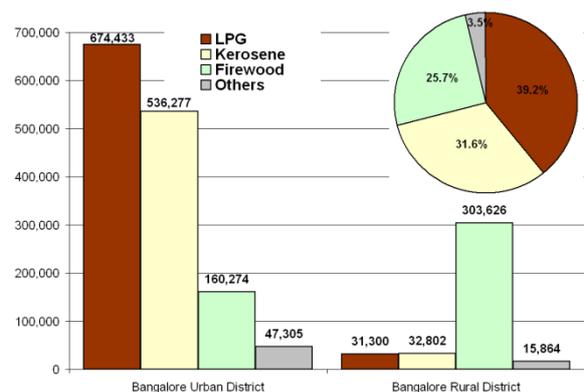


Figure 6: Cooking Fuel Type⁴¹

Domestic cooking fuel type, 48% use LPG, 38% use kerosene, 11% use firewood and 3% use other source as domestic cooking fuel in Bangalore urban district as compared to 8%, 9%, 79% and 4% in Bangalore rural district and 39%, 31%, 26% and 4% for the entire region respectively (Refer figure –6) This leaves a wide gap for promoting the non-conventional sources of energy.

Section 9.5: Housing demand and gap

Horizon Year	Pop_BMR	Avg.HH size	Demand Total Residentail Housing Stock required	Available Housing stock	Gap
2001	8420000	4.5	1,871,111	1,723,264	147,847
2011	11000000	4.5	2,444,444	1,723,264	721,180
2016	12500000	4.5	2,777,778	1,723,264	1,054,514
2021	14200000	4.4	3,227,273	1,723,264	1,504,009
2031	18000000	4.2	4,285,714	1,723,264	2,562,450

Source: Available stock is based on table No.H-4, (Only permanent & semi-permanent housing stock are considered)

Housing Series Table, Census of India-2001

Assumption : The average HH size will come down to 4.4 and 4.2 by 2021 and 2031 respectively from existing 4.5

Section 9.6: Projects under BSUP and IHSDP Schemes

Various schemes like BSUP and IHSDP are taken up to improve the services and housing conditions benefiting thousands of people in the slums

40 Groupe SCE India, Data Source: 'H - 9 : Distribution of Households by Source of Lighting, Housing Series , Census of India 2001

41 Groupe SCE India, Data Source: 'H - 11 : Distribution of Households by Availability of Separate Kitchen and Type of Fuel Used for Cooking', Housing Series , Census of India 2001

Table 8: Projects sanctioned by Govt. of India under BSUP scheme		
PHASE-1 (28-11-2006) : Total no. of dwelling units – 11,603		
	Original cost (Rs. in million)	Revised cost (Rs. in million)
Cost per dwelling unit	0.125	0.18
Project Cost		
Housing	1,450	2,088.54
Infrastructure	433	432.2
IEC, A & OE	90	90.0
T O T A L (Phase-1)	1,891	2611.74
PHASE-2 (28-11-2007) : Total no. of dwelling units – 3,151		
Project Cost	0.25	-
Housing	787.75	-
Infrastructure	342.043	-
IEC, A & OE	112.979	-
T O T A L (Phase-2)	1,242.772	-
PHASE-3 (21-01-2009) : Total no. of dwelling units – 3,426		
Project Cost	0.29	-
Housing	965.261	-
Infrastructure	279.720	-
IEC, A & OE	124.360	-
T O T A L (Phase-3)	1,369.341	-

Source: Karnataka Slum Clearance Board (presentation made to CM on 16-03-2009)

Table 9: Projects sanctioned by Govt. of India under IHSDP scheme				
PHASE-1				
District	Place	No. of houses	Unit cost (Rs. in million)	Project Cost (Rs. in million)
Bangalore Rural	Doddaballapur	648	0.135	87.48
Bangalore Rural	Ramanagaram	1800	0.135	243.0
PHASE-2				
Bangalore Rural	Kanakapura	727		223.252

Source: Karnataka Slum Clearance Board (presentation made to CM on 16-03-2009)

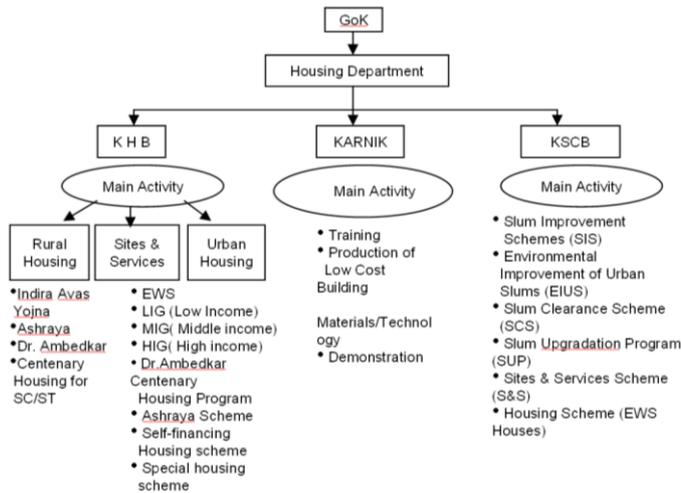


Figure 7: Public Housing Agencies and Their Activities in Karnataka

Source: Housing sector-opportunities & constraints, SKR regional concept plan & BMR structure plan, 1998 (KIADB)

was at 65,000 as per population 1991 census and as per 2001 census it has increased to 150 thousand. Whereas the projected 18 million population of BMR in 2031 require 4.2 million housing units and the current stock is just 1.7 million thus a net gap of 2.5 million housing units.

Housing supply and demand anomalies

Actual housing production remained a fraction of the estimated shortage at around only 3.26%⁴² and the selection of schemes has hardly contributed to the sought after urban dispersal policies. Furthermore, there has been little or no co-ordination with other agencies responsible for slum upgrading, water supply, low cost sanitation and the central government sponsored schemes. As a result the public sector supply side of the ‘market’ fails to address the needs of the majority of relatively less well-off urban dwellers. Instead reliance has to be placed on the private rented sector where, amongst other factors, the lack of adequate tenure and rent control measures creates social and financial insecurity.

At the more micro level, as housing demand surveys are not conducted regularly there is no basis by which to assess and match the parameters of demand and supply. Lack of affordability data negates an assessment of target groups effective demand. Registration procedures and loans and repayment conditions are unsuited to the unstable income characteristics of low income households. Thus, low-income families are by default ineligible for most supply models.

Furthermore, existing housing policies, town planning legislation and building by-laws do not provide for tenure followed by incremental and progressive housing development on a self-build basis by the urban poor. It only provides for conventional housing approaches. It seems that the formal agencies have little inclination to promote populist schemes in a demand-driven participatory manner.

It has been often cited that had the Karnataka Housing Board (KHB) concentrated on the supply of mass low-cost housing the mismatch between housing need and supply would not be so stark. Unfortunately, the KHB

Section 9.7: Housing shortage

The phenomenon of rising land prices coupled with the high cost of construction has resulted in severe imbalances in the housing and related land market of BMR.

Estimates of housing shortages for BMR are difficult to make due to lack of basic data on supply and demand characteristics. Nevertheless, to gain a grasp of the scale of the problem it is worthwhile to attempt a ball park global estimate. Housing shortage of BMR

42 Report of the technical group [11th five year plan: 2007-12] on estimation of urban housing shortage, Government of India, ministry of housing and urban poverty alleviation.

showed little interest in this segment of housing need. Instead it focused on conventional housing schemes and due to price escalation, repayments were well beyond the affordability range of low-income households.

It has been observed that only in the low volume 'composite housing schemes', where a mix of income types enabled cross-subsidy to be an implicit part of the provision formula, has a reasonable match between standards, costs and income of households been achieved. Unfortunately this approach has been jeopardised through pre-emptive sale or on-rental by allottees in violation of the KHB rules; thus eroding the precept on which composite housing schemes were meant to be developed.

Public and private sector roles- urban development forces

Analysis would indicate that investments by the Government of Karnataka in housing and urban development constitute only a very small fraction of the total⁴³. Further, it has been estimated that up to 50 percent of Gross National Product is made up of the 'exotic', or 'black' economy. The circulation of such huge resources tends to gravitate towards sectors where it can more discreetly and easily be absorbed. These forces are particularly evident in the land and property sectors and has led to undesirable price escalation's and undoubtedly accelerated the conversion of agricultural and scrub land at the urban periphery.

The demonstrable lack of control that has been possible to exert on these forces has limited the role of government agencies in the urban sector, at most, they have been regulatory with little emphasis on interventions at a developmental level. Furthermore, recent attempts to reduce governmental control by seeking to facilitate public / private sector partnership arrangements have significantly failed to change housing and urban development trends.

Urban development and housing policy

At the macro level, the typical five-year plans serve a mere administrative and budgetary purpose without a deliberate attempt to provide a policy framework for housing and urban development schemes. While Karnataka drafted a housing policy in 1995 and urban development strategy papers in 1992 and 1994, they never acquired official status. Additionally they suffered from two fundamental weaknesses. Firstly, urbanisation was perceived as the negative effect of rural poverty and as such a symptom that should be contained at the source. Secondly, it was believed that the problem of rapid urbanisation could be solved by a policy of dispersing growth to a large number of secondary cities. These cities had to be hierarchically ordered, a concept borrowed from rigid locational theorists. Little or no attempt was made to analyse and understand the dynamics of city growth and rural-urban migration. Thus, these documents have suffered from basic misconceptions and failed to provide a policy or direction for housing and urban development. This has been further supported by the report of the technical group [11th five year plan: 2007-12] on estimation of urban housing shortage, Government of India, ministry of housing and urban poverty alleviation.

43 Urban Development in the State of Karnataka, India; Policies, Actors and Outcomes - Summary and Conclusions of the Dissertation by Harry Albertus Mengers, February, 1998.

ANNEXURE 10: PHYSICAL INFRASTRUCTURE**Section 10.1: Water supply facility in the towns of BMR region**

Sl No	Town Panachayat/City Municipal Council/Town Municipal Council	No: of bore wells	Total supply (MLD)	No of days of supply in a week	No. of hours of supply in a day	Per capita supply (Lpcd)
1.	Nelamangala TP	37	0.04	2	1	1.58
2.	Doddaballapura CMC	48	3.62	2	1	50.55
3.	Devanhalli TMC	-	1.46	4	1	62.38
4.	Hoskote TMC	21	NA	NA	NA	NA
5.	Magadi TMC		2.05	6	8	81.90
6.	Ramanagaram CMC	206	8	3	1	100.76
7.	Channaptna CMC	NA	NA	NA	NA	NA
8.	Kanakapura TMC	135	0.66	NA	NA	14.02
9.	Anekal TMC	NA	.03	1	12	.90
10.	Kengeri TMC (now part of BBMP)	NA	0.56	7	9	13.19
11.	Vijayapura TMC	43	NA	2	0.50	NA

Source: Status of Infrastructure Report, Karnataka, 2006-07, KUIDFC

Section 10.2: Demand and Supply in the BMR Region: Projections

The demand supply analysis as well as projections is done for the BMR Region considering available sources such as the surface water, ground water and other non conventional methods for water harvesting ie Rain water Harvesting and usage of recycled water. For the base calculations through which the quantum of water for each source is worked out refer to Annexure 7, Table 7.1. A standard 300 lpcd is assumed for working out the future water supply projections in the BMR for any point of time till 2031. While this figure may seem to be on the higher side as compared to the national standard of 200 lpcd, it is assumed that a 35 % to 40 %⁴⁴ loss on account of leakage is likely to continue. For details refer to annexure Table 7.2. It may also be mentioned here that the SP 2011 considers a standard of 275 lpcd while making the projections.

Table 1 Demand Supply Analysis for Water Supply for BMR Region

Sl.No.	Particulars	2011	2016	2021	2031
1	Source availability in MLD				
A	Surface water	1470	1535	1535	1535
B	Ground water	1601	1601	1601	1601
C	Rain water Harvesting	-	1243	1865	2487
D	Recycled water	-	400	600	800
	Total water supply available	3071	4779	5601	6423
2	Population in million	11.00	12.50	14.00	18.00
3	Water demand in MLD at 300 lpcd	3300	3750	4200	5400
4	Variation +/- Surplus/ deficit	(-)229	(+)1029	(+)1401	(+)1023

As seen from the above table, the water supply and demand situation is critical and shows a deficit in the first decade i.e. 2011. However, given strong policy interventions, the situation can be controlled i.e. through implementing Rain Water Harvesting schemes, recycling Water and through Ground Water recharge. It is possible to have a surplus by 2016 and onwards. The gravity of the situation demands that the water supply services generators and providers consider immediate policy interventions.

As per the quantum of water availability from various sources the population that it can cater to is worked out in the following table

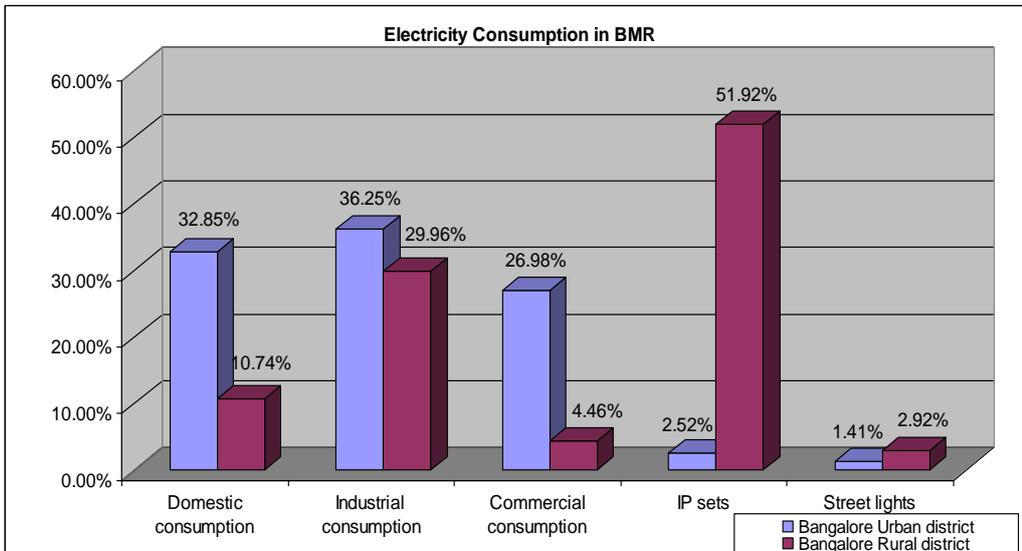
⁴⁴ In the international context too, the best public health utility has recorded a minimum loss of 15% in distribution.

Table 2 Population Capacity for BMR based on Water Availability

Sl. No.	Water Source	Population catered to considering 300 Lpcd (in Millions)
1	Surface water from Cauvery and Arkavathi 1535 MLD	5.12
2	Ground water by borewells 4 bores / Sq.km. x 50,000 lpd /borewell x 8005 = 1601 MLD	5.34
3	Rain water Harvesting – Considering 20% of rainfall = 2487 MLD	8.21
4	Reuse of water 400 MLD by 2021 600 MLD by 2031 700 MLD by 2041 800 MLD by 2051	2.33
	Total water available catered to a population of	21

As seen from the above table the population that the water availability by 2031 can cater to is approx 21 Million

Section 10.3: Electricity Consumption in the BMR Region



Section 10.4: Solid Waste Management Proposals

Name of the LPA	Proposal	Village name	Area (hectares)
Anekal	Solid waste disposal area	Gudhatti, Neralur, Bendiganahalli in Attibele hobli	69
		Madivala, Agasthamahalli, Gowrenahalli in Anekal hobli	92
		Samanduru in Anekal hobli	175
BIAAPA	Solid waste disposal area	Galipuje, Honnaghatta of Doddaballapur taluk	10.98
		Mangondanahalli & chikkabonahalli in Devanahalli taluk	74.47
		Venkabenahalli in Vijayapura	2.39
Magadi	Landfill site	Kalari Kaval village	6.07

Source: Interim Master Plans for Nelamangala, BIAAPA and Magadi

ANNEXURE 11: SOCIAL INFRASTRUCTURE**Table 1: Literacy rates by gender and area**

SI No	District/ State	Total population	Male (%)	Female (%)	Total (%)
1	Bangalore Urban	65,37,124	88	77	83
2	Bangalore Rural	18,81,514	74	55	65
3	Mysore	26,41,000	71	56	63
4	Mandya	17,64,000	70	51	61
5	Tumkur	25,85,000	77	57	67
6	Kolar	25,36,000	73	52	63
7	Udupi	11,12,000	88	75	81
	<i>Karnataka State</i>	<i>528,50,562</i>	<i>76</i>	<i>57</i>	<i>67.04</i>

Source: Census 2001

Table 2: Categories of educational facilities available in the region

SI No	District/ State	Population	Education									
			1	2	3	4	5	6	7	8	9	10
1	Bangalore Urban	76,07,000	3994	1573	580	57	58	8	8	16	6	272
2	Bangalore Rural	20,01,000	2949	390	87	4	3	-	1	-	-	135
3	Karnataka State	5,74,54,000	56348	10537	3027	179	121	36	68	43	18	5683

Source: Karnataka at a glance, Directorate of economics and statistics, Bangalore, 2006-07.

Legend: 1- Primary schools, 2- High schools, 3- Pre University, 4- Polytechnic, 5- Engineering, 6- Medical (Allopathy), 7- Indian Medicine, 8- Dental College, 9- Universities, 10- Libraries

Human development index

As per the Human Development Report of Karnataka⁴⁵, the indicators specifically for Bangalore Rural and Bangalore Urban are indicated in the table below alongside the averages for the state.

Table 3: Human Development Index of BMR

District		Indicator 2001						HDI	
		Health		Education		Income		Index	Rank
		Index	Rank	Index	Rank	Index	Rank		
1	Bangalore Rural	0.692	6	0.662	20	0.605	4	0.653	6
2	Bangalore Urban	0.705	5	0.887	1	0.666	1	0.753	1
Karnataka		0.680		0.712		0.559		0.650	

Source: Human development in Karnataka; <http://planning.kar.nic.in/khdr2005>

45 It is now widely acknowledged that conventional measures of well-being such as per capita gross domestic product or consumption expenditure or poverty ratios do not capture the broader aspects of human capability. Important as it is, high economic growth does not automatically translate into betterment of the lives of all people, especially if the benefits of that growth are not accessible to large sections of the population.

The economic growth model of development was contested by the **UNDP** in its first Human Development Report 1990, which reiterated that people, not things, are the wealth of nations, and it is they who should be the focus of a development directed to 'expanding their choices'. Three basic capabilities were identified as prerequisites to a life that is rich with potential and the fulfillment of one's aspirations: the capacity to lead long and healthy lives, access to knowledge and the limitless vistas that it opens to the questing mind, and the ability to ensure for oneself a reasonably good standard of living.

ANNEXURE 12: HERITAGE AND TOURISM

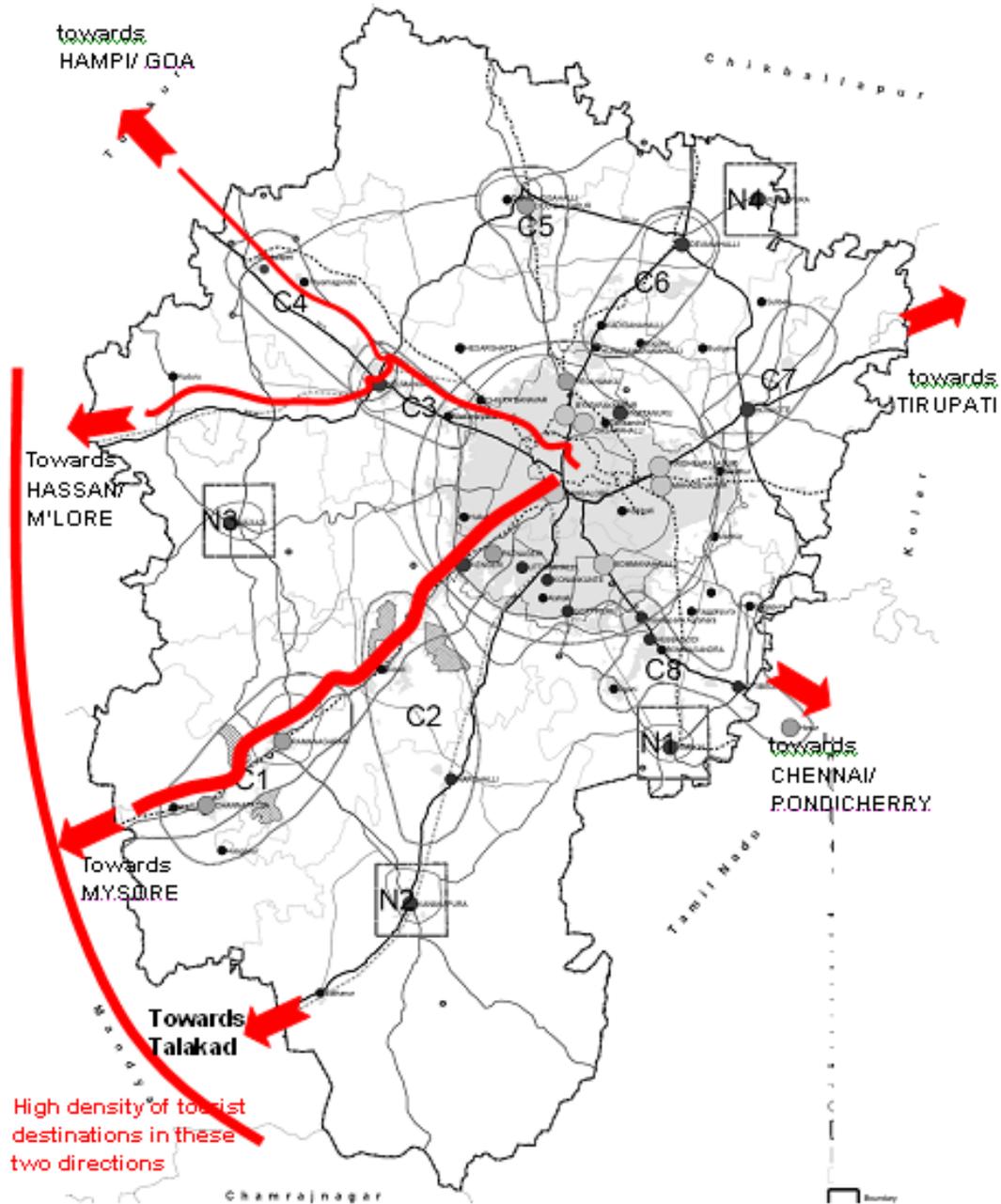


Figure 1: Map showing movement of tourists towards tourist destinations at regional scale

INVENTORY FORMAT FOR INTACH's BANGALORE HERITAGE LISTING

Photo:

Serial No.	Date:
Reference No.(on Map)-	Year of establishment:
Category: Natural/ Precinct/Building/Material/Intangible	Architect:
Type:	Past Use:
Typology:	Present Use:
Name of the Property:	Ownership: Govt/Trust/Private/Others
Location:	Owners Name:
Landmark:	
Historical Significance:	
Importance: Natural/Environmental/Age/Group/Historic/Event/Technological/Socio-Cultural/Association/Unique Style/	
Period / Style: Architectural Description:	
No. of Floors:	<i>Sketch:</i>

Plan form:	
Construction System/Materials:	
Roof:	
Walls:	
Floors:	
Openings:	
Decor/Special features	
Façade:	
Associated structures:	
Grade (will be filled by Co-ordinator):	
Present State:	
Threats:	
Reference books/Names:	
Attachments:	
Lister's name:	Contact:

GUIDE TO USING THE INVENTORY FORMAT:

Serial No. Serial Number of the sheet or the listed building, so as to keep things in order. It can be numerical 1,2,3 and so on.. As there is more than one team, it is advisable to make it alpha numeric, so each team gets an alphabet and thus it would be A1, A2, A3..... etc

Reference No.(on Map)- The grid from Eicher map can be adopted for now, so page number followed by Grid Number followed by Serial Number. The same has to be mapped on the Eicher map. For eg: a building with Serial No A3 found on page 67 in Eicher - Ref No: 67/E-2/A3

Category: Natural/ Precinct/Building/Material/Intangible

This is the broad category of the heritage to know whether we have broadly identified as a Natural Heritage or we are looking at a Man-Made intervention which can be either in a group or precinct or just a building. A Precinct could be a group of natural and built elements or even only buildings. There are elements in city like sculptures, commemorative stones, and any other are form which can be included under sculptures. Lastly there can be intangible associations such as ritual paths, places for traditional events, crafts or any other art form. Even traditional eating joints etc could be

Listed here.

Type: Under the above category, we can further provide details as whether the Natural Heritage is a Hillock, Water body, Rock formations etc. For Buildings it could be Religious building, Institutional Building, Public Building, Residential building. For Material – we can identify Sculptures, Commemorative Stones, etc and as mentioned above for the intangible it could be mentioned whether it is a craft place or a processional route etc.

Typology: Would further identify the type of heritage- Eg: Water body – could be a river, lake, drain, etc. Religious building could be temple, Shrine, Mosque, Church, Chapel, Temple of Fire etc, Public Building could be a market, an office, a library etc, a theater, etc, a Residential building – could be courtyard type or with porch or structures with separate units like kitchen outside, outhouses. A quick single line sketch on the shape or planform can be provided in the space provided.

Year of establishment: Please give the date and also mention the source – whether it was oral, its marked on the building or mentioned in any reference material.

Past Use and Present Use – mention this very specific and briefly. If it was residential and commercial- you can mention as Mixed land use.(Pls note that this should clearly provide whether the use has changed or not, for eg: a commercial activity could have changed from warehouse to shops or public building- offices could have changed from administrative office to high court – these differences should be clearly identified through listing).

Historical Significance: Please provide the information based on your perception/understanding/ reading.

Associate Structures: Most of the time there are structures related to a specific typology of buildings, can they be identified here and again an inventory of the same be separately provided.

Present state/ Threats : Your perception on visual investigations only.

Attachments: Besides additional sheets to complete inventory, Any historical map, Xeroxes, books, literature, pamphlets, CD, old photographs,

GRADING: Please do not grade the building, will be done at a later stage.

ANNEXURE 13: POPULATION RE-DISTRIBUTION (As discussed with ABIDe committee on 24.10.2010)

Bangalore Metropolitan Region Structure Plan 2031

POPULATION DISTRIBUTION : AS DISCUSSED WITH ABIDE

24th February 2010



BMRDA

STRUCTURE

- Population Distribution Alternatives
- Density Pattern within BBMP
- Other Indian Metropolises : Core vis a vis Region
- Urban Sprawl and Cost of Infrastructure
- The cluster & Growth node based model
- Integrated township model for population deflection

CONSULTATIVE PROCESS - BMRSP 2031



ALTERNATIVE 1 : Preferred (Core: Rest of BMR = 75:25)

BMRDA

OBSERVATION

1. Steady and realistic CAGR for BBMP newly added areas.
2. Steady and realistic CAGR for rest of the region outside BBMP.
3. The Financial Operating Plan for BBMP and BWSSB has considered a population of 12.8 million by 2031. This alternative gives a 2031 population of 13.5 mill and thus ensuring financial sustainability of the corporation and service provider.

* Source for the 3rd point is the draft financial feasibility study for BBMP done by KUIDFC

YEAR	2001	2011	2016	2021	2031
CAGR (%)					
	1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)					
Population	8.42	11.00	12.50	14.20	18.00
CAGR (%)	2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)					
Population	6.17	8.03	9.38	10.65	13.50
CAGR (%)	3.68	2.67	3.15	2.58	2.40
Density	7713	10038	11719	13313	16875
% of total BMR Pop	73%	73%	75%	75%	75%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015					
Population	4.30	5.14	5.35	5.35	5.35
CAGR (%)	2.69	1.80	0.78	0.00	0.00
Density	19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)					
Population	1.87	2.89	4.03	5.30	8.15
CAGR (%)	6.44	4.46	6.89	5.65	4.39
Density	3254	5031	7020	9242	14209
Rest of BMR (Outside BBMP- 7205 sq.km.)					
Population	2.25	2.97	3.13	3.55	4.50
CAGR (%)	2.25	2.82	1.02	2.58	2.40
Density	312	412	434	493	625
% of total BMR Pop	27%	27%	25%	25%	25%

C O N S U L T A T I V E P R O C E S S - B M R S P 2 0 3 1



ALTERNATIVE 1 : Preferred (Core: Rest of BMR = 75:25)

BMRDA

OBSERVATION

1. Steady and realistic CAGR for BBMP newly added areas.
2. CAGR outside BBMP for rest of the region is a little fluctuating but not unrealistic. However the increase in growth rate in rest of the region after 2011 needs to be justified and validated
3. The Financial Operating Plan for BBMP and BWSSB has considered a population of 12.8 million by 2031. This alternative gives a 2031 population of 13.5 mill and thus ensuring financial sustainability of the corporation and service provider.

* Source for the 3rd point is the draft financial feasibility study for BBMP done by KUIDFC

YEAR	2001	2011	2016	2021	2031
CAGR (%)					
	1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)					
Population in mill	8.42	11.00	12.50	14.20	18.00
CAGR (%)	2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)					
Population in mill	6.17	8.03	8.99	10.06	12.60
CAGR (%)	3.68	2.67	2.28	2.28	2.28
Density	7713	10038	11234	12573	15750
% of total BMR Pop	73%	73%	72%	71%	70%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015					
Population in mill	4.30	5.14	5.35	5.35	5.35
CAGR (%)	2.69	1.80	0.78	0.00	0.00
Density	19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)					
Population in mill	1.87	2.89	3.64	4.71	7.25
CAGR (%)	6.44	4.46	4.75	5.29	4.41
Density	3254	5031	6345	8212	12641
Rest of BMR (Outside BBMP- 7205 sq.km.)					
Population in mill	2.25	2.97	3.51	4.14	5.40
CAGR (%)	2.25	2.82	3.41	3.35	2.69
Density	312	412	488	575	749
% of total BMR Pop	27%	27%	28%	29%	30%

C O N S U L T A T I V E P R O C E S S - B M R S P 2 0 3 1



ALTERNATIVE 1 : Preferred (Core: Rest of BMR = 75:25)

BMRDA

OBSERVATION

1. Unrealistic CAGR for BBMP newly added areas- difficult to justify a huge drop in CAGR in the newly added areas of BBMP when the area is being upgraded in terms of infrastructure and services and is actually growing fast due to speculative development also.
2. CAGR outside BBMP for rest of the region witnesses a huge jump after 2011- difficult to justify such growth rate with a cluster and growth node based development model which promotes a spotaneous growth of local economy and population with facilitation.
3. The Financial Operating Plan for BBMP and BWSSB has considered a population of 12.8 million by 2031. This alternative gives a 2031 BBMP population of 10.8 mill and thus putting the financial sustainability issue of the corporation and service provider in question.

* Source for the 3rd point is the draft financial feasibility study for BBMP done by KUIDFC

YEAR	2001	2011	2016	2021	2031
CAGR (%)	1991-2001	2001-11	2011-16	2016-21	2021-31
BMR (8005 sq.km.)					
Population in mill	8.42	11.00	12.50	14.20	18.00
CAGR (%)	2.61	2.71	2.59	2.58	2.40
BBMP (800 sq.km.)					
Population in mill	6.17	8.03	8.65	9.31	10.80
CAGR (%)	3.68	2.67	1.49	1.49	1.49
Density	7713	10038	10809	11641	13500
% of total BMR Pop	73%	73%	69%	66%	60%
BMP (Erstwhile - 226 sq.km.) : As per RMP-2015					
Population in mill	4.30	5.14	5.35	5.35	5.35
CAGR (%)	2.69	1.80	0.78	0.00	0.00
Density	19023	22737	23637	23637	23637
BBMP Added area (574 sq.km.)					
Population in mill	1.87	2.89	3.30	3.97	5.45
CAGR (%)	6.44	4.46	2.72	3.74	3.24
Density	3254	5031	5753	6912	9504
Rest of BMR (Outside BBMP- 7205 sq.km.)					
Population in mill	2.25	2.97	3.85	4.89	7.20
CAGR (%)	2.25	2.82	5.34	4.87	3.95
Density	312	412	535	678	999
% of total BMR Pop	27%	27%	31%	34%	40%

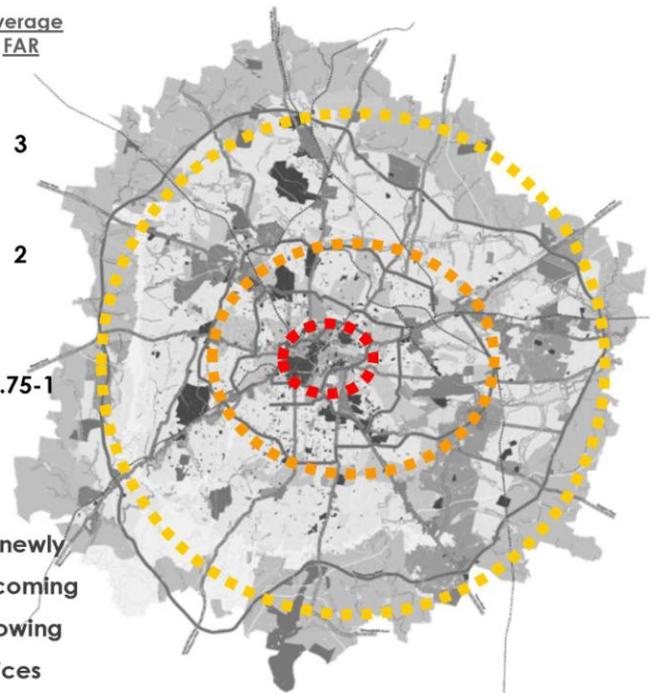
C O N S U L T A T I V E P R O C E S S - B M R S P 2 0 3 1



BMRDA

Density Pattern within RMP 2015 Limits, 2003-04

	Average Density (persons/sq.km.)	Average FAR
Ring-1 (The core area)	22500	3
Ring-2 (Developed urban areas surrounding the core area)	21000	2
Ring-3 (Urban extension areas in the city's outskirts)	2000	0.75-1



OBSERVATION

The average FAR in Ring-3, representing newly added BBMP areas, is all set to go up in coming years within the provisions of RMP-2015, owing to upgradation of infrastructure and services and resulting into a higher density

C O N S U L T A T I V E P R O C E S S - B M R S P 2 0 3 1



BMR vis a vis Other Metropolitan Regions in India : A Comparative Overview of Core and the Region-2001

BMRDA

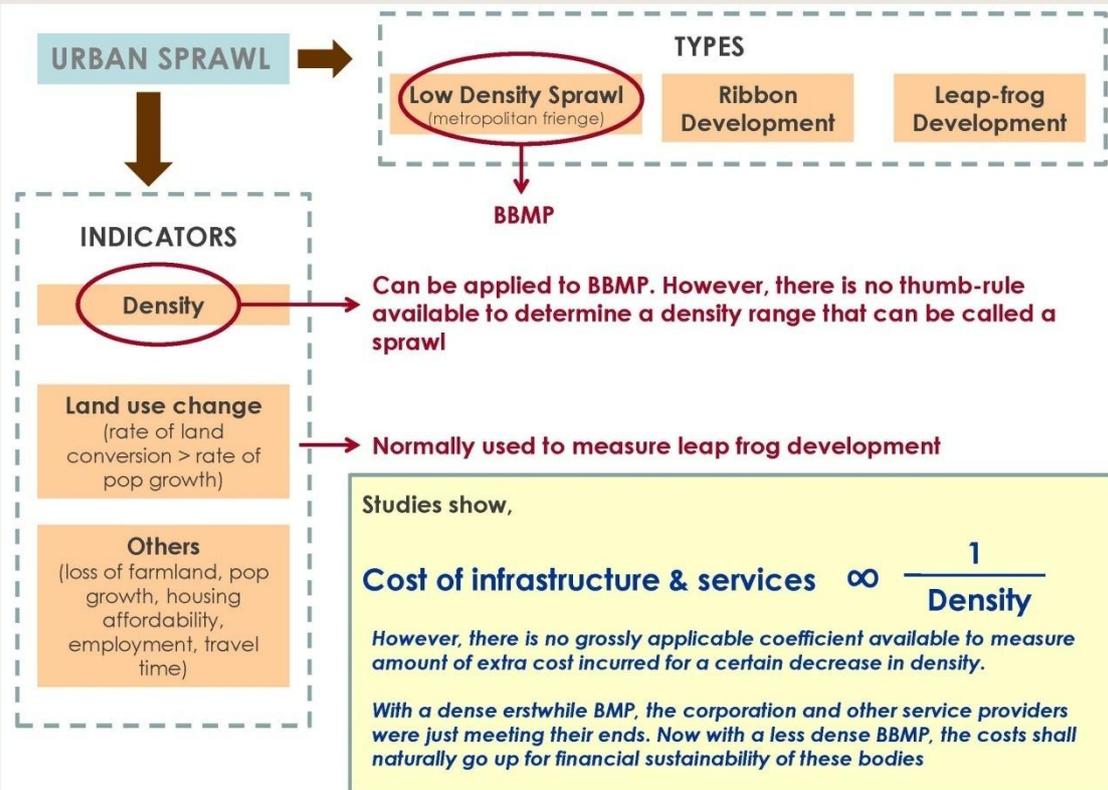
Metropolitan area / region	Bangalore Metropolitan Region	Mumbai Metropolitan Region	Delhi (NCR)	Hyderabad Metropolitan Area	Kolkata Metropolitan Area
Area covered (sq.km.)	8005	4355	33578	1864	1854
Population (in mill)	8.42	19.29	37.1	6.5	15
City corporation	Bruhat Bengaluru Mahanagar Palike	Greater Mumbai Municipal Corporation	NCT Delhi	Greater Hyderabad Municipal Corporation	KMC
Area covered (sq.km.)	800	437.7	1483	650	187
Population (In mill)	6.17	11.9	13.85	6	4.3
Density within core (persons/sq.km)	7713	27187	9339	9231	22995
Density outside core (persons/sq.km)	312	1886	724	412	6418
Population share btwn Core : Rest of Metro region / Metro area	73:27	57:43	37:63	92:8	28:72

CONSULTATIVE PROCESS - BMR SP 2031



URBAN SPRAWL & COST OF INFRASTRUCTURE

BMRDA



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CLUSTER & GROWTH NODES : A SPONTANEOUS DEVELOPMENT MODEL

BMRDA

- 1 Smaller towns (rest of BMR outside BMP)
- 2 Time taken for cluster economies to grow and attract population from core → Unlikely to attract a huge population from core by 2031
- 3 Till then, the proposed growth model shall mostly work towards improving quality of life and income of local populace
- 4 A compact growth model for these towns can be chalked out for better efficiency

CONSULTATIVE PROCESS - BMR SP 2031

INTEGRATED TOWNSHIP MODEL FOR POPULATION DEFLECTION

BMRDA

The deflection of population from core to rest of region within 2031 is commonly envisaged with an induced development which means the following:

- 1 Induced development by means of integrated townships
- 2 Ongoing, these work as walled residential enclaves and does not benefit rural hinterland. Thus the sole purpose of population deflection is lost. Far removed from local economy and thus not sustainable in long term
- 3 Previous attempts do not show encouraging results (Bidadi)
- 4 The time-cost analysis does not justify this approach
 - cost of township construction
 - time proposed in business plan
 - population proposed in business plan
 - local employment generation envisaged

CONSULTATIVE PROCESS - BMR SP 2031



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