# MAKING CITIES GREAT PLACES TO LIVE

JIT KUMAR GUPTA

Foreword
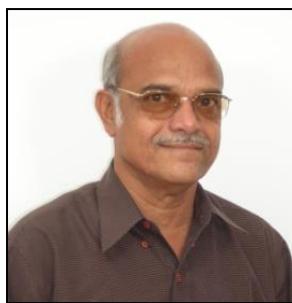
Cities, as physical entities, are known to occupy central stage on the planet earth, by leveraging their ability to energize economy, promote employment and create state of art infrastructures and services for nations and communities. Globally, cities are also fast emerging as major centres of innovations, trade and commerce, art and culture. As determinant of the national growth and development, cities have emerged as major contributors to the national wealth and   prosperity. High degree of positive co-relationship have been observed between urbanisation and prosperity, a nation enjoys.

 Occupying as little as 2% of land, housing more than half of global population (55%) and generating around three fourth(70%) of the global wealth, cities are known to be definers of future growth and development of nations . 21st century is rightly being called the century of urbanisation, with cities holding 80% of global population by the year 2050.

While displaying large positivities, cities are also known to be storehouse of number of challenges facing people living in urban areas mainly in developing nations. Cities have been found generally, to be in deficit when making provision of basic amenities of life in terms of shelter, water, sanitation, employment, solid waste management, etc. Quality of life remains a major issue for majority of urbanites. As major consumers of resources, energy and generator of waste, cities are largely responsible for global warming. Cities remain largely inefficient and inhumane. Accordingly, in this context, there is an urgent need to make cities sustainable, livable, safe and resilient, as mandated by the Sustainable Development Goal 11 of the United Nations, to which India is also signatory.

Present e-book, by   Shri Jit Kumar Gupta, 'Making Cities Great Places to Live', makes an attempt to look for options to rationalise the growth and development of urban centres and make them great places to live. This book, a compilation of various articles authored by him, dwells on various issues and approaches pertaining to urban centres; defining the role and importance of physical planning; laying down strategies for promoting sustainable development; explaining compact cities as an option for making cities smart and sustainable; redefining master plans to promote smart and sustainable cities;   options for sustainable development of hill areas;   making affordable housing for all - a reality; strategies for making India slum free; financing urban infrastructures; sourcing land for urban development; approaching urban transport and ultimately culminates on the theme - 'how to make cities great places to live'.

Known him both as a student, educationists and also as a professional planner, I hope e-book by Shri Jit Kumar Gupta, will help readers, both professionals and students of physical planning, understand the entire gamut of urban planning, development and management , more realistically and rationally. It would also help them in evolving rational, eco-friendly and realistic planning solutions based on ground realities, to make urban areas more livable, humane, sustainable, productive and efficient.

I am sure that Shri Jit Kumar Gupta must have devoted lot of his time and energy, assiduously working for bringing his articles in e-book format, which is really commendable.

Prof. Dr. D. S. Meshram
President,
Institute of Town Planners, India
New Delhi

Preword

It is indeed a great honour and privilege to write a prelude for the for the e-book 'Making City a Great Place to Live' by Prof. Jit Kumar Gupta. This e- book is a collection of various articles and papers that have been written by Prof. Gupta, over a period of more than four decades, on various issues connected with planning, urbanisation, housing, transportation, governance, infrastructure, etc. Some of the papers, though written long back, continue to reflect few ideas which have relevance even today. Besides, these will also help tracing the evolution of town planning practice in India over last four decades. I have had several occasions to read his papers and to hear presentations on several platforms. Passionate about

 Planning theory and practice that Prof. Gupta is, he has dealt with a variety of topics, with equal command over various scales of city planning. Chandigarh being close to his heart, is referred to in various papers written by him. The vast scope of coverage includes topics as varied as Planned Development of Human Settlements, Strategies for Promoting Urban Sustainability; Redefining Planning and Master Plans, Sustainable Development of Hill Areas, Compact Cities, etc. I am very glad that Prof. Gupta has covered the aspect of planning cities in the regional c ontext. He writes, "Great cities support and share with its surrounding rural/ small settlements and are also supported by them in its basic and essential day to day needs. All successful cities have made optimum use of settlements/ space existing in cities and their periphery. Accordingly, for making cities great, they have to be viewed, planned and developed in the regional context, periphery and peri-urban areas". Similarly, he has very effectively related the 'Smart Buildings', 'Green Buildings' and 'Green Transport' to the overall sustainability of our cities. Prof. Gupta has introduced and provided discussion on some innovative ideas like 'Inclusionary Zoning' and 'Traffic Calming'. Prof. Gupta presents, "Major elements involved in the concept (of Traffic Calming) are redesigning of streets and roads for a reduced vehicular speed not exceeding 30 kmph; giving priority to public transport; promoting pedestrianisation and bi-cycle traffic; enhanc ing the social quality and vitality of cities; creating large green areas as integral part of transportation network, parking management, signaling; surveillance and sanctions besides communication and participation by the public. … reduced noise and air pollution besides promoting increased road safely and improved quality of life in all". Another interesting relationship drawn by him is how the green buildings would help in considerable reduction of operational cost of the house over the entire life cycle of the building due to reduced energy and water consumption besides lower generation of waste to make the dwellings really costeffective and sustainable, towards Housing for All. Proposing an Infrastructure Master Plan is another innovative idea presented by Prof. Gupta. The last paper, 'Making City a Great Place to Live', is indeed a hope for all of us, particularly at a time when planners are debating post-Covid city scenarios. Presented in very simple language avoiding complicated jargons, and supported with adequate graphics, the e-Book will be found useful by students, academicians and professionals.

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Prof. Dr. Mahavir
Dean (Academic),
School of Planning and Architecture,
New Delhi

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Preword

"MAKING CITIES A GREAT PLACE TO LIVE" is an excellent contribution from Prof. Jit Gupta. This book is an encyclopedia in itself wherein myriad topics have been covered in the realm of City. This book will provide a great contribution towards teaching and learning, because of its availability in the digital domain.

This book shall serve as a torch bearer for the stake holders towards the planning and designing of cities, wherein the cities of today are jostling with multiple problems. The knowledge provided through the varied topics such as compact cities, Green cities, Traffic Transportation, Transit oriented development, Green infrastructure and urbanization is immense and will surely enrich the individuals with newer ideas.

The cities are considered to be the generators of Economy, providers of employment, offering opportunities for Education, Research, promising infrastructure and quality life. The spatio-temporal changes, urbanisation and migration of the rural population to cities leave the marginalised section of population in lurch and render them homeless. Nevertheless, the cities should deliver the space for the rich and poor suitably and equitably. Therefore, the cities need to be inclusive, justifiable and afford the space and shelter, for the poorest of the poor.

Since cities are dynamic entities, ever changing, ever shaping, evolving and delegating, they will require plans which offer inbuilt flexibility to cater to urban dynamism. City is the function of many layers which render the making of the cities a very complex phenomenon. The various embedded layers of History, Culture, geomorphology, vegetation, waterbodies, heritage drive the form of the city. The urbanisation is rising rapidly; with only 3% in 1800, it has risen to 50% in the beginning of 21st century. As a consequence of this, even the great cities in Europe, and in other regions, enormous number of migrants shifted from rural communities to urban areas as new prospects emerged.

Quick growth brought urban problems, therefore the industrial-era cities were rife with dangers to health and safety. At one point of time, rapidly expanding industrial cities became quite lethal, and were packed with loads of problems of polluted water, air and communicable diseases. Living conditions during the Industrial Revolution speckled with the splendour of the homes for the wealthy to the squalor for the working class. Poor people continue to live in small hutments or slums in cramped streets. These shelters with shared toilet facilities, had open sewers, which were prone to epidemics aggravated by persistent dampness. Diseases often spread through contaminated water supplies.

The United States had set a good example by unfolding the entire process; from 1860 to 1910, the invention of railroads reduced transportation costs and large manufacturing centres began to emerge in the United States, allowing migration from rural to urban areas. Furthermore, the emergence of central park in Manhattan area of New York was an eye opener for utopians, as it provided the much required lung space for performing and catering to the varied activities of a huge population.

This paradigm became the precursor for the city parks and provided a great relief to the citizens. Citizens thronged in big numbers in the lap of nature. So the city making traversed a full cycle. The efforts are on in the city to be the part of nature and to bring nature inside the cities.

In this book, emphasis has been given on the Green transport, green infrastructure, green buildings, open and green spaces. I am very optimistic, written in a very simplistic vocabulary, this book will win millions of hearts. I congratulate Prof. Jit Gupta Ji on his arduous and significant endeavours.

Prof. Minakshi Jain
Director SPA,
'Vijayawada (AP)

PREFACE

Earth, as a planet is urbanising rapidly. With addition of 1.9 lakh people in the urban milieu on daily basis, globally nations are required to plan a new metropolis every five days to accommodate this rush to urban areas. With cities becoming preferred destinations for living and working, it has been estimated that 60% of the global population will be part of the urban culture by the year 2030 and four out of five persons on this planet will be urbanites by the middle of twenty first censtury. This unending and ever increasing global rush to urban culture has its genesis in the distinct advantages which cities and towns offer in terms of employment, economy and infrastructure.

Occupying 2% of the global land, city generates 70% of the world economy. Cities are known to be generators of economy, employment and promoters of economic development. Cities remain places of innovations, entrepreneurship, art and culture besides providers of quality infrastructures and services. Cities have been part of human history, showcasing its growth and development in the past. They shall continue to define footprints of future march of human growth and development.

Despite distinct advantages, cities are also known to be places of dualities and contradictions housing both positivity and negativities. Cities are also known to be places of exclusion and creators of worst living conditions for the bottom rung of economic pyramid. Cities remain perpetually deficient in making available basic amenities of life to majority of its residents. Shelter remains always a major issue with availability of potable water and sanitation eluding majority of urban residents. In the process cities have emerged as areas of concentrated poverty housing large number of slums and squatter colonies.

Cities attract large manpower from rural hinterland to work in urban areas to ensure cities remain operational and productive .But cities never own these valuable service and employment providers, leading to emergence of a distinct class, known as informal sector in the economic and planning parlance.

 In addition to promoting poverty and exclusion, cities have emerged as centres of large consumers of energy and resources. Consuming 60% of the global energy, cities are known to generate 70% of greenhouse gases, making them responsible for global warming and ozone depletion . Cities are also responsible for generating 70% of global waste creating enormous problems of safety and sustainability for majority of residents, communities and nations. Known to be major destroyer of ecology and environment, cities consume large areas of bio-diversity and eco-sensitivity, leading to emergence of large number of epidemics and pandemics, hitting the planet with frequencies unknown in the human history. Floods and disasters, both natural and manmade, are fast becoming integral part of the culture of urban growth and development. This calls for redefining and rationalisation of the pattern of urbanisation, urban planning,   growth and development of cities and towns. We need to understand cities in terms of; who they belong to; what is their structure and fabric; who are the stakeholders in the city; what is going to be future path of the city and what kind of city we want? These questions remain both difficult and complex to answer because cities remain complex.

In search for appropriate solutions to make cities more humane, healthy, sustainable, equitable, resilient and happy places to live and work ; realistic options and strategies need to be looked into and searched. Learning for options is also needed from the enormous work already done by reputed international/ national organisations and research/academic institutions to make cities safe, vibrant and livable. This e-book tries to make an attempt to portray some random thoughts, which I, as a student of urban planning, think are relevant and contextual in making cities better place to live in.

This e- book is a collections of various articles and papers that have been penned by me over a period   spanning over 40 years on various issues connected with urbanisation, urban planning, housing, transportation, governance, infrastructure etc. Few articles, written long back, may look outdated in terms of data, but they continue to reflect few ideas which have relevance even today. Since these papers have not been edited, there may be repetitions at some places. But these repetitions   showcase their importance and relevance in making cities better organised, planned and developed

Urban areas remain complex, ever evolving and devolving. They are never static. Accordingly they need solutions , which are rational, realistic and commensurate with the local conditions and changing needs of the communities. Since no two cities are same, therefore solutions provided cannot be same. Looking at the present context, technology will be the major driver of city planning, development, management , efficient mapping and delivery of services besides connecting with people and communities. As technologies are rapidly evolving, options for city planning needs to be made more dynamic and relevant to local context.

Compiling this e-book was never an idea while writing the papers, but a later thought. There may appear some disconnect between the continuity of the text, but each paper makes an attempt to remain focused on the theme and issues dealt in the said papers. I hope contents of various articles will have some relevance for planning of cities and towns . There exists enormous scope for making cities better place to live and work, but using my limited knowledge and understanding of cities, I have tried to remain focused on urban areas and relevant to the context.

I would like to express my gratitude and special thanks to Dr D S Meshram, President, Institute of Town Planners, India, who first made me learn the basics of town planning, while being a student of Masters of City and Regional Planning at Guru Ram Das School of Planning, Guru Nanak Dev University, Amritsar and later on making me part of Institute of Town Planners, both at local and national level.

I acknowledge the valuable contribution made by my teachers, friends, students , professional institutions and the organisations I served during my career spanning over five decades ,who made me learn and understand the context of urban planning, development and management.

I must also acknowledge the support of my student, Ms Priyanka Sagar , student of Final Year B.ARCH of IKG PTU Campus Mohali, who despite her pre-occupation with her final year thesis in Architecture, made this book a distinct reality. But for her hard work, sincerity, commitment and dedication this book would never have been possible.

 This document is dedicated to the sacred memory of my mother, Late Smt Leela Gupta, who made me where I stand today, despite all odds and hardships she faced in bringing me up, and to my father Late Ved Parkash Gupta, whose benevolence I was deprived of, in my childhood

Jit Kumar Gupta
Chandigarh
Dated 24-07-2020

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-a Tool to Promote Planned Development of Human Settlements

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Introduction

With India heading on the path of rapid and massive urbanization, urban centers are growing at a faster pace. Last census held in 2011, placed level of urbanization at 31.1% with number of urban residents at 378 million spread over 7935 urban settlements. Even with low level of urbanization, India ranks second among the urban systems in the world after China. Estimates made globally have placed India's urban population at 591 million in 2031 and 750 million by 2051. Number of metro-cities are estimated to increase from 53 to 67 by 2031 and ten million plus cities would number 9 in 2051 as against 3 in 2011 and 5 in 2031, calling for more professionally trained planners to be involved in rationalizing the orderly growth and development of urban centers in India. Urban centers not only will house more population but would also be the major economic driver of the country and generators of employment. Globally urban centers have been the determinant of national prosperity. However, this prosperity depends upon how well planned and developed cities are. Planned development has been found to be the major driver in making the cities more livable, productive, effective and efficient. Accordingly promoting state of art planning to ensure planned development has assumed importance, With rapid growth and expansion , development and management of cities is becoming highly complex and professional. Complexity of planning is also emerging due to fast changing technologies and economies both locally and globally. Cities are gaining momentum in terms of their areas and extent of operation. Integration of societies and economies of the world are extending the operational domain from city to the regions, making the planning process all the more complex and essential.

Urban India has under-performed as against the defined benchmarks of proficiency because majority of cities are growing without having input of planned development. Considering the need and importance for promoting planned development, professionally trained town and country planners are needed to usher an era of planned development and management in this country by evolving new strategies and state of art options. Accordingly, planning profession needs to be promoted on priority in this country to provide required level of manpower to meet the growing needs of planners and the planned development.

Planning professionals are also urgently needed keeping in view the government agenda of developing initially 100 smart cities in the country with an outlay of more than Rs 70,000 crores. The program is being launched in a phased manner with the intent of making all urban centers smart over a period of time. Planning and designing smart cities would require the services of trained town planners and accordingly, it becomes critical to create required professional town planners. In addition government of India has also launched three more missions and two yojnas focusing on urban areas which include; PMAY, Swatchh Bharat Mission,NULM, SWM, AMRUT and HRIDAY, all requiring the services of urban planners. In addition, agenda defined in 74th Constitutional Amendment Acts, 1992, provides for urban/land use planning besides 16 other functions to be given to urban local bodies, which would require active involvement of town planning profession to prepare schemes for planned development of the urban centers at the local level. In addition, preparing District Development Plans and Metropolitan Area Development Plans, would also require the active and absolute involvement of planning profession to prepare such documents. Master Plans are required to be prepared for promoting planned development of urban centres ,which can only be prepared by the physical planners. Considering the fact that large scale urban development is being envisioned in India , role of town planning profession will become critical.

Town Planning

Town planning is primarily and essentially a physical planning process of planning of human settlements and related activities , both urban, rural, based on defined norms and standards, involving all the residents, identification and sub-division of land, its development, allocating land use, defining

parameters for built environment besides defining amenities, facilities and infrastructure to be provided including transportation, communications, distribution networks and the provision of municipal services to residents and visitors. Town planning also involves defining physical layout of human settlements. The underlining concern for the entire process of planning remains to promote larger public interest, promote human welfare, meet all current and future basic needs of individuals, promote human efficiency and productivity, creating enabling environment which permits holistic development of individuals and communities, protect environment, protecting heritage both natural and manmade, make optimum use of available resources on sustained basis besides providing security and safety to individuals and communities . Town planning remains largely an interdisciplinary field that includes art and science involving architecture, urban design, engineering, sociology, landscaping, housing, traffic and transportation, health & hygiene, history, geography, culture, heritage, economics, statistics, demography, anthropology etc.

Town planning besides dealing with planning and development of urban and rural planning also includes regional planning. Major tool for town planners remains Regional Plans, Master Plans, Development Plans, Zonal Plans, Layout Plans, Zoning Plans, Demarcation Plans etc through which planning and development of human settlements, at Regional, city and local level, are regulated. Regional Plans, Master Plans/ Development Plans are essentially long term plans defining the future growth of regions/cities, generally for a period of next two decades. They are basically land based plans defining the use of land falling within the planning area. Various land uses are the outcome of existing population and the projected population of the region/ town based on past trends besides existing trends of growth and development of different land-uses. Land uses and amenities are defined based on prescribed norms and standards, which are essentially based on population and area. There is variance in different standards adopted in different states. Ministry of urban Development has also come out with Urban and Regional Development Plans Formulation &Implementation(URDPFI) Guidelines, suggesting the process, norms and standards of different aspects of Town Planning. Planning tools of Master Plans/Development Plans have been subjected to lot of criticism because of their rigidity and consuming large time for plan preparation besides requiring large manpower and resources. These plans have largely been called controllers of development rather than promoters of planned development. Town Planning, as a process is undergoing lot of change due to its recognized role and importance in promoting sustainability, promoting economy, generating employment, making cities vibrant and places of happening/innovations, conserving environment, ecology and providing optimum conditions of living and working conditions. Globally urban areas are occupying central stage and town planning is viewed with lot of interest in rationalizing the growth and development of human settlements in general and urban settlements in particular. Indian government has also been focusing on promoting planned development of urban settlements through various urban related missions and yojnas, already enumerated above.

Definition

Considering the fact that planning of human settlements encompasses large number of subjects, stakeholders and issues , accordingly Town planning has been defined in numerous ways by different experts depending upon their focus, approach and understanding. Few definitions are enumerated below for understanding the intent, content and scope of the profession.

- It is the art and science of planning human settlements to make them more productive, effective, efficient, livable and sustainable besides providing optimum quality of life to its residents.
- It is the art and science of sub-dividing land, allocation use to sub-divided land, defining what could be built on different parcels based on the larger goals of physical, socio- economic development of communities and individuals, making settlement as their preferred home
- It is the art and science of ordering the use of land and siting of buildings and communication routes so as to secure maximum degree of economy, convenience and beauty
- Town planning is the planning and design of all the new buildings, roads, and parks in a place in order to make them attractive and convenient for the people who live therein.

- Town Planning is the Comprehensive planning of the physical and social development of a town, including the construction of facilities
- A city should be built to give its residents security and happiness- Aristotel

Objectives

The Objectives of the town planning are to;

- promote larger public interest
- Plan for people and their happiness
- promote quality of life of the residents
- promote human welfare irrespective of cast, creed, age, sex, financial status
- create enabling environment to facilitate the meeting of basic human need of living , working, care of body & spirit and circulation.
- promote healthy living conditions
- ensuring health, convenience and beauty
- protect and promote the environment,
- improve public health, safety and security
- making available basic amenities/services/infrastructures
- increase choices available to each/every citizen
- respect nature and natural elements
- minimize adverse impact of physical development.
- make human settlements sustainable
- create opportunities for all of gainful employment
- eliminate poverty
- minimize mobility and promote accessibility
- preserve natural resources
- Make optimum use of land and other resource
- Promote, protect and preserve heritage – both natural and manmade
- Creating value for city

Town Planning Involves;

Town planning involves carrying a detailed study of the settlement fabric, structure and genesis in terms of its historical perspective, growth and development. Study also includes its specific features in order to understand the fabric of the city. It also involves a detailed demographical study to understand the socio-economic features of the population living there in , their specialized characteristics and past trends of growth, in order to define the number of future population which will live in the city in next 20 years. Planning also involves carrying out physical, social, economic and environmental study of the settlements which is being planned. It also involves preparing an existing land use map showing the planning areas, administrative boundaries, physical features, land morphology/topography, different shades of built up area, vacant areas, different land uses, slums, industries, major commercial nodes, institutions/institutional areas, parks/open spaces/play grounds, amenities/facilities, protected/forest areas, road network, service network, transportation nodes, area under different uses etc. In addition, it calls for carrying out SWOT analysis of the settlement, so as to understand its strength, identify weaknesses, opportunities it offers and threat it poses. Problems faced by city in different aspects are identified and quantified systematically. Surveys are also conducted to ascertain facts on different aspects in terms of quantity and quality. Wider periodic consultation with all stakeholders remain integral part of planning process, Based on studies made and analysis carried out, town planning aims at preparing the final proposals, based on a defined vision and mission, by producing the proposed landuse plan. In addition, it includes a detailed report on the study made, problems identified and the proposal for promoting planned development.

Town planning, basically and essentially includes;

A. *Planning*
- Reflecting the people's aspiration.
- Ensuring highest quality of life.

- Ensuring rational distribution of Population.
- Rationalizing the land use planning.
- Eliminating non- compatible land uses.
- Eliminating subjectivity in decision making.
- Defining the future vision for the human settlement.
- Defining future shape and size of the city.
- Defining location of different land uses, amenities, services etc
- Defining hierarchy of all activities like commercial, infrastructure, health care, education etc
- Making human living more effective and effective.
- Rationalizing the development of urban and rural areas falling within planning area.
- Creating self -sustaining communities.
- Making informal sector integral part of the planning process
- Defining land uses for existing and future population
- Defining future population for quantification of different land uses
- Defining the direction of future growth of the city
- Preparing framework for the growth and development of the city - master plan / development plans/layout plans/zoning/zonal plans

B. Development

- Promoting Planned Development.
- Eliminating the unplanned development.
- Making urban Development orderly.
- Taking care of current development of settlement.
- Promoting sustainable development of human settlements.
- Promoting development based on the proposals defined in the master plan

C. Land

- Optimizing use of urban land
- Minimizing the use of land for urban development
- Carrying out land suitability analysis
- Providing land for different uses on prescribed norms and standards
- Making land market more effective and efficient
- Making available land at right cost in right quantity in right place and right time
- Minimizing the conversion of land from agriculture to non-agricultural uses
- Promoting the development of derelict land

D. Housing

- Eliminating slums.
- Providing adequate space for housing - present and future
- Promoting affordable housing
- Earmarking adequate space for informal housing.
- Ensuring housing for all the residents of the city
- Making cities slum free
- Promoting all basic amenities/services in the residential area
- Creating self-contained communities
- Promoting multiple options for housing
- Planning for rental housing/ transit housing

E. Amenities& Facilities

- Identifying /quantifying different amenities/facilities in the city
- Defining norms and standards for different amenities / facilities
- Identifying existing gaps between demand and supply

- Overcoming existing deficiencies in infrastructure
- Mapping healthcare/education/entertainment facilities
- Ensuring rational distribution of amenities / facilities across the city- both quantitative/qualitative
- Avoiding concentration /absence of amenities and facilities at different places
- Defining the network for amenities/facilities
- Defining sourcing of water/ electricity etc
- Identifying space for disposal of waste both- solid and liquid

F. Traffic &Transportation

- Promoting accessibility rather than mobility
- Planning for people not vehicles
- Rationalizing the traffic and transportation.
- Segregating inter and intra-city traffic
- Mapping existing mobility problems
- Suggesting options for traffic and transportation both in short-term/ long-term perspective
- Identifying the areas of congestion/accidents and provide solution
- Defining solution to the parking
- Rationalizing the mobility in the city
- Re-ordering the priority of traffic planning with maximum focus on pedestrianisation and least focus on individual cars
- Promoting mass transportation
- Adopting integrated approach for transportation
- Defining the transportation network/nodes
- Defining the hierarchy of traffic network

E. Environment

- Making city environmentally vibrant
- Mapping the existing status of environment
- Identifying sources of pollution.
- Identifying options for minimizing pollution.
- Providing green spaces on the specified norms .
- Identifying environmentally sensitive areas
- Protecting /promoting the eco-sensitive areas
- Identifying derelict/eco-sensitive areas in the city
- Promoting green cover
- Identifying water bodies and suggest approach for preservation
- Segregating the industry area from residential uses
- Creating city forests as part of city greening

G. Economy

- Making city economically vibrant
- Generating employment for all
- Creating opportunities for both skill/unskilled manpower
- Promoting economy/economic development of City
- Making urban development self sustainable.
- Generating resources for the infrastructure development in the city.
- Creating enabling environment to attract investment

H. Heritage

- Identifying /mapping city heritage

- Classifying the heritage depending upon the importance
- Suggesting strategies/ roadmap for the preservation/conservation/promotion of heritage
- Framing schemes/framework for the heritage development
- Making heritage development integral part of planning process
- Making heritage conservation mass movement
- Evolving specific legal framework for heritage areas/zones.

I Villages

- Identifying villages within the planning area
- Identifying villages falling in urbanisable area
- Identifying villages falling in the urban areas
- Making villages falling in the master plan area, integral part of urban planning process
- Defining specific strategies for different categories of villages based on the study made and analysis carried out

J Phasing

- Quantifying the amount of development in the master plan
- Dividing development into four distinct phases
- Phasing made based on a time frame of 5 years periods- depending upon the population projection made and area defined for development
- Phasing priorities defined on the basis of economy, integration, making optimum use of available services and area/population to be served.

K FUNCTIONS

- Major functions performed by Town Planning Departments generally include;:-
- Providing technical advice on matters related to urban planning and development
- Aiding, assisting and advising the state government/ development authorities/urban local bodies/industrial corporations in policy formulation and implementation related to planning of human settlement and related issues.
- Identifying planning areas and preparing regional plans/master plans/development plans /zonal /zoning plans at the region/settlement levels besides preparing existing land-use plans
- Prepare Building Bye Laws, regulating construction on defined site.
- Co-ordinating the activities of various stake holders involved in urban planning
- Preparing traffic mobility Plans
- Ensuring planned development of human settlements
- Framing policies/programs related to private sector involvement in urban planning/infrastructure development
- Sanctioning building plans for various buildings coming up in human settlements.
- Regulating development and checking the haphazard development in and around towns in accordance with the provisions of statutes
- Assist in selecting sites for setting up new towns/industrial areas/ SEZ/ institutions etc

WAY FORWARD

Town planning, which had its origin with the dawn of civilization on this planet, shall continue to be relevant till homo-sapiens will live on this earth. Town planning offers unlimited scope which shall be co-terminus with the genesis, growth, development and management of human settlements. UNO has already included resilient cities and communities in the list of 17 Sustainable Development Goals to be achieved globally, in order to make this planet sustainable. It recognizes the critical role of Town Planning in making cities resilient and sustainable. Town Planning remains the only profession which holistically looks at the integrated physical, socio-economic planned growth and development of human settlements. However, town planning has not been given its due share and

recognition in the planning and development of the human settlements. Majority of agencies operating and dealing with human settlements do not have qualified town planners on their role. Deployment of town planners is largely confined to larger settlements and few development authorities created at the regional/ settlement level. Out of 4041 statutory towns in India, even 20% ULBs do not have the services of town planners with them. This has resulted in mushrooming and haphazard growth/development of these settlements. Unfortunately, it has not been realized that unplanned development causes enormous loss to the communities, cities and nations. People living in these areas or in their close vicinity, are greatly impacted by such development which normally involves deficiency/absence of basic amenities/services. These services form the core of health and hygiene of the communities/city. In the process, cities become less efficient and less productive, causing enormous loss to economy and employment. The most impacted are the vulnerable sections of society in general and poor in particular. If the cities have the benefit of services of town planning, they would become much better place to live in and work contributing immensely to the growth and development of nations and communities. Marginalization of the town planning profession can be seen as the major cause promoting poverty, unemployment and poor quality of life in urban centers in developing countries

With India on the cusp of rapid/massive urbanization, it will be essential that cities should be mandated to use the professional services of town planners by creating a dedicated cadre of town planners in the state municipal services. However, planning profession also need to be made more effective and efficient by looking at the intent, content and scope of the profession, both in education and practice. The way planning profession is being practiced, it has done more damage than good to the planned development of human settlements. Profession involves more subjectivity than objectivity where critical decisions of planning and development are taken on the personal whims and fancies/under duress or pressures, rather than on objectivity and well laid down principles. It is time, profession has to look critically the way it is being practiced and how the decisions are taken. In addition, planners have to re-look at their planning tools to make them more effective and efficient in order to cater to the emerging urban dynamism. It will require making research and development integral part of planning education and planning practice. Role of academic institutions will be critical to make planning profession vibrant, effective and efficient. Creating data bank for all human settlements will be critical for rational decision making. In order to put profession on higher pedestal, it will be important that;

- Profession should be dictated by objectivity rather than subjectivity.
- Planning process and systems must be clearly defined to make them more rational.
- Intent, content and scope of planning tools must be critically and objectively reviewed and redefined to make them more effective and efficient.
- Research and Development should be made integral part of academics and the practice.
- Technology/ICT/GIS/urban mapping should be made integral part of planning profession
- Urban Mapping unit should be set up immediately in all states/ town planning offices to create accurate base maps of all human settlements for their rational planning and development.
- Technology/ICT should be effectively leveraged to bring efficiency and transparency in planning and decision making besides creating a data bank for human settlements.
- Course curricula of planning needs to be periodically reviewed to bridge the gap between academics and practice.
- Town planning should aim at making human settlements better by putting the right things in the right place
- All planning schools should be asked to create consultancy cell to involve students and faculty in real life projects
- Energy conservation must be made integral part of planning process.
- Sustainability should be made underlying principle of planning of human settlements.
- Informal sector should be appropriately spaced in the planning process.
- Land conservation and its optimum utilization should be basic agenda for town planning.

- Planning should be leveraged as promoter of planned development rather than controller of development.
- Poverty should be appropriately addressed in planning framework.
- Urban planning must be made self- contained and self-sustaining both socially, physically and economically.
- Planning should aim at providing highest quality of life.
- Town Planning should focus on holistic development of individuals/communities.
- Preservation, conservation and management of Natural/manmade heritage should be appropriately made integral part of planning process.
- Adequate manpower of trained planners needs to be created by setting up more planning schools for meeting the emerging challenges posed by rapid urbanization/population growth.
- Planning cadre must be created in all states/UT's to address the needs of town planning at state/regional/city/ rural levels.
- 73rd and 74th Constitutional amendment Acts must be made operational to put planning on firm pedestal.
- Good urban planning, development and management practices, operational at global and local level, must be documented and shared for adoption and application.
- Master Plans/Development Plans for all settlements should be prepared on priority and time bound basis, so as the rationalize their planned development
- Town Planning practices should appropriately address the agenda defined in the Sustainable Development Goals.
- Town planning needs to be leveraged to address critical issues in the urban governance.
- Urban Governance should be integral part of planning education.
- Planning faculty should be a mix of academicians and persons of eminence in practice.
- Planning should make cities more compact, using minimum land and having minimum network to promote walking/cycling rather than using mechanized vehicles.
- Town Planning must focus on future rather than on present/past.
- Town Planning must focus on outcome rather than time-frame.
- Town Planning must be based on sharing of ideas/resources
- Town Planning must involve all stakeholders/communities in planning and decision making.
- Planning must be made people/resource centric.
- Town planning must focus on planning for people rather than vehicles to rationalize traffic and transportation in human settlements
- Planning should aim at promoting accessibility rather than mobility in human settlements.
- Cities should be planned to be zero waste, zero slum, zero energy, zero carbon and zero car city.
- City planning needs to be made broader -based by involving related professions and professionals.
- Available planning related existing Legal framework must be objectively reviewed, revised and redefined, to make it supportive of planned urban settlements.
- Flexibility must be built in the planning process so as to take care of all the emerging challenges and changes in the settlement system.
- Regional Planning must precede the town planning for effectively dove-tailing both urban and rural settlements,
- State vision and mission plans should be prepared on priority by town planning departments and periodically reviewed to make it more rational and relevant for policy formulation and promoting planned development in the state.
- All policies/programs impacting the development of human settlements must involve professional planners.
- Planning departments at the state/central level must be appropriately strengthened with appropriate manpower and resources.

- Services of Town Planning profession must be utilized for preparing District Development Plans and Metropolitan Area Plans mandated under the 74thConstitutional Amendment Act, 1992
- Town planning systems should be at the heart of finding solutions to enormous challenges facing human settlements and communities besides shaping places to make them better places to live and work.

Strategies for Promoting Urban Sustainability

Strategies for Promoting Urban Sustainability

Abstract: Despite numerous advantages cities offer, they are also known for their dualities and contradictions; where poverty and prosperity compete; sky-scrappers and slums rub shoulders and where unplanned and haphazard development have emerged as the order of the day. If cities are creators of wealth they are also areas of concentration of population, poverty and exclusion.Cities, as conglomerate of people, population, buildings and activities, are known to be consumers of large amount of energy, resources and generators of enormous waste. In the process, they are known to be prime generators of conditions adversely impacting both local and global ecology and climate besides polluting environment. . Global warming and climate change can be largely attributed to the way cities grow, operate, function and consume energy. Cities are known to be responsible for consuming more than 75% of global energy and generating 70% of carbon footprints. Cities, as consumers of energy and resources, have its genesis in the manner they are planned ; way majority of building are designed and the manner in which people are made to travel for meeting their basic needs and discharge their daily obligations. City planning has also been found to be heavily biased towards physical planning with little focus and priority for protecting, preserving and promoting environment. Such an approach has made cities highly polluted and environmentally unsustainable. In order to make cities more livable, humane, sustainable and promoters of quality environment and ecology, paper looks at the options of redefining the planning process to make cities compact with focus on environment; leveraging nature to promote energy efficient/ green buildings; creating options for green mobility and promoting ruralisation to make urban areas as promoters, sustainers and usherers of a new era of clean environment and urban sustainability.

Key words: Compact cities, environment, Green buildings, Green Mobility, Ruralisation

INTRODUCTION

Studies made by United Nations about the global trends in urbanization, has concluded that world is urbanizing rapidly, with year 2007 marking a historic milestone in the human history ,when for the first time global urban population exceeded the global rural population and the world population has remained predominantly urban thereafter. The present trend has history spanning over last six decades when process of urbanization gained momentum and got accelerated. UN Report further enumerates that in 1950, more than two- third (70%) population worldwide lived in rural settlements and less than one-third(30%) in urban settlements. In 2014, 54% of the world population became urban. With present growth rate, it is estimated that by 2050, the world will be one-third rural and two-third urban- roughly the reverse of global rural- urban population distribution of mid twentieth century. With level of urbanization varying greatly, study further states that Africa and Asia remain largely rural with urbanisation levels placed at 40% and 48%.However, these two regions, housing major global population, will urbanize faster with projected levels of 56% and 64% by 2050. Despite low level of urbanization, China, which in 2014 housed an urban population of 758.360 million as against 410.204 million in India, will have 1049.948 million urban population as against India's 814.399 million in 2050. India will be home to 7 out of 40 ten million cities of the world in 2050 as against 3 out of 28 in 2014. . With 378 million persons (2011 census) residing in 53 metros and 7935 urban centres, India has emerged as the second largest urban system in the world after China despite level of urbanization placed at 31.1%. The growth of urban population has been rather fast in the post- independence period. Growth of urban population has also been found to be co-terminus with the number of urban centres. Census 2011, will be known for two historic facts in the Indian demography, firstly for the largest increase (53%) in number of urban settlements from 5161(2001) to 7935(2011) and secondly for the higher growth of urban population(91million) as compared to rural population (90 million) in absolute terms during the decay2001-11, indicating that India is now on the fast trajectory of urbanization.

 Cities are known to be dictating economy, generating majority of employment, determining quality of life, emerging as incubators of ideas and innovation and providers of quality social and physical infrastructures and accordingly are the major drivers of development and prosperity. However, despite many positive aspects of urban centres, cities have been growing in an unplanned and haphazard manner with urban growth marked by chaos, disorder, dualities and contradictions. . Cities are facing the greatest challenges of   meeting the basic needs of shelter, healthcare , education, water and sanitation for its residents. In the process, majority of urban residents are being marginalised. Quality of life in urban India is fast becoming nightmare for migrants. Population, poverty, pollution and exclusion have emerged as the hallmarks of Indian urbanisation. With urban population reaching 600 million out of 1.4 billion in 2030, greatest challenge before urban planners, architects and policy makers would be, how to harmonize the growth and development of urban India and make it smart and rational.

Growth of cities is largely dictated by urban planning, development and management processes. Accordingly, it will be appropriate to look at the prevailing planning, development and management practices in India , identify roadblocks and redefine new order of urban planning and development options to make cities smart, green, more humane, equitable, just, efficient, productive, sustainable and providers of assured quality of life to all urban residents including poorest of the poor.

REDEFINING PLANNING

Creating smart cities would require new order of urban planning, considering the contours and complexity of such a city. New order of planning would involve making planning people centric, transparent, community oriented and flexible. Its focus shall be to minimize prevailing urban dualities and contradictions and to promote development based on equity, inclusiveness and providing opportunities to all. Master Plans, which have been used by planners as the panacea to overcome all the urban ills, will have to be redrawn /redefined with appropriate innovations/changes made in the intent, contents and scope of such plans. New order of Master Plans will not be merely land-use plans, defining/freezing the city future once for all for next two decades, indicating the use of every parcel of land in the city. They will take a 'whole city' approach to planning and will focus on the urban form, shape and typology of the city. Since cities are dynamic entities, ever changing, ever shaping, evolving and devolving, they will require plans which provide inbuilt flexibility to cater to urban dynamism. The master plans would accordingly be dynamic in nature, growing and evolving with the growth of towns. New breed of Master Plans would be based on state of art technologies and a distinct vision, evolved after detailed study, analysis and understanding of the city fabric and its growth potential duly supported by detailed planning and development guidelines. The vision shall be achieved through well defined missions for different facets of city involving planning and development. Each development project shall be evaluated in the context of defined vision and guidelines, by a multi-disciplinary team of experts by involving stakeholders before accepting. The city planning shall not be dictated exclusively by planners but will involve larger set of experts representing different shades of city planning, growth and management to rationalize decision making. Architects, urban designers, landscape experts, service providers, environmentalists, transport experts, conservationists, art and culture historians and sociologists etc will have major role in planning the smart cities.

New order of planning will be geared to make the city compact to reduce travel and extent of service network to bring economy and operational efficiency in the city. In this context, the focus of the city shall be people. Planning shall also promote better relationship between living and working by adopting the mechanism of transit oriented development. In this pattern, the focus shall be to provide housing, offices, work areas, commercial and institutions along the mass transport network provided within walking distance. Green spaces on the defined norms shall form integral part of urban living and working in order to promote highest order of environment and ecology. Smart cities will be planned on the basis of inclusiveness, self-reliance and self-sustainability, having minimum impact on local and global environment and ecology.

Considering the major implications of urban areas, being largest consumers of energy and resources, generators of waste and emitters of green house gasses , largely due to transportation and built environment, the new regime of planning will focus on minimising travel and create buildings which are least consumers of energy and resources. Smart planning will focus on creating cities which are highly energy efficient made possible by adopting shape and size of the city which involve minimum travel and services

In addition, to *looking inward*, new regime of urban planning will also be *looking outward* so as to link the city with its surrounding areas/settlements. No city exists in spatial isolation. Every city has its periphery/area of influence to support it. This zone of influence varies with the size, location, primacy, accessibility, population, nature of specialisation, administrative status, amenities, services etc. The existing pattern of urban planning ignores the critical role and importance of periphery in sustaining/rationalizing the city growth and development. In fact majority of prevailing urban ills have their genesis in ignoring the planning, growth and development of surrounding urban/rural settlements. Accordingly, new regime of urban planning will involve an approach which would involve inward and outward looking at the cities. Most efficient cities in the world have adopted *Regional perspective* and not just looking at cities growth. The Regional approach/model has helped them in minimizing local competition and conflicts, over/under investment in infrastructure and overcoming confusion over role and

responsibilities of various agencies and making city smart. In the process, it has promoted higher order of co-operation and growth, of not only of the city but of the region. Looking outward can also help in achieving the objectives of integration and decentralized planning, enshrined in *74th Constitutional Amendment Act,1992.*

Tianjin eco-city, in China, has been planned and developed as a smart city for a population of 3, 50,000 spread over an area of 30 sq.kms. The city is planned as a combination of *Three Harmonies involving social harmony, economic vibrancy and environmental sustainability besides Three Abilities including practicability, replicability and scalability.* These objectives have been achieved by using a derelict/non-arable site with planning based on mixed land use and transit oriented development principles; city mobility based on green transportation providing for increased use of public transport and non-motorised modes involving walking and cycling. Highest quality of life has been achieved by planning extensive green(vegetation) and blue(water) networks, as integral part of city fabric of living and working. For ensuring appropriate quality of life to the residents on sustained basis, planning is based on 22 *quantitative and 4 qualitative Key Performance Indicators (KPIs),*which define the development standards for the city in terms of amenities, services, air-quality, environment, ecology, noise, carbon emission, wetland, buildings, plantation, green spaces, accessibility, housing and employment. *R&D* has also been included as one of the KPI to ensure city growth is based on latest technologies and innovations. Tianjin is envisioned to be a thriving city which is socially harmonious, environmental friendly, resource efficient and a role model of sustainable development. Tianjin eco-city provides a replicable model of planning smart cities in India with appropriate modifications.

MAKING CITIES COMPACT

Smart cities have to be compact. For making a city compact, it has to be planned, designed and developed as a vertical and inward looking city. No horizontal and outward looking city can be smart. Creating compact city would essentially involve promoting high density development for providing large built up area using minimum land. Horizontally spread cities are known to be cost intensive, energy and land inefficient because of larger spread of services and road network. Horizontal spread of city leads to larger travel demand and greater trip length , calling for the provision of large and complex mechanized transportation, making the city large consumer of resources and energy, generating green house gasses, creating more pollution, adversely impacting the health and quality of life of the residents. Horizontal cities invariably lead to numerous operational and management problems besides making the city environmentally unsustainable. It also reduces the productivity and operational efficiency of the city due to large time and resources spent on travel. Compact cities on other hand offer distinct advantages in terms of saving precious land resource, economy in development, energy efficiency, promoting pedestrianization, cycling and mass transportation with least dependence on personalized vehicles. Compact cities are known to make city life supportive of social living and overcoming the two worst gifts of urbanization including travel and traffic. Promoting non-mechanized travel has distinct advantages in improving the health of residents besides making cities more humane and livable due to large personal contacts. Planning vertical cities would however, require new state of art approach to planning. Present approach to city planning would have to be re-defined with new order of development controls put in place. It would also require new planning norms and standards for land use and supportive amenities and basic services to be put in place. Planning vertical cities would ensure that basic principles of city planning are not sacrificed and city would be planned and designed to promote highest order of quality of life, provide high order of productivity and ensure availability of basic services/ amenities to lead an optimum life. Cities of Singapore and New York have clearly demonstrated the distinct advantages of vertical development in promoting quality of life and higher order of operational efficiency. In search of finding optimum solutions to make the city development inward and vertical, Singapore adopted the mechanism of using digital survey of the city, identified buildings which were low rise, evolved a policy and provided incentives to owners to put high rise buildings to replace the low intensity development in order to overcome the problem of high cost of living and provide more housing space in the city. City of New York permitted the sub-division of land and construction of studio apartments on the terraces of the existing buildings to create more housing space in the city. Though the system of re-densification of the existing cities may be slow and cumbersome but new and green field cities offer enormous opportunities to be planned and developed as vertical cities for making them smart. With cities responsible for consuming more than 70% global

energy and generating 75% of green house gas emissions, largely due to transportation and built environment, it becomes critical that both these problems are addressed by planning and designing the cities in a manner that they involve minimum travel and have buildings which are primarily and essentially green. Planning vertical cities would be most desirable and essential because India has only 2.4% of global land with 16.7% of global population to hold/support, which would require land resource to be preserved, conserved, protected and used in a most optimum manner for ensuring sustainability and survival of the country.

SMART BUILDINGS

Buildings have critical role in making the cities smart. No city can be made smart unless it is supported by built environment, which is energy efficient and intelligent because buildings use over 40% world's total energy, 30% raw materials, 25% timber harveste**d, 16% fresh water withdrawal and are responsible for 35% of world's CO2 emission, 40% municipal solid waste, 50% ozone depleting CFC besides making 30% residents having sick building syndrome. With number of people rushing, towards urban centres, energy requirements of cities due to buildings, is going to rise sharply** in future. As per Mckinsey Global Institute Report (April, 2010), *'India Urban Awakening :Building Inclusive Cities'*, India would be required to create on annual basis buildings to the tune of 700-900 million sqmts (*equal to the built up volume of Chicago City in USA*) to meet the needs of urban India. Despite huge projected requirements , very little focus is being given to mitigate the adverse impact on the environment caused by rapid and uncontrolled growth of building industry. Thus building as a sector would require close scrutiny and monitoring for effecting overall economy in the levels of energy consumption and making cities smart.

Green transport

Experience and studies have shown that adopting an integrated approach to design can reduce energy implications of buildings. Integrated approach to building design would essentially revolve round, rational site planning, shape and size of the buildings, built form, surface to volume ratio; promoting building efficiency ,rationalising ratio between length and depth of the building, using simple techniques of building structure, efficient structural design; adopting principles of solar passive techniques , using energy efficient equipment, controlling lighting, heating, ventilation ; using solar energy/air movement, reduced use of transportation energy, low energy components; minimising waste, using local materials, optimising landscaping etc.

Orientation is the most critical factor which needs to be effectively used in all building designs in order to evolve energy efficient building design by making use of solar light/heat/radiation and the wind energy. However, requirements of building design would vary from region to region, state to state and within regions and states. Accordingly, buildings with regard to sun and wind will have to be oriented differently in different regions. In order to ensure that buildings make best use of solar and wind energy, it would be essential that majority of buildings would have the site advantage of having best orientation where such buildings are to be constructed. Accordingly, in this context town planners have important role cast for themselves for ensuring that while preparing the layout plan of the area, highest consideration is given to orientation so that maximum number of plots have the advantage of best orientation. Once this is ensured at the planning level, it would be much easier for the Architects to evolve a design which would be energy efficient. Further, the planners should ensure that ratio of plot width and depth is fixed in such a manner that the entire depth of built up area permitted on a plot should have access to natural light during the day, minimizing the requirement of artificial lighting. This would be particularly important in case of row housing where plots have the option to draw light from front and the rear only.

Designing with nature by making best use of existing natural elements/sources and vegetation, offers the best option of creating green buildings. In order to ensure that buildings are designed as energy efficient, they must be designed to conform to the norms and standards laid down by the IGBC/LEED. In addition, concerted efforts should be made to promote retrofitting of existing buildings to make them energy efficient. Singapore has already drawn a master plan to make all the existing buildings green through a collaborative policy framework involving residents, property owners and the government. Retrofitting of Empire State Building of New York has led to achieving reduction of electricity load for the building to the tune of 3.5 MW and reduction of green house gas emissions by 1,00,000 tonnes over a 15 years period. The payback/recovery period for the $13.1 million spent on retrofitting of building, has been laced at 3.5 years due to saving of energy.

PLANNING SMART/SUSTAINABLE MOBILITY

Cities, as explained above, are known to contribute 70% of global green house gas *emissions,* with majority of contribution coming from transportation and buildings. With traditional fuels, transportation sector alone contributes 45% of total carbon emissions. Challenges posed by transportation sector accordingly remain daunting and formidable in creating smart cities. To overcome these challenges one of the best option would be to promote sustainable urban transport in order to make cities cleaner, greener and smarter. Promoting sustainable urban transport would accordingly form integral and essential part of any strategy to promote Smart Cities. Smart cities would have different order of priority for transportation led by pedestrianization, cycling and public transport with least priority going to personal transport. Smart cities will be planned with priority for people and not for vehicles. In smart cities, sustainable transport would essentially call for minimizing use of personalized vehicles; promoting non- mechanized/ non-fuel based options for travel; using public transport with large capacity, run essentials on non-polluting fuels /electricity; using state of art technologies, making vehicles zero-emission; making cities more compact to limit the need of mechanized travel; using land use planning to rationalize the travel pattern etc. It would also involve use of information technologies as one of the mechanism to reduce travel by using homes as offices, schools, libraries etc.

Study recently made by Central Road Research Institute (CRRI), has revealed that Delhi Metro, having daily ridership of 27 lakhs, has helped in replacing 3.9 lakh vehicles off the Delhi roads in 2014 besides saving Rs 10,364 crores in terms of fuel, pollution and passenger's time. In absolute terms, the annual reduction in fuel consumption has been recorded at 2.76 lakh tonnes, as against the corresponding figures of the year 2011, besides bringing down the travel time of commuters by 32 minutes. In addition to promoting operational efficiency and making Delhi cleaner and green, study furthers states that metro has made the city safer by reducing the number of fatal accidents.

 Draft Concept note evolved by the Ministry of Urban Development for the Smart Cities has defined the transportation parameters for a smart city in terms of maximum travel time of 30 minutes in small & medium size cities and 45 minutes in metropolitan areas; creating continuous unobstructed footpaths of minimum 2m width on either side of all street with right of way of 12m or more; dedicated and physically segregated bicycle tracks with a width of 2m or more, one in each direction, provided on all streets with carriageway larger than 10m ;high quality and high frequency mass transport within 800m (10-15 minute walking distance) of all residences in areas with density of over 175 persons / ha of built Area and access to para -transit within 300m walking distance, in order to promote the use of mass transport for meeting the travel demand of residents with least dependence on individual mechanized transport.

Increased use of environment-friendly public transport systems and halting of urban sprawl in cities can substantially reduce emissions at city level and make cities cleaner, greener, smarter and sustainable.. However, creating sustainable urban transport would require a multi-pronged strategy based on leveraging the advantages of all modes of travel, involving communities and stakeholders besides professionals engaged in urban/transport planning, development and management Our capacity to create sustainable urban transport, through state of art cleaner and greener technologies with innovative city planning, development and management, would hold the key to the productivity, economy, quality of life, sustainability and operational efficiency of human settlements and to make cities smart.

Delhi Metro

LEVERAGING SMART TECHNOLOGY

Smart cities, besides being smart will also have to be intelligent. They will have to be user-friendly and supportive of higher order of productivity and quality of life. Accordingly, state of art technologies will form integral part of planning, development and management of day to day operations of smart cities. Use of *innovative/smart technologies* will promote operational efficiency, bring economy, efficiency in service delivery and promote high degree of urban governance. Globally, successful cities are extensively using *Information Communication Technology (ICT)* to promote good governance, bringing transparency in decision making and involving communities and residents in planning and decision making. ICT is also being used to reduce/bridge gap between people's aspiration and administrative decision making. ICT has critical role in rationalizing traffic and transportation, reducing congestion, creating awareness among road users, reducing pollution and green house

gas emissions. Monitoring of service delivery and plugging leakage in services have been checked effectively by ICT. Technology has also been used to generate enormous data regarding city, its growth, development and operations which serves as a valuable base/input for planning and rational decision making. Intelligent systems have been used to integrate data generated by different sources in the organization at the city level and to bring high degree of integration among the working of the various departments within the organization.

 Many cities have created interactive portals to provide information and promote connectivity with people and for addressing their grievances. Dimming/ switching street lights automatically by using real time data to save 30% on energy cost; using cameras at cross-sections to optimise traffic lights, cut travel times while reducing air pollution and cost of tackling it ; using *One Map*, an online portal, enabling government, business, organisations and residents to access geo-spatial data; using *digital applications* to register concern about streets that require cleaning and potholes needing repair ; posting information online about pending changes to land use plan; sharing data suggesting best bus route for any journey in the city ; engaging *citizens as active partners* in planning and development process; providing drivers with real- time traffic information to avoid congested roads and   city authorities to track traffic volumes and plan for new roads; creating world's *first solar powered bike lane* to make cycle even greener, have been effectively leveraged by cities of Boston, Berlin, California, London, and Bucheon in South Korea to make them smarter and harmonious.

CONCLUSION

Smart city is not a new concept and has been followed globally to improve the quality of living and promote operational efficiency and productivity of the cities. It is an attempt to make cities more livable, sustainable and for creating a brand image to attract investment and make them a tourist destination. Globally , smart cities are characterised by high degree of environmental consciousness; using information technology to promote energy/ resources efficiency; creation of   knowledge infrastructure; promoting sustainable economic development and high quality of life; ensuring wise management of natural resources through participatory action. According to *Forbe*, the structure of smart cities will have to be built on eight pillars involving: 'smart governance, smart energy, smart buildings, smart mobility, smart infrastructure, smart technology,

smart healthcare and smart citizens'**.** Based on detailed studies and in-depth analysis made of the most successful case studies globally, as how to transform cities into great places to live and make a city great, Mckinsey's suggests three pronged strategy involving, *achieving smart growth, do more with less and win support for change*. Considering the entire gamut of urban settlements , a city can be made Smart only if it is *planned smart, developed smart, operated smart, financed smart and governed smartly* .

Compact City as an Option for Making Indian Cities Smart and Sustainable

Compact City as an Option for Making Indian Cities Smart and Sustainable

Abstract—Paper searches for appropriate solutions and options to make Indian cities more sustainable, productive , livable and least consumers of energy and resources. In search for appropriate solutions and options paper objectively looks at the prevailing pattern of urbanization, city planning and development in India; road blocks hampering the sustainability and livability in urban centers; options for making Indian cities promoters of environment and ecology through planning compact cities; adopting mixed land use, minimizing urban sprawl and increasing densities

Keywords— Compact cities, mixed landuse , urban sprawl, density

Introduction

Cities have existed in the past and they shall continue to exist in future also. Cities are known to be definers of history and scripter of the journey of growth and development of mankind. Cities are places where large number of people live and work. They are hubs of governance,, commerce and transportation. Cities are known to be places of concentration, consolidation and dominance besides promoters of economy, generators of wealth and providers of higher order of infrastructure and services. Known for concentration, cities have emerged as centers of innovations, excellence and achievements. Nations and communities depend upon cities to usher an era of quality living and prosperity. With globalization and liberalization dictating the economies, urbanization is known to usher an era of considerable economic and social transformations, putting cities at the centre stage of economic growth and development. Cities enjoy distinct advantages of economies of scale in their operation and management. Due to large concentration of the economic activities, cities are known to be drivers of development and reducers of poverty. Higher levels of literacy and education, better healthcare, greater access to social services and enhanced opportunities for cultural and political participation are the hallmark of urbanization and urban living. However, despite distinct advantages, cities are places where inequality is found to be norm/rule rather than exception with millions of urban residents living in slums/sub-standard conditions. Cities are also known for their dualities and contradictions where poverty and prosperity compete, where skyscrapers and slums are seen to rub shoulders, where unplanned and haphazard development have emerged as the order of the day, where informal sector do not find place in city growth and development and where majority of residents are excluded from the planning process and provision of basic services and amenities. Cities are also known to be promoters of inequality and exclusion besides global warming. Rapid and unplanned urban growth threatens sustainable development and perpetuates adverse quality of life when policies are not implemented to ensure that the benefits of city life are equitably shared with people and communities. Unplanned or inadequately managed expansion also leads to urban sprawl, pollution, and environmental degradation, together with unsustainable production and consumption patterns. Because of large consumers of energy and non-renewable resources, cities are responsible and known to be promoters of climate change and global warming. Considering the role of cities in promoting sustainable, economic and social development besides environmental protection of communities and nations, it becomes critical that a new urban agenda is immediately defined and put in place for integrating all the facets of urban development to promote sustainability and livability in urban settlements. New urban agenda is required to effectively address the emerging threats and challenges and take advantage of the opportunities offered by urbanization to make it more sustainable, productive, effective, efficient and equitable
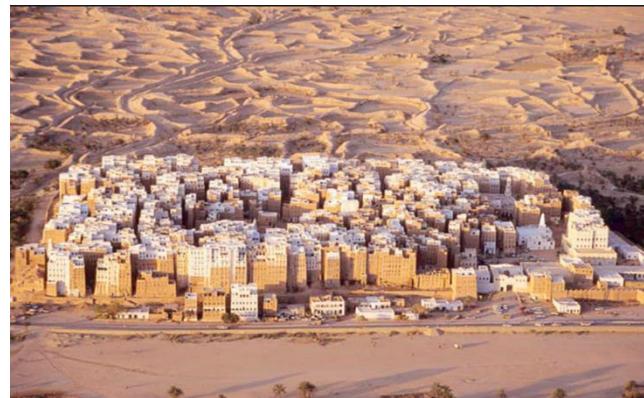
INDIAN URBANIZATION

Indian urbanization, beginning with Indus Valley, has history spanning over 4500 years when cities and towns were largely associated with the seats of administration, capital and trading centers. Context however underwent a qualitative and quantitative change under the impact of industrialization with the arrival of the Europeans in India; large number of adversities and geo-political factors including famine and plague; epidemic; agricultural depression; two global wars; massive migration propelled by partition of country, planning new urban centers, rapid industrialization, green revolution, better basic healthcare, education and entertainment services and amenities; increased mobility, expanded transportation network, better employment opportunities, rapid technological advances and ever increasing trade and commerce, in the post independence period which led to increased footfall in cities. However, Indian urbanization suffers from the malaise of being subsistence in nature,

generally propelled by push factor involving poor migrants moving from rural areas to urban environment for better economic options and employment opportunities, adversely impacting quality of life in the urban spaces. Indian urbanization is distinctly characterized by polarization and concentration of the population, economic activities and services in the metropolitan centers while small towns continue to stagnate. Indian urbanization, globally known for its peculiarities, has been called slow, massive and sometimes disguised by the World Bank. Despite level of urbanization standing at 31.1% in 2011, India as a nation holds the distinction of being the second largest urban system in the world after China.

Year 2007 is considered a watershed in the global demographic history, when for the first time global urban population exceeded the global rural population and the world population has remained predominantly urban thereafter. Year 2011 will be remembered in the demographic history of India for two distinct landmark developments involving; urban India adding more people (91 million) than Rural India (90million) and for the largest growth in the number of towns placed at 2774 (from 5161 to 7935), putting India on the fast track of urbanization.
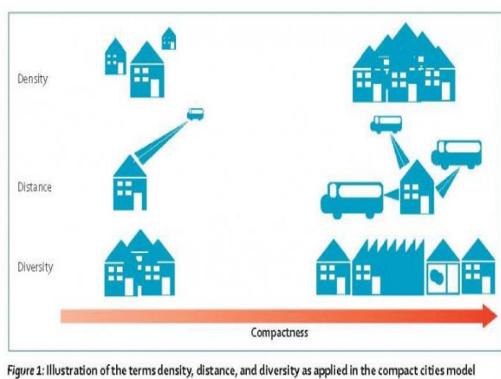

Figure 1: Illustration of the terms density, distance, and diversity as applied in the compact cities model

In the Indian context, next four decades are likely to witness enormous growth in terms of number of urban centers, their size and population. It is estimated that number of urban residents will grow to 590 million in 2030 and 800 million by 2050 when Indian population will be 1.4 billion and 1.6 billion. India is projected to take over China in 2036, becoming the largest populated country globally. Estimates made in World Urbanization Prospects –The 2014 Revision Report of Department of Economic and Social Affairs, United Nations, 'India by 2030 will have 7 cities with population exceeding 10 million and 2 cities of population above 5 million. By 2050 AD, number of Metro Cities will go beyond 100 and 10 million plus cities will be 9 with Delhi becoming second most populated agglomeration in the world after Tokyo city'. In the given context, urban centers are likely to emerge as major settlements, housing large proportion of Indian population besides making sizeable contribution to the national(75% in 2031) and global economy. Urban India would be the major propeller of economy, generator of employment and scripter of the future growth and development story of India. To make this a distinct reality, cities will require a new order of growth agenda and large investment and efforts from all stakeholders to meet the greatest challenges of providing adequate shelter, healthcare , education, mobility, water sanitation and poverty, pollution, exclusion and quality of life in urban India. With urban population reaching 590 million in 2030, greatest challenge before urban planners, architects and policy makers would be, how to harmonize the growth and development of urban India and make it rational.

Growth of cities is largely dictated by urban planning, development and management processes. Uncontrolled and haphazard pattern of urban expansion is considered wasteful both in terms of land, energy consumption and greenhouse gas emissions. Accordingly, it will be appropriate to look at the prevailing planning, development and management practices in India , identify roadblocks and redefine new order of urban planning and development options to make cities smart, green, more humane, equitable, just, efficient, productive, sustainable and providers of assured quality of life to all urban residents including poorest of the poor.

III. PLANNING FOR COMPACT CITIES

Cities have been globally recognized to be major catalyst for promoting global warming and climate change, being largest consumers of fossil fuel based energy and generators of green house gas emissions. Cities, are known to consume 60 to 80 per cent global energy , and generate 70 per cent human-induced greenhouse gas emissions, primarily through built environment and transportation .However, cities offer numerous opportunities and options to develop, mitigation and adaptation strategies to deal with climate change and sustainability especially through urban planning and design process by rationalizing land use pattern , adopting innovative design solutions, prescribing optimum densities and creating green travel options which minimizes car ownership and promote walking, cycling and public transport.

Unfortunately, all our urban planning tools and planning strategies have been leveraged to promote rapid expansion and sprawl of cities, both in population and area. Majority of the Master plans prepared for promoting

the planned development of the urban areas have used the mechanism of providing series of ring roads and bye-passes around the existing cities to create additional urban areas and promote faster movement of vehicles. Focus has always been planning for vehicle rather than people and promoting decentralization of population and activities. This has led to uncontrolled expansion and urban sprawl in physical terms leading to increased distances between places of living and working and entertainment besides accessing basic amenities and services used by urban inhabitants. Accordingly, urban areas are witnessing increased number of vehicular trips and trip length leading to building more roads, encouraging more car travel and creating more air pollution, making cities expand outward. Studies have revealed that urban dispersal is known to cause 20 to 50 per cent higher air pollution than compact development. In addition, urban sprawl has proved to be economically inefficient, especially in the provision, operation and maintenance of services and infrastructure because of larger length ,breadth and depth of urban services network. Urban sprawl is also known to be large consumer of agricultural land. India, with only 2.4% of the global land and home to 16.7% of the global population, is already highly land stressed. As the negative environmental, economic and social effects of urban sprawl become increasingly visible through traffic congestion, social isolation and the continual loss of valuable land on the urban fringe, it becomes clear that continuing this pattern of development into the future will be highly unsustainable. Accordingly, urban planning must focus on making cities least consumers of land and resources by making them look inward. All urban policies and planning tools which make cities look outwards and promote urban sprawl have to be replaced to make cities look inward and more compact.

Existing urban planning practices based on the principles of low density development, automobile dependency and single-use development are known to be promoters of urban sprawl and economic, social and environmental un-sustainability. This outlines the need for change the way urban areas are being planned and designed to make them more sustainable. The Compact city hypothesis, introduced as an alternative to urban sprawl, focuses on optimizing the use of urban land, limiting the peripheral expansion, intensification of activities, increasing densities, minimizing mechanized transportation, minimizing car ownership and redeveloping underused or abandoned sites. The compact city model will help in promoting efficient use of existing land resources and infrastructure, as well as reducing automobile usage and promoting public transportation ,which becomes more viable at higher urban densities.

Compact city, as a concept, has gained global acceptance among planners and urban designers because of its distinct advantages. Compact cities are known to create urban settlements which are human centric with relatively high densities, using mixed land-uses with considerable design quality.These cities are known to be oriented towards high degree of public transport accessibility with focus on walking and cycling as preferred mode of travel. Compact cities are known to be anti-thesis and antidote to excessive urban sprawl, mono-functional suburban housing, and peri-urban development besides promoters of the sustainable development within the urban environment. As per, Burton, 2002, compact city is distinguished by three essentials identified as : a high-density city, a mixed-use city, and an intensified city , in which first two are related to the form of the compact city, while the third focuses on the process of making the city more compact. The third point remains most critical because there are few opportunities for a compact city to be created from scratch (Williams et. al., 1996: 83). Objective of creating compact cities can only be achieved through a process of making existing cities more dense by creating building at higher densities and mixing of compatible urban uses. Mixed-use development traditionally reduces travel times by locating businesses among residential areas in close proximity, making more people to walk or cycle to work, while reducing the distance travelled to conduct daily activities in comparison to single-use dominated cities. Mixed-use development has the distinct advantage of promoting economic sustainability for local businesses, as they are located within close proximity of a greater number of people, therefore increasing 'foot-traffic' and improving social equity through decreasing the need to own an automobile to access many of the destinations required by local residents. Options for mixed-use development could be a horizontal (where individual developments of different uses sit side-by-side) or vertical (a variety of use within the individual building) mix of uses within the same development.

Compact mixed-use nodes reduce journey requirements and create lively sustainable neighbourhoods

Zoning of activities leads to reliance on the private car.

Compact nodes reduce travel and allow walking and cycling.

In addition to mixed land use, planning of compact cities will be largely guided by principle of optimizing the land resource by using land on the principle of 24x7; where number of public amenities and services will be provided on multiple use basis; where the open areas provided with institutions   will also be available to communities for their daily use and where institutions will be used on multiple basis. Planning of compact cities will need new order of land use pattern where the area under traffic and transportation will be reduced due to minimization of mechanized travel, planning norms for amenities and services shall be rationalized and plotted development shall be replaced by mixed-use flatted development to achieve higher densities and promote compactness. Building bye-laws and development controls will have to be re-defined to permit more built-up area using minimum land. City shape and pattern of growth will also undergo qualitative change to achieve higher operational efficiencies and minimize urban sprawl. In nutshell, a new regime, order and pattern of urban planning , urban development and urban legislation shall be required to be put in place to achieve compactness of cities.

Considering enormous environmental concern cities have, compact cities offer distinct advantages as promoters of sustainability because of shorter distances to be travelled, reduced number of vehicles on the roads and lower energy consumption. These cities are also known for their livability and quality of life due to less pollution and lesser number of vehicles on the roads. Compactness also makes cities more inclusive by making them people centric. In addition, they offer urban environments which is operationally efficient because of having high degree of utilization of urban infrastructure and services. Dense development also makes cities highly land and resource efficient. Compact city also enables promoting a culture of shared economy, where individual ownership of goods and services is transferred across the neighborhood and communities. Compactness also makes city safe against crime and promoters of more social interaction, making cities socially more vibrant. Because of less car-oriented, these cities are more community oriented and offer distinct social advantages as neighbors know each other more, and there is high degree of human interaction and exchange. Because of high correlations between compactness and productivity, agglomeration effects are key for growth for innovation . Compact cities with green public transport, offer major health benefits by making people more active ,healthy and productive as they walk and cycle more.

IV CHALLENGES OF A COMPACT CITY

Compact city, despite numerous advantages, offer distinct challenges to planners, architects and administrators to make them sustainable These challenges can be enumerated in terms of issues related to affordability, environment, traffic and transportation and heat island. Many cities that have successfully become more compact have also seen a considerable increase in real estate prices making them unaffordable for majority of urban residents. Accordingly, it will be critical for cities to think and plan for housing affordability and making cities inclusive while promoting compactness. Compact city policies also need to consider its impact on environment due to urban heat island effect. In order to create ambient temperature, city will also have to create large green spaces to minimize adverse impact of compactness on the pattern adopted by Singapore. However, green spaces, unless managed properly, may lead to higher temperatures in more compact, dense, urban environment.

Transport will be another issue requiring focused attention. While minimizing dependence on the personal vehicles, adequate opportunities will have to be created and made operational for seamless mobility in the city through an efficient and smart public transport system in order to make the concept workable and sustainable. This will also include providing attractive and safe options for pedestrians and cycling within the city. Traffic and transportation planning will have to be done with care and caution making communities as active partners. However, there cannot be a straight jacket option for achieving compactness in urban settlements. It has to be city specific, depending upon social, physical, environmental and economic fabric of the city. It will be rational on the part of city authorities to conduct a comprehensive socio-economic survey, identify areas which are vacant, derelict, unused, abandoned, underused, misused and abused within the urban limits and take up their development based on well defined planning and development norms in order to optimize their use and integrate them with the city development process. Buildings, which are not built to their optimum capacity, will also have to leveraged with owners made to undertake construction up to prescribed height consuming total permitted floor area ratio.

Singapore has already developed a master plan for the city, containing development options for all available land parcels/properties under plotted development to be converted into flatted development. There are many cities in India, which are already hyper dense. Such cities will have to expand into their hinterlands ideally along rapid

rail corridors with key elements of compact urban growth attached, In case of cities where the existing urban footprint of the city allows for urban growth, at least for the foreseeable future, it will be appropriate to accommodate most of the urban growth within the existing city. However, green field cities offer numerous options to make them compact. Researchers globally remain sceptical about the benefits and acceptability of the compact city , questioning whether such an approach could be feasible and acceptable because of restriction it imposes on the individual choices over the location and size of their dwellings, which has been the major cause of sub-urbanization and decentralization of most cities in the developed world.

V CONCLUSION

Cities and towns remain critical in chartering and scripting the India's development trajectory. Structural transformation of the Indian economy, sustaining high rates of economic growth and realization of India's economic potential will largely be contingent on the efficacy and efficiency of urban settlements and rationalization of the process of urbanization. Well-managed, urbanization is known to fosters social and economic advancement and improved quality of life. However, urban India is facing greater challenges than ever in terms of growing number of urban residents living in informal settlements , inadequate urban services, climate change; exclusion and rising inequality and poverty; rising insecurity; growing migration, rising global carbon emission. The current models of urbanization and urban planning are highly unsustainable. Majority of Indian cities lack planning, capacity and preparedness to manage effectively the challenges associated with rapid and massive urbanization. Accordingly, a new agenda is required to be scripted and defined to effectively address these challenges and take advantage of the opportunities offered by urbanization. The new urban agenda should promote human settlements that are environmentally sustainable; socially inclusive and economically productive. Compact city, as a model of urban intensification, offers enormous opportunities to make cities more sustainable. Accordingly, appropriate urban planning, development and management framework needs to be evolved and made operational to make compact city model a distinct reality.
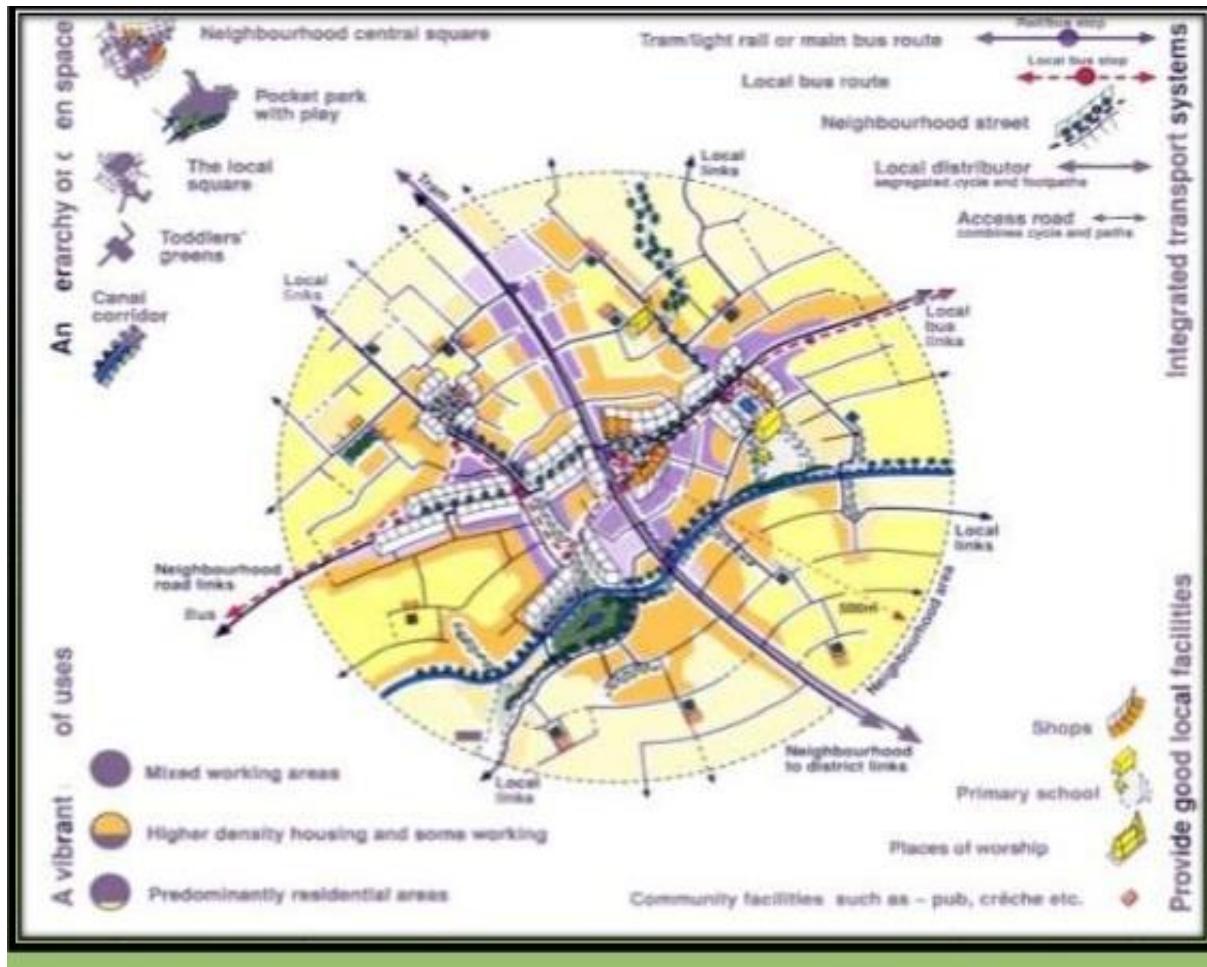
Planning and Designing Sustainable Cities in India

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Abstract

Nations and communities depend upon cities for ushering an era of quality living and prosperity. Despite numerous advantages, cities are also known to be centres of dualities and contradictions; where poverty and prosperity compete; sky-scrappers and slums rub shoulders and where unplanned and haphazard development have emerged as the obvious and preferred choices of development. Besides being creators of wealth, cities are also known to be promoters of poverty and exclusion. Majority of cities are unable to meet the basic human requirement of shelter, water and sanitation of its residents. Consuming more than 75% of global energy and generating 70% of carbon footprints, cities are also known to adversely impact ecology / climate, leading to local and global warming. Cities, as consumers of energy and resources besides being generators of the waste and promoters of poor quality of life, have their genesis; in the manner they are planned ; the way building are designed ; manner in which people are made to travel and the way cities are managed and governed. This calls for rationalising and redefining the planning, designing and management of cities, so as to make them inclusive, people centric and providers of basic amenities and quality of life to all the urban dwellers irrespective of their age, gender, economic/social status, Looking at the emerging issues and challenges facing Indian urban centres, paper focuses on suggesting strategies to make these cities more inclusive, sustainable, productive , livable and least consumers of energy and resources. In search for appropriate options, paper looks at the existing pattern of Indian urbanization, prevailing practices and tools used for planning and designing urban areas and road-blocks hampering the sustainability and livability in these centres. Paper suggests options to make cities promoters of environment and ecology by making them compact; promoting smart/sustainable buildings; leveraging smart technologies and ensuring good governance.

Key words: Compact cities, Green buildings, Green Travel, Smart Technologies, Governance

Inroduction

Being integral part of human history, cities are known to be definers of the journey of human growth and development. Cities have existed in the past and shall continue to charter the destiny of nations and communities in future also. Globally, urbanisation and development have been known to have positive co-relationship, with all developed nations recording higher urbanisation level. Led by industrialisation, globalisation, liberlisation and opening up of economies, cities have found favour with people in general and rural population in particular, as a preferred destination for finding better avenue of employment, skill development , education and healthcare. Accordingly, urbanisation is gaining momentum across the globe with developing countries recording higher urban population. Following the pattern and propelled by massive addition to urban population, India as a nation , is passing through an era of rapid and massive urbanisation.Despite standing at low level of urbanisation, placed at 31.1% (2011 census), India as a nation is known as second largest urban system globally after China, with 378 million people living in 7935 urban centres Estimates made by McKinsey Global Research Institite and the World Bank have placed urban population at 600 million in the year 2031 and 800 million in 2051, when India will become the most populated country in the world with total population standing at 1.4 and 1.6 billion respectively. Thus another urban India will be added in next four decades, since last Census in 2011, to the existing urban population when Indian urbanisation will increase from 31.1% to 50%.This growth will be mostly concentrated in the larger cities. India then will house 9 largest cities with population exceeding 10 million with Delhi emerging as the largest urban agglomeration globally with population placed at 35 million, religating Tokyo in the second position.

Known for concentration of population, activities and institutions besides being promoters of economy, generators of wealth and providers of quality infrastructures, cities have emerged as centres of performance, innovations, excellence and achievements.In the process cities make major contribution to the economy and employment in the country. With merely 31.1% population, urban India generates 60% wealth of the nation. This proportion is likely to go up with urbanisation level going up.. Despite making large contribution to economy and prosperity,Indian cities have been growing in an irrational,haphazard and unplanned manner. Majority of urbanites face exclusion from shelter, healthcare, water, sanitation and employment because cities are unable to provide them these basic services.In the process majority of urban population lead a life of deprivation , exclusion and anonymity. Considering the high cost of living coupled with low capacity to pay for shelter and services, cities face enormous onslaught of slums and shanties.Every sixth urbanite in India is a resident of slum, with more than half of Mumbai and Delhi population being recorded as slumdwellers. Slums are known to perptuate most inhuman living condition adversly impacting the heath hygiene and productivity of the human being. It is said that urbanisation perse is not bad but it is the lack of capacity of cities to provide basic services which makes city living highly challenging.In addition, cities are suffering from the onslaught of rural poverty migrating to urban area with traffic and transportation becoming major challenge and cities facing enormous problems of ground, water and air pollution.Existing pattern of planning and development has done more damage than good to city fabric. Master Plans prepared for the cities have emerged as the greatest roadblock in the rational growth and development of urban settlements.Cities are being managed with proxy. Multiplicity of planning and development agencies with overlapping areas of operation has led to wastage of precious resources.Despite putting in operation 74th constitutional Amendment in 1992, city still lack ownership. Looking at the entire context, Indian urbanisation can be rightly called, Urbanisation of Population, Urbanisation of Poverty and Urbanisation of Pollution. Thus in order to enable cities to play their designated role in city growth and development and to achieve the agenda defined in Sustainable Development Goal- 11, to make cities inclusive, resilient, safe and sustainable, it becomes crucial that process of urbanisation and urban development is rationalised so that cities are made more productive, livable and sustainable. Indian urbanisation accordingly needs to be rationalised/redefined with city development put in order by evolving a new agenda and framework for planning of human settlements, designing of buildings, rationalising travel and putting in place higher level of urban governance besides using state of art technologies to impart higher order of operational efficiency, making cities more productive, livable and providers of basic amenities of life, even to the poorest of poor to lead a dignified life.

Compact City

Since the inception of civilisation on this planet, human settlements have been evolving and devolving in shape, size, form, contents, area and complexity. Planners have been involved in creating settlement typologies which have focus on making human living more effective, safe, pleasant and efficient. Considering the large growth of population, size of cities, ever increasing demand for vehicles as preferred mode of travel and numerous problems faced by cities and towns, a new urban typology in the shape of Compact City, is fast gaining global acceptance among planners and urban designers to take care of majority of urban ills.

IEREK defines Compact City as," *City of short distance promoting relatively high residential density with mixing of various activities and providing required infrastructure facilities within walkable distance."* Compact city concept aims at creating humane, diverse, compact, and mixed neighbourhoods based on the principles of a high-density mixed-use, and intensified urban form. It is based on the principle that urban activities should be located closer/ together to ensure better access to services and facilities via public transport, walking, and cycling, and more efficient utilisation of utilities and infrastructure. Compact city leverages the human scale for achieving better quality of life. It focuses on protecting the local environment as key components of planning. In addition, compact city aims at providing a pleasant, comfortable, interesting, and safe environment for pedestrians, by providing affordable alternatives to car use in terms of public transit and cycling facilities

Compact cities are also known to be more humane and for their capacity and advantage to create urban settlements which are socially vibrant and human centric with considerable design quality. They are also known to be least consumers of land resource and promoters of land optimization. These typologies are known for reducing mobility and promote accessibility with city movement oriented towards high degree of public transport accessibility with focus on walking and cycling as preferred mode of travel. Compact cities are based on the principle of building thick not shallow; building mix not pure; building inside not outside; building flatted not plotted ; building society not individuals and building vertically not horizontally. Accordingly these cities are labelled as anti-thesis and antidote to excessive urban sprawl, mono-functional suburban housing, and peri-urban development.

 As per, Burton, "Compact city is distinguished by three essentials : a high-density city, a mixed-use city, and an intensified city , in which first two are related to the form of the compact city, while the third focuses on the process of making the city more compact". Third point remains most critical because there are few opportunities for a compact city to be created from scratch (Williams et. al., 1996: 83). Objective of creating compact cities can only be achieved through a process of making existing cities more dense by creating building at higher densities and mixing of compatible urban uses. Mixed-use, high density and compact development are known to be reducers of travel times by locating businesses, schools, healthcare and entertainment among residential areas in close proximity, making more people to walk or cycle to work, while reducing the distance travelled to conduct daily activities. Mixed-use developments are also known to have the distinct advantage of promoting economic sustainability for local businesses, as they are located within close distance. Options for mixed-use development could be both horizontal / vertical/ mix of uses within the same space/development.

In addition to mixed land use, planning of compact cities will be largely guided by principle of optimizing the land resource by using land on the principle of 24x7x365; where number of public amenities and services are provided on multiple use basis; where the open areas provided with institutions will also be available to communities for their daily use and where institutions will be used on multiple basis. Planning of compact cities will need new order of land use pattern where the area under traffic and transportation will be reduced due to minimization of mechanized travel/parking, planning norms for amenities and services shall be rationalized and plotted development shall be replaced by mixed-use flatted

development to achieve higher densities and promote compactness. Building bye-laws and development controls for this typology of development will have to be re-defined to permit more built-up area using minimum land. City shape and pattern of growth will also undergo qualitative change to achieve higher operational efficiencies and minimize urban sprawl. In nutshell, a new regime, order and pattern of urban planning, urban development and urban legislation shall be required to make compact city a distinct reality..
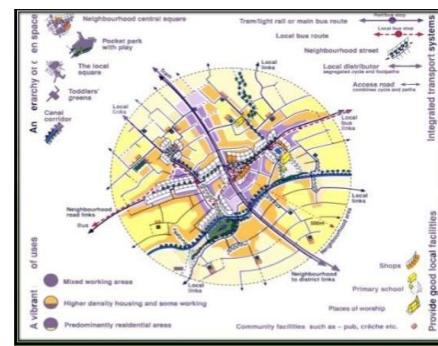
 Compact cities offer distinct advantages as promoters of sustainability and safety because of lesser car dependency; reduced number of vehicular traffic; shorter trip length; reduced number of trips; reduced road accidents; low vehicular emission; reduced fossil energy consumption; etc Compact cities are also known for their high degree of liveability and quality of life due to less pollution and lesser number of vehicles on the roads. Compactness also makes cities more inclusive by making them people centric. In addition, they offer urban environment which is operationally efficient because of having high degree of utilization of urban infrastructure and services. Dense development also makes cities highly land and resource efficient. Compact city also enables promoting a culture of shared economy, where individual ownership of goods and services is transferred across the neighbourhoods and communities. Compactness also makes city safe against crime and promoters of more social interaction, making cities socially more vibrant. Reduced number of cars make compact cities more community oriented and offer distinct social advantages as neighbours know each other more, and there is high degree of human interaction and exchange. Because of high correlations between compactness and productivity, agglomeration effects are key for growth for innovation . Compact cities with green public transport and more green spaces, offer major health benefits by making people more active, healthy and productive as they walk and cycle more.

GREEN BUILDINGS

Buildings, as living organism and manmade environment, have critical role in defining the basic fabric, personality and sustainability of human settlements because they have been integral part of human history, growth and development since inception. Buildings are also known to be vital for human living; container/platform of all human activities; largest consumers of energy (50%); largest consumers of resources (30% global raw materials); largest generators of solid waste (40%); largest polluter of environment /ecology; responsible for largest carbon footprints (35% of world CO2 emission); responsible for global warming; major determinant of global sustainability. Buildings have also major implications for human living because 80% of human life is spent within four walls of buildings. Buildings have also their share   in making people healthy/sick due to sick building syndrome and remain vital to address / overcome   human/ ecological concerns. Accordingly making buildings green/sustainable remains essential to make city smart and make value addition to resources, environment and ecology of any human settlement. Studies have shown that Green School buildings makes learning easy and more meaningful; Green Home makes people happy and healthy; Green Hospital cures patients quickly and Green shopping mall increases sale / profits.

As per Mckinsey Global Institute Report (April, 2010), *'India Urban Awakening :Building Inclusive Cities'*, India would be required to create, on annual basis, buildings to the tune of 700-900 million sqmts to meet the needs of urban India. Making buildings green assumes importance in the context of sustainability of urban settlements because India is on the cusp of massive urbanisation requiring large volume of buildings to be constructed to accommodate massive addition to urban population. Thus building as a sector would require close scrutiny, rationalisation and monitoring for effecting overall economy in energy/resource consumption and making cities sustainable by creating green built environment. Green buildings are known for their capacity to reduce energy use up to 50%, water consumption by 40%, reducing solid waste generation by 70% and carbon footprints to the extent of 39%. Thus green buildings assume importance for promoting the sustainability of urban settlements because buildings constitute largest mass of cities /towns.

 Green buildings have been defined as, "Buildings which use less water, optimise energy efficiency, conserve natural resources, generate less waste and provide healthier spaces to occupants as compared to conventional buildings". Designing green buildings require an integrated and team (architect, structure/civil/public health/electrical/service engineers, landscape expert etc) based approach as compared to individual approach in case of traditional buildings. Green buildings looks at the life cycle cost, optimisation of resources and reducing both maintenance and operational cost of buildings. It makes optimum use of natural resources of sun/wind for meeting the needs of air, light, ventilation and heat of the occupants. It looks at the passive system to create ambient living conditions within buildings rather than active systems. Design solutions for green buildings are based on adopting an integrated approach to design involving number of elements including study/analysis of macro/micro climate; site climate; building orientation; sun movement; wind movement; planning of buildings; building envelop design; fenestrations; shading devices; materials/construction technologies used; indoor air quality etc Integrated approach would also involve, rational site planning, optimising shape and size of the buildings/built form, minimising surface to volume ratio; promoting building efficiency ,rationalising ratio between length and depth of the building, using simple techniques of building structure, efficient structural design; adopting principles of solar passive techniques , using energy efficient equipment, controlling lighting, heating, ventilation ; using solar energy/air movement, reducing embodied/ operational energy, using low energy components; minimising waste, using local materials in natural form, optimising landscaping etc. Orientation plays critical role in evolving energy efficient building design by making optimum use of solar light/heat/radiation. Considering the variation of requirement of heat, light, air and ventilation in different climatic regions, requirements of building design would vary from region to region, state

to state and within regions and states. Accordingly, buildings with regard to sun and wind will have to be oriented differently in different climatic zones. Designing with nature, making best use of existing natural elements/sources, respecting site, climate and vegetation, offers the best option of creating green buildings. Conforming to the norms and standards laid down by the IGBC will help in designing green buildings .In addition to designing green buildings , retrofitting of existing buildings will go a long way in promoting urban sustainability. For promoting urban sustainability, Singapore has already drawn a master plan to make all the existing buildings green through a collaborative policy framework involving residents, property owners and the government. Retrofitting of existing buildings and making them green has already been launched by New York city by taking up retrofitting of Empire State Building leading to reduction of electricity load to the tune of 3.5 MW and green house gas emissions by 1,00,000 tonnes over a 15 years period . Green buildings offer a win-win opportunity to both owners and occupants of buildings.

SMART TECHNOLOGIES

In this era of globalisation, liberalisation and complexity of urban operations, technology has been found to have great role in effective and efficient planning, state of art development, qualitative management, efficient operation and governance of cities. Globally, technology has been found to promote better, cost-effective, cheaper, time-efficient, faster, scalable and easy to use solutions for everyday problems cities face. Technologies are known for their capacity to define and improve how cities will operate and people would live and work. Globally, cities are looking at the ever changing and ever growing technologies, including automation, electric vehicles, robotics, bio-technology, artificial intelligence, internet of things, renewable energy etc , which are known to transform social, economic and environmental quality of cities and communities living therein. Looking at the role and importance of technologies, UN Habitat has adopted,' Frontier Technologies as an Innovative Tool to Transform Waste to Wealth', as the theme for World Habitat Day 2019, which is celebrated globally on the first Monday of October every year. For making cities, sustainable, user-friendly and supportive of higher order of productivity and quality of life they have to be technology oriented   with technologies forming integral part of the planning, development and management process of their day to day operations/policy formation.

 According to **Mahashreveta Choudhary**, six technologies remain crucial to make cities smart and sustainable, which include; Information and communication technology, Internet of things, Sensors, Geo-spatial technology, Artificial intelligence and Blockchain technology. These technologies can help in creating two-way communication and bridging gap between government and citizen; building cities of citizen choice; creating pool of resources and collective intelligence for resource optimisation; managing resources; bringing all services on same platform; providing smart solutions; processing, securing and interpreting data;, managing electric grid, traffic mobility, healthcare; boosting safety, security and transparency.

 Use of *innovative/smart technology* will promote operational efficiency, bring economy, efficiency in service delivery and promote high degree of urban governance. Globally, successful cities are extensively using *Information Communication Technology (ICT)* to promote good governance, bringing transparency in decision making and involving communities and residents in planning and decision making. ICT is also   being used to reduce/bridge gap between people's aspiration and administrative decision making. ICT has critical role in rationalizing traffic and transportation, reducing congestion, creating awareness among road users, reducing pollution and green house gas emissions. Monitoring of service delivery and plugging leakage in services have been checked effectively by ICT. Technology has also been used to generate enormous data regarding city, its growth, development and operations which serves as a valuable base/input for planning and rational decision making. Intelligent systems have been used to integrate data generated by different sources in the organization at the city level and to bring high degree of integration among the working of the various departments within the organization. Technology helps in bringing broad spectrum of expertise including financing, urban planning, architecture, transport and energy on the same platform for conceptualising and implementation of various projects which make cities sustainable. Technology has also been leveraged to impart efficiency in service delivery, promoting optimum utilisation of resources, monitoring effectively air pollution, rationalising vehicle traffic flows, optimising energy consumption, ensuring smart healthcare, formulating rational plans, promoting safety, making projections and evolving strategies for different services. Technology also helps in managing end-to-end data in a secure way for making cities sustainable. Globally, sensors, smart networks, common platforms, and projects are known to make up a sustainable city. In Brussels and Paris technology has already been deployed/ planned to

promote driverless trains, improved video surveillance, and a host of operational efficiencies. Looking at the entire context, technology has relevance in all operations and services which a city undertakes and provides. Sustainability of cities will be largely governed by efficacy and efficiency of technologies which will be made applicable to cities. Technology has been used by, Pavegen a London-based clean tech company,   which developed flooring that generates energy via people's footsteps; Western Australia. created Carnegie Perth Wave Energy Project to fully utilize the powerful waves; Lucid Pipe allows residents to generate electricity whenever they turn on their water taps and flush their toilets, with the help of turbines that are installed within the existing pipe. Quay Valley located between Los Angeles and San Francisco , is poised to become one of California's newest towns in 2016,which will be 100% self-sustaining with the help of solar power and its Hyperloop, an advanced transportation network that reduces the need for pollution-causing transportation (e.g., cars and buses). **Parking apps has been used extensively by cities** to inform drivers about the nearest available parking spot, saving commuters time, gas, emissions and money, while also easing the flow of traffic. **City guide app,** with information about museums, parks, landmarks, public art, restaurants and real-time traffic data, launched by Baltimore, Ottawa, Charlotte and New Orleans have helped citizens and tourists to improve their experience in the city.

GREEN TRANSPORT

Ever increasing concentration of large population and activities in a relatively small area, are fast emerging as the major challenges of the urban development for promoting seamless mobility of men and material. Traffic volumes are growing rapidly with massive influx of population coupled with haphazard and unplanned pattern of urban growth, characterized largely by the sprawling conurbation, scattered and unstructured physical expansion of urban centres. These patterns of urban growth have led to larger trip length by increasing distances between place of work, place of living, place of trade and commerce, place of leisure etc. Increasing number of trips and trip length has led to placing large demand on transport network to move large number of people from one place to another.

Looking at the prevailing pattern of urban growth and development, emerging transportation scenario in India is going to be both chaotic and complex, marked by dualities and contradictions. Despite poor road geometry and low holding capacity, vehicular population on Indian roads is increasing rapidly. Despite lack of parking areas, more and more vehicles are being added into cities, occupying every available road space including open spaces. Accordingly, cities are facing high degree of vehicular congestion; long delays and raised cost of business; extremely low vehicular speed; high degree of air pollution adversely impacting the life /health of the people; large number of road accidents leading to loss of precious life and property and emission of large volume of green house gasses and global warming.

 Instead of providing safe and seamless mobility and operational efficiency, urban transportation has emerged as the major roadblock and threat to safety, economy, environment and sustainability of cities. With people spending one sixth of daily hours in travel and traffic, millions of precious man- hours are lost to posterity every day. Transportation is accordingly adversely impacting the productivity and quality of life of majority of urban residents. Every hour 55 accident takes place and every 3.5 minutes a human life is recorded to be lost on Indian roads. In the process, travel and traffic blues are fast emerging as two major threats to the safety, productivity, operational efficiency and sustainability of the urban canters. This calls for making transportation system more sustainable, effective and efficient, if the cities are to be made sustainable, livable and productive.

Sustainable transportation has been defined as," the capacity to support the mobility needs of a society in a manner that is least damaging to the environment and does not impair the mobility needs of future generations

(Rodrigue)". In order to promote sustainable urban transportation, mobility needs of the society has to be minimised and transportation as a sector needs immediate review and rationalization. Strategies for the urban mobility will have to be based on both hard (infrastructure) and soft (planning) options. Transportation being a function of land use planning, accordingly for sustainable transportation, urban planning process would need a critical review and revision. Present approach to planning of cities based on pure land use planning and expanding urban limits has to be replaced by mixed land use planning and making cities more compact. Accordingly, this would call for reviewing density and floor area norms so that city growth is directed inside not outside. In addition, transport network needs to be made focus of urban development so that living, working, healthcare, education, trade and commerce is located along the travel network to promote accessibility. Cities need to adopt the concept of transit oriented development leading to linear development and mixed lands use as the option for shaping the cities. Future planning of cities should be integrated with traffic and transportation planning in order to promote better accessibility. In addition, options for city planning has to be redefined by changing focus from planning for vehicles to planning for people and promoting accessibility not mobility. To achieve this, order of mobility in cities will require re-definition with highest priority going to pedestrianisation, followed by cycling, mass transportation with least priority going to personalised vehicles. In addition to redefining planning of urban settlements and changing order of travel, the strategies for traffic rationalization in urban sector should essentially revolve around and focus on:

- o Minimizing travel demand
- o Rationalizing travel demand
- o Minimizing trip length.
- o Minimizing mechanized movement.
- o Minimizing pollution.
- o Minimizing personalized vehicles on roads.
- o Minimizing congestion.
- o Minimizing accidents
- o Promoting safe, comfortable and affordable travel
- o Promoting sustainable transportation.
- o Promoting highest order of traffic managements

To achieve the above objectives, the options suggested would be:

- o Redefining urban planning.
- o Redefining shape and size of cities
- o Making cities compact
- o Making transportation integral part of city planning
- o Promoting sustainable communities
- o Reordering prioritization of modes of travel .
- o Promoting pedestrianisation.
- o Promoting bicycles
- o Making public transport more equitable, reliable, affordable, safe, comfortable, efficient and user friendly
- o Equitable allocation of road space.
- o Integrating public transport system
- o Traffic Calming
- o Road Pricing
- o Creating public awareness
- o Involving communities/ stakeholders
- o Creating unified traffic and transportation authority at local level
    .

Making transport planning integral part of city planning would help in rationalizing the transportation within the urban centres. If future growth of any city is dictated by a pre-defined traffic network, the city has much better chance/opportunity of serving its entire population and yet minimizing travel needs. In addition, addressing the issue of regional connectivity would go a long way in rationalizing both inter and intra-city traffic and save cities from the traffic blues. Objective of establishing a sustainable urban transport system in Singapore has been achieved by;

- Developing road network to include maximized capacity;
- Improving quality/efficiency of existing transportation modes (rail and bus);
- Managing car population and demand of road usage to reduce congestion

- Minimizing travel by incorporating transportation in land use planning

GOOD GOVERNANCE

Studies made globally of the existing vibrant cities in the world, has revealed that good urban governance is a pre-requisite for any city to become sustainable and smart. Credibility of such cities has been largely built on the governance model they adopted and excellent leadership they had. United Nations Economic and Social Commission for Asia and the Pacific has defined, "*Governance as the process of decision-making and the process by which decisions are implemented (or not implemented)*" Since Governance deals with decision making, accordingly it will be important that all decisions taken by the authorities, regarding planning, development and management of the urban centres, are rational and based on premise of serving the larger public interest besides being promoter of urban sustainability . Commission has emphasised the role of Good Governance as the panacea for all urban ills and Bad Governance as one of the root causes of all evil within our societies/cities. For having good governance, it will be vital that cities must have ownership. Unfortunately, with large number of agencies operating in the urban India, ownership of urban areas remains diluted and hazy. Accordingly, it will be critical city ownership needs to be created at local level so that good governance is made operational. Looking at the entire context, urban local body seems to be the only agency, which is closest to the people at the local/community level that has intimate knowledge of city fabric, deserves to be vested with city ownership at local level. Accordingly, urban local bodies should be adequately strengthened in terms of their administrative, fiscal, technical and political capacities to enable them to emerge as governments in their own right and discharge all their obligations to urban centers with effectiveness and efficiency. 74th Constitutional Amendment Act has already mandated and laid down a framework for action in this regard. However, there is an urgent need to made structural, legal and functional changes at the state and local level on priority to make urban local bodies effective institutions of self-governance. *UN Commission has listed eight fold pre-requisites for any agency for achieving good governance in urban centres which include; Transparency, Accountability, Consensus , Responsiveness, Effectiveness & Efficiency, Equitable, Inclusive and following the rule of law*. They need to be made part of every governance system in order to have good governance at the local level.

For showcasing involvement and performance, local bodies should focus on areas having large visibility but involving less resources. Garbage cleaning, putting street lighting in order, removing pot-holes from the roads and removing encroachments from public places make immediate impact on the public soliciting their appreciation of the work, which would help people understand the intent and commitment of local bodies to perform and ensure their cooperation. If local bodies plug all loopholes in revenue collection and ensure compliance by people, it can generate enough resources for managing cities without levying any additional taxes etc. Accordingly, capacity to perform holds the key to good urban governance. Generally it is understood that municipalities are bad managers and cannot achieve the objectives of good governance. In fact many urban local bodies have done exemplary development work at the local level to prove that they mean business and have required capacity and capability to plan and perform, provided they have a good leadership. In case of Ahmadabad, Surat, Pune and Kolkata, the good governance was ushered in due to leadership provided by Corporation Commissioners. In case of Jalgaon; Mayor of Corporation did the job and in case of Tirpur private sector helped in achieving governance and leadership. Mayors of Curitiba ,New York, Washington, Rio-de Jeneario,, Bogota, Toledo ,London, have created highest degree of urban Leadership/Governance to make cities Smart and sustainable..

CONCLUSION

Study made of large number of global vibrant and best cities, has revealed the adoption of three pronged strategy to make these cities sustainable and great places to live and work through; *Achieving Smart Growth* - by adopting a strategic approach, planning for a change, integrating environmental thinking and insisting on opportunities for all; *Doing More With Less*-by assessing and managing expenses rigorously, exploring partnerships, introducing accountability and embracing technology **;** *Winning Support for a Change*- by crafting a personal vision, building a high performing team ,creating a culture of accountability and forging stakeholder consensus. All these *mantras* require change in vision, approach to planning, development and the way cities are managed. Considering the growing size, population and complexities of the problems and challenges posed by the urban India the task appears to be much more complex and difficult. Smart City Mission launched by Government of India, to rationalise urban centres, offers a great opportunity to make cities sustainable. All the 100 cities selected under Mission should be mandated to undertake green field projects, applying innovative planning and management strategies based on using the state of art technologies to create replicable model for making cities happy, healthy, productive, sustainable, livable, effective and efficient

REDEFINING MASTER PLANS TO PROMOTE SMART AND SUSTAINABLE CITIES

REDEFINING MASTER PLANS TO PROMOTE SMART AND SUSTAINABLE CITIES

Abstract: Urban planning, globally and locally, has been dictated by the Master plans to make city growth and development more rational, orderly and logical. Studies made and analysis carried out, have shown that mechanism adopted for preparing master plans ,based on pure land use planning, has made these plans both rigid and time consuming besides unsustainable. Master plans have been found to be largely ignoring the dynamism of urban growth and development besides promoting dualities and contradictions in urban setting. By defining land use of all parcels of land, cities have been virtually frozen. In the process, majority of cities have been suffering from illegal, sub-standard, haphazard and unplanned growth. Master plans have accordingly, emerged as the major road block in promoting planned urban development and making cities sustainable .In search for appropriate solutions for promoting planned development and making city growth both rational and dynamic, paper focus on redefining and putting in place a new order of urban planning, development options and management strategies besides suggesting new format of Master Plans to make cities smart, more humane, equitable, just, efficient, productive, sustainable and providers of assured quality of life to all existing and future urban residents including poorest of the poor.
 Key words: Compact cities, Regional planning, Energy efficiency and Green transportation,,

INTRODUCTION

Last two centuries have witnessed rapid transformation of countries and societies in terms of way of living, distribution of population, pattern of employment, means of productivity & mobility, pattern of income, distribution and consumption of wealth and resource etc. These patterns are largely marked by both speed and concentration of population, activities, resources and infrastructure. All these changes and transformations have their genesis in urbanisation, which has reshaped and redefined the entire fabric of human settlements. Starting with industrial revolution, the process is gaining high degree of currency across the globe ushering a new era and regime of population growth, prosperity, development and rapid expansion of human settlements besides promoting poverty, pollution and exclusion.

Globally twenty first century has been called century of urbanization, with larger proportion of population, living in the urban centres. Studies made by United Nations about the global trends in urbanization, has concluded that world is urbanizing rapidly, with year 2007 marking a historic milestone in the human history ,when for the first time global urban population exceeded the global rural population. Following the global pattern, India is also fast treading on the path of rapid urbanization. Rapid increase in urban population coupled with in-migration from rural hinterland is making cities grow larger and larger. Accordingly, metropolises, megalopolises and ecumonopolises are fast emerging on the urban canvas. With recorded urban population standing over 377.1 million (31.16 per cent) residing in 3 super- metros, 50 metropolises and 7935 towns (Census 2011), India has emerged as the second largest urban system in the world after China. Cities like Mumbai (185lacs), Kolkata (158 lacs) and Delhi (125 lacs) are assuming monstrous proportions. Under this process of rapid population growth, cities are fast melting to encompass larger and larger rural hinterland within urban fold, increasing distances between basic human activities of living and working, asking for larger transportation network to keep the city moving. Energy and resource consumption levels are rising, making cities more polluted and grey.

 Cities are known to be propeller of rapid growth of economy, generators of large scale employment, providers of basic and essential amenities & services besides quality of life as compared to their rural counterpart. This makes urban centres important and vital when the issues of employment, economic growth and development are considered as priority. Globally, urbanisation and prosperity have been found to have high degree of positive co-relationship. However, despite distinct positivity of urban centres, cities have been growing in an unplanned and haphazard manner with urban growth marked by chaos, disorder, dualities and contradictions. . Cities are facing the greatest challenges of   meeting the basic needs of shelter, healthcare, education, water and sanitation for its residents. In the process, majority of urban residents are being marginalised. Quality of life in urban India is fast becoming nightmare for migrants. Population, poverty, pollution and exclusion have emerged as the hallmarks of Indian urbanisation. With urban population projected to reach 590 million out of 1.4 billion in 2030, greatest challenge before urban planners, architects and policy makers would be, how to harmonise the growth and development of urban India and make it smart and rational. This calls for making process of urbanisation and

urban settlements more effective, efficient and sustainable, Productivity of urban centre largely hinges on their planned and rational development, which makes urban planning vital and important for rationalising the entire process of economic and physical development.

DEFINING MASTER PLAN

Master plan , as a planning tool, has been extensively and religiously used by planners, locally and globally, to understand and analyse the basic fabric of the city; genesis of its origin , growth and development; its culture and heritage; changing demographic profile; defining status of the city in terms of infrastructure , services and amenities; existing land utilization pattern and distribution of housing, work centres, trade and commerce, industry, leisure etc; developmental and environmental issues and challenges faced by city . Based on the studies made and analysis carried out, Master Plan tries to lay down and define agenda for future growth to launch cities on the path of planned development; to make city more sustainable and to ensure that it overcomes all its existing problems; provides basic amenities of life to all its existing and future residents including poorest of the poor, to lead a dignified life. Premise of Master Plan is used extensively to make city economically vibrant, socially just and environmentally sustainable place, through the mechanism of planned development, using land use as the basic tool and strategy. It is long term document which defines the city in a futuristic context generally spread over a period of two decades.

Considering its role and importance, Master Plans have been viewed differently by Planners in different counties. Master Plan has also been called Comprehensive Plan, considering the comprehensive approach adopted in its visioning, formulation and implementation. Master Plan has also been named as Development Plan by redefining its intent, content and scope in order to make city growth more flexible and less rigid, to effectively respond to challenges unleashed by urban dynamism and fast changing technologies impacting the urban areas, urban living and urban working. Difference in approach has its genesis in the fact that Master Plan has been used both as a policy document to guide the future development of a city and a document detailing precise shape and size of the city in terms of land use and allocation of uses to different parcels of urban land. Approach to Master Plan, as a policy document, has been used extensively by developed world countries to bring flexibility in future planned development whereas majority of developing nations have adopted the mechanism of defining land use for different land parcels to control and regulate the planned development of urban centres.. Indian planners have adopted the land use planning as the approach for preparing Master Plans of the cities. In order to understand the genesis , contents and scope , it will be relevant to look at how Master Plans have been defined by different experts/ planning agencies.

 Delhi Development Authority Act defines Master Plan as: '*A long term perspective plan, for guiding the sustainable planned development of the city. This document lays down the planning guidelines, policies, development code and space requirements for various socio-economic activities supporting the city population during the plan period. It is also the basis for determining all infrastructure requirements'*.

Division of Planning, City of Trenton, NJ has defined Master Plan in terms of; '*A comprehensive plan providing a long-range vision for the built environment of a community. It guides the appropriate use of lands within a municipality in order to protect the public health and safety and to promote general welfare. Among other issues, the Master Plan can identify:*

- *Suitable locations for commercial, housing and mixed-use development;*
- *Locations where the city should increase density, use redevelopment, or intervene in other ways;*
- *Opportunities to extend and/or improve open space, recreational areas, and civic facilities;*
- *Strategies for increasing economic development;*
- *Environmental, historic and cultural resources that need conservation; and*
- *Strategies for solving congestion and improving transit services.*

Master Plan has also been defined as, '*A plan that shows an overall development concept that includes urban design, landscaping, infrastructure, service provision, circulation, present and future land use and built form. It consists of three dimensional images, texts, diagrams, statistics, reports, maps and aerial photos that describe*

how a specific location will be developed. It provides a structured approach and creates a clear framework for developing an area.

Looking at the above definitions, it can be safely concluded that Master Plans are mandated to be definer of physical environment, social environment and economic environment and are supposed to have all the ingredients which can make a city people centric, more livable, sustainable, productive and sustainers of quality human living besides making it an attractive investment destination. Considering its focus, approach, context and importance, governments and city development authorities have adopted Master Plan as the mechanism to promote planned development. Accordingly, state governments have put in place comprehensive legal framework defining objectives, intent, scope and contents besides methodology for preparing Master Plan to ensure that these plans are prepared for the existing and proposed urban centres, in order to launch them on the fast trajectory of rational growth and planned development.

ISSUES

Despite the fact Master Plan showcases distinct advantages in terms of promoting planned development, capability of ushering an era of quality development, capacity to leverage economic development and making urban development both inclusive and equitable, but the past experience of development of cities in the post-independence era, for whom Master Plans have been prepared and made operational, has been found to be marked with dualities and contradictions. Instead of planned development, majority of the growth in these cities is dotted with   haphazard and sub-standard development with unplanned development emerging as the order of the day. Despite Master Plans assuring quality of life to all the residents, even to the poorest of the poor to lead a dignified life, majority of urban dwellers have been observed to face a life of deprivation and poverty, living in slums and shanty towns. As engines of economic growth, Indian cities showcase large scale poverty rubbing shoulders with prosperity and slums existing besides sky-scrappers. Basic amenities of life including shelter, water supply, sanitation, electricity, road network, healthcare, education etc are eluding majority of urban residents. Cities are found to be fast emerging as island of prosperity in the sea of poverty. This clearly shows that Master Plans, in its present shape and approach, have not been able to promote, achieve and deliver the objectives for which they were put in place. Instead they have created dualities and promoted contradictions, making cities less attractive and less preferred destination. Instead of promoters of development, Master Plans have emerges as role model of controllers of development. They have frozen the cities through rigidly defining their land uses, making these plans emerging as major roadblock in the process of development. Master plans, in majority of cases, have been found to promote and follow policy of exclusion instead of inclusion by focusing more on physical aspects of city planning ignoring the environmental, economic and social aspects. This approach has caused enormous damage to city fabric and its growth and development. By excluding majority of urban population, consisting of poor, informal sector and lower section of societal pyramid from the process of planning, Master Plans have ushered an era of unplanned growth and mushrooming of slums. In this process, these plans have emerged as instruments of serving the interests of elite at the cost of poor and have-nots. With cumbersome legal framework, large resources and time frame is required for preparing and approval of Master Plans. This invariably delays the preparation of such plans leading to a situation where planning is found to be invariably chasing the development. Mumbai Master Plan once took 17 long years for approval leading to largest city and economic capital of India growing without a plan during these 17 long years. Plan preparation in the present context is considered more as an official business ,carried out within four walls of town planning agencies with minimum involvement of stake holders including people, communities, institutions, industry etc, to whom this plan is supposed to serve and whose needs and interests it is supposed to cater. Master Plan thus prepared, does not reflect the ground realities and people aspiration leading to its non- implementation and rejection by majority of urban residents. Absence of latest technologies makes planning process both time consuming and inaccurate which invariably delays the plan preparation and negates its implementation. Existence of multiple agencies of urban planning and development in majority of Indian cities leads to conflict of interests and non-implementation of plan besides duplication of works, leading to overlap and wastage. Lack of ownership of Master Plan has emerged as the main factor for non-implementation of these plans. Lack of focus on energy, sustainability and ignoring villages as partner in city planned growth in the Master Plans have made these plans highly energy inefficient, unsustainable leading to mushroom growth by speculators and land mafia. Process of declaring large planning area, enlarging urban and urbanisable area in the successive plans has lead to making city not only energy inefficient but also consumers of large area of land and resources. It also

increases the length, breadth and depth of network and services making city development and maintenance cost-intensive besides creating large number of problems related to mobility, traffic, transportation and pollution. In the words of *Ishar Judge Walia,* 'Indian urban planning needs major overhaul—it is overly top down and controlling, not providing much needed guidance, coordination and integration'. Considering all the above issues, it becomes critical that the intent, content, scope along with entire process and procedure of preparing/approval of Master Plan is, objectively and critically, reviewed and reframed to make it an effective instrument and role model of promoting planned growth, rational development and good governance .

REDEFINING PLANNING

In order to rationalise the urban development process in the country, Government of India has launched a Smart City Mission covering initially 100 selected cities. Creating smart cities would require new order of Master Plans, considering the contours and complexity of urban settlements. New order of Master Plans would involve making planning people centric, transparent, community oriented and flexible. Its focus shall be to minimize prevailing urban dualities and contradictions and to promote development based on equity, inclusiveness and providing opportunities to all.   Contours of Master Plans,will have to be redrawn /redefined with appropriate innovations/changes made in the intent, contents and scope of such plans. New order of Master Plans will not be merely land-use plans, defining/freezing the city future once for all for next two decades, indicating the use of every parcel of land in the city. They will take a 'whole city' approach to planning and will focus on the urban form, shape and typology of the city. Since cities are dynamic entities, ever changing, ever shaping, evolving and devolving, they will require plans which provide inbuilt flexibility to cater to urban dynamism. The Master Plans would accordingly be dynamic in nature, growing and evolving with the growth of towns. New breed of Master Plans would be based on state art technologies and a distinct vision, evolved after detailed study, analysis and understanding of the city fabric and its growth potential, duly supported by detailed planning and development guidelines. The vision shall be achieved through well defined missions for different facets of city involving planning and development. Each development project shall be evaluated in the context of defined vision and guidelines, by a multi-disciplinary team of experts by involving stakeholders before accepting. The city planning shall not be dictated exclusively by planners but will involve larger set of experts representing different shades of city planning, growth and management to rationalize decision making. Architects, urban designers, landscape experts, service providers, environmentalists, transport experts, conservationists, art and culture historians and sociologists etc will have major role in planning the smart cities.

 New order of planning will be geared to make the city compact to reduce travel and extent of service network to bring economy and operational efficiency in the city. In this context, the focus of the city shall be people. Planning shall also promote better relationship between living and working by adopting the mechanism of transit oriented development. In this pattern, the focus shall be to provide housing, offices, work areas, commercial and institutions along the mass transport network provided within walking distance. Green spaces on the defined norms shall form integral part of urban living and working in order to promote highest order of environment and ecology. Smart cities will be planned on the basis of inclusiveness, self-reliance and self-sustainability, having minimum impact on local and global environment and ecology. Considering the major implications of urban areas, being largest consumers of energy and resources, generators of waste and emitters of green house gasses , largely due to transportation and built environment, the new regime of planning will focus on minimising travel and create buildings which are least consumers of energy and resources. Smart planning will focus on creating cities which are highly energy efficient. This would be made possible by adopting shape and size of the city which involve minimum travel and services. In addition, to *looking inward*, new regime of urban planning will also be *looking outward* so as to link the city with its surrounding areas/settlements. No city exists in spatial isolation. Every city has its periphery/area of influence to support it. This zone of influence varies with the size, location, primacy, accessibility, population, nature of specialisation, administrative status, amenities, services etc. Existing pattern of urban planning ignores the critical role and importance of periphery in sustaining/rationalizing the city growth and development. In fact majority of prevailing urban ills have their genesis in ignoring the planning, growth and development of surrounding urban/rural settlements. Accordingly, new regime of Master Planning will be based on the approach which would involve inward and outward looking at the cities. Most efficient cities in the world have adopted *Regional perspective* and not just looking at cities growth. The Regional approach/model has helped them in minimizing local competition and conflicts, over/under investment in infrastructure and overcoming

confusion over role and responsibilities of various agencies and making city smart. In the process, it has promoted higher order of co-operation and growth, of not only of the city but of the region. Looking outward can also help in achieving the objectives of integration and decentralized planning, enshrined in *74th Constitutional Amendment Act,1992.*

WAY FORWARD

Despite the fact that urban India is placed as the second largest urban system in the world, only about 30 percent cities out of a total of 7935 urban settlements in the country have completed master plans even after seven decades of independence and completing twelve five year plans of growth and development. In order to ensure that urban centres become smart and engines of economic growth besides usherers of new era of rapid and equitable growth, we have to put in a place a new order and system which leads to preparing Better Master Plans of cities on a time bound basis. This calls for changing our existing approach, intent, contents and scope of preparing Master Plans. Cities must be made to live, breathe and grow freely. They must provide supportive environment to promote orderly development, attract investment and ensure quality of life besides providing opportunities to all its existing and future residents to lead an optimum and quality life. Options for preparing new order of Master Plans to make cities smart and sustainable should essentially revolve around:

- **Defining a realistic and achievable Vision** for the city based on in-depth study, and analysis including SWOT analysis, through a consultative process involving all stakeholders, experts and parastatal agencies
- **Defreezing the City** by changing our approach from defining land uses of all parcels of land to providing a developmental framework within which city should grow for meeting its ever changing needs and people aspirations due to emerging technologies and ever changing urban contexts.
- **Making city Compact** by redefining shape and size of the city and adopting high rise and high density development mechanism to optimise land, minimise travel, reduce carbon footprints and make city development cost and energy efficient.
- **Promoting Green Transport** by changing our approach from planning for vehicle to planning for people with order of priority for travel placed as pedestrianisation, cycling, mass transportation and personal vehicles in that order of preference to minimise congestion, lowering environmental pollution and avoiding traffic blues.
- **Making city energy efficient** through preparing Master Plan with minimising energy consumption as the focus by adopting mixed land use, avoiding pure land use and redefining living-working-leisure relationship and adopting transit oriented development approach
- **Promoting Regional Context** by viewing and planning city in the larger context by linking cities and towns as well as linking urban areas to rural areas
- **Making urban villages integral part of planning process** by defining a well laid down policy framework and agenda for the planning and development of villages falling in urban/ urbanisable/ planning area.
- **Making informal sector integral part of planning process** by earmarking appropriate and dedicated space for their living and working
- **Creating Ownership of plan** by avoiding multiplicity of agencies and designating a single agency for co-ordination and implementation of master plan
- **Using latest, state of art and innovative technologies** for preparing, approval, implementation and interpretation of Master Plan besides using it for public consultation and receiving suggestions , views and communicating status of planning
- **Using a Group approach** comprising of architects,planners engineers, urban designer, transport planner landscape expert, sociologist, geographer, environmentalist, conservationist to prepare Master Plan and evaluate all projects presented for approval and implementation in city
- **Planning city on a set of well defined parameters** of open spaces, services, mobility, sanitation, services, energy etc to ensure the provision of services, amenities, services on a defined scale to all the residents.

- **Addressing issues like poverty, employment and economy** by redefining approach from merely land use planning to planning for economic development, environment promotion and employment generation
- **Making city Smart** by preparing Master plan with focus on people, energy, environment, employment, sustainability, services, mobility and shelter to create zero car, zero energy, zero slum, zero waste and zero carbon city.
- **Preserving heritage,** both natural and manmade, to showcase and preserve past glory and cultural values for posterity
- **Adopting a participatory approach** by actively creating forum and institutional framework for involving people, communities, NGO's, CBO's, industry, trade & commerce, academic institutions etc to create local ownership
- **Making Master Plan promoter of development**. rather than controller of developing by providing space for inclusion of all people centric development activities which promote public and city interest
- **Promoting use of land 24x7** to minimise diversion of land under agriculture to non-agricultural uses, making cities more compact, ensuring optimum utilisation of infrastructure and to make urban development highly cost-efficient.
- **Generating resources** for plan preparation, implementation, revision and reframing besides creating/maintaining city/local level infrastructures, amenities and services
- **Redefining the legal framework** for preparing the Master Plan in a time bound manner by making it simple cost/ time efficient and more participatory.
- **Ensuring effective implementation of Master Plan** by creating/designating a dedicated agency, duly equipped with appropriate level of resources both manpower and financial, having adequate legal backing to punish violators
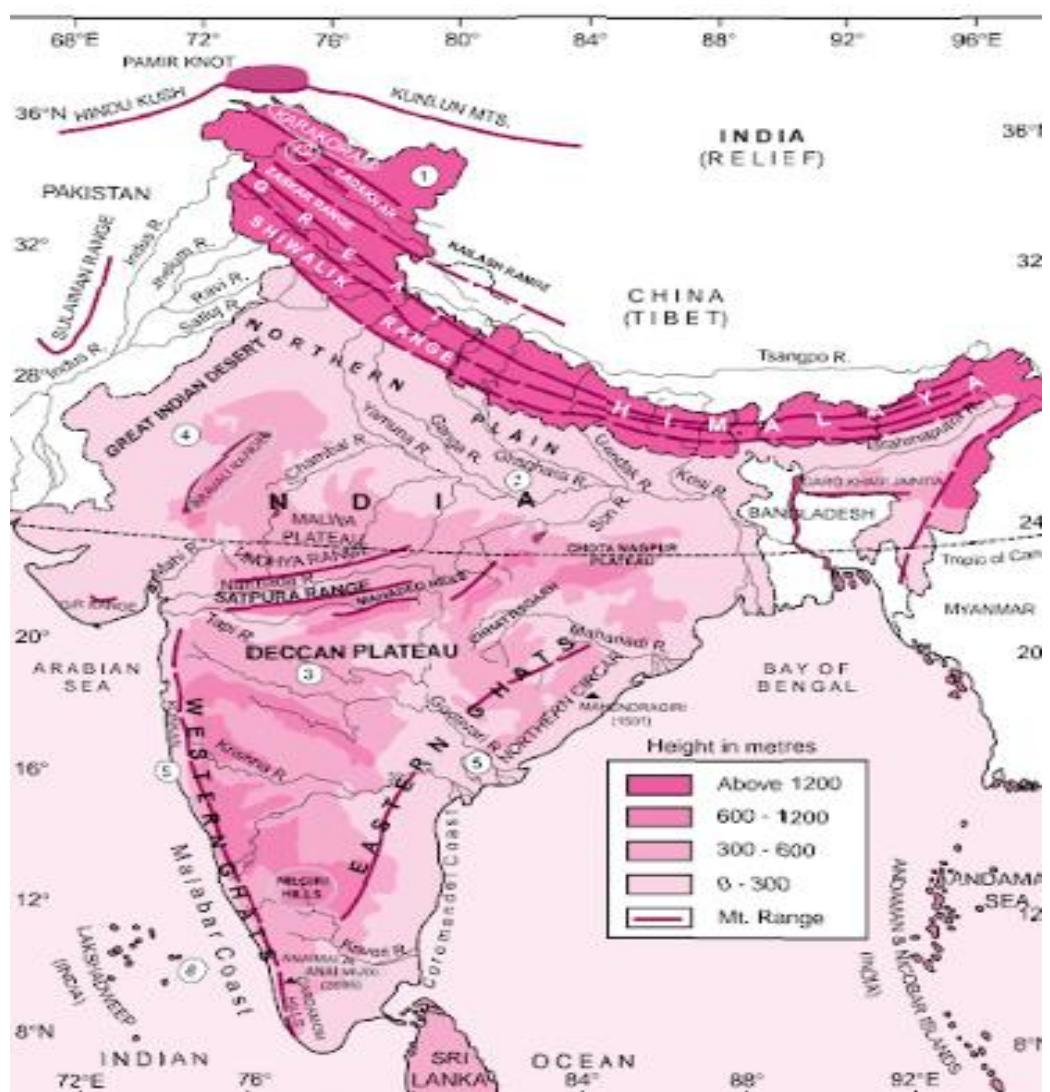
PROMOTING SUSTAINABLE DEVELOPMENT OF HILL AREAS- ISSUES AND OPTIONS

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INTRODUCTION

Hills, as the natural bio-sphere reserves, have special significance in terms of environment and economy of any region, state or country and have accordingly critical role and importance in their growth and development. Though hill states constitutes 20% of geographical area containing 11% of the total population of the country but vast majority of nation's populations living nearby, directly or indirectly, depends on the resources of hill states. Hills areas despite being rich in natural resources i.e. forests, Hydel power, minerals, valuable herbs, medicinal plants, horticultural products, etc. have by and large, remained poverty driven due to lower order of development. Increasing pressure of human activities has contributed its share in damaging ecology and environment of hill areas. Unscientific exploitation of valuable natural resources and putting into operation numerous ill-conceived development projects has threatened the sensitive eco-system of hills. Obvious impact of such exploitation and development has been repeated destruction of life and property on colossal scale both in hills and plains. Stockholm Conference on Human Environment in 1972 has tried to a create awareness among nation's policy planners, communities and people about the deteriorating environmental quality and its adverse impact on growth and development but the remedial steps have not been commensurate.

It is understood that developmental policies made operational in the Agriculture and Tourism Sectors during the post-independence era have resulted in extensive deforestation, adverse environmental impact and consequential ecological imbalance with the result most of the hill areas in India have been listed as ecological sensitive zones by the Ministry of Environment and Forests. However, simply declaring the hill areas as eco-sensitive zones would not yield desired dividends unless well focused and well planned strategies for their rational development are put into operation. It must be understood clearly and appreciated properly that considering the sensitivity and fragility of hill areas eco-system including their peculiar problems and potentials, development strategy to be made operational has to be different both in intent, content and approach from what is made applicable in the plains. It would be appropriate, rather desirable, to adopt an approach which has both the elements of conservation and development built in.
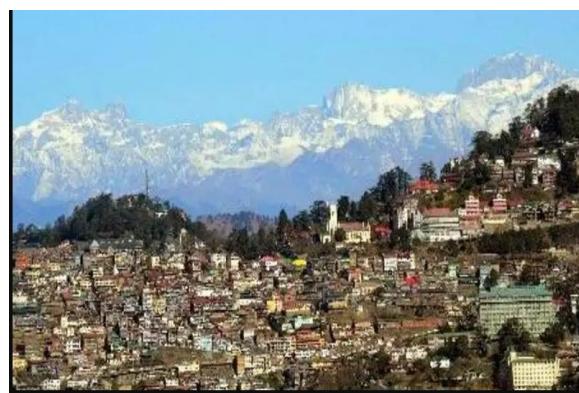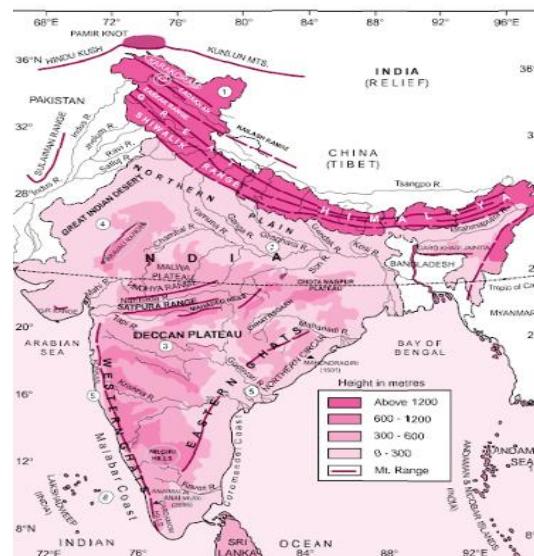
The initial tranche of hill area development was witnessed during the 19th century and pre-independence, period when Britishers developed numerous towns, health resorts, cantonments etc. in the hill areas and made them accessible through the construction of road and rail network. However, these centers have now grown into urban nodes of hill regions in the post-independence period with large concentration of population and activities taking place resulting in numerous problems of congestion, water &, land scarcity, pollution, destruction of scenic beauty and creating visual blight and poor living conditions in the process. These problems are the outcome of uncontrolled migration to hill areas and rapid, uncontrolled & haphazard expansion in the name of tourism, conversion of forest lands to plantation & pasture lands, construction of dams and reservoirs for irrigation and creating road network for improving accessibility in the hill areas. These problems have their genesis in the approach adopted by the policy planners and development agencies which never focused on creating balance between the components of environment and issues of development. It is important that if hill areas are to the properly developed with resources adequately safeguarded, area of natural and scenic beauty preserved, natural

bio-sphere kept intact, richness of bio-diversity, uniqueness of eco-system and visual resources maintained, then adoption of a well planned and well designed development strategy would be a pre-requisite.

2. ISSUES

Ecology

Hill areas in the Indian context represent a mosaic which is marked by dualities and contradictions. Though rich ecologically yet these area remain economically poor. Despite having numerous resources with enormous development potential, poverty still is the order of the day. Though rich in natural heritage still general living conditions are sub-standard. Looking critically, these dualities and contradictions are the outcome of irrational, unplanned and unscientific approach adopted for the development of hill areas. Hill areas, with sensitive eco-system require equally sensitive and scientific approach for ensuring their proper growth and development.

Development

From the snow clad Himalayas to the denuded hills of Aravallis the problems and potential of hill areas have been found to be at considerable variance because of their peculiar setting and conditions. However, some of the common problems faced by the hill regions in the country include; indiscriminate felling of trees, unscientific exploitation of natural resources, soil erosion, siltation in downstream areas, flooding, shifting cultivation, faulty agricultural practices, low availability of cropped lands, fragmented and small landholding, heavy pressure an agricultural land, least diversified economy, large extent of uncultivated wasteland, inadequate irrigation facilities, scarcity of buildable land, haphazard, unauthorized, unplanned, substandard constructions, linear development along the critical road network and within urban areas, uneven development of urban system, deficiency of infrastructures both physical and social and lack of accessibility.

Industrial Growth

Despite richness in natural resources, industrial development in the hill areas has been very poor and whatever industrial development has taken place remained confined only to few pockets and that too mostly on the borders of the adjoining states leading to wide spatial imbalances. The vast potential offered by hill area in terms of excellent pollution free climate, availability of abundant horticultural products in terms of quality fruits, vegetables, rare herbal flora and fauna; existence of huge deposits of natural resources etc. have not been properly exploited for improving the state economy. Existing pattern of industrial growth and development has done more damage than good to state resources, environment and economy and has emerged as one of the major bottleneck in the rational development of hill areas. Pattern of industrial growth accordingly needs to be critically looked into.

Tourism

Tourism has emerged as one of the major issue on the development agenda of hill areas. All hill states are putting in place numerous policies and programmes which would promote the state as tourist destination within and outside the country. As a result hill are now witnessing enormous influx of tourists and in the process growth and development of tourist related facilities and infrastructures. Though tourism is being encouraged on considerations of economy and employment, but its impact on bio-diversity, eco-system, ecology, environment, culture, growth and development has been found to be highly adverse. Uncontrolled tourism has done irreparable damage to the hill area's valuable resources with far reaching long terms development implications. In the absence of proper planning and developmental framework, tourism related development has been found to be both haphazard and sub-standard. Hill areas in the past has witnessed enormous level of construction activity in the highly ecologically fragile areas with slopes higher than 30 degrees used indiscriminately for putting in place concrete monsters. Carrying capacity of the area has become a non-issue in permitting development with real estate lobby creating structures which are not only against all norms, standards and building bye-laws but are also violative of all cannons of planning principles and sound development practices. The issue of regulating

uncontrolled tourism and related development should form an integral part of agenda for promoting rational development of hill areas.

Settlement Pattern

Emerging settlement scenario in general and urban settlement framework in particular is another area of concern for all hill states. Existing settlement mosaic is being dominated by few urban centres having large concentration of population with large number of small size settlements spread far and wide leaving large tracts of areas which are ill-serviced. Wide variations have been observed in the settlement pattern and population density within hill states making policy options limited.

Urbanization

With state population of 6 million in 2001, level of urbanization placed at 9.8%, around half of population of the state concentrated in 3 districts (out of 12) namely Kangra, Mandi and Shimla, 9 districts having annual growth below 2% with half of the urban population housed in the state capital and state having high literacy rate makes Himachal Pradesh unique in its setting and structure with Lahul & Spiti District having lowest population density of 2 person per sqkm as compared to 292 persons in case of Bilaspur district clearly brings out wide variation in population distribution in the state. The wide variations in populations structure, settlement pattern and prevailing density within the state brings numerous planning and development issues which calls for different options and strategies to be put in place for each part of the state keeping in view their problems and potentials.

Land

In hills areas limiting factors like slope, soil characteristics, flora & fauna, vegetation, nature of rocks and their structure have emerged as the greatest challenge to the   state agencies in evolving rational planning and development framework. With limited availability of land for development purposes, land under eco-fragile areas has come under lot of stress. In the race of making available more land for development and construction, large scale cutting of trees is being resorted to resulting in destruction of large reservoirs of flora and fauna in the state. Not only every inch of available land is being subjected to sub-standard and haphazard development but level and intensity of such development is beyond the sustainability and capacity of such land. Land sharks and land mafia are emerging as most powerful lobbies in the states which are constantly on prowl, looking for more and more vulnerable areas which can be cleared and sold at exorbitant price. The issue of land management, land conversion, preservation, utilization and creating balance between agricultural and non-agricultural uses needs to be critically looked into for promoting rational growth and development.
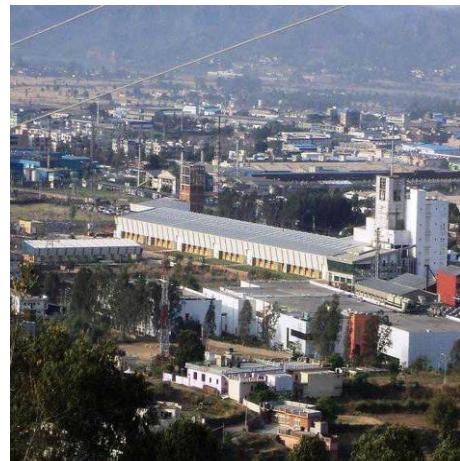
Heritage

Hill areas have inherited large reservoir of valuable manmade and natural heritage created by man and nature over a period of centuries. This heritage is in the shape of numerous buildings, temples, palaces, public buildings, public spaces, precincts, building complexes, bio-sphere reserves, lakes, dense forests, wild life sanctuaries, flora and fauna . Number of villages, cities and towns house these valuable heritage. With rapid growth and development of hill areas, most of the heritage has been lost due to fire and destruction of buildings. Number of heritage buildings have been tempered with and numerous others have been lost in the haze of unauthorized and inconsistent uses to which they have been put. Uncontrolled tourism has also resulted in causing irreparable damage to the heritage areas due to mushrooming of construction around heritage buildings. Absence of appropriate building controls and development regulations has led to choking of the areas around heritage

buildings. Unauthorized encroachments have destroyed the important public spaces, available fore-courts of these buildings. Unplanned and substandard development has contributed its share in destroying the valuable treasure of the state. It is important that state must put in place appropriate plans and strategies which eliminate all possible causes which tend to damage, destroy or undermine the value, aesthetics and architectural glory of these buildings and natural areas.

Communication

Hill areas are facing problems of preserving the vital road network and regulating growth and development taking place along these roads. Roads in hill areas have been found to be most vulnerable, being best destination for constructing shops, eating joints, dhabas, hotels, restaurants, repairs shops, industries and even houses. All such constructions come up along the entire length of the road immediately where the road reservation ends. Thus most of the roads are having linear growth and development which is totally unplanned, substandard and haphazard in nature. These structures put enormous pressure on road network causing high degree of stress on the smooth flow of traffic. Due to inadequacy of space and with areas around subjected to intense development, future widening of roads become totally impossible. The business activities being carried out along the roads invariably spills over, creating traffic bottlenecks. In order to preserve proper accessibility and to allow roads to function as arteries carrying vital men and material across the hill areas, it becomes essential that appropriate strategies should be put in place to properly regulate construction and development along road network. No development/construction should be permitted to come up without prior approval with minimum set back defined along the roads as **"no construction zone".** Proper guidelines for permitting construction should be put in place with stringent penalties imposed on the violators. Efforts should be to levy charges whenever construction is permitted which should form a corpus to be used for up-gradation of road infrastructure/network in the state.

OPTIONS

Development without Destruction

Issues related to Environment, Ecology, land, development, resources, heritage, culture and management are critical for any hill areas and as such all development strategies must focus on sound land use practices, development of alternate sources of energy, conservation of heritage, planned development of tourism related activities, rational settlement system, optimum utilization and development of resources etc. The basic approach to hill area development must be based on the principle of **development without destruction** with efforts made to arrest further damage to the fragile eco-system.

European and Swiss Models

Two successful models of hill area development are presently available in the world which include (i) European Model and (ii) Japanese Model. European countries have tackled the problems of hill areas development by adopting sound practices of land use planning with the help of land tenure system, development of hydro-electric power as a major source of alternate energy , preventing destruction of forest cover and by adopting development of planned and dispersed tourism. All these factors have been integrated to achieve the objective of conservation and development. In the Japanese model, hills have been made areas of very low density with only 2% population made to occupy 75% of land areas whereas remaining 98% population have been settled in remaining 25% of land area. Hill areas have largely been used for conservation of resources, forestry, generating hydro-electric power, promoting tourism whereas plain areas have been used for housing large scale economic activities including industry, trade, commerce and housing despite adverse impact of acute congestion and pollution. Both these models have their own relevance, advantages, limitations, importance and contexts and can be adopted with suitable modifications to suite the needs of physical and socio-economic conditions prevailing in the Himachal Pradesh
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Regional Approach

Adoption of a Regional approach would be critical in ensuring conservation, preservation and development of hill areas without much damage to ecology and environment. Accordingly indicators like altitude, slope, existing, vegetation, soil types and average rain fall could be used to classify state into areas ranging from extremely sensitive, very high sensitive, highly sensitive, medium sensitive and low sensitive zones with preservation becoming hallmark of strategy for areas of high sensitivity and development getting concentrated in zones of medium and low sensitivity. All ecologically degraded areas which have become derelict over a period of time should become priority area for restoration, reclamation and development activities. However, all developments must be properly planned keeping in view the carrying capacity of such areas. Development could also be directed to valley floors and upland flats in order to relieve future pressure on more sensitive areas. Adoption of Regional approach will also help in integrated development of urban and rural areas in a mutually supportive manner by minimising friction in urban and rural settlements.

Rational Land Use Planning

Rational land use planning based on the land capacity & suitability would be another critical factor in ensuring the planned development and rational use of resources of the state. In this planning mechanism, very steep slope could be put to intensive afforestation with moderate slopes put to a mix of horticulture plants of economic importance. The valley and plains flat lands in the hills could be put under cultivation of food crops and human habitation. Vast scope of hydel power could be tapped for generating electricity with water resources used for irrigation, recharging of ground water & ensuring growth of vegetation cover in the derelict areas. Non-polluting hi-tech industries requiring dust free environment and industries which are land intensive requiring minimum of resources with zero level of pollution should be encouraged in the areas of low eco-sensitivity to generate employment and promote economic growth and development of the people and the area. Agro based industries using horticulture and agricultural produce including bio-tech parks should be considered as priority area in the selected growth centres for orderly growth of hill areas.
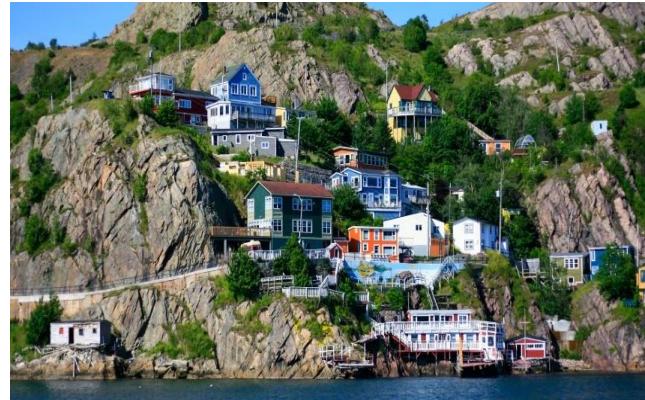
Eco-Tourism

Promoting tourism should become the priority area on the economic agenda of the hill states. While developing tourist related infrastructure, care should be taken to ensure that such development should be in perfect harmony with the surrounding environment. Tourism related polices should be developed by involving local community leading to their economic development. It should clearly identify conflicts between use of resources for tourism and for the livelihood of local inhabitants with attempts to minimize them. The type and scale of tourism development to be permitted in any area should be commensurate with the environment and socio-cultural characteristics of the local community. Tourism should be planned as an integral part of overall area development strategy guided by an integrated land use plan. In nutshell all tourism related issues must be addressed squarely within the framework of Eco-Tourism policy and guidelines, 1997 evolved by the Department of Tourism, Government of India.

HERITAGE PRESERVATION

Heritage Preservation should be adequately addressed in all hill areas development. Any strategy which does not include heritage preservation as its essential part would be self-defeating and become counter- productive in the longer run. All hill states must put in place appropriate planning framework, development guidelines and heritage related regulations to identity the valuable heritage in the state and strategies for their conservation preservation and integration with the existing and proposed development. It would be essential that such framework must be put in place immediately to minimize damage to the heritage buildings and heritage areas. Concept of heritage areas, heritage zones and heritage cities/towns should also be put in place to protect the total environment in heritage rich areas. Adequate incentives need to be built in to encourage people
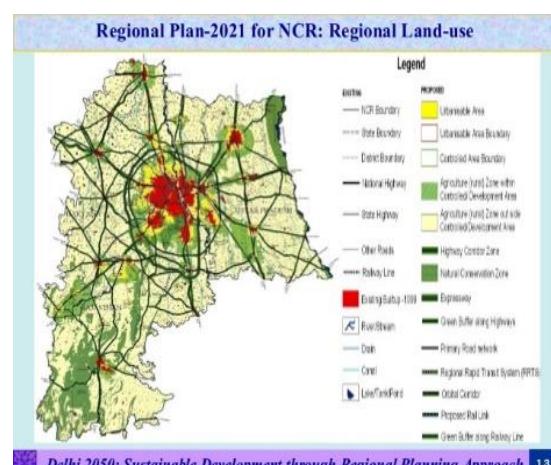
in preserving valuable heritage with stringent measures put in place to discourage destruction of such areas. Development controls for these areas should be sensitively designed so that no new construction changes the basic character of the area. People must be educated about the need and importance of heritage and its preservation & conservation in order to make the process a people oriented scheme and not solely guided by the government and parastatal agencies.

Building Design

Considering the role and importance of energy as the major driver of economic growth and physical development coupled with limited availability of conventional and non-renewal sources of energy and ever rising demand and spiraling market prices, issues related energy consumption, energy conservation and promoting non-conventional and alternate sources of energy have assumed global concerns. Considering the fact that existing built up structures account for 40 % of the global primary energy consumption and generator of 24% of CO2 emission, criticality of buildings and their role in minimizing energy consumption and promoting sustainability of human habitat assumes importance. With rapid urbanization and growth of population, more and more buildings would be required to be constructed to meet the increasing demand of shelter, trade & commerce, industries, entertainment, institutions etc. and accordingly level of energy consumption are likely to rise on a compounded pattern. Looking at the high degree of energy consumption, which has been placed at 300 Kwh for every square metre on annual basis, there appears to be enough options to bring it down to the level of 140 Kwh with proper design. However, the most desirable level to be achieved would be 100 Kwh.
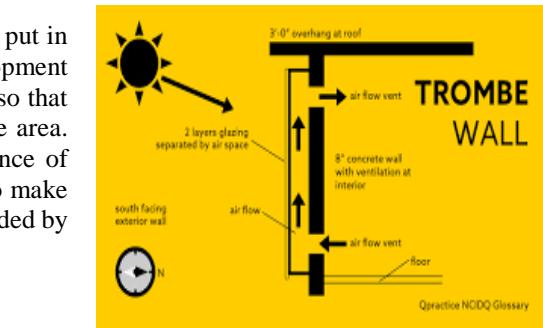
Built environment in Hill area for peculiar climatic conditions, are consumers of large energy. Accordingly for reducing their energy requirements, it will be critical to use innovative building designs solutions. The options available in hill area would revolve round using sun as major source of light and heat for meeting the energy requirements of buildings. Accordingly, only southern slope in hill area should be permitted to be used for construction of buildings so that maximum use of solar energy is made to meet the major portion of energy requirements of the buildings. In this process, construction of buildings on the Northern slope should not be permitted. Site planning in this context would assume critical importance for achieving optimum design solutions and promoting sustainable by using the best orientation available and minimum disturbance of site. Walls and roof should be appropriately used for heat gain and their retention and circulation in the building in order to keep the temperature at most optimum level. In addition, use of double glazed windows with proper sealing should be used to bring in sun light and prevent loss of heat. Insulation of north well would be critical to minimize heat loss in the buildings. Use of solar chimneys and cavity walls are other options which can be used for promoting heat gain and minimizing heat loss in the buildings. Locally available building materials and building technologies would require up-gradation in order to achieve the desired objectives. Use of CFL light fixtures should be made mandatory to reduce the energy consumption used for lighting. Appropriate building bye-laws would be required to be reframed in order to promote building designs which are least consumers of energy. Similarly all old buildings should be brought under retrofitting in order to reduce their energy consumption. Accordingly, in search of appropriate solutions and strategies for promoting energy efficiency and sustainability in buildings, multi-pronged strategy involving using site planning, study of macro and micro climatic conditions, building form, area and volume ratio, landscaping, roof typologies, orientation, space efficiency, cavity walls, solar chimneys etc. would be required to be put in operation.

PLANNED DEVELOPMENT

Looking at the entire gamut of hill area development, it appears that options available are very limited for promoting rational development and protecting, preserving ecology, environment and resources of the hill areas. The limited option which appears to be available is to go for planned development of hill areas based on

sustainability as defined by the World Commission on Environment and Development. Thus state government must put in position a strong machinery for evolving, putting in place and implementing planning framework both at state level in the regional context and at the local level for all individual settlements in order to ensure that entire future growth and development takes place within the given framework. Sooner it is done, better it would be for ushering an era of economic prosperity and development for the people, community, area and the state of Himachal Pradesh.

Affordable Housing for All in India – Issues and Options

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Abstract

As one of the basic necessity and provider of safety, security, identity, dignity and assured quality of life, housing remains critical for human living. Besides social connotations, housing is known to be among largest contributors to economy, generator of employment and promoter of industrialization. Securing ownership of an appropriate shelter remains lifetime ambition of every individual and family. Considering the critical role and importance of housing in human living, Habitat-II also included ,"Housing for All", as one of the universal goal to be achieved by all nations.UNO has also mandated nations to make adequate housing as one of the basic human right. However, increasing gap exists in the demand and supply of the shelter for the lower base of social pyramid with demand chasing the supply. Estimates made by the Technical Committee ,set up by Ministry of Housing and Poverty Alleviation, Government of India, has placed urban housing shortage, at the end of 10th five year plan, at 24.71 million dwelling units with more than 99% shortage in the economical weaker sections and low income groups. Projected housing shortage has been placed at 30 million dwelling units by the year 2020. Considering the large gap, providing housing to the poorer sections of society, has emerged as the major challenge for all parastatal agencies. Ever rising cost of land and cost of construction besides increasing land speculation and large number of externalities have put housing beyond the affordability of majority of urban residents excluding them from formal process of owning/ renting an appropriate shelter. Looking at the enormity /magnitude of problem, Government of India has launched PMAY(U) in the year 2015, visioned with, 'Affordable Housing for All', by the year 2022, In search of appropriate solutions to make the vision a distinct reality, paper looks at the existing issues and roadblocks in bridging the gap between demand and supply of affordable housing. In addition, paper explores the options of, adopting innovative planning, leveraging state of art technologies; involving all stakeholders; creating enabling environment; making land market more efficient, promoting rental housing and minimizing cost of shelter besides leveraging the potential of private/co-operative sectors, as key partners in creating larger housing stock for EWS/LIG categories so as to put affordable housing on the fast track and making housing for all a distinct reality

Key words: *Affordable housing, Land, Technology, rental housing inclusive planning*

Introduction

If 19th century marked the ushering of industrialization at the global level, 21st century is being called the century of urbanization. Following the global pattern, India is also urbanizing at a fast pace. India ranks today as the second largest urban system in the world after China. Census 2011 has placed the population of Urban India at 377.10 million and level of urbanization at 31.16% as against 279 million in 2001 with level of urbanization at 27.8%. Urban areas are growing with a multiplier of 3 against rural areas with annual growth rate placed at 3.18% against 1.22% during the decade 2001-2011. Based on the prevailing growth rate by the year 2031, urban India is estimated to house 600 million people out of a total population of 1400 million and by 2051, urban and rural areas will have equal share with total population placed at 1600 million. Concentration of population in urban centers has become more and more pronounced with number of urban centers going up from 5161 in 2001 to 7935 in 2011 and million plus cities recording 50% increase, going up from 35 in 2001 to 53 in 2011. It is estimated, number of such centers will be 68 in 2031 and 100 in 2051. Out of 26 ten million plus cities of the world, three cities, namely Mumbai, Kolkata and Delhi, are located in India. As per estimates made by the United Nations in its report, 'World Urbanization Prospect, The Revision 2014', the number of such cities will go up to 7 in 2031 and 9 in 2051.

Urban areas are known for their higher productivity, larger capacity to generate employment and making greater contribution to the economy and prosperity of the nations and communities. They are also known to be centers of innovations, promoters of entrepreneurship and providers of state of art services and amenities. However, despite distinct advantages, large number of dualities, contradictions and peculiarities mark urbanization. UN Habitat Report, State of World's Cities 2008/2009-Harmonious. Cities, defines the cities in their basic characteristics and growth pattern in terms of:

> Cities contain both order and chaos. In them reside beauty and ugliness, virtue and vice. They can bring out the best or the worst in humankind. They are the physical manifestation of history and culture and incubators of innovations, industry, technology, entrepreneurship and creativity. Cities are the materialization of humanity's noblest ideas, ambitions and aspirations, but when not planned or governed properly, can be the repository of society's ills. Cities drive national economies by creating wealth, enhancing social development

and providing employment but they can also be the breeding grounds for poverty, exclusion and environmental degradation

Indian cities are no different from the global pattern, which are distinguished by dualities and contradictions and where growth and development is marked by deprivation and opulence. Despite showcasing distinct advantages and critical role, urban centers have not been growing in a planned and rational manner. Emerging urban scenario on Indian canvas portrays large number of shanty towns over-shadowing the city growth; slums and state-of-the-art buildings rubbing shoulders; poverty and prosperity competing for urban space, unplanned development emerging as the order of the day; informal sector governing the growth and development of cities and basic amenities and services eluding the majority of urban residents. Majority of urban centers continue to face problems of acute housing shortage and rapid uncontrolled growth resulting into haphazard expansion with sub-standard infrastructure, adversely impacting the quality of life of majority of urban residents. The existing inadequacies have resulted into uncontrolled rapid growth and proliferation of informal sector. Poverty, population, pollution and environment have emerged as the major issues and greatest threat to the urban living.

Housing

Rapid urbanization and concentration of population in urban areas have numerous implications.. Uncontrolled migration of rural poverty, skyrocketing price of land and ever-rising prices of building materials besides large financial resources required to create appropriate shelter through legal means, the poor urban residents and rural migrants have no option but to encroach upon available marginalized public and derelict land in the city to create temporary and makeshift shelter due to poor financial capacity and affordability. This has lead to mushrooming of slums and shantytowns in urban areas. Mumbai has more than 54% of its population living in slums whereas Kolkata share is placed at 33%. In India more than 60 million urbanites are residents of slums and shanty towns and the proportion is increasing rapidly. The makeshift shelter lacking in the basic necessities of life makes it unfit for reasonable human habitation. With shelter lacking in proper air, light and ventilation, poor health and hygiene besides poor quality of life have emerged as the natural corollary of urban living for these migrants. With shelter made on the encroached public/private land, the poor are in perpetual fear of being displaced by the parastatal agencies with possible destruction of makeshift shelter. The fear of demolition acts as a major deterrent to improve their shelter with savings available at their disposal. This has lead to housing shortage, which keeps on growing and gap between demand and supply getting wider and wider.

As major determinant of quality of life, provider of security/ identity to human beings and providing large employment to both, skilled and unskilled manpower, housing is known to be one of the major contributors to the economy/ gross domestic product. With more than 290 industries involved in producing materials used in the construction, housing has been considered to be the key promoter of industrialization. Considering the multiple connotations, providing housing has emerged as one of the major priority for nations. For focusing on housing as the priority sector, Government of India initiated number of steps and enacted number of housing policies involving; providing shelter to all with every family having a dwelling unit of appropriate quality and space duly supported by basic amenities ; transition of public sector role from provider to facilitator; making housing integral part of neighborhood; prioritizing on urban housing and emphasizing the need for providing and promoting housing on a large scale with priority for EWS and LIG categories. Based on the efforts made, housing sector is being given priority and ranks high on the agenda of state and central Governments.

Housing Shortage

Globally, all developing nations are facing perpetual shortage of housing the EWS sections of the society. Uncontrolled urbanization and rapid migration coupled with lack of authentic data are making it difficult to accurately quantify the level of housing shortage in urban areas. Technical Group constituted by Ministry of Housing and Poverty Alleviation (MHPUA), placed shortage at 24.71 million dwelling units at the end of 10th Five Year Plan for 66.30 million urban households. Group further estimated that majority of shortage was in the EWS category with gap placed at 88%, LIG accounted for 11% whereas in MIG/HIG groups, the estimated shortage was merely 0.04 million dwelling units. For the 11th Five Year Plan (2007-12), the Group projected that total housing requirement in urban centers including backlog, will be of the order of 26.53 million dwelling units for 75.01 million households. If current trend of increase in backlog of housing is allowed to continue, report said that 30 million houses would be required by the year 2020 to achieve the national goal of providing affordable shelter for all. Technical Committee also critically looked at the housing shortage in all categories individually and observed that housing shortage in EWS category was highest with shortage placed at 99.9% of total EWS households, 10.5% in LIG whereas it was only 0.2% in MIG/HIG categories.

Despite the fact that large volume of housing stock has been added since the involvement of private sector but majority of the additions falls under the category of higher and upper- mid housing segments because of high premium these categories command. Housing for the poor and EWS categories essentially falls in the domain of parastatal agencies and to some extent with private developers, to meet the legal obligation of license granted to them for colonies/ townships. With limited capacity and resources available, housing for the poor face perpetual neglect and shortage. However, considering enormous demand in these categories, existing shortage can be leveraged both as an opportunity and challenge to create large housing stock for LIG/EWS categories, based on their affordability.

Affordable Housing

Affordable Housing, as a concept, approach and opportunity, has recently been gaining currency and attracting lot of attention of providers and developers involved in housing sector. However, affordability cannot be precisely defined because of large number of variables and determinants, which go into the making of affordability. RICS defines *affordability in the context of urban housing as provision of 'adequate shelter' on sustainable basis, ensuring security of tenure within the means of the common urban households.* KPMG has defined it , '*in terms of three main parameters, namely income level, size of dwelling unit and affordability* .US Department of Housing defines *housing affordability simply in terms of expenditure of household on housing as proportion of annual income that should not exceed 30% of the total income.* Task Force on Affordable Housing considers two variables namely *size of dwelling and household income whereas* JNNURM has defined it in terms of *size of dwelling units involving super built up area/carpet area and EMI/Rent not exceeding 30-40% of gross monthly income of the buyer.* Jones Lang LaSalle considers *affordable housing in terms of volume of habitation instead of area, provision of basic amenities, cost of the house (including purchase cost and maintenance cost) and location of the shelter.*

Based on the studies made and analysis carried out, it has been observed that the highest gap between demand and supply of housing is found to exist in the annual income range of Rs 2-3 lakhs because of the limitations imposed by minimum disposable income surplus placed at 30-35%. This considerably reduces the purchasable capacity of this income group particularly the shelter, which is highly cost- intensive. Based on the defined norms and the concept given above, the cost of the dwelling unit needs to be rationalized to bring it within the affordability limits. . The cost of house can be made more rational and affordable if the developer's margin is lowered and cost of construction is reduced by using state of art/ cost effective technologies, using cost- effective locally based building materials, materials made from waste, effective project management and production of houses on a mass basis leading to economy of scale. Affordable housing is essentially a volume game and not a margin game**.** However, the price of dwelling unit will vary depending upon location, cost of land, FAR, density, number of dwelling units permitted per unit area and government charges. Considering the present status, housing cost can be made affordable with the enabling environment and supportive policies of the Government

Issues in Developing Affordable Housing

 Housing, as already stated, is both labor and capital intensive activity with land, money, materials and construction as the major components. Considering the multi-lateral implications of the housing, there are large numbers of economic, regulatory and urban challenges in developing the affordable housing. Ever rising cost of land and cost of construction are the constraints that have emerged on the supply side whereas lack of access to home finance and identification of right beneficiaries are the major demand side constraints, creating roadblocks in supplying adequate number of houses in the affordable category. Despite large efforts made to mitigate these challenges, tangible results have not been commensurate. Multi-pronged and focused action is required to promote creation of affordable housing on large scale. Looking at the existing scenario, major issues identified in developing affordable housing are enumerated below :

- **Low availability of developed land**
  With 2.4% of global land and 17.3% of world population, India is under perpetual shortage of land needed to meet the basic requirements of more than 1.31 billion Indians for food, clothing and shelter. With rapid urbanization and industrialization, asking for more and more land to be brought under non-agricultural uses, the pressure on the land is increasing rapidly. With low land-man ratio coupled with ever rising demand and numerous constraints emerging out of speculation, ever rising land prices, legal framework, planning tools and building bye-laws, the supply of developed urban land is diminishing very fast and accordingly, cost of land rising very rapidly, making the cost of shelter highly unaffordable for majority of urbanites.

- **Rising Threshold Cost of Construction**

With construction constituting 50-60% of the total selling price in the affordable housing, for reducing cost of dwelling unit, it will be critical to optimize the cost of construction. However, due to rapidly rising cost of building materials, cost of labor, cost of transportation, government levies, taxes and charges, cost of affordable housing remains highly stressed.

- **Higher Government charges-**
  Charges levied by the parastatal agencies for granting change of land use, approval of the layout/building plan, licensing fee, internal and external development charges, registration of land and registration charges for the finished house etc are major contributors to the cost of the housing. These would need relook, rationalization and redefinition to promote affordability in the housing sector.

- **Rigid land use planning**
  Master Plans/ Development Plans, prepared for the rational growth and development of the city/periphery, do not create any space for the Informal sector which leads to their exclusion from planning process. Their demand for shelter and employment perpetually remain unfulfilled. For making affordable housing a reality, mechanism, approach, intent, content and scope of these plans need to be rationalized and re-defined to make them more inclusive.

- **Irrational Building Bye-Laws**
  Prevailing operational inefficiencies in land utilization, non- use of cost- effective and state of art building materials and construction technologies have their genesis in the prevailing outdated and archaic building bye-laws and subdivision regulations. They need critical review on priority for optimizing land resource and adopting cutting edge technologies.

- **Delay in Project Approvals**
  Complicated procedures, cumbersome processes, involving large number of agencies, duplications of processes/procedures and lack of decentralization of powers has led to considerable time taken to approve the projects/building plans (16-24months) resulting in both time over- runs and cost over- runs of the projects. Delayed project approvals are estimated to add 25-30% to the project cost. For making affordable housing reality, project approvals needs to be put on fast track and made time bound.

- **Lack of access to cheaper housing finance**
  Lack of access to cheaper housing finance for low income groups has its genesis in the non- availability of large number of documentations involved in approvals based on providing securities, proof of assured sources of income and residential address etc, which needs rationalization.

- **Multiplicity of agencies involved**
  As per study made by the KPMG and NAREDCO, real estate projects are required to pass through 150 tables in about 40 departments of central/state/urban local bodies before getting approved leading to delayed projects and making housing cost-inefficient.

- **Outdated and irrational legal frame work** including Rent Control Act.
- **Non- involvement of Private Sector**
- **Outdated technologies and poor project management**
  Outdated technologies and conventional methods of construction besides poor project management are major contributors leading to wastage, delayed construction and rising cost of dwelling units.

WAY FORWARD

Conventionally, housing for EWS/LIG sections of the economic/social pyramid has been largely the responsibility of the parastatal agencies with limited role assigned to the Private Sector. Considering the large demand for housing in this segment, most of the developer's have started working on the affordable housing to explore the depth, breadth and length of the demand on a long-term basis. With major initiatives in the urban development being taken at the national/ state level including launching of National Urban Housing and Habitat Policy, 2007(NUHHP); Jawaharlal Nehru National Urban Renewal Mission (JNNURM); Basic Services for the Urban Poor (BSUP); Integrated Housing and Slum Development Program (IHSDP); Rajiv Awas Yojna (RAY) and Affordable Housing in Partnership (AHIP) focusing on the lower portion of the pyramid, affordable housing has emerged as the priority area. Further, industry analysts and developers have started believing that if the government takes the initiative to remove the roadblocks, the segment could move to fast track. Considering the enormity of demand developers feel, it is possible to have a profitable proposition in affordable housing if the project and cost management are made very strong. Improved technologies can further help in reducing timeframe

and cut down cost of construction to a large extent. Innovative architectural/structural design of dwelling units and standardization of housing units/components can help in cost reduction. Further, economies of scale and developing a standard product can keep the cost low. Thus project design and construction management can lead to making the affordable housing projects risk free and profitable, considering the huge latent demand with salability not an issue. To create large stock of housing in the country and to put affordable housing on fast track of growth and development, following options are suggested:

- **Adopting project based approach**
  Considering elements of cross-subsidy and cost - reduction, a project based approach should be adopted for creating affordable housing. Housing project should invariably involve mixing of all categories including HIG, MIG besides EWS and LIG, to make project viable and self-sustaining. Making provision and addition of commercial component would help in making project profitable and attractive for both public and private sectors.

- **Promoting strong project and cost- management**
  Adopting professional and dedicated project and cost- management approach in planning, designing and construction would minimise time span for completion of the project, bringing high degree of cost-efficiency by eliminating   time and cost-over run.

- **Single Window Clearance**
  Putting in place an effective and efficient mechanism of single window clearance to ensure approval of the projects within a prescribed time frame, not exceeding three months, will go a long way in ensuring early completion of the project and avoiding any cost escalation.

- **Creating Land Bank**
  Creating large stock of affordable housing through the active involvement of private sector, will require promoting a dedicated Land Bank, for making available off the shelf land parcels ,with all required clearances, to developers under a joint venture mechanism .

- **Innovative and state of art architectural designs**
  Innovative and State of art architectural designs, providing for highest building efficiency, optimum utilization of land resource, optimum structural design, cost-effective building technologies/services, use of large prefabricated components and minimum of maintenance and upkeep, would be critical for creating cost-effective affordable housing.

- **Green Buildings**
  For promoting affordable living, designing affordable housing on the concept of Green Buildings would help in considerable reduction of operational cost of the house over the entire life cycle of the building due to reduced energy and water consumption besides lower generation of waste to make the dwellings really cost-effective and sustainable.

- **Promoting off-site Construction**
  Creating large stock of affordable housing will require shifting strategy from on-site to off-site construction. Standardising building components based on available size of materials and promoting pre-fabrication will be pre-requisite to promote off-site construction. Pre-fabrication is known for its capacity to reduce wastage, minimise cost, promote quality and achieve economy of scale and reduce time frame of construction and labour component for the housing, making it cost-effective.

- **Providing Higher Floor Area/ Density**
  Floor Area Ratio and Density are the two major determinants for achieving optimization of land resource and rationalizing the housing cost. Making available higher Floor Area Ratio and redefining density accordingly will help in optimising land utilisation, create larger housing stock and making housing cost-effective by lowering cost of land for each dwelling unit.

- **Improving Building Technologies**
  Reducing period of construction, lowering construction cost and ensuring quality of construction would essentially need adoption of state of art and innovative building technologies. Technology Mission of Government of India under PMAY for sourcing most innovative and cost-effective global technologies will usher a new era in affordable housing.

- **Rationalising government levies, charges, fees and taxes**
  Considerable proportion of the total cost of housing has genesis in the government charges, fees, taxes etc which would require rationalisation to make housing affordable in real sense of the term. Reducing these charges would involve redefining land use conversion charges, plan scrutiny fee, internal and external development charges. In all affordable housing projects, no land use conversion and licensing charges should be levied, building scrutiny fee should be charged @25% of prescribed rates whereas EDC should be charged @50% for EWS and@ 75 % for LIG categories.

- **Long term tie up of conventional materials**

Longer gestation period and other externalities, not only increase the cost of essential materials but also sometimes disrupt their supply, which adversely impacts the sustainability of the project. In order to hedge the project against the cost-escalation of essential materials including cement, steel, bricks, tiles sand, wood etc and to ensure the assured supply of critical materials during the project life cycle, it will be vital to have long term tie up with the producers/suppliers of such materials.

- **Promoting locally available building materials**
  Using locally available building materials and materials based on industrial and agricultural waste would be critical for promoting cost-effectiveness and utilizing waste. Encouraging research and development and promoting industries producing materials from industrial and agricultural waste would not only increase the availability of cost-effective materials but also reduce depletion of non-renewable resources used for creating conventional building materials.

- **Adopting co-operate based approach**
  Involving stakeholders by creating co-operative societies of beneficiaries and promoting co-operative culture would be vital for sourcing their support and resources for creating housing stock, minimising transfer of such units and procuring loan from financial institutions

- **Treating Affordable Housing a volume Game**
  Making affordable housing a business venture would require treating the sector not as a profit game but a volume game based on the principle of creating large housing stock with minimum cost, within a short span of 18-24 months and disposing off the entire stock within the time span of the project. Taking up large housing projects with number of units ranging from 1000-1500 for promoting economy of scale have already proved their worth in promoting affordable housing.

- **Separating Right to Shelter from Right to Ownership of Shelter**
  For achieving the objective of housing for all,the 'Right to shelter must be separated from Right to Ownership of Shelter'. This concept will help in minimising transfer of affordable housing to non-beneficiaries/ higher strata of society.

- **Migrating from Right to use land from Right to ownership of Land**
  With India already precariously placed in land-man ratio, it will be appropriate for India to eliminate all practices which promote trading of land as a commodity. Accordingly, considering the larger national interest, India should consider the option of migrating from right to ownership to right to use the land for human working/living based on pre-defined conditions, to optimise the land resource and minimise its misuse/abuse.

- **Creating Multiple Options for Shelter**
  Instead of focusing only on creating ownership houses; promoting multiple options of providing affordable shelter, needs to be considered based on affordability, family size, shelter requirements, marital status, type of avocation, skill, tenure etc. Night shelters, mobile housing, rental housing, bachelor/single accommodation etc at various places should be used as options for augmenting shelter and minimise quantum of formal and expensive housing.

- **Creating Built up Houses**
  Reservations made for the LIG/EWS housing in the approved colonies, under the legal framework, should be mandated in the shape of built up houses for augmenting affordable housing stock in various cities. Existing provision of providing plots for these groups must be dispensed with and replaced with built up houses, irrespective of the area of the project/number of dwelling units. For avoiding misuse,land parcels marked for affordable housing should be transferred to the Housing Board/ Development Authorities for constructing such houses and making them available to identified beneficiaries.

- **Rationalising Siting of Projects**
  Careful siting of affordable housing projects would be critical for their success. Locating such projects close to place of work/industrial estates, supported by all basic day-to-day amenities involving education, healthcare ,recreation , child care, shopping, community centre etc and making available cost-effective, efficient and reliable public transport from the project area would be critical to promote the acceptability/success of the project..

- **Using Peri- urban areas**
  Peri- urban areas with basic infrastructures, services and transport should be permitted to be used for creating affordable housing due to lower prevailing land cost
  .

- **Identifying Right Beneficiaries**
  Major problem in affordable housing is the identification of right/genuine beneficiaries, which has been grossly misused/abused for personal gains. Formulating well defined, transparent and objective guidelines with a networked system of sharing information, would be critical and essential for identifying right beneficiaries eliminating speculators, minimising multiple ownership and transfer/ sale of units at the local ,state and national level.

- **Using PPP Model**
  Housing**,** being largely a private sector activity, leveraging land for market based strategies and PPP models, would remain relevant in improving supply of affordable housing.

- **Revolving Fund**
  Promoting easy access to institutional finance at an affordable cost for creating cost-effective housing through a dedicated Revolving Fund, created at the national and state level with contributions made by central and state governments, urban local bodies, development authorities and assistance provided under different centrally and state sponsored schemes, would be a pre-requisite, critical and essential to ensure supply of affordable housing on large scale..

- **Making land market more efficient**
  Making 'affordable housing for all a distinct reality', critical and absolute will be to make land market more cost- effective and operationally efficient by streamlining the land ownership record, rationalising stamp duties, minimising benami transactions, eliminating speculation , taxing vacant urban lands, minimising monopolisation, regulating land use conversion, rationalising building bye-laws, zoning regulations , development controls, rationalising densities, ground coverage, floor area ratio, height etc would be pre-requisite

- **Redefining Master Plans**
  For making adequate land available for affordable housing at local level, all planning agencies must be mandated to provide dedicated land use zones for affordable housing in the Master Plans based in population projected to be living in the city. These pockets should be developed on time bound basis. No conversion of such pockets to any other use/higher category of housing should be permitted. 40% of entire residential area in the master plan should be put in this category and distributed over the city considering the work centres defined in the plan. Dedicated and well defined planning and development norms for such areas should be made integral part of master plan. These guidelines should also be made part of UDPFI Guidelines and that of NBC for their implementation.

- **Documenting Good Practices**
  Affordable housing remains most challenging segment in the housing sector and have defied all logics and rationale in solving this problem in its entirety. Accordingly, no single solution can clinch the problem. Various agencies, locally and globally, have made successful attempts to create replicable model in the affordable housing segment. These examples need to be documented and disseminated for wider study and replication.

- **Promoting Strong Project Management**
  Professional project management has enormous capacity, capability and potential to make project cost-effective, avoiding time-overrun , cost- over run, avoiding wastage of materials/resources, reducing manpower etc

- **Promoting Rental Housing**
  Rental housing in India has not been given a thought as part of solution to affordable housing in India. Unfortunately, archaic rent laws in the country have emerged as the major road block in creating housing stock in this category. Government should initiate a mission approach to create large rental housing stock for EWS/LIG categories in each city through either in PPP mode or by the Development Authorities/Housing Boards near the work centers. Rent laws should be accordingly amended to support the rental housing. Rental housing will also help in reducing/mushrooming of slums in the cities.

- **Sizing of the Project**
  Studies have revealed that affordable housing projects having area in the range of 15-35 acres, with number of dwelling units ranging between 1500-3500, located not beyond 20-25 kms from the city centre of metro cities, with area of dwelling units ranging between 250-350 sft, constructed as low rise G+3/G+4 walk up apartments , completed within 18-24 months and provided with all basic amenities have proved to be successful and should be taken as role model for constructing the affordable housing.

Conclusion

Looking at the entire policy framework, technological innovations,, financial and operational context, it appears that providing affordable housing can become a distinct reality only if concerted efforts are made in tandem and in a holistic / sustained manner by all the stakeholders including Governments, parastatal agencies, financial institutions, private sector, builders, developers, colonizers, industry, beneficiaries, NGC/CBO and professionals including Architects / Engineers/Planners etc. For achieving the goal of housing every Indian in general and weaker sections of the society in particular, rational housing friendly policy framework will have to be put in place on priority by the government providing required incentives and removing all roadblocks to achieve the desired objectives. Role of parastatal agencies shall be that of facilitators rather than provider with key responsibility given to the private and co-operative sectors. Reform linked policy framework; calling for making land market effective and

efficient; rationalising government levies/fees/taxes; incentivising industries involved in producing pre-fabricated components and making building materials from waste; providing housing loans at concessional and affordable rates with flexible options of repayment; making landowners active partners in creating affordable housing on a mass scale; bridging gap between demand and supply sides; bringing enablers, providers and executors on the same platform; making all stakeholders work in a concerted/committed manner would be critical in making affordable housing a distinct reality in the Indian context. Looking at the role and importance of housing, affordable housing can be effectively leveraged to create/ expand large job market for unskilled/ semi-skilled rural migrants; revitalize Indian industry; promote economy; achieving high growth rate and marginalize poverty in urban India. Housing, as a sector, can also be effectively leveraged in making urban centers inclusive, resilient, smart , more productive, more effective, highly efficient, more healthier, better habitable, better organized, well planned and more sustainable with assured quality of life.

MAKING URBAN INDIA SLUM FREE THROUGH INNOVATIVE LAND MANAGEMENT

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Abstract

Large population base coupled with massive rural-urban migration is promoting rapid urbanization in India. Considering the limited capacity and resources available with local bodies and parastatal institutions, cities are fast growing in an unplanned and irrational manner, unable to provide basic amenities of life, including shelter to its inhabitants, leading to mushrooming of slums. Considering slums as the shadow of urbanization, rapid urbanization has also lead to mushrooming of slums in urban India. Every sixth urbanite in India has been recorded to be a slum dweller. At the root of the problem of slums is the inadequate availability of land which has critical role and importance in providing adequate housing. With India having only 2.4% share of global land and 16.7% of population to support, land resource in India is highly stressed. Coupled with limited land and high degree of speculation, urban land prices have sky- rocketed. Since land is the major determinant of the housing cost, accordingly making housing affordable requires land cost to be minimized. Reducing land cost would call for making land market more efficient. In addition, cost-effective housing would require providing adequate land, at right place in right quantity and at right price. Minimizing land cost for creating affordable housing for slum dwellers, would require innovative options to be explored and put in place. For sourcing land at minimal cost paper would explore the options of making landowners partners in the urban development process; using the mechanism of land pooling and land redistribution; promoting guided urban development; rationalizing land records; optimum utilization of government lands; promoting public-private partnership; regeneration of existing derelict urban land; taxing vacant urban land; using land as a resource, creating efficient legal frame- work; redefining urban planning and rationalizing building bye- laws & development controls etc
Key Words; Slums, land, urban planning, building bye-laws,

INTRODUCTION

With merely 2.4 percent of the land and more than 17 percent of the world's population, India represents a unique example globally in terms of land-man ratio. Nation's population that was placed at 1210 million in 2011, is estimated to grow to 1400 million in 2031 and 1600 million in 2051. Further, urban population is estimated to grow to 600 million in 2031 and 800 million in 2051 as against 378 million in 2011. Massive growth of population has enormous social, economic, physical, infrastructural and environmental implications besides providing appropriate shelter for the poor . Providing appropriate shelter for the poor assumes importance because housing has been recognized, as basic human necessity contributing substantially to human livability and productivity. Housing has also been accepted globally as an important indicator of growth and development of a nation and quality of life it bestows on its citizens. Considering the role and importance of housing as a basic essential, World Assembly of Nations (Habitat – II) took the opportunity of endorsing universal goals of "Ensuring adequate shelter to all and making human settlements safer, healthier, more livable, equitable, sustainable and more productive".

INDIAN HOUSING SCENARIO

Globally, developing nations suffer from the perpetual problem of housing shortage with supply not keeping pace with the demand. The situation assumes alarming situation due to ever increasing number of urban migrants. Poor migrants, with inadequate financial resources, put pressure on land, urban services and infrastructures, which inevitably lead to congestion, increase in number of pavement dwellers and growth of slums and squatter settlements. The growth of slums is a sign of inability of people to afford land and shelter through the normal market mechanism and failure on the part of public sector to ensure equitable access to the poor. As per Census 2011, 65 million people were living in slums and squatter settlements. Nearby 38 percent population in metro cities was found to be in declared slums with Calcutta, Bombay and Delhi recording higher proportions. Poor quality housing coupled with absence of adequate water supply, disposal of human waste and garbage collection with 40 percent of urban dwellers left without access to safe drinking water and over 90 percent without access to safe sanitation are the general characteristics of these slums. Considering the present scenario of rapid migration and urbanization, slums are likely to house major chunk of future urban population.

Parallel existence and development of formal and informal housing stock and settlements in urban India, City within a City- a multiple city syndrome, is a phenomenon seen all over the developing world. Slums rubbing shoulders with housing of the rich are a classic testimony to the process of urbanization, which has thrown up "Islands of Affluence in a Sea of Poverty". With housing shortage placed at 24 million dwelling units (with more than 96% in EWS/LIG categories), sourcing adequate land for housing the poor appears to be most challenging task. Indian housing market is beset with problems like ever growing shortage of housing stock for urban poor, lack of basic infrastructure , overcrowdings, poor quality housing, multiplicity of squatter colonies, mushrooming of slums, high land cost, scarcity of serviced land, lack of resources etc.

LAND RELATED ISSUES

Land, basic platform of all human activities, is considered most critical component of any housing. Despite the fact success of any housing program is contingent on availability of adequate land, still majority of developing countries have not been able to increase the supply of serviced land in urban areas. Land cost has become excessive and unaffordable. Intervention by the public agencies has not produced the desired effect in achieving the objective of supply of adequate serviced land at affordable price, to meet the needs of the shelter for the poor Accordingly, over the years availability of land has emerged as the greatest roadblock in providing appropriate shelter. .

Land market in past has been controlled by the public sector and government had the virtual monopoly. With inefficient legal framework and lack of adequate resources available with the parastatal agencies, supply of the serviced land has become highly skewed. Excessive governmental controls have restricted the role of private sector in bringing adequate land into the urban market. Accordingly, most of the land available in urban areas is both unauthorized and unserviced. This has lead to the creation of a parallel urban land market, beyond the control and ambit of any regulated system. The share of informal land market has been steadily increasing making most of the land available in urban market un-serviced and city growth illegal. Treating land as a commodity, new paradigm of land speculation has lead to large tracts of urban land remaining vacant for number of years. With land prices going up steadily, capacity of the government to intervene effectively in the land market has been considerably eroded. Limited availability of land with public agencies has further reduced the supply in the urban market. Land acquisition through new legal framework has become a major hurdle which has made Development Authorities incapable of supplying serviced land in the urban market at an affordable price. Development Authorities have also made land as the sole mechanism of making huge profits. In the process only a limited supply of developed land is made and the prices of released land go up considerably. Monopolizing land and restricting supply of serviced land coupled with its high pricing has edged out the urban poor from the urban market resulting in illegal occupation of public land in their search for the shelter.

In-efficient functioning of land market has its genesis in the non-involvement of private sector. With more than 90 percent of housing stock still being supplied by the private sector, its potential needs to be fully exploited. This becomes all the more critical due to limited availability of resources with public agencies and the ever growing demand for serviced land. From its role of "sole suppliers", public agencies should become facilitators" in making the urban land market more efficient by giving increased role to the private and co-operative sectors. State should remove all roadblocks, which hamper the efficient functioning of these sectors. Planning tools like Master Plans, Development Plans, Development controls and building by-laws have emerged as the greatest hindrance in the operation of land market. They require objective study, review and modification for making them promoters of orderly growth and efficient functioning of land market.

National Seminar on Future Cities, identified following issues hampering provision of affordable shelter to the urban poor :

- Reduced supply of land despite increased demand.
- Higher costs making land unaffordable for urban poor.
- Haphazard and premature exploitation of peripheral lands.
- Out-pricing of the urban poor from the land market.
- Proliferation of squatter settlements, haphazard and unplanned growth.
- Irrational land use controls.
- Unrealistic legal and regulatory framework.
- Focus on higher/middle income housing
- Locking government/private lands in inefficient uses.
- High degree of land speculation.
- Poor land information system/high transaction costs.
- Limited public agencies capacity to acquire large parcels of land.
- Non-involvement of private/co-operative sector.
- Irrational planning tools.
- Exclusion of urban poor from city planning/development process
- Mechanism of auction to dispose off land
- Low priority to land for housing poor
- Large government levies
- High registration Charges

- Promoting plotted development instead of flatted development
- Irrational land development norms
- Non- availability of rational land parcels
- Large scale litigations and cumbersome legal framework
- Multiplicity of agencies involved working at cross-purposes
- Absence of dedicated land for the urban poor
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STRATEGIES

Globally, housing for the urban poor remains most formidable challenge and accordingly housing strategies for the poor need a holistic and multi-pronged approach. For effectively addressing the issue, increased supply of developed land and its availability in equitable and   sustainable manner would be vital. The existing inequality in access of land to poor has to be removed. Policies must free the restrictions on land supply and make the land market efficient and sensitive to their demand. National Report for Habitat-II suggested following strategies to improve availability of land for the urban poor:

- Minimizing monopolizing or pre-empting land assembly, development and disposal by parastatal agencies.
- Land development made a joint activity of public/private/ cooperative sectors with adequate safeguards to protect the lower income groups.
- Directing public agencies towards increasing the supply of serviced land with preponderant proposition for the poorer section.
- Promoting optimum utilization of land
- Developing an automated cadastral/land titling system.
- Rationalizing legal framework.

UNCHS suggested following strategies for increasing supply of land for housing low income disadvantaged groups by:

- Appropriating vacant public lands.
- Acquiring land through the private market, at a price based on the present productive income.
- Trading land/development rights for land in alternative locations.
- Freezing land prices in specific locations.
- Pre-empting the sale of land when the value declared by its owners is under-valued.
- Appropriating land in lieu of taxes on inherited land.
- Appropriating land at lower than market value through the use of development gain taxes.
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Above options are area, city and country specific depending upon the political agenda, government setup, legal and administrative framework, social structure, political will and commitment to the cause of weaker sections of the society. Looking at the entire context and prevailing trends, different options for strategizing sourcing of land for housing of the poor in the Indian context can be summarized in terms of:

Cross – subsidization
Cross-subsidization, as a mechanism for sourcing land, has been effectively used in Hong Kong where problem of low affordability of the poor has been resolved by leveraging the public/private sector resources. Cross-subsidization to the extent of 45% of the market value of housing for urban poor has been made possible through the mechanism of comprehensive urban development/re-development programme which capitalizes on increase in land values due to continued re-development of the city of Hong Kong.

Inclusionary Zoning
Many developed/developing countries have used the system of inclusionary zoning for making available land and housing to the poor. Under this, a product mix of houses/plots is to be provided by defining a   percentage of plots/houses to be made available for the low-income categories at affordable price. In case of Haryana all private developers are required to provide 20 percent of plots for the EWS category, at a price fixed by the State government. In state of Punjab, under the Punjab Apartment and Property Regulation Act, 1995, every developer is required to provide 10 percent of total residential area for the EWS. In case of apartments, 10 percent of apartments are to be provided for EWS category. However, this proportion needs to be increased with all restrictive conditions removed and land made available should be used for creating built-up houses. In this manner, large housing stock can be created for urban poor.

Squatter Zones

Integration of the informal sector with the urban planning process needs to be effectively leveraged to source land for shelter etc. In the Development Plans, sufficient area needs to be identified for the housing of the urban poor/ rural migrants, which can be acquired/developed to provide housing with basic infrastructures. Houses can be constructed and upgraded by the poor over a period of time. For the success of the scheme, sufficient funds need to be generated from different sources. Repayment scheduled needs to be linked to earning of the migrants.

Land Bank

Creating a land bank ,with all approvals, would be critical to facilitate the process of making available affordable shelter. Provision can be made to earmark 5-10 percent of the land in every urban development project for housing the poor. This land can be placed at the disposal of public authorities to be utilized for construction of housing for the poor

Land Pooling & Redistribution Schemes

These schemes involve landowners being treated as coparceners in the urban development process with no compulsory acquisition of land involved. Schemes generate enough land for public purposes/resources for infrastructure development besides bringing large amount of potential land, falling on the urban fringe into the land market. This helps in keeping the land price stable and imparts efficiency to the land market. Under the plot re-constitution mechanism, large amount of land has been brought into the urban market in Ahmadabad city alone. P.R. Scheme is popular in India and has been successfully employed in the states of Maharashtra, Gujarat, Tamil Nadu, Punjab etc. Scheme needs to be leveraged in other states also to make land available for housing the poor.

Guided Urban Development

Under the World Bank assisted project in the state of Tamil Nadu, CMDA collaborated with private developers to build 10,000 units for EWS/LIG people. Under these schemes, owner/developers having land and agreeing to provide 75 percent of the plots for EWS/LIG categories were given exemption from Urban Land Ceiling Act. Though project did not make much headway but with certain modifications' can be effectively used for improving the availability of shelter to the poor.

Private Sector Involvement

Keeping in view the limitations of the public sector, it is necessary to encourage the private sector in large-scale assembly, development and disposal of land to supplement the efforts of public agencies. Haryana State has taken a lead in this regards by evolving a comprehensive and effective framework for sanctioning of colonies, which has brought in lot of reputed builders in urban centers. Haryana model needs replication with certain modifications in order to attract developers in small and medium towns. Developers have not only contributed substantially to the orderly growth and development of urban centers but have also made available large number of plots for the urban poor at an affordable price. Haryana has also evolved an innovative affordable housing policy where private developers, having land, have been provided with number of incentives involving higher density, FAR, height, rebate in levies and development charges etc to provide affordable housing on a pre-determined price for pre-determined area of flats.

Public-Private Partnership

The combined strength of both public/private sectors can be effectively used in providing shelter to the urban poor. State of West Bengal has taken a lead by floating number of joint venture companies between West Bengal Housing Board and reputed private sector companies like Peerless Group, Ambuja Cement etc. Under these JV's, large stock of houses created for LIG/EWS categories on a highly subsidized price. The subsidy is made good through HIG housing and commercial sites. Lucknow Development Authority allotted land to the private developers, who were required to provide 40 percent of the plots for EWS category to be handed over to the Development Authority for disposal to urban poor at a heavily subsidized price.

Regeneration of Urban Land

Lot of public and private land is locked in inefficient uses in the urban areas in the shape of closed industries/offices/institutions/derelict buildings etc. In order to make optimum use, it is essential that such land parcels are brought into urban market and used for meeting the requirements of housing for public/urban poor. State of Punjab has already launched a scheme called, 'Optimum Utilization of Vacant Government Lands (OUVGL)', under which all unused and under-used potential public lands are being identified, planned, developed and disposed off for housing/commercial purposes. This has not only generated resources for the state for infrastructure development but has also brought in considerable amount of land into the urban market. Part of resources generated/land needs be used for housing poor in the State.

Taxing Vacant Urban Land

Speculation in land as a phenomenon has gained enormous currency. This process has put on hold large quantity of serviced urban land. In order to bring this land into the market, it would be desirable to tax the owners of such land. The tax liability should be heavy so as to act as deterrent for keeping the land vacant. This would serve dual purpose of land being brought into urban market and also generate resource, which can be utilized for funding the housing for the poor. PUDA has imposed extension fee on the vacant plots after three years of allotment @ 2%

of current allotment price. This has resulted in rapid construction on plots lying vacant for number of years besides generating resources, which can be leveraged for creating housing for poor.

Efficient Legal Framework

For improving the supply of serviced land in urban areas, existing legal framework needs close scrutiny/drastic amendments. Amended Land Acquisition Act has made the land acquisition both costly, time consuming and expensive. Law needs to be reviewed to ensure availability of adequate amount of land at affordable price for housing the poor. Rent control law also needs rationalization to create more housing stock.

Building Bye-Laws & Development controls

Effective and optimum utilization of valuable urban land is often hindered by the existence of archaic/outdated building bye-laws/development controls, which impose undue restrictions on the efficient use/development of the land. Rationalizing development controls and building restrictions relating to FAR, mixed land use, height, plot size, room height etc will help in optimum utilization of land and improving housing stock for the poor.

CONCLUSION

Considering the enormity and magnitude of problem and declared policy of government to provide housing for all by 2022 and launching number of innovative schemes by the state/national governments for affordable housing, making India slum free will largely depend upon our capacity to leverage land in right quantity, at right place and at right price.

Issues and Options for Raising Resources for financing Infrastructure in Urban Areas

Issues and Options for Raising Resources for financing Infrastructure in Urban Areas

Abstract;

As promoter of economy, generator of employment, determinant of quality of life and operational efficiency, infrastructures are known for their critical role and importance in ensuring rational growth and development of urban settlements . Infrastructures, both social and physical, are also credited to be the foundations on which entire urban super-structure is built and made operational. Accordingly, providing appropriate level of infrastructure assumes importance. Despite distinct advantages and critical role in the urban context, infrastructure are conspicuous by their absence in large majority of urban settlements in India, adversely impacting quality of life , their capacity and capabilities as engines of economic growth. Inadequate infrastructure has its genesis in the prevailing pattern of urban growth and development which is both haphazard , unplanned and sub-standard; low priority accorded to provision of infrastructure; non-availability of adequate financial resources; ever expanding dimensions of urban centers; uncontrolled development in peri-urban areas; multiplicity of agencies with overlapping areas of operations involved in infrastructure sector; outdated technologies adopted ; lack of proper maintenance and upkeep; irrational user charges; poor operational efficiency and service delivery; non-availability of adequate urban land; irrational norms and standards; poor management; non-involvement of private sector; urban poverty ; exclusion of communities and majority of stakeholders in planning and development of infrastructures etc In search for appropriate solutions to provide basic infrastructure to all the urban residents in India, including poorest of the poor to lead a dignified life, paper looks at the numerous options in term of: promoting planned development; making cities compact; promoting vertical cities; creating infrastructure master plan ; using land as a resource; involving state of art technologies; using dual strategy of reducing network and making services lean and smart; improving operational efficiency and effective management in service delivery; creating unified agencies for infrastructure; involving all stakeholders and communities; making private sector an active partner .

Key words: Planned development, compact cities, land, communitie

INTRODUCTION

Advent of industrialization and process of mass production, duly supported by service sector, has not only revolutionized the economic structures at the local and global level but has also deeply impacted the demographic structures of the nations and communities. In the process, there has emerged a new class of settlement called urban and the process known as urbanization. With large number of people opting for urban settlements, due to distinct and inherent advantages, these settlements have and opportunities they offer, as compared to their rural counterpart, cities are witnessing large influx of population. Urban population of developing countries is accordingly growing at a fast pace and India is no exception to the prevailing global trend. With level of urbanization placed at 31.1% (Census 2011), India has emerged as the second largest urban system in the world after China with population placed at 378 million. With annual urban population growth rate placed at 2.1% as compared to 0.7% in case of rural India, it is estimated by 2030 number of urban residents will be of the order of 590 million and 800 million in 2050 with majority of the urban population opting for living in the large urban centres.

The rapid growth of the urban population and its concentration in few large urban centres has obvious implications in terms of infrastructures and services because all human beings, for their living, sustenance, growth, effective working and quality living, need basic services. In fact infrastructure is the foundation on which entire super-structure of human living and settlements is built. As promoter of economy, generator of employment, determinant of quality of life and operational efficiency of cities and towns, infrastructures are known for their critical role and importance in ensuring rational growth and development of urban settlements. Infrastructure as a sector also propels overall development of the national economy. Economic growth of a country is also found to have positive co-relation with the development of its infrastructure.

Despite distinct role and importance in leveraging the economy and human living, majority of urban centres are found to be deficient in providing basic infrastructure to its inhabitants., New economic policies of the government emerging from liberalization and globalization have also placed heavy demand on infrastructures and services in urban areas putting the available infrastructure under heavy stress The emerging infrastructure bottlenecks in urban areas pose serious impediments in enhancing operational efficiency and productivity. Failure to expand water supplies, improve sanitation system, expand housing supply and improve transportation

to match the growth of population has emerged as major causes of poverty and misery in urban areas. Accordingly, it becomes critical that provision of urban infrastructures, on prescribed norms and standards to urban residents, should be taken on priority for making urban centres as engines of economic growth and provider of quality living.

ISSUES

In the Indian context, existing infrastructure scenario is critical. As per recent estimates, no city provides water 24 hours a day and 7 days a week, only 64 percent of urban households are covered by individual connections and stand-posts for water supply. Only one half had toilet facilities. More than two third population is left uncovered by sanitation facilities. Coverage of organized sewerage system ranges from 35 percent in Class-IV to 75 percent in Class-I cities. 4861 cities/towns in India do not have even a partial sewerage network. The drainage system for rainwater disposal covers only 66 percent of urban population. The city roads are inadequate for traffic requirements leading to congestion and fast deterioration in quality of roads due to excessive load and traffic. Apart from deficiencies in terms of access to facilities, the operation and maintenance of infrastructures leaves much to be desired. Inadequate infrastructures are hampering the growth, development and expansion of the major growth centres of the country. Infrastructure is the foundation, sustainer and backbone of any settlement structure. It has a strong co-relation with activity location pattern. Quality of life has also been found to have high degree of positive co-relationship with the available quality of physical and social infrastructures.

Provision of infrastructures has primarily remained within the domain of public sector. Governments have traditionally been providers of the services because of monopolistic nature of these services usually involving high up-front costs and long payback periods besides requiring huge amount of resources and investments. These services are also characterized by existence of externalities making it difficult for agencies to recoup investment costs and operational expenses through levy of user charges

The fact that infrastructure services do not pay for themselves and the government does not have resources and financial capacity to subsidize the beneficiaries, has resulted in low availability of funds. With increasing requirement, this has led to the deficiency in volumes as well as quality of services.

Assessment of investments has been made by different groups including the working group constituted by Planning Commission for Infrastructure Development based on norms laid down by the Task Force on Housing and Urban Development. Estimated per capita investment at 1995 prices for providing water supply, sewerage, sanitation, solid waste disposal, storm water drains, roads, street lights has been placed at Rs.2366 at lower end and Rs. 3260 at higher end. Accordingly, India required investment in the range of 249.6 to 588.7 billions for 1991-2001 and additional 330.9 to 632 billions for 2001-2011. Further, as per estimates of the India Infrastructure Report, 1996, a total of 133.38 billion would be required to clear backlog of water supply, sanitation and roads as of 1995. The additional investment required for provision of new services was estimated to be around Rs.51.67 billion per annum over the period 1996-2001 and Rs.46.42 billion per annum over the period 2001-2006. As per official estimates, an amount of Rs. 2,00,377 crore would be needed by 2021 A.D. for increasing water supply coverage to 100 percent and covering entire population under solid waste management. MRTS/LRT in 2 million plus cities was estimated to cost additional Rs 50,000 crores at current price. NIUA (1995) estimated an annual gap of Rs. 8.82 billion (at 1995 prices) in the operation and maintenance of municipal services during 1990-91. The cumulative deficit of O&M was likely to be of the order of Rs. 184 billion by the year 2001. .High Powered Expert Committee Report (March ,2011) on 'Indian Urban Infrastructure and Services', set up by Ministry of Urban Development, GOI, has estimated that the investment for urban infrastructure over the next 20 year period (2011-2031) to be of the order of Rs 59.1 lakh crores at 2009-10 prices which include Rs 39.2 lakh crore as capital cost and Rs 19.9 lakh crores as O&M cost for eight identified new and old services including water supply, solid waste management ,storm water drains, urban roads, urban transport, street lighting and traffic support infrastructure.

Bridging these financial gaps for creating adequate infrastructures is surely beyond the capacity of public sector and accordingly alternative strategies will have to be evolved to generate resources besides tapping additional avenues for funding the urban infrastructures.

Cities are finding it increasingly difficult to provide / maintain infrastructures due to;

- rapid growth of demand for infrastructures arising out of massive influx of population in urban areas
- low allocation of funds in the national/state/local budgets
- limited capacity of state/ local level authorities to provide such service
- increasing gap between demand and supply

- poor maintenance and upkeep of existing infrastructure
- Use of obsolete and expensive technology for providing services
- irrational user charges and highly subsidized urban services
- poor recovery and collection of service charges
- lack of accountability leading to inefficiency and low productivity
- non-involvement of communities
- public sector monopoly in providing services
- lack of political commitment/will to rationalize the service charges.
- large proportion of unaccounted services due to theft and leakage
- low priority to provision of infrastructure
- over dependence upon fiscal resources starved public sector for infrastructure provision
- lack of committed political decision making
- poor co-ordination among various departments involved in providing services.
  These factors have emerged as the major road block and are likely to further hamper the provision of services unless innovative approaches are adopted to overcome these impediments.

SUGGESTED APPROACH

Studies made and analysis carried out globally, has concluded that Infrastructures play critical role in accelerating the pace of socio-economic development, generating employment, improving productivity, promoting quality of life and minimizing poverty of any nation. Therefore, it becomes vital   that provision of infrastructures, both soft and hard, in urban areas is accorded highest priority. Appropriate strategies would have to be put in place to remove all roadblocks which hamper the provision of such services with innovative techniques adopted to improve their availability. In order to achieve the target of providing basic infrastructures to all in urban India and improve the quality of life, following suggestions are made;

PROMOTING PLANNED DEVELOPMENT

Promoting planned development of urban areas offers the best option to provide basic infrastructure on self-sustainable basis. In the case of planned development provision of basic amenities, as mandated in the legal framework, has to be provided as part of planning process which makes available not only land required but also the resources to develop the infrastructure. In colonies developed in the states of Punjab/ Haryana, area to the extent of 55% is kept as salable area whereas remaining 45% is to be used for roads, open spaces and amenities to be provided , based on population proposed to be housed therein. The cost of providing and developing the infrastructure/amenities is loaded as development cost on the cost of land which is charged from allottees of plots. Thus it becomes critical that efforts should be made to promote planned development of urban areas and all haphazard and unplanned development is strictly controlled and prohibited. Planned development thus offers the best option for providing state of art, self-sustaining, qualitative, efficient network and services delivery mechanism for urban sectors without any cost to urban local bodies.

INFRASTRUCTURE MASTER PLAN

Preparing Master Plan for urban settlements would be critical in order to ensure the provision of all basic infrastructures on pan-city basis to all the inhabitants in an integrated manner over a period of time. Most of the urban residents are facing deprivation in the provision of basic services because of absence of any statutory framework guiding their future growth and development. Gaps and overlapping of services and infrastructure are the outcome of absence of a pre-defined growth pattern for the cities. Based on the Master plan it is also essential to prepare a master plan for the infrastructure development of each city . Preparing infrastructure master plan should be made integral part of the master planning process which would help in not only promoting orderly growth and development of the city but would also help in making provision and ensuring the availability of the critical physical and social infrastructure in the urban settlements on the prescribed norms and standards as integral part of city planning.

MAKING CITIES COMPACT

Making provision of the infrastructure is highly cost and resource intensive. Accordingly, it is important they must be made both cost- effective using minimum of resources. This would call for minimizing the size, length, breadth and depth of hard infrastructure. Once this is done the cost will considerably go down. Making cities compact offers best option to cut down the cost of infrastructure. Compact cities are planned on high rise and high density basis involving high population densities. Adopting flatted development rather than plotted development can lead to

making cities compact. Rationalizing city shape and extent can also help in making city compact. Based on this premise, city plan evolved occupy minimum area as compared to traditionally planned city. Once size is optimized with minimum area , service network is also gets minimized and lean, minimizing the cost of infrastructure. Thus new approach to planning has to be based on minimizing the size and cost of service network so as to make city development cost- effective. Compact city also helps in minimizing travel, reducing the road network required for vehicular traffic. Cities become walkable which leads to reduced cost of road infrastructure, Adopting Transit Oriented Development also helps in making development cost-effective. Accordingly, making city compact needs to be promoted to make infrastructure available to all in urban India at minimum cost.

ADOPTING 24X7 APPROACH

In addition to making cities compact, to making infrastructure cost- effective, it will also be essential to adopt the 24x7 approach to optimize the use of public amenities provided. India with 2.4% global land, housing 16.67% of population, has already land resource highly stressed. Multiple use of public amenities like schools, community centres, parking areas etc will not only help in saving precious land but also cut down number of such amenities to be provided by avoiding duplication.

RATIONALISING NORMS & STANDARDS

Provision of appropriate infrastructure has suffered in the past in the urban centres due to the adoptions of variable and unrealistic norms by pararstatal agencies. In many cases precious resources have been wasted due to adoption of unrealistic standards of services provided, making them uneconomical and unsustainable over a period of time. Accordingly, it becomes critical that appropriate and realistic norms and standards will have to be evolved for both social and basic services to be provided in the urban areas so that fair assessment could be made of the requirement of such infrastructures in each of the urban settlement and its provision is ensured on time bound basis. While defining the norms, it will be critical to discount the margins which become available due to policy of reduction, recycle and reuse, particularly in the case water supply besides keeping in view the local conditions, culture and living standards.

PHASING INFRASTRUCTURE DEVELOPMENT

Mechanism and option of phasing would be essential keeping in view the demand of the services in a particular area in order to economize and optimize the provision of infrastructures and services. Tendency of providing and developing entire infrastructures at the beginning of the project, irrespective of the demand, has resulted in enormous wastage of precious resources in urban areas. Development should be planned in such a manner that provision of services is restricted to the area where plots are to be disposed off. Such a strategy would help in utilizing scarce resources in a much better way, spread development over a larger area and would ensure the provision of services over the area where such services are required

ADOPTING NEW TECHNOLOGIES

In order to improve the availability of infrastructures in urban areas, the technology identified and used would need considerable improvement. Outdated technologies used in creating services have resulted in wastage of precious resources. Accordingly ,effective and efficient new technologies, which are cost-effective over entire life span of infrastructure and services need to be adopted so that optimum use of available resources is made. While making evaluation of different technologies, cost- benefit analysis should be made for the entire cycle and not separated into initial cost and O&M costs. Technologies selected should also keep in view local conditions, local culture and local climate in order to ensure they are put to optimum use.

PROMOTING GREEN BUILDINGS

Mandating new buildings to be constructed in urban areas and retro-fitting the existing buildings as Green Buildings can help in ushering a new era of providing cost- effective infrastructure. Green Building are known to cut down energy consumption by 24-50%, water consumption by 40% and generation of solid waste by 70%. This would lead to lower order of electricity and water network and supply, minimizing the cost of infrastructure, In addition, it will lead to making city more clean as waste to be transported will be reduced enormously, leading to economy in such services. Green Buildings are also known to reduce carbon footprints of cities between 33-39%, making them environmentally more sustainable.

INVOLVING COMMUNITIES

Involving communities would be critical , which would require focused attention so as to ensure appropriate planning, provision, development and maintenance of infrastructures. Upkeep and maintenance of open spaces and garbage disposal along with sanitation are the few areas where community can play a key role. Not only community should be involved in creation of assets but their active involvement in maintenance and upkeep of assets would be most valuable in making them sustainable over a larger period of time. This would help in rationalizing planning, optimum utilization and safety of such infrastructure. It has been observed infrastructure and amenities provided and developed without involving communities are often neglected, misused and abused leading to wastage of precious resources. Involving communities will be critical in case of amenities provided in low income communities.

MAKING HIGHER BUDGETARY PROVISIONING

Infrastructure sector in the past was monopolized by the public sector. However, priority attached to the sector was found to be very low, as has been indicated by the outlay made by the public sector in the past. In the second five year plan the funds earmarked for this sector was merely 0.65% which rose to 1.38% in the Eighth Five Year Plan. Due to low budgetary allocations made, availability of resources in the past has not been commensurate to the actual demand and as such provision of infrastructures in the urban areas has suffered enormously. If productivity of urban areas is to be leveraged, then investment in the public sector has to be of higher order/increased, and as such it would be appropriate that higher outlay is provided in the budget for the infrastructure sector in future. Allocations should be in the range of 8 - 9% of the total outlay. India Infrastructure Report, 2011 has also recommended Increasing investment in urban infrastructure from 0.7 per cent of GDP in 2011-12 to 1.1 per cent by 2031-32 to provide adequate resources to provide infrastructure in urban areas.

INVOLVING PRIVATE SECTOR

Private sector needs to be involved in a big way in the creation of soft and hard infrastructures in the urban area. Technological innovations have permitted low-cost supply options and increasing range and quality of services. In addition, new technologies have considerably reduced the cost of providing these services making the infrastructures commercially viable for the private sector. Thus private sector should be given appropriate role by making them co-parceners in the planning/ creation /provision/ operation/ maintenance of local level services and amenities. Involvement of private sector in urban development through granting permissions/licenses to develop colonies/SEZ/Mega Projects/Industrial Estate, offers immense opportunities for creating local and city level facilities. These services can be funded by the internal development carried out by these colonizers/promoters at their own level whereas city level infrastructure can be created through the mechanism of making contributions in the shape of External Development charges. States of Haryana/Punjab have been able to generate enormous resources from the private colonizers on account of EDC charged on the area developed by them. Haryana/Punjab model of resource generation and urban development through the involvement of private sector can be used by other states with certain modifications in order to provide adequate/quality infrastructure in urban areas

CONTRACTING OUT

In western countries, system of contracting out of urban services to private agencies, to improve operational efficiency and quality of services, has been used extensively which can also be considered for adoption in India . Possible services which may be covered under the scheme could be solid waste management, sanitation, development and management of green or recreation spaces like parks and gardens, roads and street lights. Rajkot municipality has contracted out number of municipal services to private firms and community groups, which has brought in considerable operational efficiency in the services undertaken by these agencies. It has cut down the operational costs of providing these services resulting in saving varying from 9 to 40 percent. However, contracting out would require well defined and transparent guidelines to be put in place for selecting competent, efficient and well meaning contracting agencies, having appropriate experience, expertise, skill and resources to carry out the services.

CREATING UNIFIED AGENCY

Multiplicity of agencies operating in urban areas in the domain of infrastructure development has done more damage than good in providing service at local level. Absence of any single agency looking after the entire gamut of infrastructure has been the root cause of majority of urban ills. .Accordingly, ensuring co-ordination among various agencies responsible for providing infrastructures and services in the urban sector is another area which requires focused action on priority. Generally, it has been observed that infrastructures created by one agency are often damaged by another agency operating in the urban area. Roads are laid first and when water supply and sewer pipes are laid, roads already laid are dug and damaged requiring re-laying at huge cost. Similarly while laying down

telephone lines, installing electric lines, making improvement in road network, road infrastructures are damaged. Thus it would be important that laying of services should be planned and coordinated in such a manner that all services should be laid as per a pre-drawn program so that no damage is done to the infrastructure, which are already laid. In case of connectivity of services at the household level, prior connections should be laid for each house for water and sullage so that no road cuts are made. Master Plan of infrastructures should be available with local authority and before laying of any service, prior permission of local authority should be made mandatory. Damage, if any, caused to any infrastructure should be rectified on the risk and cost of the department doing such damage. It would also require that a nodal agency for each city must be identified and given the task and responsibility in order to ensure effective coordination between various agencies. Nodal agency must be equipped with necessary expertise and manpower resources to deal with all issues of infrastructure. Such an agency should also have all the maps of network available with them.

ADOPTING TUNNELING TECHNOLOGY

At present all services are laid independently and separately at the underground level or on poles. This pattern causes lot of developmental problems when services are being laid. This also poses considerable problems in their maintenance and upkeep. In order to avoid this, system of providing services in a tunnel has been used. This helps in providing large number of services in a single trench which is put in place along the road. It also helps in providing additional services as and when required without resorting to digging. Maintenance and upkeep of services besides detecting faults also becomes easy and speedier. System can be improved /perfected for better provision and management of infrastructure.

USING INFORMATION TECHNOLOGY

Information technology can be effectively used in planning, mapping, monitoring and managing services. SCADA has been extensively used for managing water supply distribution system and operation of tube wells in the country. Many countries have used IT for detecting leakage and damage to the services resulting in minimizing loss and early repairs. Solid waste management has also been effectively monitored by putting chips on the garbage bins communicating their status about garbage for their disposal. Road damage has also been detected automatically whereas traffic and transportation system have been regulated effectively by the use of appropriate technologies. However, technology has much more potential which can be leveraged in planning, designing, construction, operation and maintenance of services with minimum involvement of resources and manpower.

LEVYING INTRNAL & EXTERNAL DEVELOPMENT CHARGES

In order to raise resources for funding the provision of infrastructures, mechanism of Internal Development Charges and External Development Charges should be adopted as the one of the option. Internal Development Charges would take care of providing services and amenities like roads, water supply, storm water drainage, sullage disposal, electricity, landscaping of open areas, provision of schools, dispensaries, community centres and other common facilities required at the local level, External Development Charges would take care of city level infrastructures like ring roads, water works, disposal works, electric grid stations, colleges, hospitals, city level parks and other facilities required to cater to the need of urban population.

OTHER OPTIONS.

Large number of Innovative mechanisms has also been used pan India in the area of urban development which can be considered for creating and developing infrastructures. Practices like *Accommodation Reservation* has been used extensively in Maharashtra, for creating social infrastructures at local level. *Transfer of Development Rights* has been used for road widening or creating new linkages in the city area without involving any acquisition and spending any resources. Mechanism of *Town Planning schemes* has also been used for providing space for roads, open spaces and other social and physical infrastructures in the city area without involving any resources of the local body. *Betterment Levy* is another mechanism, which can be effectively leveraged for creating resources for funding of physical infrastructures in the city. Municipalities under their laws have provisions, which enable them to frame schemes for providing infrastructures, and services for any part or the area falling within municipal limits and can recover the cost from all the beneficiaries. This mechanism can be used effectively for providing infrastructures in the core and congested areas without any financial liability on the part of local bodies. Construction of important roads in urban areas has been funded by giving *Advertisement Rights* and leasing out kiosks along these roads.

CONCLUSION

Habitat-II-1996 mandates that sustainability of urban areas cannot be attained without providing adequate infrastructures and services besides ensuring availability of the services at an affordable price. India has also recently launched Atal Mission for Rejuvenation and Urban Transformation (AMRUT) to provide basic services to every household in order to improve the quality of life, while promoting equitable access to city services. Mission targets 500 out of the estimated 4,040 urban zones in India to improve service delivery, resource mobilisation and bringing greater transparency in municipal functioning and capacity building to increase their operational efficiency. Considering role and importance of infrastructure in human habitat and human living, it will be essential to achieve the target of providing basic service to all as the urban agenda because deficiencies in physical infrastructures deeply constrain the contribution which a city can make to the national economy, whereas lack of social infrastructures have adverse impact on quality of life prevailing in urban areas. Inadequate infrastructures impose greater economic burden, lower returns on investments and eventually cause considerable losses to the community and nation. Informal sector has been seen to be major sufferer of inadequate infrastructures.

Considering the magnitude of infrastructure to be provided in 7935 urban settlements, innovative and state of art technologies would have to be evolved and made operational. This would not only help in rationalizing the urban growth but also go a long way in generating adequate resources for creating basic infrastructures. Approach has to be people centric involving all the stakeholders in the task. Promoting planned development and creating compact cities should lead the agenda for providing infrastructure on self-sustaining basis. Norms and standards for infrastructure would need rationalization, considering the local conditions to make them cost- effective, more realistic and least consumers of resources and land. Multiplicity of use could be considered as one of the option to optimize the available infrastructures. Preparing Infrastructure Master Plan for each city should be considered as a priority to plan and provide infrastructure at pan-city level on time bound basis. Adopting top down for planning and bottom up approach for developing infrastructure would be of value addition in making city self-sufficient in infrastructure. Critical will be creating local ownership to optimize their siting, planning, utilization and maintenance of infrastructure and services. Efforts have to be made to create Green and intelligent infrastructure in order to make them more sustainable and operationally efficient. Role of private sector would be critical in infrastructure development. While promoting private sector, care and caution has to be exercised to protect the larger public interest against any undue exploitation by the private sector. For achieving the goal of infrastructure for all, providing infrastructure in urban areas has to be declared as a priority area with higher allocation made in the national, state and local budgets. Adequate infrastructure can launch Urban India on the fast trajectory of growth and development besides making people and cities more healthy, sustainable and productive.

APPROACHING SUSTAINABLE URBAN TRANSPORT

APPROACHING SUSTAINABLE URBAN TRANSPORT

INTRODUCTION

Urbanization appears to be the accepted agenda of population and nations spread across the globe. With larger proportion of population opting for urban culture as way of living, more and more nations are accepting higher levels of urbanization as the assured way to prosper economically and grow physically. In this race of globalization and rapid urbanization, cities are growing in size, area and physical dimensions with fastest growth taking place in the developing world. Phenomenon of urbanization is not new because cities have not only existed as integral part of human history but have also scripted the growth story of mankind right from its inception. Cities have existed in the past and shall continue to exist in future too. Recognizing the critical role and importance of urban areas, U N Habitat Report on State of the World Cities, 2008-09 have defined cities in terms of one of humanity's most complex creation, never finished, never definitive and like a journey that never ends. Evolution of cities is determined largely by their ascent into greatness or their descent into decline. Cities have also been recognized as the past, the present and the future. Looking at these aspects, cities have proved to be great places, determining the vocabulary of ideas and innovations. As economic drivers, cities are known to be major contributors to the national economy and wealth besides generators of large employment opportunities.

India, despite low level of urbanization placed at 31.1% in 2011, has emerged as the second largest urban system in the world after China, thanks to its large population base of 1.21 billion. However, India is urbanizing rapidly under the impact of migration, industrial growth and spread of service sector. The pace of urbanization is picking up with more and more people making cities as their place of residence and place of work. In India, cities are on the move and are designated to play critical role in the growth and development of the country. India is projected to have population of 1.6 billion in 2050 with half of them living in urban areas. The urban population is projected to the level of 800 million by 2050, as against 378 million in 2011.

As per *Mckinsey Global Institute Report - India Urban Awakening: Building Inclusive Cities-* Urban India will house 590 million people by 2030 (as against 377 million in 2011), which is twice the present US population. Cities will generate 70% GDP, 80% Revenue and 70% (170 million) of new jobs, which India as a nation will generate. Cities will also create enormous wealth at the individual level with 91 million urban households joining the select band of middle class, more than four times the number of existing households (22 million). Number of metropolitan centres will rise to 68 (53 in 2011), which is twice the number of metropolises entire Europe has (35). However, India will need to invest considerable amount of resources to create appropriate level of infrastructure and services to sustain the additional and existing population. Investment, estimated to the tune of $ 1.2 Trillion will be needed to meet projected infrastructure demand, whereas 700-900 million Sq mts of residential/ commercial area will be needed on annual basis- a new Chicago to be created -to meet the built area needs of the urban India. In addition, 2.5 billion Sq mts of roads will have to be paved, which is 20 times the road network created in last decade with 7400km (350-400 km/year) of metro needed – 20 times created in last decade, to meet the projected transportation/mobility demand of cities by 2030.

In this era of liberalization, cities have emerged as the major drivers of national economies using transportation as the mechanism because movement of both people and goods have been observed to be a necessary condition/component of development. In the process, traffic and transportation has gained importance because of its critical role in promoting economic development and social integration of a region and country. In addition to bridging the gap between demand and supply of goods and services and providing mobility for its citizens, transportation has been considered vital for leveraging employment, promoting industries besides contributing to the prosperity of a nation. If cities are known as engines of economic growth then transportation has rightly been called wheels of such engines.

Transportation is fast emerging as the critical element of urban development, considering the concentration of large population and activities in a relatively small area as compared to rural settlements, leading to generation of high traffic volume and large travel demand. With rapid growth of population and pattern of urban growth characterized by the sprawling conurbation, scattered and unstructured physical expansion of urban centers in general and metropolitan centers in particular, traffic volumes have been leapfrogging. The physical expansion of cities has led to larger distances between place of work, place of living, place of trade and commerce, place of leisure etc, placing large demand on transport network to ferry large number of people from one place to another. Considering the overall scenario of urban growth and development, emerging transportation pattern in India is likely to be problematic and complex, marked by large number of dualities and contradictions. Despite poor road geometry and low holding capacity, vehicular population on Indian roads is increasing rapidly. Despite lack of parking areas, more and more vehicles are being added into the cities, occupying every available road space including all possible open spaces. In the planning parlance, parking and park have become synonymous, one replacing the other over a period of time. In the process, Indian cities are marked with high degree of vehicular congestion leading to long delays and raising the cost of business; extremely low vehicular speed; high degree of air pollution threatening the life /health of the people; large number of road accidents leading to loss of precious life and property and emission of large volume of green house gasses and global warming. Instead of providing high degree of mobility and operational efficiency, urban transportation has emerged as the major roadblock and threat to the mobility, economy, environment and sustainability of majority of cities. With millions of precious man- hours lost in everyday travel, transportation is adversely impacting the productivity of human beings. In the process, travel and traffic blues are fast emerging as two major threats to the operational efficiency and sustainability of the urban centers.

With Indian transportation scenario showcased by large variety of heterogeneous and contradictory travel modes involving varying sizes, speed and characteristics, operating in the urban centers and competing with each other for adequate space on already highly stresses road network, the problems of traffic and transportation are assuming complex and alarming proportions. Majority of these problems are concentrated in core areas, which house major commercial activities besides large chunk of population. With limited space, inadequate road network and limited holding capacity, these areas are already under enormous stress causing numerous operational problems. Considering the role and importance in overall economic and social growth, it becomes important that urban transportation, as a sector and as a essential human activity, is critically looked at and appropriate strategies put in place on priority to make it safe, affordable, faster, comfortable, reliable, sustainable, effective and efficient in order to improve accessibility to jobs, healthcare, education, recreation and other day to day needs of human beings. This would involve looking objectively at the entire mechanism of transportation. Since transportation is the product of rapid urbanization, size and shape of cities, human behavior, increased travel demand and defined land uses, accordingly it would call for making urban transportation integral part of urban planning and development process. In addition, it would also require re- defining our transport priorities, vehicle ownership, planning strategies and traffic management options in the urban sector in order to rationalize the travel demand and traffic patterns.

INDIAN TRANSPORTATION SCENARIO

Transport, as a sector, makes substantial contribution to the Indian economy. As per   statistics available, overall contribution of transportation sector to the national GDP was placed at 6.4% in 2006-07. Major contribution came from the road transport whose share was placed at 4.5% (70% of total share). Contribution of railways stood merely at 1.2% (20%) whereas rest of the modes accounted for only 0.7% (10%). Further, the entire increase in percentage share of transport to GDP since 1999-2000 has come from only road transport sector with share of other modes remaining constant. This clearly indicates the criticality of road transport in the Indian economy and

urban growth. However, this also indicates the marginalization of the other means of transport which needs to be leveraged to promote speedier transportation of goods and services in the urban sector.

Post-independence period has witnessed enormous production and growth of vehicles on the Indian roads . Number of registered vehicles at the end of 2005-06 stood at 89.6 million with largest concentration recorded in major urban centres of Delhi, Kolkata, Mumbai, Chennai, Hyderabad and Bangaluru. Urban centres also recorded large mismatch in growth of population and number of vehicles. Six major metropolitan centers, where population increase was merely of the order of 1.9 times during last 2 decades , the number of motor vehicles went up by over 7.75 times during the same period. Besides increase in numbers, pattern of vehicle ownership has also undergone rapid change with personalized mode accounting for more than 80% of total vehicles. Maximum growth has been recorded in the category of two wheelers whose share has gone up from 8.8%, in 1951 to 72.2% in 2006. During the same period, share of buses have gone down from 11.1% to merely 1.1%. Considering the fact that India is fast emerging as the global manufacturing hub of automobile, Munich based Roland Berger Strategy Consultants Report has estimated that vehicle penetration in India will grow six fold in next fifteen years from 12 vehicles in 2010 to 72 vehicles per 1000 persons in 2025 as against 187 for China, 221 for Brazil and 388 for Russia. Vehicle market in India is expected to grow to 5 million units and two wheeler market will become 29.5 million units in the year 2020. With rising income and greater demand for mobility, the personalized mode of transport is likely to grow rapidly in number and importance in the coming years. Proliferation of the personalized mode of transport is likely to have serious implications in terms of traffic congestion, parking, energy inefficiency, carbon footprints, green house gas emission, global warming and pollution. Strategies need to be evolved to reduce, minimize, control and regulate the ownership of personalized vehicles and promote public transport and other modes of eco-friendly travel to reduce congestion on urban roads.

Rapid increase in number of vehicles has not only led to overcrowding and congestion, it has also made road travel in the Indian cities highly risky and unsafe and prone to disasters with number of accidents going up rapidly. As per data available, 1.6 lakh accidents were recorded in 1981, whereas number of accidents recorded in 2001 were of the order of 3.9 lakh- a 250% increase in the last two decades. However during the said period, number of causalities increased from 28,400 to over 80,000. The majority of causalities in terms of loss of life and injury were found to be among the cyclists, pedestrians and pavement dwellers, showing the vulnerability of these classes of road users. The transport related casualties are rapidly increasing in India making the travel highly unsafe and travelers/road users highly vulnerable.

The Indian transport sector is marked with high degree of mismatch between the number of vehicles and available road capacity. The growth of vehicles and vehicular traffic has been observed to be much faster as compared to growth of capacity and road network. During last 53 years (1951-2004), motor vehicle population has recorded a CAGR growth close to 10.9% compared to 3.6% in total road length with National Highways increasing merely by 2.3%. This mismatch between vehicular growth and road capacity has lead to high degree of congestion and capacity saturation, resulting in creation of numerous operational and environmental problems. In addition to congestion, motor vehicles are largely responsible for generating green house gasses in terms of CO_2 , promoting global warming on large scale. As per a recent study made, cities produce 70% of global green house gas emissions, largely from energy consumption by transportation and buildings. Thus if we have to create **Smart cities** which are not only eco-friendly and energy efficient but also environmentally sustainable, we have to create innovative and state of art options for effective , efficient and eco-friendly transportation within the urban areas besides making buildings green.

 Looking at the existing patterns of movement in urban areas, it can be clearly observed that Indian urban scenario is largely dictated by road transportation; increasing individual vehicle ownership; low road capacity; poor road geometry; high degree of fuel inefficiency; large obsolete vehicular population; heterogeneous traffic; inefficient and inadequate public transportation; high degree of environmental pollution; low priority for traffic planning; low priority to eco-friendly transport modes ; poor traffic management; large mismatch between vehicle density and road capacity; multiplicity of agencies involved and absence of unified traffic regulatory authority; acute problems of parking; high rates of accidents etc. These peculiarities of urban transportation require innovative strategies to be put in place to address effectively the transportation issues and make urban transportation promoters of economic growth, operational efficiency and urban productivity besides creator of environmental sustainability.

STRATEGIES

Urban transportation in India needs immediate review and rationalization. Strategies for rationalizing would have to be a combination and mix of preventive, curative and innovative options. It has to be based on both hard

(infrastructure) and soft (planning) options. The strategies for traffic rationalization in urban sector should essentially revolve around and focus on:

- Minimizing travel demand
- Rationalizing travel demand
- Minimizing trip length.
- Minimizing mechanized movement.
- Minimizing pollution.
- Minimizing personalized vehicles on roads.
- Minimizing personalized ownership of vehicles
- Minimizing congestion.
- Minimizing accidents
- Promoting safe, comfortable and affordable travel
- Promoting sustainable transportation.
- Promoting highest order of traffic managements

3.2   To achieve the above objectives, the options suggested would be:

- Redefining Urban Planning.
- Redefining shape and size of cities
- Making cities compact
- Making transportation integral part of city planning
- Promoting sustainable communities
- Reordering prioritization of modes of travel .
- Promoting pedestrianisation.
- Promoting bicycles
- Making public transport more equitable, reliable, affordable, safe, comfortable, efficient and user friendly
- Equitable allocation of road space.
- Integrating public transport system
- Traffic Calming
- Road Pricing
- Creating public awareness
- Involving communities/ stakeholders
- Promoting sustainable urban transport.
- Involving state of art technologies
- Promoting innovations through R&D
- Deregistration of Old Vehicles
- Creating unified traffic and transportation Authority

3.3 Redefining Urban Planning

Traffic and Transportation has been considered essentially the function and product of the land use planning and accordingly it becomes critical that land use planning is rationalized and carried out in a manner which generates minimum travel and minimum traffic. Master Plans, which primarily define and lay down the agenda for the pattern and intensity of urban land uses, should be used intelligently and effectively for integrating the land use and transportation. Considering the present chaotic urban transport scenario, options and patterns used for working out land use planning in the master plans need to be reviewed, revised and redefined with new options put in place to make urban mobility more effective and efficient. In the past, the cities have been planned for vehicles whereas the new strategy should be planning for people and not for vehicles. In the new order of planning, priority should go to people with travel made supportive of the basic human needs. Planning should aim at minimizing traffic and travel, the two worst gifts of urbanization. Pattern of city development should be dictated by the mechanism of *Transit Oriented Development (TOD)* which has been found to be of immense value in rationalizing and reducing travel and to promote highly efficient living-working relationship in urban areas. In this pattern, urban planning is dictated by placing high density development along the major transport corridors, where compatible land uses are permitted in terms of commercial, residential, institutional ,offices, recreation, healthcare, education etc. Activities generating maximum volume of traffic are accordingly placed along the major transport arteries of the city within a walkable /cycleable distance of 400-600 meters in order to facilitate easy access to the public transport, without involving any personalized mode. This pattern has been found to be of immense value in rationalizing traffic and to make cities green and

healthy. This pattern also reduces the travel time and takes off most of the vehicles from the road. City of Chicago in USA has launched a plan for 2040 by which city growth is being restructured in a manner so that 75% of the residents will be living within 10 minutes walk of the mass transportation network. Concept note prepared for the Smart Cities by the Ministry of Urban Development, also states that accessibility to mass transportation by walking/cycling should be made a priority. Eco- City of Tianjin, in China, has been planned and developed following this pattern.

Pure land use, used by many cities in planning, has been observed to be promoter of increased travel demand, making people travel longer distances for living, working and approaching education and healthcare facilities. Accordingly, pure land use planning should be avoided to reduce travel and traffic on city roads. *Mixed land use planning* offers better options of providing majority of facilities in close vicinity, cutting down on the travel needs of the communities and making them self-contained and self-sufficient in basic day to day needs.

Further, in order to rationalize the travel, it would be critical to *make transport planning as an integral part of the urban land use planning*. In fact entire land use planning should be based on the transport planning, if travel demands are to be rationalized. Transport plans should enable a city to evolve an urban form that suits the topography and best supports the key social and economic activities of the residents. Making transport plans integral part of land use plans would help in rationalizing the transportation within the urban centres. If future growth of any city is dictated by a pre-planned traffic network (rather than developing a transport system after uncontrolled sprawl has taken place) the city has much better chance/opportunity of serving its entire population and yet minimizing travel needs. Thus the intent, content and approach to prepare master plans for urban areas need to be re-defined in order to make master plans supporters and promoters of rational transportation options. Master plans should also invariably address the issue of regional connectivity in order to rationalize both inter and intra- city traffic and save cities from the traffic blues.

3.3 Redefining shape and size of the city.

Travel in a city is closely linked to shape and size of the urban centres. It has been observed that there are shapes which promote larger travel and large transportation, whereas there are shapes which minimize road network and make city more travel friendly. Accordingly, in order to rationalize the travel demand, it will be critical to look at the shape and size to be adopted for the city while planning. *Grid iron pattern* should invariably be avoided because it promotes more travel and is highly unsuitable for an efficient mass transportation system .City of Chandigarh, known for its planned development, is facing major problems of traffic and transportation which has its genesis in the grid iron road pattern which has been used for its planning. Grid- Iron pattern where used, should be super-imposed with diagonal road network to reduce the trip length. *Ring and radial pattern* offers better options for reducing travel demand within the city and to promote mass transportation. Inherent advantages of *Linear Cities* can also be thoughtfully explored for effectively managing the travel demand. Accordingly, while preparing the development plans/master plans, it would be important to look at the shape of the city being adopted to rationalize the traffic and transportation. In addition, *size of the city* would also be critical. Larger the city, larger would be the trip length; accordingly cities must be made *small and compact* in order to reduce travel demand and promote energy efficiency. Small and medium cities offer better and simpler options of managing the traffic and transportation within urban centers as compared to metropolitan centres. In case of larger cities, options of *decentralization* could be used to create *self-contained communities* for minimizing travel. Chengdu . a westernmost mega city of China, is following a new concept of city planning in which 80,000 residents will be living and working in a circle of half-square mile, where any location will not be more than 15 minutes walk. City has been designed to be *a pedestrian city* supported by efficient public transport system.

3.4 Making Cities Compact

Reducing travel and traffic within urban areas would largely depend upon the extent and footprints of the city. Low density and large sized plots with higher allocation of land to other uses invariably lead to poor utilization of land and increase the footprints of the city. Increased footprints results in increasing distances between different corners of the city which makes people travel more. In order to reduce and rationalize the travel, it will be important to look critically and objectively at the *density pattern* adopted for the city planning and development. Promoting higher residential densities will make the city more compact by housing large number of people within small areas. This pattern automatically reduces travel distances and promotes non-mechanised vehicles for commuting. Higher densities would involve reducing plot sizes and changing pattern of city planning. It will also involve prescribing higher Floor Area Ratio and larger heights for buildings in order to create larger volume of built up area and optimum utilization of land, housing more people and activities in a smaller area. Promoting group housing instead of plotted development also helps in better utilization of land resource creating more dwelling units in the same area making cities more compact besides avoiding the land speculation. Higher densities not only reduce the travel needs but also considerably reduce the cost of services making city development cost- effective. *Compact cities* have been considered to be more energy efficient and eco-friendly because they reduce mechanical travel and make communities green and more sustainable with reduced carbon footprints. It is not only new cities to be developed, which can be made more compact , existing cities also offer enormous opportunities of re-densification provided their existing densities are re-looked, rationalized and re-defined , with a proper policy framework put in place, duly supported by additional infrastructure and services. Singapore increased the capacity of the city by scientifically identifying the plots which were low rise/ underutilized and encouraged owners to promote high density development. New York city encouraged refurbishment of existing housing units by dividing larger plots into smaller units and adding studio apartments on the roof tops to create additional living space. Hong Kong also used the mechanism of *re-densification* to achieve higher densities. Indian cities, with extended municipal boundaries containing large open spaces and low density development, offer enormous opportunities of looking inward for development to create large built up space without extending the city boundaries. Density pattern needs to be clearly and urgently defined by all states, to ensure creating/developing compact cities in the country. Creating high density communities offer a distinct and realistic option for making cities compact, improving environment, promoting better utilization of resources and allowing people to walk/use cycle rather than cars.

3.5   **Re-ordering prioritization of travel modes**.

Travelling options and preferences exercised, globally and locally, by people have also led to creating traffic blues in the urban areas. Globally it has been seen that passenger cars have dominated the travel preference and are responsible for 75% of passenger kilometers travelled whereas their average occupancy is close to one. Further, less than 10% passenger trips are performed by the public transport which has the highest carrying capacity. Walking and cycling is fast decreasing in cities. Less than 5% of passenger trips are being made by bicycle. Indian transportation scenario is no different. Despite the fact in India, pattern of trips is still being dominated by pedestrians and the cyclists, they have least   recognition, priority, provision and safety in the parlance of traffic and transportation. In the absence of clearly defined and dedicated right of way, Indian roads follow a system of first come

first serve leading to occupation of majority of road space by personalized vehicles , marginalizing in the process all other road users. Major problem facing the Indian transportation is also the outcome of the

highest priority being accorded to personalized vehicles which occupy maximum available road space, have very low load capacity and cause maximum congestion and pollution. Accordingly, for rationalization of transportation needs and demand we have to reorder our priorities in city planning. *Transport Planning must focus on people and not on vehicles*. Accordingly, cities should be planned with highest priority given to pedestrians to be followed by cyclists. public transportation should be accorded third priority whereas personalized vehicles should have the least priority. If the plans are prepared with this hierarchy, cities will have better options/chances of rationalizing its traffic demand and creating *sustainable transportation*. This would also help in making cities more eco-friendly besides least consumers of energy.

3.6   Promoting Pedestrianisation

Despite the fact that pedestrian traffic constitutes considerable proportion of the city traffic, still it has the lowest priority in the transport planning. Accordingly, it will be critical that pedestrian traffic is appropriately catered to in the planning process in order to promote pedestrianisation. The most rational measure, to make people adopt walking as the preferred mode of travel for shorter distances, would be the creation of *pedestrian zones* and dedicated pedestrian ways. Most of the central/ crowded areas, having high degree of traffic congestion and limited road space offer best options for creating such zones. Core areas and walled cities need to be pedestrianised with appropriate planning and design options. Vehicles in the core areas could be discouraged by introducing metered parking with high parking charges prescribed. However, these areas need to be linked with an effective and efficient public transport system for providing high degree of accessibility. Pedestrian zone is the best option for improving the travel conditions and promoting safety for pedestrians in urban areas. Further linking major activity nodes and residential areas of the city with efficient public transport by planning exclusive pedestrian pathways will help in rationalizing the traffic in the city. All local communities should also be effectively linked with nearby eating joints, shopping areas and other public places which are in common use on day to day basis, to promote pedestrianisation. Pedestrian pathways will, however, have to be planned intelligently, with prior community consultations, in order to make them more attractive and usable. They need to be made integral part of the green belt with attractive visuals, duly supported with appropriate level of amenities and street furniture to make it user friendly. Activity areas also need to be planned with places for people, to gather and socialize, to make them more attractive. Promoting pedestrianization should be high on the local agenda because this mode of travel has enormous capacity to rationalize traffic besides having zero carbon footprints

3.7   Promoting Bicycle Traffic

After pedestrianisation, most preferred mode of travel should be bicycle. Besides being economical, flexible and environmental friendly, *bicycles* are essentially zero emission vehicles (ZEV). They occupy minimum road space and require limited parking space. In addition, cycling is also the healthiest transport mode. Despite having distinct advantages, bicycles have been neglected by transport planners as preferred mode of transportation. Its enormous potential remains unexplored. As per the data available, cycling still has the largest share of urban transport not only in India but even in developed countries. In China, highest priority is given to bicycles by creating *express cycle ways* and creating exclusive lanes

dedicated to the cycle traffic. Cycle lanes form integral part of city road network including the major arterial roads in order to facilitate safe movement of bicycles in the urban centres. Majority of car trips of less than 5 kms can be conveniently made by bicycles, which can go a long way in reducing traffic problems in the urban areas. Most of the developed countries are now promoting use of bi-cycles for shorter trips and trips undertaken for education and shopping. However, in order to promote bi-cycle it would require the creation of dense network of bi-cycle lanes in cities along all the major road network; creating a ring road around the most congested areas; preferential positioning of cyclist at the crossing and junctions; declaring certain roads as bicycle streets; allowing cycling along pedestrian zones; creating bicycle stations; supervised parking lots; integrating it with other systems of transportation including railway/metro stations, inter/intra bus stations and connecting important destinations including schools, offices, industries, leisure etc. City of Copenhagen is known for its bicycling culture and supporting infrastructure. Over the years, city has created 388 kms of cycling routes catering to 50% of the city trips. In order to make city more bi-cycle friendly, City of Copenhagen is now putting in place a unique traffic system by the name, *Green Wave* ,which would ensure that cyclists will never encounter a red light during travel. Many cities are promoting bi-cycle rides by offering free use of bi-cycles to residents/visitors for travelling in the city. Corbusier, the master Architect and Planner, in the planning of Chandigarh redefined the system of 7Vs to include 8bc for catering to two wheeler traffic, peculiar to the new city. However the same has not been put in place and Chandigarh is now suffering from major traffic problems. Promoting bicycle traffic would require launching public campaigns on regular basis to involve communities and people to use bicycles. However, technology related to cycle would also require up-gradation on regular basis besides making cycle affordable and efficient. Despite all limitations, bi-cycle offers the best option as cost-effective, non-polluting and energy efficient mode of urban transportation, occupying minimum road space to solve majority of urban traffic problems.

3.8 **Making Public Transport more efficient**

Public transport holds the key to rationalization and effectively catering to larger proportion of traffic demand in the urban areas. However, despite enormous potential, public transport remains largely a neglected area and least preferred mode of transportation. Unfortunately, in India public transport has been considered as a mode of travel largely used by poor or who do not own any vehicles. This has lead to keeping the fares low, leading to large resources going as subsidy to keep the system going. This approach needs rationalization, review and re-look. Low allocation of resources has been one of the major factors for perpetual neglect of public transport in the urban areas. Vesting power with the local authorities to run the public transport at local level has emerged as the major bottleneck in its rational growth due to lack of expertise and inadequate resources. Making public transport a preferred mode of travel, would require re-defining the entire approach and framework of public transportation including its planning, operation and management. Promoting public transport would require putting in place higher frequencies; improved regularity; better safety; higher comfort; more effective communication with users; provision of new buses/trains/LRT systems besides competitive and easily comprehensible fare levels; dedicated right of way; prioritization at traffic lights and integration with other modes of traffic etc. Identification of potential corridors for mass transportation would help in rationalizing the traffic demand in urban centres. Use of eco-friendly mass transportation vehicles using non-polluting fuels (CNG) can usher a new era of sustainable transport in the urban centres making them free from major problems of vehicular pollution. In addition to providing an efficient, effective, affordable and cost- effective means of transportation, public transport has been found to be highly effective in reducing road congestion and air pollution and accordingly requires higher priority. Considering different categories of clientele, different travel options must be offered to divert people using cars/two wheelers to public transport.

Promoting public transport on large scale would also involve creation of state of art infrastructure including improved bus stations/terminals; improved passenger information system; use of intelligent transport systems for monitoring and control; affordable ticket pricing; e-ticketing; using single ticket for all modes of travel making any number of changes; carrying out maintenance during the night and introducing comfortable buses (air conditioned buses) etc. Ahmadabad BRTS has already demonstrated its strength in solving the traffic problems of the metropolis. Delhi metro has already achieved the mark

of moving 2.8 million passengers in a single day and is now gearing to reach 6 million mark when all the phases will be completed. Study made about the impact of Metro on Delhi by the CRRI , has revealed that Metro has helped in not only taking away 3,90,000 cars off the city roads but has resulted in reducing travel time of users by 32 minutes. In addition, it has resulted in saving valuable fossil fuel besides saving the city from the emission of green house gases. The net saving has been estimated, on account of fuel, time, reduced carbon footprints, to be of the order of more than 10,000 Crores on annual basis. In addition, it has made Delhi safe and travel friendly by reducing loss of human life and property on account of reduced accidents besides increasing the productivity of city. Mumbai sub-urban trains have proved to be lifeline of the city to keep it running even in all adverse conditions. To effectively solve the problems of traffic, Copenhagen has developed world class public transport system from where all residents will be living within a distance of 400 meters to minimize use of private cars and to promote public transport. City of Chicago is also extending its suburban railway network to ensure that 75% of the city residents should have houses within a walking distance by the year 2040 under 'Go to 2040' plan to rationalize travel. Thus public transport has enormous potential which needs to be thoughtfully and rationally explored to solve the traffic problems of urban areas.

3.10 Equitable Allocation of Road Space

Indian transportation scenario is distinctly marked with multiplicity of vehicles occupying, sharing and competing for the common road space. In the absence of any clear allocations, road space occupation is largely governed by first come first serve basis. With focus on vehicles, majority of road space is being occupied by personalized vehicles that outnumber the other vehicles. This leads to high degree of congestion because of low capacity of these vehicles and squeezing other vehicles out of the road space. Bus, carrying more than 50 people requiring merely 2.5 times the road space that is occupied by a car carrying 2-3 people, has very limited space available to move on urban roads. Disproportionate space allocation leads to higher travel times and higher travel cost and most of the people suffering from this paradigm belong to lower income groups. The existing trend need rationalization with an appropriate mechanism *of rational allocation of road space* immediately put in place. The focus of the road space allocation has to be based on equity and the carrying capacity of the vehicles in order to rationalize the traffic and minimize the congestion. It has to be redefined with focus shifting from being vehicle centric to the people centric. Vehicles carrying large commuters should be allocated more space in order to ensure their speedier movement. Further based on equity, all the modes of transportation should be given priority in terms of their carrying capacity. This objective can be achieved by reserving lanes and corridors exclusively for public transport, non- motorized modes of travel, high occupancy vehicle lanes, pedestrians, bicycles depending upon their share in the overall traffic. However, preferential allocation to public transport and cyclists will help in diverting more traffic to these modes from personalized vehicles leading to higher order of operational efficiency and better capacity utilization of road network besides promoting sustainable transportation. Many cities in the world have used, both successfully and effectively, the mechanism of reserving stretches of roads exclusively for the use of public transport to reduce congestion, air pollution and improving efficiency of rapid bus transit system. Istanbul dedicated 42 kms of existing road lanes for the newly introduced Bus Rapid Transit System. This helped in two fold increase in speed of buses as compared to other vehicles. With buses arriving at 30-45 second interval providing continuous service, city was able to effectively and efficiently move 6,20,000 passengers a day.

3.11   Traffic Calming

Traffic Calming is another concept being followed in developed countries to minimize the hazards of traffic, promote quality of life in urban centres and eliminate environmental pollution. Major elements involved in the concept are redesigning of streets and roads for a reduced vehicular speed not exceeding 30 kmph; giving priority to public transport; promoting pedestrianisation and bi-cycle traffic; enhancing the social quality and vitality of cities; allocating large road space to vehicles other than personalized mode of travel; creating large green areas as integral part of transportation network; management of car traffic through
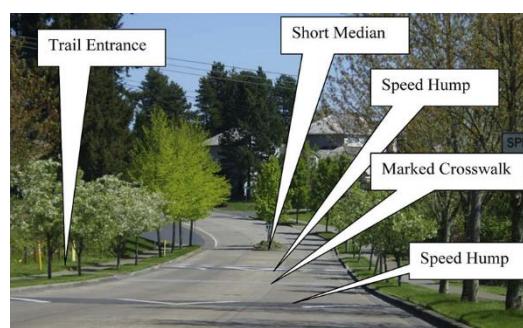
re-routing, parking management, signaling ; surveillance and sanctions besides communication and participation by the public. Feedback received from the communities has given distinct appreciation of the concept in terms of reduced noise & air pollution besides promoting increased road safely and improved quality of life in all residential areas.

3.12 Road Pricing

Road pricing is a new concept which has been used effectively to rationalize traffic, minimize congestion , promote public transport , minimize use of personalized modes of travel, promote environment, reduce pollution and generate resources. Singapore, which uses a unique system of traffic information to guide and educate the drivers and road users, has used the road pricing mechanism effectively to tackle the problem of congestion on city roads. It has put in place a Unique Electronic Road Pricing System which makes road users to pay a variable congestion charge according to the prevailing traffic conditions and distance travelled. It not only generates revenue for the city government but also encourages drivers to take less congested roads. Levy of charges has discouraged use of personalized cars, promoted preference for car pooling and use of public transport. The system also generated a revenue of $ 125 million in 2010, which was used for promoting and rationalization of transportation in Singapore. This mechanism can be used effectively by metro cities on critical roads/stretches facing large volume of traffic and posing perpetual problems of congestion.

3.13 Creating Unified Transport Authority

Indian transportation scenario at the local level is distinguished by existence of multiplicity of authorities with overlapping areas of operations in large urban centres and absence of such agencies in the smaller towns. It has led to a scenario which is both chaotic and irrational. Available agencies lack in capacity, competency, expertise and requite manpower to study, analyze , plan , develop and manage the entire gamut of inter and intra city traffic, with the result urban transport is being run and managed by proxy. This calls for creating a dedicated and unified agency for managing traffic and transportation at the state and local level in order to holistically address the problems, issues and traffic blues. The dedicated agency must be fully equipped with appropriate level of manpower having indepth, knowledge, expertise and experience of peculiarities of urban traffic and provide solutions to rationalize them. Research and Development should be made integral part traffic planning in order to bring innovations in traffic management. National Transport Policy, provides for setting up UMTA (Unified Metropolitan Transport Authority) in all 53 million plus cities in order to facilitate co-ordinated planning and implementation of urban transport programs and projects on time bound basis besides promoting integrated management of transport systems at the local level. Policy further recommends setting up these authorities under state laws to make them more effective, efficient and meaningful. Number of states has already set up such Authorities.
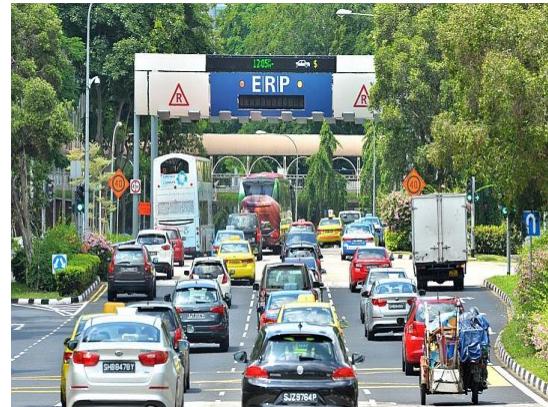
3.14 Involving Technologies

Technology can play major role in rationalizing and planning the urban traffic. Unfortunately potential of technology has been used to a limited extent in India to manage traffic. In developed countries, technology has been extensively leveraged in monitoring, planning and designing the transportation policies, and programs and their implementation. In addition, it has been used effectively to monitor the traffic conditions in the city and its various parts , to minimize the problems of congestion and to ensure smooth flow of traffic. Use of IT and ITES have also helped in generating valuable data for planning, framing realistic short and long term policies and programs based on ground realities. Placing cameras at intersections to optimize the traffic lights and cut transit time while reducing air pollution and cost of

tackling it; dimming/ switching street lights automatically by using real time data to save 30% on energy cost and creating *solar powered bike lane* to make cycle even greener, have been effectively used globally to improve traffic and transportation. In London, transport operator, 'Transport for London' has shared its data to encourage the development of service oriented apps such as '*Bus I T London*', which suggests best bus route for any journey in the city depending upon user's location. *Road Pricing mechanism* evolved by Singapore has its genesis in the I T technology. Thus IT needs to be extensively and innovatively used in rationalizing , planning and managing urban traffic.

3.15 Singapore Experiment with Traffic Management

Singapore is known for its urban development and traffic management strategies, which it has evolved over a period of time. It accepts the critical role   transportation plays in promoting   urbanization , economic growth and the quality of life. In the initial period of growth, it faced numerous urban and traffic related problems in terms of haphazard , unplanned, sub-standard development, serious congestion, poor traffic management, lack of driving skills, poor infrastructure, inadequate and inefficient public transportation system and lack of transportation planning. To overcome traffic related problems, Singapore, initially adopted the strategy which revolved around increasing the size of the roads/ number of lanes to increase the road capacity. However with increasing economic and population growth, projected high volume of traffic, availability of the limited geographical area, it was considered prudent to change this strategy and adopt two fold option, *involving promoting efficient public transport and controlling number of privately owned vehicles on the roads*.

 For managing the transportation within Singapore, which is primarily land based, Land Transport Authority (LTA) was created in 1995 by merging four different public transportation agencies with the objective of establish a sustainable land transport system for Singapore. The LTA was to ensure:

- *Developing road network to include maximized capacity;*
- *Improving quality and efficiency of existing transportation modes (i.e. rail and bus);*
- *Managing car population and demand of road usage to reduce the congestion*
- *Minimizing the need of travel by incorporating transportation in land use planning*

The most innovative part of strategy was to control the number of privately owned vehicles on the roads which was done through the mechanism involving *Vehicle Quota System (VQS), Electronic Road Pricing (ERP), Certificate of Entitlement (COE).* Under this system, no person could own a vehicle in Singapore unless he had obtained a Certificate of Entitlement (COE) from LTA which was priced and further linked to Vehicle Quota System (VQS) released by the Authority under which only pre-defined number of vehicles could be added on the roads every year. Since people wishing to own vehicles were more than the vehicle quota, people were asked to bid for the same. In certain cases, the cost of obtaining the COE is more than the cost of vehicle   which made owning a vehicle in Singapore both difficult and highly expensive.. This approach has worked very effectively. Since the implementation of VQS the growth of vehicle population has reduced from 3% (2009) to   0.5 % in 2014. Further, with the introduction of Electronic Road Pricing (ERP), every individual vehicle owner has to pay price based on the duration of road used, distance travelled and the population of vehicle density on the road used, making car ownership very expensive. Further, the COE is issued only for a period of 10 years, which can be further extended for a period of 5 years, based on the payment of additional money. After the expiry of COE , the vehicle is de-registered and cannot be retained in Singapore. It has to be sold and exported out or destroyed. This makes the vehicle ownership most difficult and expensive.

The loss of privately owned vehicles has been compensated by Singapore's public transport system, which is highly developed, effective and efficient. The network of Mass Rapid Transit (MRT) comprising of trains, buses and taxis serves to shuttle population across the city state every day, at relatively inexpensive and affordable fares. MRT is the backbone of the Singapore transport system, which

provides seamless transfer for reaching any part of Singapore, the moment you step onto an MRT train. In addition, an highly efficient fleet of 4,050 buses move about 3 million people to their destinations daily in a clean, air conditioned comfort at the most affordable fare. For making BRTS more effective and meaningful, 200 kms of road lanes have been dedicated exclusively for the buses with waiting time to be reduced to 8 minutes during peak time by the year 2017 as against prevailing 10/15 minutes. Out of 12 million daily week day trips, 60% are performed through public transport, indicating the acceptance and preference for this mode of travel. In addition, large network of cycle tracks have also been laid in order to promote cycling on large scale for travelling shorter distances and also for accessing the public places and public transport nodes with dedicated space provided for parking of cycles. People with foldable   bi-cycles are also permitted to carry them in the public transport subject to the safety of co-passengers.

Singapore also provides intelligent traffic information system which can be accessed by the road users to source information on the traffic status in any area/road and decide about the best travel options in the city. Singapore , with a land area of 710 Sq Km and a population of 5.3 million, is supported by 3300 /177 kms of road/rail network and vehicle/car population of 9,69,000/6,20,000 with 12% area placed under the road network for meeting the daily needs of mobility in the island. The role of government in this transformation is pivotal, followed by public participation. The bold policies opted by the government are based on technology, innovations, which has helped the city to maintain its transportation health .Singapore offers numerous   options , messages, good practices   and lessons for creating   smart and sustainable transportation, which can be adopted by Indian cities with appropriate modifications.

3.16   Conclusion

In 2006, the transport sector produced 6.4 Gigaton CO_2 emission, or 23% of world energy related CO_2 emission. With the use of traditional fuels, transportation sector alone will be contributing 45% of all total carbon emissions coming from developing world. With numbers of personalized vehicles recording high degree of growth and exhaust from cars and buses being the single largest contributor to the green house gas emissions, challenges posed by transportation sector accordingly remain daunting and formidable. To overcome these challenges options would clearly hinge on promoting sustainability of urban transport in order to make it as collaborative partner in the process. Sustainable urban transport would essentially call for minimizing use of personalized vehicles; promoting non- mechanized/ non-fuel based options for travel; using public transport with large capacity run essentials on non-polluting fuels /electricity ; using state of art technologies making vehicles zero-emission; making cities more compact to limit the need of mechanized travel; using land use planning to rationalize the travel pattern etc. It would also involve use of information technologies as one of the mechanism to reduce travel by using homes as offices, schools, libraries etc. Use of multi-storied buildings for making cities more compact can also be considered a distinct option for minimizing travel needs of the city. Draft Concept note evolved by the Ministry of Urban Development for the Smart Cities have defined the transportation parameters for a smart city in terms of maximum travel time; creating continuous unobstructed footpaths; dedicated and physically segregated bicycle tracks; high quality and high frequency mass transport within walking distance;. However, creating sustainable urban transport would require a multi- pronged strategy based on leveraging the advantages of all modes of travel, involving communities and stakeholders besides professionals engaged in urban/transport planning, development and management. Increased use of environmentally- friendly public transport systems and halting of urban sprawl in cities to substantially reduce emissions and make cities cleaner, greener and sustainable. Our capacity to create sustainable urban transport, through state of art cleaner and greener technologies with innovative city planning, development and management options would hold the key to the productivity, economy, quality of life, sustainability and operational efficiency of human settlements.

Efficiency

Equity

Transparency

Subsidiarity

Good Urban
Governance

Civic
Engagement

Sustainability

Security
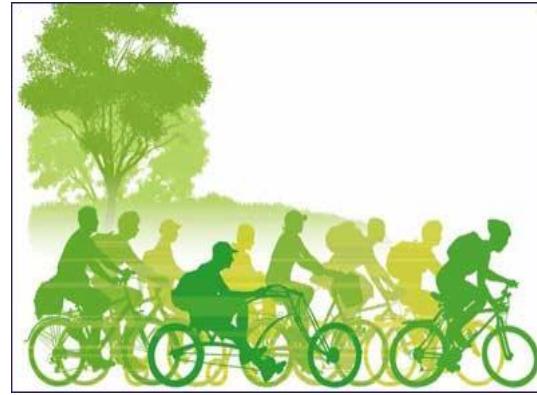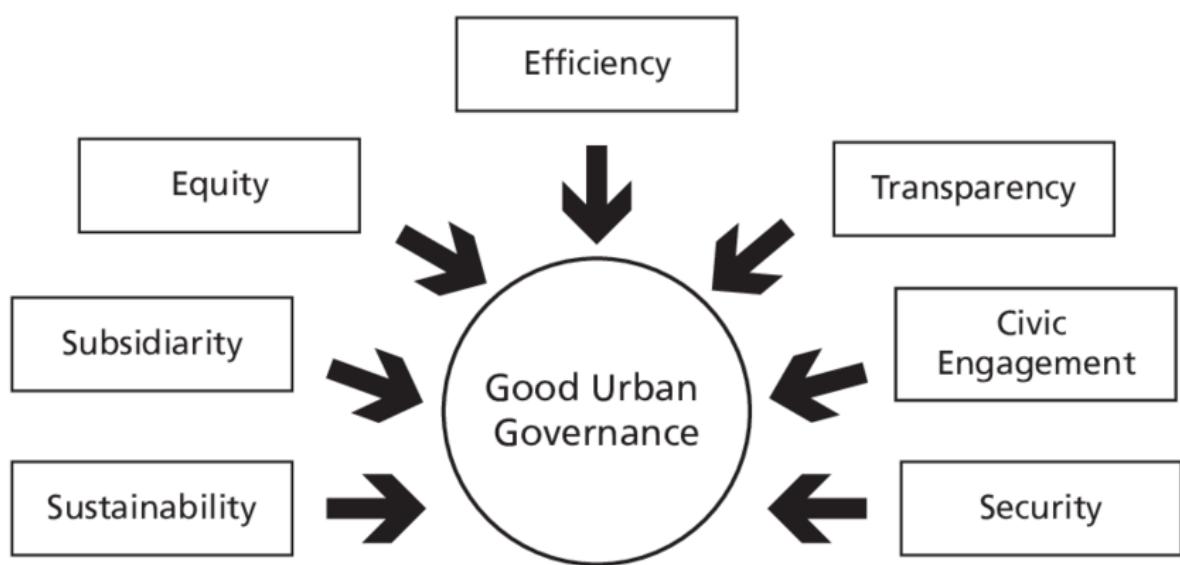
APPROACHING GOOD URBAN GOVERNANCE

APPROACHING GOOD URBAN GOVERNANCE

INTRODUCTION

Urban governance has critical importance in the context of ever growing role of urban centres in the overall economic growth, employment generation and contributions such centres make to the national and state wealth. With urban centers growing larger and larger, urban governance becomes crucial because of the impact it has on the life and liberty of innumerable urban dwellers. With cities becoming centres for large investment, concentration of population and providers of specialized services and amenities, their effective and efficient functioning assumes added importance. If urban centres have been termed as the engines of economic growth, urban governance can rightly be called wheels of such engines. India is passing through a phase of massive urbanization with number and size of urban centres growing larger and larger. Despite the fact that level of urbanization in 2011 stood merely at 31.1 per cent, number of urban dwellers recorded were 378 million. Considering the annual rate of urban population growth, which is three times faster than the rural areas (2.1% against 0.7%), it is assumed that number of urban dwellers will equal rural population by the year 2050. Next four decades are likely to witness enormous growth of large urban centres, raising number of metro cities from 53 to more than 100 with Kolkata, Bombay and Delhi occupying higher slot and rating amongst the largest urban centres in the world. Considering the future population scenario, it is important these centres are effectively and efficiently governed so that they are able to play their designated role in national emancipation.

Urbanization and Economic Development-- Urban centres besides housing large chunks of concentrated population in a limited area also make substantial contribution to the national economies . It is said that in the year 1951, when level of urbanization was merely 17.29 per cent, their contribution to gross national product was of the order of 29 per cent, in 1971 it grew to 37 per cent when urbanization level was placed at 19.91 per cent. In 1990-91 with urbanization going up to 25.72 percent, the contribution of urban centres was estimated to be 50 per cent. In the year 2011 urban centres contributed 60 per cent of national wealth when urbanization level was recorded as 31.1 per cent. It is estimated that by 2021, when level of urbanization would be in the range of 40-45 per cent, contribution of urban centres will be in the range of 72-75 per cent. Thus it can be seen that level of urbanization has high degree of positive co-relation with the contribution to GNP made by urban centres. It can be safely concluded that urban centres would continue to be major contributors to national wealth in the years to come. Accordingly, it becomes important that adequate of attention is paid to the urban centres in terms of their productivity, sustainability, efficiency and healthiness. With India following a policy of economic liberalization, globalization, deregulation, urban centres in general and large urban centres in particular are going to attract lot of investment. Such centres are likely to emerge as hub for economic growth and development. Accordingly, it will be critical that appropriate environment in these centres is created which would help them to attract investment, provide employment, ensure a quality of life and make them more productive. Urban governance accordingly becomes more relevant and critical in this context because capacity of a nation to pursue its economic goals is contingent upon its capacity to govern towns and cities effectively and efficiently.

PRESENT STATUS

- **Poor Urban Governance** --In Indian context urban centres are being governed by proxy because of excessive controls exercised by state governments over local bodies. Despite the enactment of 74th Constitutional Amendment Act,1992, which mandates independence, authority, resources and responsibility to local bodies to enable them to act and perform like governments in their own right at local level, most of the amendments carried out in the legal framework at state end follow amendment only in letters and not the spirit, making these bodies largely ineffective and inefficient.

- **Low Priority to Urban Development**--Looking critically, it can be observed that policies of national and state governments are primarily biased against urban sector and local bodies with approach focused on restricting the growth of urban centres, minimizing migration and encouraging people to stay in the rural areas. Despite these restrictive policies, urban centres are growing at a phenomenal pace. This calls for changing our priorities and strategies towards urban areas. Instead of restricting their growth, policy should aim at allowing these centres to grow at their natural pace with state acting as facilitator, ensuring that all urban dwellers have access to basic minimum facilities required for having an appropriate level of quality of life.

- **Poor Capacity of ULB's**--If we critically look at entire scenario, it can be safely concluded that urban growth per-se is not bad, but the rapid rate of growth which outpaces the institutional,

administrative and financial capacity to cope with it. This challenge needs to be met without wasting resources or distorting the pattern of national development. Our capacity to effectively govern and meet these challenges holds the key to the sustainability of urban India.

- **Mismatch between Resources and Responsibilities**--Despite the fact that urban local bodies have long history spanning over 3 centuries with Madras Municipal Corporation being established in 1688, not much headway has been made in allowing these local bodies to grow in terms of their capacity to effectively discharge their functions, duties, responsibilities within local areas. The basic tenor, character and structure of local bodies have remained unchanged despite dramatic change in the complexion of their nature of duties and people at large. Financial base of ULB's has been eroded by the state and parastatal agencies by taking away most of the productive sources of revenue.

- **Multiplicity of Agencies --**State governments on their part have done little to empower these local bodies to ensure appropriate level of urban governance. Functional domain has considerably been narrowed down by setting up state level and parastatal agencies duplicating or replicating the functions of local bodies.

- **Low Credibility-**- In addition, repeated suppressions, not holding elections on regular intervals and appointments of administrators to run these local bodies have adversely impacted their functioning in a democratic way and capacity to discharge their role in effective urban governance. Over the years credibility of local bodies has considerably been lowered with very few people respecting and cooperating with them.

- **Poor Basic Infrastructure-**-Development perspective of urban areas presents a grim picture. In the process city lacks basic infrastructures and services, garbage collection has become a nightmare, unauthorized constructions and unplanned development has emerged as the order of the day, street lights do not operate and pot-holes dominate the road network. Quality of life suffered enormously and city functioning has been adversely impacted. Thus it becomes essential that for making urban areas livable places, providing basic amenities of life to all its residents, for ensuring their productivity, sustainability and healthiness, the city governance should be made a priority area on the agenda of any government.

- **Weak ULB's---**Local governments are considered closest to the people at local level; it becomes essential that these bodies should be adequately strengthened in terms of their administrative, fiscal, technical and political capacities to enable them to emerge as governments in their own right so as to enable them to discharge all their obligations to urban centres with effectiveness and efficiency. 74th constitutional amendment act has provided a direction and laid down a framework for action in this regard, it will now depend upon how state allows local bodies to take up these challenges and use the opportunities offered to empower these agencies as institutions of local governance

ROLE OF THE STATE

- **Empowering/capacity building**--Capacity and will to govern cannot be brought from outside, it has to be generated within the organization. Unless the municipal functionaries themselves realize the need and importance of effective governance, it will be difficult for local bodies to become institution of good governance. 'Role of state has to be that of enabler in order to facilitate these local bodies to become agencies of good governance. However, state can relook at the existing legal framework governing these local bodies and remove all irritants and bottle-necks which hinder the growth and functioning of the urban local bodies.

- **Widening Financial Base**--State should widen the fiscal base of local bodies in order to allow them to undertake all works and discharge their obligations. It must help in widening their functional domain and create an enabling environment where local bodies can function and operate freely. State should help in enhancing their technical and managerial capacities in order to enable them to emerge as institutions of good governance. All state level parastatal agencies should operate at local level under the umbrella of local bodies which would help them to evolve their strategies for good governance. In this context state and local bodies have to act on partnership basis with all areas of conflict and overlapping removed.

- **Managing Cities--** In order to ensure good governance at local level, it would be desirable that concept of city managers should be put in place. City management being a specialized area, calls for specialized skills, accordingly it will be appropriate that a cadre of city managers is created. State should consider creation of such cadre with appropriate skills in management, urban development, financing etc. so that city governance is put on a professional pedestal and not treated as a routine task where people without any skill are involved in the process of governance. In addition, efforts should be made to enhance the capacities of employees by making them undergo training and exposing them to new ideas and examples of good governance on regular basis. Motivation of employees would be critical to achieve good governance.

- **Good Leadership---** Good leadership at the local level will be another pre- requisite to ensure good governance. This leadership is, by and large, to be provided by the elected representatives. Accordingly, it is essential that committed and enlightened people are elected to local bodies who would understand the role and importance of good governance. Once this culture is put in place, good governance would be much easier to achieve. In addition it would be essential that orientation programs for elected representatives need to be organized at regular intervals in order to make them understand their role and importance in good governance. Visits to places where good work has been done and interaction with representatives of such local bodies can bring in sea change in the approach and vision of municipal councilors in promoting good governance. Cooperation between elected representatives and employees of municipalities will be another area which would require focused attention to promote the ethos of good governance.

- **IMPROVING DECISION MAKING--** Good governance in Indian context has suffered because of absence or lack of objectivity in decision making. It is important that decision making should be made more transparent, keeping in view the public good. If the decisions are done jointly by involving communities and stakeholders, then their implementation also becomes easier. Accordingly it will be desirable that a participatory mechanism is put in place at local level so that more and more people are involved in decision making. This will enhance the credibility and acceptability of the decisions made by local bodies and would help in promoting good governance.

- **Decentralization**--Setting up of ward level committees, as mandated in the 74 th Constitutional Amendment Act, would be critical in decentralization of decision making at local level. In addition, local bodies have to be responsive to the citizen's complaints in order to have good credibility. Appropriate mechanism of re-dressal of complaints must be put in place if objectives of good governance are to be achieved. Any feeling among citizens that local bodies are not responsive or sensitive to their genuine grievances, would not facilitate making them partners in the overall process of governance. If Surat became one of the cleanest city within a year of having plague, it was all due to the fact that people and officials were effectively involved in the process and all public complaints were duly taken note of and appropriately addressed through an efficient system of complaints re-dressal which was put in place. Today Surat has become a role model of urban governance at the local level due to its good performance and efficient re-dressal system of public complaints.

- **Improving Performance--** For any culture of good governance to be ushered in, the local bodies have to be performance oriented. Until and unless local bodies demonstrate that they mean business and are capable of good performance, citizen would not involve themselves in the process. Only good performance can enhance the credibility of local bodies and once local bodies start performing, people would have respect for them and willingly pay taxes and involve themselves in the decision making.

- **Creating Visibility--**In order to initiate the process of involvement and performance, local bodies should focus on few areas which are visible to people and also do not involve much resources. Garbage cleaning, putting street lighting in order, removing pot-holes from the roads and removing encroachments from public places makes immediate impact on the public and appreciation of the work. This would help people in understanding that local bodies are having a businesslike approach and ensure their cooperation. If local bodies plug all loopholes in revenue collection and ensure compliance by people, it can generate enough resources without levying any additional taxes etc. Accordingly capacities to perform will hold the key to the good urban governance.

- **Leading by Examples--**Generally it is understood that municipalities are bad managers and cannot achieve the objectives of good governance .in fact many urban local bodies have exploded this myth by demonstrating that they are capable of performing provided they have a good leadership. In case of Ahmadabad, Surat, Pune and Calcutta the good governance was ushered in due to leadership provided

by Corporation Commissioners .in case of Jalgaon ,Mayor of corporation did the job and in case of Tirpur private sector helped in achieving governance and leadership. Accordingly, it will be essential that due care is taken to provide an enabling environment in which quality leadership is provided in the local bodies to take up the onus of providing good governance.

- **Creating Partnerships--**Private sector has an important role cast for them in the good governance. Private sector should be actively involved as a service providers in urban areas in order to ensure provisions of all essential services at most affordable pricing. This would help in improving quality of life in urban areas and would bring credibility to local bodies. Tirpur has clearly demonstrated that partnerships both between industry, local bodies and state government can usher in an era of quality governance at the local level .in this regard role of NGOS ,CBOS and voluntary groups would also be critical in order to ensure the involvement of people in the municipal governance .it needs to be understood that more participatory is the approach adopted by all stakeholders, easier will be to achieve the goal of good urban governance. Another critical issue would be finding ways and means to generate fiscal resources for local bodies. Numerous innovative options involving; using land as a resource, leveraging the mechanism of planned urban development; levying of internal and external development charges; transfer of development rights; tradable FAR; conversion charges on change of land use etc. can be effectively put in place to generate revenue for local bodies. Local bodies have to be innovative and performance oriented in order to tap non-conventional sources for revenue generation.

CONCLUSION

- **Capacity Building**-- Despite the fact that role of urban local bodies is critical in urban governance and 74th constitution Amendment have put them on the pedestals of government in their own right ,but keeping in view their structure ,resources and culture it appears that their capacity in the area of urban governance is lacking. Keeping in view the growing size, population and complexities of the problems and challenges posed by the urban areas, the task appears to be much more difficult .if good urban governance through local bodies is to be ensured, their capacity to govern has to be improved by providing them necessary skills in terms of institutional, technical, administrative and political capacities. Sate must make available appropriate level of skilled manpower to enable urban local bodies to discharge their role and function in good governance .Sufficient resources must be made available to broaden their fiscal base. Personnel management at local level also needs to be improved.

- **Incentivizing Performance**--Performed based incentives should be provided to encourage local bodies to ensure good performance. State must recognize good work done by the local bodies by suitably rewarding such local bodies. Municipal Commissioners and other functionaries should be strictly evaluated in terms of their performance.

- **Professionally Managing Cities**--Creation of skilled cadre of city mangers will help in promoting good urban governance. State must review legal framework and remove all bottleneck which hinder the process of good governance and provide a legal, setup that creates enabling environment for the local bodies to perform. Mechanism of fruitful partnership between state and local bodies, when put in place, can help achieve good governance.

- **Efficient Grievance Re-dressal Mechanism**--All local bodies should be helped in putting in place grievances cells to redress public complaints, to make them more responsive to people's need and aspirations. Let local bodies also put a place an appropriate mechanism of involving community and people in decision making, which would help in not only bringing transparency and efficiency in decision making but would also ensure good governance in urban areas. Examples of good governance in the state and country must be disseminated to local bodies for replication and application   in order to enable them to learn and build on the good practices to ensure that every urban centre becomes a place which becomes a role model of safety, resilience and   productivity, sustainability , providing all basic amenities and services of life to all the urban residents to lead a dignifies life. .

HOW TO MAKE CITIES GREAT PLACES TO LIVE

HOW TO MAKE CITIES GREAT PLACES TO LIVE
Introduction

Cities are known to have great potential for promoting quality living, productive working and offering best options for state of art infrastructures, employment, leisure and travel. Globally communities, states, nations, professionals, planners, managers and parastatal agencies are looking at the innovative options to make cities great place to live and work. Unfortunately, all cities donot offer quality infrastructures, amenities and facilities to all its residents. Accordingly, cities donot become inclusive which generally makes them chaotic and inhospitable places to live and work. In the emerging scenario, in addition to being places of excellence, innovations, creativity and doing great business, cities have also become places which are known for their exclusion, dualities and contradictions. They are known to have both strengths and weaknesses. If they are known to be promoter of large employment, they are also known to be storehouse of poverty. If they have state of art buildings, they are also home to the most derelict typologies of buildings in the shape of slums. If they showcase wealth, poverty is known to rub shoulders with prosperity. Despite efforts made to make them inclusive, cities believe and promote exclusion. Despite attempts made for promoting planned development, unplanned and haphazard development has emerged as the preferred mode of development. These dualities and contradictions offer great challenge and opportunities to planners and administrators to look at cities, for evolving appropriate strategies to overcome their problems and build on their strength to make them great places for human habitation.

World is urbanizing at a fast pace. Accordingly, 21st century has been called the century of urbanization. However, urbanization does not have uniform spread. With developed world already getting saturated, most of the nations getting impacted by urbanization are the developing nations, where still large population lives in rural settlements. With globalization and economic liberalization, developed nations are looking at the unexploited resources and cheap labour available in the developing nations. Considering large concentration of population in developing nations, providing for a great market for consumer goods, large number of obsolete manufacturing and economic processes are being relocated in the developing nations. These nations are now fast urbanizing in the face of relocated industry and economic activities.

Global Good Practices

Most of the studies made globally have revealed that by the year 2030, 60 percent of the world's population will live in cities. Accordingly, economic growth, social and physical development of communities and nations will largely depend upon how they make their cities more productive, livable, effective and efficient. That could mean, great things for economic growth—if the cities handle their expansion wisely and rationally. What will make a city great place to live and work is the greatest challenge facing nations, administrators and professional planners, because 5 billion people—60 percent of the world's population—will be making cities as their preferred place of residence by 2030, compared to existing 3.6 billion. Accordingly, developing nations will have to evolve rational policies, realistic programs and focused strategies to cope with rapid urbanization on an unprecedented scale. Developed nations, on their part, have also to play active role in rationalizing the urbanization process due to rapid immigration, melting of cities, aging infrastructures and stretched budgets. To attract investment, generate resources and make their cities global destinations, all nations are trying to secure/maintain the competitiveness of their cities by providing better livelihoods to the urban people, creating options/opportunities for ease of doing business besides making cities more inclusive, resource- efficient, livable and sustainable. This paper makes an attempt to showcase various options which can help various stakeholders involved in city planning, development and management, to make cities a great destination for all. Few strategies and options suggested /followed /enunciated globally by research institutions/experts/researchers/ academicians/ practitioners/renowned urban planners etc. to make cities great places to live and work, are detailed below;

- **Smart Visioning**--For making any city vibrant, productive, sustainable and a great place for human habitation, it will be critical and pre-requisite to define a smart, realistic and achievable vision for the city. Visioning of the city would essentially involve, laying- down well defined objectives, specifying achievable goals and putting in place detailed agenda for the city to be achieved during its journey to glory. Vision for the city has to be defined based on carrying out detailed study and in-depth analysis besides quantifying problems and identifying potential of the city duly supported by carrying out a SWOT analysis. Realistic visioning shall invariably involve local stakeholders, local communities, local

resources, local manpower, local NGOs/CBOs, local intelligence and local institutions of excellence. In addition, vision has to be supported by well- defined mission.

- **Promoting State of Art Planned Development--**Planned development has been recognized as the best option for making cities great places. No city can be made great and livable unless it is supported by state of art planning and development on continued basis. Unplanned, sub-standard and haphazard development has been found to be the major root-cause for making majority of the cities in-hospitable and unattractive places to live. Planned development has been found to offer major advantages to the city and its residents in terms of creating appropriate quantity and quality of spaces for living, working, mobility and doing business; provisioning/meeting the basic needs of all the residents of the city; providing basic and essential amenities/services, infrastructures based on the defined norms and standards; creating appropriate services/travel networks; creating public spaces of appropriate quality etc. However, rational siting of the city defined by natural features etc will be critical for ensuring its success and making value addition to city and its environment and ecology. Quality of manpower, expertise, knowledge, understanding, commitment dedication and sincerity of the teams and systems identified for planning, development and management shall be vital for the success of the city. Acquiring land in bulk for the city planning and development will be pre-requisite and critical for rational planning, making provision of basic amenities and earmarking dedicated space for housing, trade & commerce, institutions, industry, open spaces etc besides generating financial resources for funding the city. Creating supportive, simple, effective and efficient legal framework for city planning, development and management will help in achieving the objective of making city great place to live and work.

- **Planning Cities in the Regional Context;** --No city exists in isolation in space. It invariably has a regional context. Great cities support and share with its surrounding rural/ small settlements and are also supported by them in its basic and essential day to day needs. All urban settlements planned and developed in isolation have suffered from the disadvantages of uncontrolled urbanization, duplication/overlapping of services; over/under provisioning of services and infrastructures; malaise of conflicts and dichotomy between city and its periphery. All successful cities have made optimum use of settlements/ space existing in cities and their periphery. Accordingly, for making cities great, they have to be viewed, planned and developed in the regional context, periphery and peri-urban areas. This has not only made city development both rational and cost-effective but has also eliminated all overlaps and conflicts between city and periphery.

- **Making Cities Compact**-- Shape, size, structure and typology evolved and followed for the planning and development of the city has been found to have great role and impact on the success, failure and determining quality of life city provides to its residents. Compact city as a typology has been found to have considerable advantages as compared to conventional, ever- expanding and ever-melting cities. Such cities have been found to be most land efficient, energy efficient, cost-effective, eco-friendly and people friendly human settlements. Compact cities are the outcome of planning inside and not outside; planning vertical and not horizontal; planning mix and not pure; planning flatted not plotted development; planning for people not vehicles; planning for accessibility and not mobility etc. Planning compact has the advantage of making city land efficient and energy efficient. In addition, it makes city development and maintenance cost-effective and economical due to limited size, extent and volume of
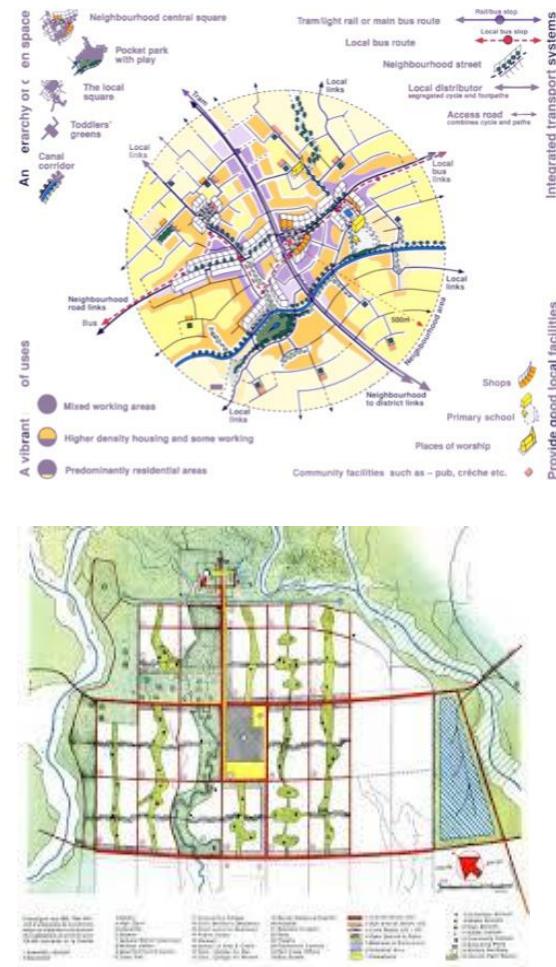
service network. It makes city more sustainable and livable by eliminating pollution, noise and hazards caused by vehicular traffic. It redefines the order of mobility by giving first priority to pedestrianisation and cycling with least priority going to individual vehicles. Reducing area under roads &parking with urban planning based on using land on the principle of 24x7x365 basis helps in economizing and saving of precious urban land, create opportunities for providing more areas under green and quality public spaces. It helps in reducing the carbon footprints and global warming caused by vehicular movement in the city. Compact cities eliminates the heat island effect by the provision of more open spaces, green plantation, landscaping etc reducing the energy requirements involved in the heating and cooling the built spaces. Compact cities promote community living by marginalizing the individual living and offer the best option for planning cities for the countries which are highly land stressed and over populated like India. Compact city concept offers enormous opportunities for making cities zero car, zero waste and zero carbon besides making cities more livable, sustainable and resilient as ordained by Sustainable Development Goal 11, enunciated by UNO.

- **Making Cities Green** -- For making cities to be great places to live, work and providers of higher order of quality of life, they shall have to be made and developed essentially as Green Cities in addition to be planned cities and compact cities. Green cities are known for their quality and capacity to make value addition to human living and resources. They are also known to be highly energy and resource efficient besides least consumers of energy and generators of waste. The operational mechanism of these cities does not revolve around or based on using and consuming conventional resources. They are essentially planned, developed and operated, making use of available natural/ non-conventional sources of energy. Their planning is based on the principle of planning with nature and making optimum use of natural resources, flora and fauna available at the local/regional levels. They are known for their capacity to make value addition to the human habitation. They make optimum use of nature and natural resources represented by *Panchbhutas*, comprising of Prithvi, Jal, Vaayu, Agni and Aakash. City planning is based on making natural triad of Sun, Space and Verdure(Greenery) integral part of city planning and development process. Built environment created in the green city follows the mandate of optimizing the site/ city/regional climate; best available orientation; existing flora and fauna; movement of sun and air besides creating optimum indoor air quality; reducing waste and using minimum energy and water. In search for optimum solutions to make cities and buildings green, Indian Green Building Council has already evolved framework for zero energy buildings; whereas evolving framework for zero water building is on the fast track. Ultimately Green cities will be planned and designed as zero energy, zero water, zero waste, and zero pollution settlements with technological advancement graduating to make them resource/energy/water positive cities.

- **Making Cities Inclusive**; Despite making great contribution to economy, employment and infrastructure, cities are also known to be places showcasing dichotomy and contradictions on large scale. Intensity of contradictions goes on increasing with the increase in size and growth of the city and population. With rising cost of land and living, large cities believe in marginalizing vast majority of population which does not have enough resources. Cities believe in welcoming elites and people with resources. Cities remain largely stratified, duly showcased by areas having good infrastructures and bad infrastructure; good housing and bad housing; planned and unplanned development; excess and lack of open spaces/amenities etc. Accordingly, rapid growth and mushrooming of slums, dilapidated housing, inadequate basic infrastructures, poor quality of life, informal housing; growth of informal trade and commerce; lack of open spaces, poor amenities and services etc are some of visible signs of exclusion displayed by majority of cities. Cities must be developed to provide appropriate options of gainful employment to all its residents so as to enable them have decent wages/adequate resources to meet their day to day needs. Cities should offer their citizens inclusive opportunities and a sense of personal pride, belonging and ownership for the place. Cities should make provision for adequate space, duly marked and developed, to enable all its residents, a place for living and doing business. No city can be great place to live unless it is made inclusive and self-sufficient, catering to basic needs of the all its citizens, irrespective of their economic& social status, gender, sex, age, caste, creed, place of residence etc.

Accordingly great cities have to be inclusive by creating an inbuilt systems which would provide basic amenities of life even to the poorest of the poor of its citizens, to lead a dignified life.

• **Making Cities Safe;** Safety remains a distinct feature and characteristics of great cities**.** For making cities great place to live, they have to be made safe against social/physical/economic discrimination; crimes; manmade and natural disasters. Safety has been found to have great connectivity and positive co-relationship with livability and prosperity. All great cities are known to be promoters, providers and assurers of safety and security to its inhabitants. Majority of declining cities globally have been found to suffer from the malaise of being unsafe. For promoting safety, cities have to evolve innovative people/area centric options. For safety against crime, all public spaces would require careful round the clock monitoring and surveillance. Using technologies and installing cameras at all public spaces shall be essential for eliminating any chance of crime at these places. Planning has a great role in promoting safety in cities. Introvert planning is known to be promoter of lack of safety in cities. Visibility would be crucial for promoting safety in city and making the public places safe. Avoiding dark and inaccessible corners will be crucial to promote safety in the cities. Safety has to be made integral part of urban planning/development and preparation of master plans/development plans of cities in order to make cities great places to live and work. For making cities safe against natural disasters, all low lying areas, floodable areas; derelict areas; areas under forest/ water bodies; eco-sensitive areas etc. have to be earmarked as areas prohibited for urbanization. Infact carrying out a detailed land suitability analysis for any area/city for determining the suitability of area for urban development and its use in the urban context will be crucial to promote safety against any natural and manmade disaster.

• **Leveraging Heritage, Art and Architecture**—Great cities are known to have always leveraged its available heritage, both natural and manmade, to make value addition to the city in terms of its growth and development by attracting visitors from home and outside. Heritage has also been used to promote economy and generate resources for the city besides generating gainful employment for the local communities. These cities have made numerous efforts to identify its valuable heritage, evolved policies and programs to preserve, conserve and promote heritage; made heritage integral part of city planning, development and management process; involved communities in identifying heritage and its management by evolving people centric policies to create local ownership. In addition to optimizing heritage, great cities have also made optimum use of art and architecture to make cities iconic. Many great cities are known for their great work of art and architecture. Globally, great cities are known for their great public spaces, with great pieces of art and architecture. Renowned artists/master craftsmen/professionals can be actively involved, on continued basis, in making derelict areas/public places as the most attractive spaces in the public domain by their creativity and works of art. Many cities have also become great by the existence of iconic buildings created by the master architects. Accordingly, profession of architecture and eminent local architects can also be actively involved to make cities a great destination.

• **Creating Quality Public Places**-- Iconic public plazas, green spaces, boulevards, streets, squares, people, food, outdoor environment, transit systems, in-creditable art , architecture, museums, galleries and parks, which belong to and create ownership for people and community at the local level, are known for their capacity, role and importance to make a city great. *Minneapolis, Madrid and London*, are the leading

examples of creating amazing spaces in the public realm (Alex Garvin). However, for public spaces to become qualitative, iconic, amazing and great, they must be made *universally accessible*- identifiable, safe and easy to use, accommodating people of different goals, backgrounds and creating reasons to be there. Such spaces should also be made *universal providers*- offering something for all who visitor them- shops selling crafts and art, restaurant, entertainment, leisure etc. *Have capacity to attract and maintain demand*- by drawing people from near and far; eliminating noise, pollution and cars; providing retail opportunities; cutting off the street from vehicular traffic; making space an open-air people mall etc. *Defining a framework for urbanization*, to promote development-- by aligning public spaces to lead to the city's iconic buildings/ conspicuous landmarks, *making spaces People centric, sustainable, eco-friendly*---by involving communities, designing them for people based on basic human needs-- fresh air, lack of noise/trash, plenty of shade, unifying environmental remediation and economic development to promote economy and environment. *Nurturing a civil society*--for bringing out the best in people; involving people/ business/ communities/ parastatal agencies who use them; making them responsible for overseeing them--New York's Grand Central Terminal.

- **Promoting Quality Leadership -** Based on interviews carried out of the Mayors and city leaders besides analyzing the case studies of globally successful cities, *McKinsey* concluded that core processes and services from urban planning to financial planning and social housing besides benchmarks, that can transform cities into superior places to live and work, were largely the outcome of the great efforts made by leaders in improving their cities. No city can be made great unless it has great leadership which is knowledgeable, committed, sincere, focused and believes in performing and delivery. Leadership has to be essentially local, representing the local communities, duly elected by local communities directly, based on the pre-defined vision and detailed agenda for action for the growth and development of the city. They should be able to involve communities in the decision making and make optimum use of available resources. Leadership has to be accountable and answerable to the local communities for its action, performance and decisions. Leadership should have adequate time to perform and deliver besides having freedom to raise resources and invest in the city development programs. Freedom from outside and state interference has to be guaranteed, based on appropriate checks and balances. Good leadership must be duly recognized and awarded for their qualities, performances and innovations. As per study made, *McKinsey* concluded that great leaders have to do three things really well to make cities great places, which inter-alia should include:

- **Achieving smart urban growth** through identifying and nurturing the very best opportunities for growth; planning ways to cope with its demands; integrating environmental thinking, and ensuring *all* citizens enjoy a city's prosperity. Good city leaders also think about regional growth because with metropolis expanding, they will need the cooperation of surrounding municipalities and regional service providers; integrating the environment into economic decision making; investing in city infrastructure to reduce emissions, waste production, and water use, as well as building high-density communities.

- **Doing more with less--** Great cities secure all revenues due; explore investment partnerships, use technology; make organizational changes that eliminate overlapping roles and manage expenses and leveraging, rationally designing and executing private–public partnerships, as an essential element of smart growth, delivering lower-cost, higher-quality infrastructure and services.

- **Winning support for change--** Considering the fact that change is no easy, and its momentum can even attract opposition; successful city leaders build a high-performing team of civil servants; create a working environment where all employees are accountable for their actions; take every opportunity to forge a stakeholder consensus with the local population and business community; taking steps to recruit and retain top talent; emphasize collaboration, and train civil servants in the use of technology. Mayors are only too aware that their tenure being limited; no longer-term plans are to be articulated for gaining popular support. Short-term projects are more critical for successes, which can start a virtuous cycle that sustains and encourages a great urban environment.

- **Using Smart Technologies--**Technology has a great role in making a city more productive, effective and efficient in terms of delivery/managing of services; maintaining the quality of services; rationalizing traffic and transportation; promoting mass transportation; promoting urban planning; creating base maps for

the city; preparing and monitoring implementation of master plans/ development plans; urban governance; involving communities in planning, development, management and governance; creating a data base for managing the city; granting permissions for building plans; networking of urban services; promoting transparency in decision making; managing disasters; monitoring operations; recording/resolving public complaints; determining operational status of infrastructures; controlling crimes; making cities safe; promoting energy efficiency; managing resources; monitoring waste etc. Globally all successful cities are evolving and devolving new systems for making optimum use of technology for managing their day to day operations besides looking for future options for making cities more livable and productive. Cities are being networked so that technology can be leveraged for promoting ease of doing businesses, creating employment and promoting economy of the city. However, use of technology still remains limited which has impacted the city planning, development and management. Making cities great places to live will gravitate around our capacity to leverage the technology in the domain of urban planning, development and governance.

- **Leveraging Landscaping;** Most livable cities globally, are known for their achievements in the field of planning, designing and promoting quality landscaping, creating network of open spaces/parks, green belts, gardens, boulevards, city forests etc. These spaces not only make cities most livable but also promote quality of life. These spaces are known to make value addition to the city, communities, real estate and its residents in terms of promoting health; creating aesthetic value; creating interface between manmade and natural environment etc. Green spaces are known to promote physical activities and overcoming stresses and strains of daily life. Studies made globally have revealed, people living near green spaces are three times more physically active than those living away from them. The incidence of falling sick has been recorded lower in areas having large open spaces. Cities having large number of trees and open spaces are known for their health related advantages. Many cities globally are known for their landscaping and open spaces which attract large number of visitors, both from within and outside the city. Curitiba city has emerged as one of the most successful urban experiment due to creation of large open spaces and state of art landscaping in the city. Chandigarh also has emerged as one of the best livable city because of its unique landscaping. City planning in case of Chandigarh was supplemented with its landscape planning right in the beginning. Landscape planning has to be based on the local climate and climatic conditions; quality of soil; local flora & fauna; pattern of planning; pattern of land use; segregation of non-compatible landuses; making optimum use of derelict/low lying areas; creating a network of green spaces; creating area for shading pedestrians; connecting man with nature; connecting nature with traffic and transportation, pattern and hierarchy of roads; promoting walkability; overcoming adverse orientation in designing ; locating and making value addition to the built environment etc. Promoting and planning landscaping would also require protecting, preserving and promoting the existing wealth of the flora and fauna in the city by creating an enabling legal framework besides creating a data base of the wealth, so as to monitor its status over a period of time.

- **Creating Vibrant Communities** remains one of the major challenge and focus of successful cities. Vibrant city life flourishes only in neighborhoods that serve multiple functions having mix of compatible landuses to support mix of tenants and attract different people throughout the day and night; having small blocks with narrow streets interlaced with piazzas/open spaces for people to walk, meet, interact and chat. Vibrant communities offer great support to promote social living and making cities safe. For communities to become vibrant, they have to be planned as self-contained and self-sustaining entities, providing all the basic human day to day needs based on walkability. The size of the community is based on human scale and contents are defined so as to promote cohesion and diversity. These communities have mobility based on pedestrianisation with focus on safety for children and elders. All public places occupy central positions whereas all activities attracting mechanized vehicles are put on the periphery. These communities have dedicated open space available within the walkable distance and have well defined boundaries.

- **Creating a Dedicated Local Agency-** For making any city great place and creating a local ownership, it must have a dedicated agency responsible for planning, development and management for the city. Multiplicity of agencies existing at local level, with over-lapping areas of operation and responsibilities have done more damage than good to make cities great places. Indian cities lack ownership, which has emerged as the major cause for their irrational, haphazard and unplanned development besides steady decay and decline of the Indian cities. City Planning remains divorced from development and management leading to emergence of dualities and contradictions in city growth. Despite enactment of 74th Constitutional Amendment Act, 1992, mandating urban local bodies to be made institutions of urban governance at the local level, urban local bodies have not been recognized as the agencies for planning, development and management of urban areas at local level. These agencies remain under the perpetual shadow/mercy of the development authorities created at the local/state level in the area of planning and development. Lack of adequate financial and manpower resources have made urban local level agencies highly vulnerable, functionally ineffective and operationally inefficient, incapable of leading the cities to become great places. Accordingly, for making any city great place, it must have a fully empowered and dedicated agency having adequate capacity, capability, manpower/financial resources, structure, leadership, processes, functions, responsibility and authority to take care of its planning, development and management issues. For creating an fully empowered and dedicated local level agency, it will be critical to have a comprehensive, well defined, simple, easy to understand, operate and implement, legal framework for planning, development ,management and governance of urban areas.
- *Guy Parson-* considers five things that make a city great place which include; *they're exciting-*energizing, inspiring places to live; *they're tasty--* providing with known quality of food, bars and restaurants. *They're worth exploring--*having interesting places to live and explore. *They take things a little easier--*City putting in fewer hours at the office and having more spare time for socializing; *they're friendly-* where people would like to chat to a stranger.
- *Jeffrey Sachs* -suggests that large natural resources donot necessarily lead to making cities great. He finds negative correlation between resource abundance and economic growth/urban innovations/employment, because resources not only fuel conflict but also create monopolies. Natural resources can also deter growth by lowering levels of education. Diversity would be critical to make a city great. Blessed by its harbor, New York became a great place, which gave it diversity involving worldwide connections leading to the growth of the garment industry, printing, publishing and financial services.

Way Forward

From narrative given above, it can be visualized that making cities great places to live and work, remains both complex, difficult and daunting task, requiring out of box thinking, adopting multiple` approaches and innovating state of art options for planning , development and management of cities. Rapid pace and massive influx of population in the urban areas offers enormous opportunities and challenges to innovate, experiment, evolve and devolve to the planners, architects, engineers, professionals, developers, administrators, politicians, urban local bodies, parastatal agencies, private sector and other stakeholders to make cities great entities and best place for living and working; meeting all basic human needs; promoting ease of doing business; promoting sharing; creating enabling environment and spaces for all human operations. How effectively and efficiently we meet these challenges and make use of opportunities offered in the urban domain, shall hold the key to the sustainability, growth and development of the communities and nations. All cities can be made places to live and work, depending upon how residents, local communities and all stakeholders commit, involve, innovate and experiment to achieve the objective of making their city great place.

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