A METROPOLIS PUBLICATION
IN ASSOCIATION WITH INDIA'S NATIONAL INSTITUTE OF URBAN AFFAIRS

metropolis

WORLD ORGANIZATION OF MAJOR METROPOLISES

INDIA

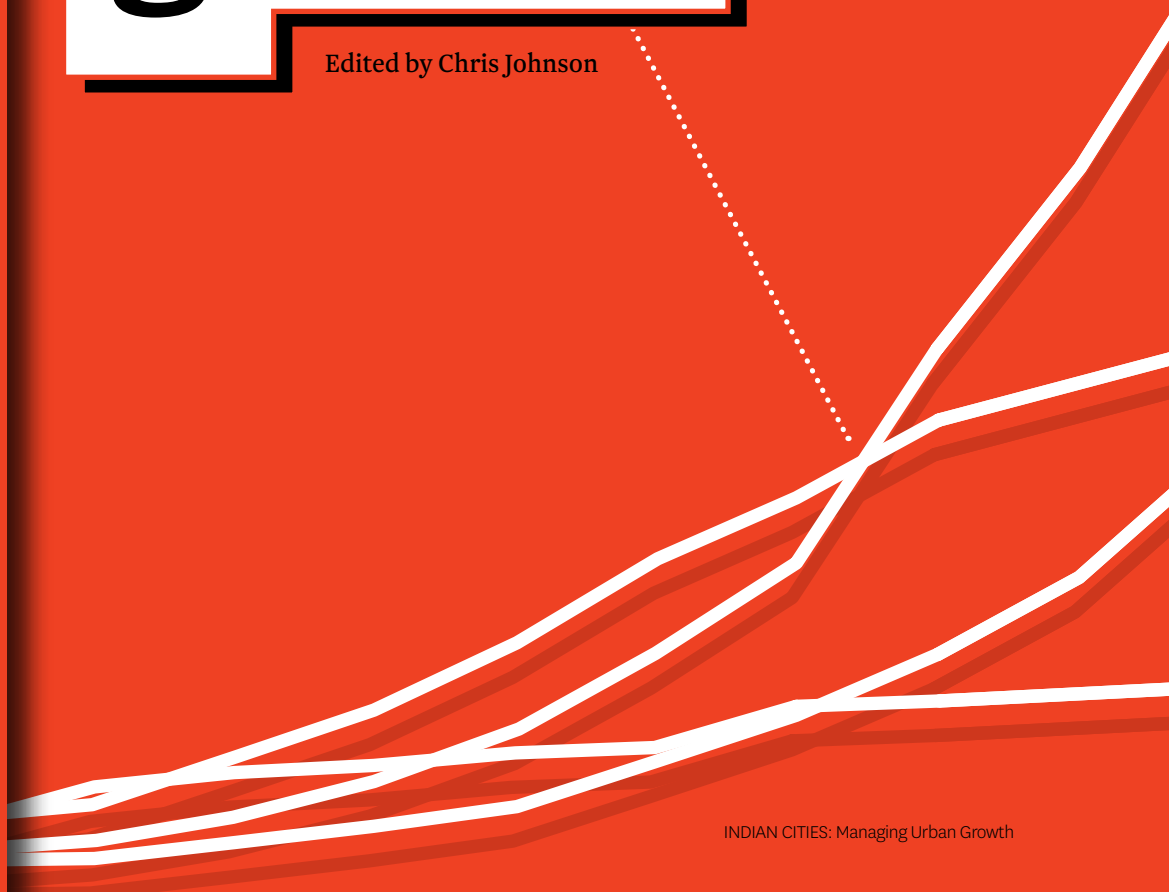
A Metropolis Research Publication

CITIES AND TOWNS OF INDIA ARE GROWING AT AN UNPRECEDENTED PACE—AT OVER 3 MILLION A YEAR.

THIS BOOK OUTLINES PEOPLE, PROJECTS AND IDEAS THAT ARE CHANGING THE SUBCONTINENT THROUGH:
—MILLENNIUM GOALS
—SLUM RENEWAL
—NEW CITIES
—RIVERFRONTS
—TRAFFIC SYSTEMS
—WATERWAYS

managing urban growth

Edited by Chris Johnson



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AGRA
AHMEDABAD
BANGALORE
KOLKATA
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MAGARPATTA
NEW DELHI
PUNE
SURAT

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Forewords

Managing Urban Growth in India

Jean Paul Huchon
METROPOLIS PRESIDENT

The world is urbanising fast, but much of the predicted urban growth (five billion by 2030) is occurring in Asian and African cities. This pattern is set to continue well into the future.

Metropolis was founded in 1984 in response to rapid urbanisation and the implications for decision–makers and city managers. It fosters cooperation between the world's largest cities in the pursuit of sustainable urban development solutions viewed from environmental, economic, and civil society perspectives.

From a small beginning with 14 cities in 1984, Metropolis now has 119 members, and has grown into a substantial organisation that enjoys wide international recognition. As the only organisation representing the interests of the world's conurbations, Metropolis naturally is eager to engage with the ever growing number of cities, especially in Asia.
When considering the historic economic transformation of China and India, the emerging picture is one of ongoing increase in the number of metropolises, that is, cities whose population exceeds one million inhabitants. China alone has 160 cities, and India is second with 68 cities.

As part of its strategy to engage with the Region, Metropolis established a presence in India and entered into an agreement with the *National Institute of Urban Affairs* (NIUA) for 'collaboration through exchanges and joint projects that promote innovative approaches in responding to urban challenges, and support member cities in managing effective sustainable development'.

This publication is one of the activities undertaken jointly by NIUA and Metropolis. It focuses on metropolitan India and aims to capture national and local government policy initiatives and infrastructure investment to achieve sustainable and inclusive urban growth. I am confident that readers will find the case studies in this book very interesting and uplifting.

I look forward to greater numbers of Indian cities joining Metropolis, to participate in its activities and benefit from the various opportunities afforded through membership.

Chetan Vaidya
DIRECTOR, NATIONAL INSTITUTE OF URBAN AFFAIRS (INDIA)

India has to continually improve its urban areas to achieve the objectives of increased economic development. However, urban governance and management of services is far from satisfactory. Huge investments are required in India's urban sector. Since public funds for these services are inadequate, urban local bodies (ULBs) have to look for innovative approaches for financing and management of urban services. In response to burgeoning urban problems, the Government of India launched a reform–linked urban infrastructure investment project, the Jawaharlal Nehru Urban National Renewal Mission (JNNURM).

JNNURM has brought a national focus on the urban sector, increased capital investments in service provision, created a catalytic environment for reforms, and enabled ULBs to usher in innovations. JNNURM has seen a mixed response across the states both in reforms and projects. Key challenges being faced by the Mission include lack of capacity to prepare project documents, raise revenues, and implement large projects and reforms. Challenges also lie in sustaining reforms and ensuring inclusive urban development through the Mission.

Metropolis is an international forum of decision–makers from the world's largest cities and is a knowledge centre that fosters cooperation and exchange of information on unique issues faced by expanding, modern metropolises. NIUA's mission is to be a knowledge centre on urban development issues and support sustainable and inclusive urban development in India. Metropolis and NIUA have come together to publish this book that presents experiences and case studies of diverse and innovative projects ranging from slum upgrading, heritage development, new towns, transport solutions, etc. It is hoped that this set of rich operational experiences will be of interest to urban policy makers and practitioners and encourage them to undertake innovative urban development in India as well as other developing countries.

I thank Mr. Josep Roig, Secretary General, Metropolis for giving us the opportunity to jointly publish this volume. Special thanks are due to Ms. Mary Lewin, Coordinator of the Metropolis commission on Managing Urban Growth, and Manager International Affairs, Department of Planning and Community Development, State of Victoria, Australia, for her guidance, support and coordination of this effort.

Thanks are also due to Mr. Chris Johnson for his research, leadership and successfully carrying out this project. This book would not have been possible without his energy, efforts and love for urban India. I also take the opportunity to thank the other members of the editorial board, namely Prof. Usha Raghupathi, NIUA and Mr. Sunil Dubey, Advisor Metropolis in carrying out this work. Finally, I sincerely acknowledge all the authors and urban champions who have written and provided inputs to the case studies.

INTRODUCTION

India is in a major phase of urbanisation. No matter which figures you select, the urban population growth projections are incredible. In a 2006 report, India's Registrar General suggested a rise of 248 million people living in cities between 2001 and 2026. The 2010 McKinsey Global Institute Report on 'India's Urban Awakening' suggests a rise of 250 million citizens between 2008 and 2030. That means between 10 million and 11.4 million new people to be accommodated in Indian cities every year.

This requires major planning and intense government focus at national, state and city level. In 2005 the Government of India launched the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) to develop cities as engines of economic growth. The Mission follows on from the 74th Constitutional Amendment Act, 1992 that strengthened decentralisation of the management of cities to Urban Local Bodies (ULBs). There is a raft of other initiatives focused on the urban poor and cities generally.

This publication aims to highlight and explain 11 excellent current examples of managing India's rapid urban growth. It follows a previous Metropolis Research Publication, *Connecting Cities: India*—which was one of five volumes of essays that I edited as Director of the Metropolis Congress in Sydney in October 2008. In that edition, some of India's key urban issues were examined through the eyes of commentators including Amitabh Kundu, Narinder Nayer, H.S. Sudhira, Chetan Vaidya, Hitesh Vaidya, Philippe Rode and Rit Chandra.
At the conference, *Connecting Cities: India* catalysed discussions among some of the authors and civic leaders from many Indian cities. Later, Metropolis established a Commission to help evolve debate on issues of Managing Urban Growth. In that context, it seems appropriate to supplement the first book with further documentation on a series of case studies that could help inform governments and communities in other cities.

Chetan Vaidya at the *National Institute of Urban Affairs (NIUA)* and Sneha Palnikar at the *All India Institute of Local Self Government (AIILSG*), and others, helped to track down interesting projects and interesting people helping to lead these projects.

Clearly, there is no simple solution to managing an extra 10 million people a year moving to India's cities. Because India is a diverse and varied country with a rich and diverse culture, the approach to managing city growth must also be diverse. The case studies therefore range from new satellite cities, to new urban hubs in existing cities, to renewing slum areas, to environmental and transport solutions for cities.

To complement the case studies, two essays present the context of Indian

urbanism. The first, at the beginning of the book, is by Professor Chetan Vaidya, Director of the NIUA, who explains current urban circumstances. He identifies eleven mega cities which will have populations of over four million by 2026. Three of these will be the super mega cities of Mumbai, Delhi and Kolkata, each with projected population of over 20 million. Examples from each of the super mega cities are in the book as are case studies from seven of the eleven mega cities.

This is followed by an essay by Sneha Palnikar from the AIILSG on the *Millennium Development Goals* adopted by the United Nations and how Indian cities are responding to those goals. Her major focus is on *Goal 7: Environmental Sustainability*.

The following nine chapters focus on individuals who are driving change in urban India by undertaking specific projects on the ground.

While each chapter focuses on a particular person as the driver of the project, all of those interviewed stressed that many others were also involved. So we apologise in advance if we have accidentally overlooked people who should have been mentioned. It is much easier to understand a project through one person's eyes rather than through many.

All these people are champions in driving advances for rapidly urbanising India. Each of them leads by example and readers are encouraged to make contact with them. No doubt there are many other champions across Indian cities who are working to improve living standards and establish better systems for Indian cities.

Champions of the projects in this book respect the city as an organism, and as a dynamic network. This is seen in the river project in Ahmedabad, the slums across Pune, the flow of transport in Bangalore and the Nullahs of Delhi.

Even the tourist routes in Agra are woven through slum settlements and in Surat the heritage buildings underpin the character of the city.

We encourage readers to explore these case studies and follow up on the references. I would like to specially thank all those champions driving projects for sharing their visions with us. Metropolis thanks NIUA for its support in publishing this book, especially Chetan Vaidya for helping promote its activities in India.

Chris Johnson
EDITOR

Each of these case studies is replicable in other cities; each has lessons for all to learn from. We have therefore provided contact details. Informing this book are a range of earlier key publications and reports. The work on Indian cities by the Urban Age Program from the London School of Economics was revealing. Jeb Brugmann's book *Welcome to the Urban Revolution–How Cities are Changing the World*, also was a useful analysis on the future directions of cities.

NIUA **CHETAN VAIDYA** operates across all levels of government. As Director of the *National Institute of Urban Affairs (NIUA)* in Delhi he heads a team driving change and disseminating ideas across the country. This book will become part of NIUA's kit of ideas and case studies and will fit into its urban portal (www.indiaurbanportal.in) which is the website for the *Peer Experience and Reflective Learning Program (PEARL)*.

AIILSG **SNEHA PALNITKAR** is Director of the *Regional Centre for Urban and Environmental Studies* at the *All–India Institute of Local Self Government* in Mumbai which drives information exchange program on cities across India. She has produced many publications on urban issues and specialised training programs, seminars and workshops; and wrote about the *Millennium Development Goals* in the *India Urban Poverty Report 2009*.

MAGARPATTA **SATISH MAGAR** has formed a partnership with 120 farming families to develop a new city within a city. Magarpatta is a work–live–play centre for 100,000 people, constructed within the Pune city limits. The city is very green with lush landscape, solar collectors and sophisticated waste recycling. Its main asset is that the 50,000 jobs in the IT industry are within walking distance of all living in the city.

AHMEDABAD **BIMAL PATEL** is an urban planner and architect in Ahmedabad who has been leading the team designing renewal of 10.5km of the previously flooded banks of the Sabarmati River. The project resettles slum dwellers and develops a variety of new flood–free precincts along the river.

AGRA **RENU KHOSLA** is Director of the *Centre for Urban and Regional Excellence (CURE)* and she works closely with slum dwellers including those resettled into the Savda Ghevra area on the outskirts of Delhi. *CURE* also has developed an innovative program to lift the lifestyles of slum dwellers in Agra using tourism as the lever to develop a Mughal Heritage Walk.

PUNE **PRATIMA JOSHI** is a *Google Earth Hero* for her work improving the lot of India's urban poor by using GIS data collection and mapping systems. Working closely with slum–settled families in Pune, she developed new housing that lifts living standards at feasible costs, and strongly believes that existing cities in India must have slum resettlement at the heart of their planning systems.

SURAT **MANVITA BARADI** heads India's Urban Management Centre based in Ahmedabad, which helps train key city staff across the country. Manvita has completed a detailed heritage survey of the city of Surat to identify buildings to be kept as the city's future is planned.

LAVASA **RAJGOPAL NOGJA** is the President of *Lavasa Corporation*, which is managing design and construction of the new city of Lavasa set on a lake outside Pune. This city for around 300,000 people uses new urbanism principles and sets new standards for satellite cities.

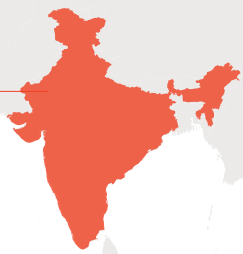
DELHI **ANUPAM YOG** runs two organisations in Delhi—the *Mirabilis Advisory* organisation and the *Urban Habitat Forum*. He is a creative thinker who supports strategic interventions to improve urban areas. He is closely involved in two Delhi projects—the *Ring Rail* to transform an under–utilised rail line into useful assets for the community, and *Delhi Nullah* to revitalise Delhi's network of 350 km of polluted open drains.

BANGALORE **ASHWIN MAHESH** through a company called Mapunity is driving innovative uses of technologies in cities. At his home city of Bangalore, he has established the *Bangalore Transport Information System* to help commuters manage their way around the congested city.

KOLKATA **ASHWAJIT SINGH** an acknowledged urban governance guru in India, led the *Kolkata Environmental Improvement Project (KEIP)*, an innovative project to help the Kolkata Municipal Corporation improve sewerage and drainage and protect the urban environment. KEIP has set a new benchmark for urban reform projects is South Asia.

INDIA

SOURCE: CIA WORLD FACT BOOK



2011 POPULATION
1.19 BILLION

MEDIAN AGE
26 YEARS

2010 GDP
US$ 1.43 TRILLION

2010 GDP PER CAPITA
US$ 3,400

INTERNET USERS
61,300,000

RAILWAYS
64,000 KM

RATE OF URBANISATION

24%

URBAN POPULATION

30%

UNDER THE POVERTY LINE

25%

RATE OF INFLATION

11.7%

% OF WORLD POPULATION

17.5%

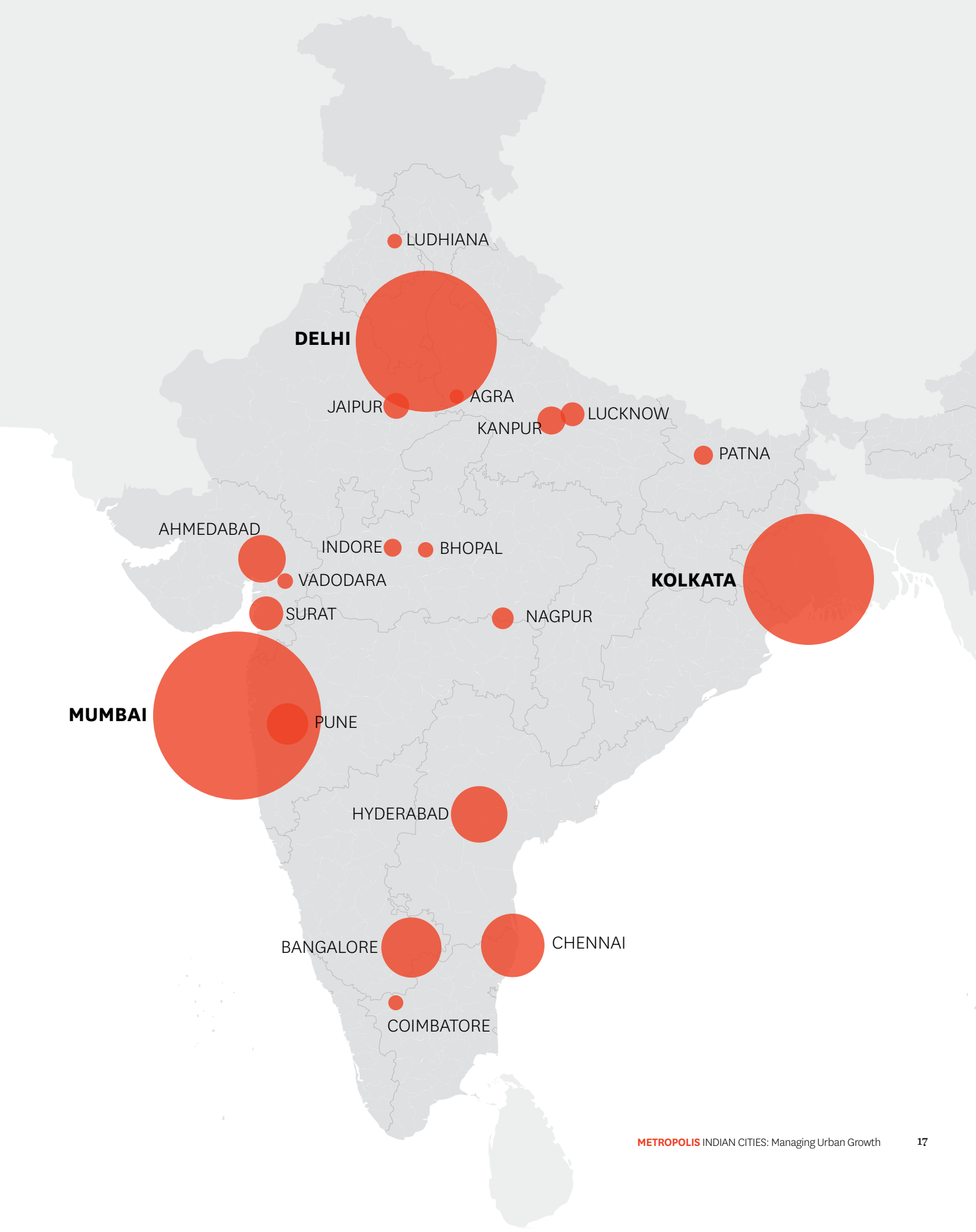
LIFE EXPECTANCY IN YEARS

66.4

20 LARGEST INDIA CITIES

UNITED NATIONS SECRETARIAT WWW.ESA.UN.ORG/UNUP

1 MUMBAI	**18,978,000**
2 NEW DELHI	**15,926,000**
3 KOLKATA	**14,787,000**
4 CHENNAI	7,163,000
5 BANGALORE	6,787,000
6 HYDERABAD	6,376,000
7 AHMEDABAD	5,375,000
8 PUNE	4,672,000
9 SURAT	3,842,000
10 KANPUR	3,162,000
11 JAIPUR	2,917,000
12 LUCKNOW	2,695,000
13 NAGPUR	2,454,000
14 PATNA	2,158,000
15 INDORE	2,026,000
16 VADODARA	1,756,000
17 BHOPAL	1,727,000
18 COIMBATORE	1,696,000
19 LUDHIANA	1,649,000
20 AGRA	1,592,000


LUDHIANA
DELHI
JAIPUR
AGRA
LUCKNOW
KANPUR
PATNA
AHMEDABAD
INDORE
BHOPAL
VADODARA
KOLKATA
SURAT
NAGPUR
MUMBAI
PUNE
HYDERABAD
BANGALORE
CHENNAI
COIMBATORE

India is the second most populous country in the world, with over 1,180,000,000 people.

One in six people on earth live in India.

17.5% of global population.

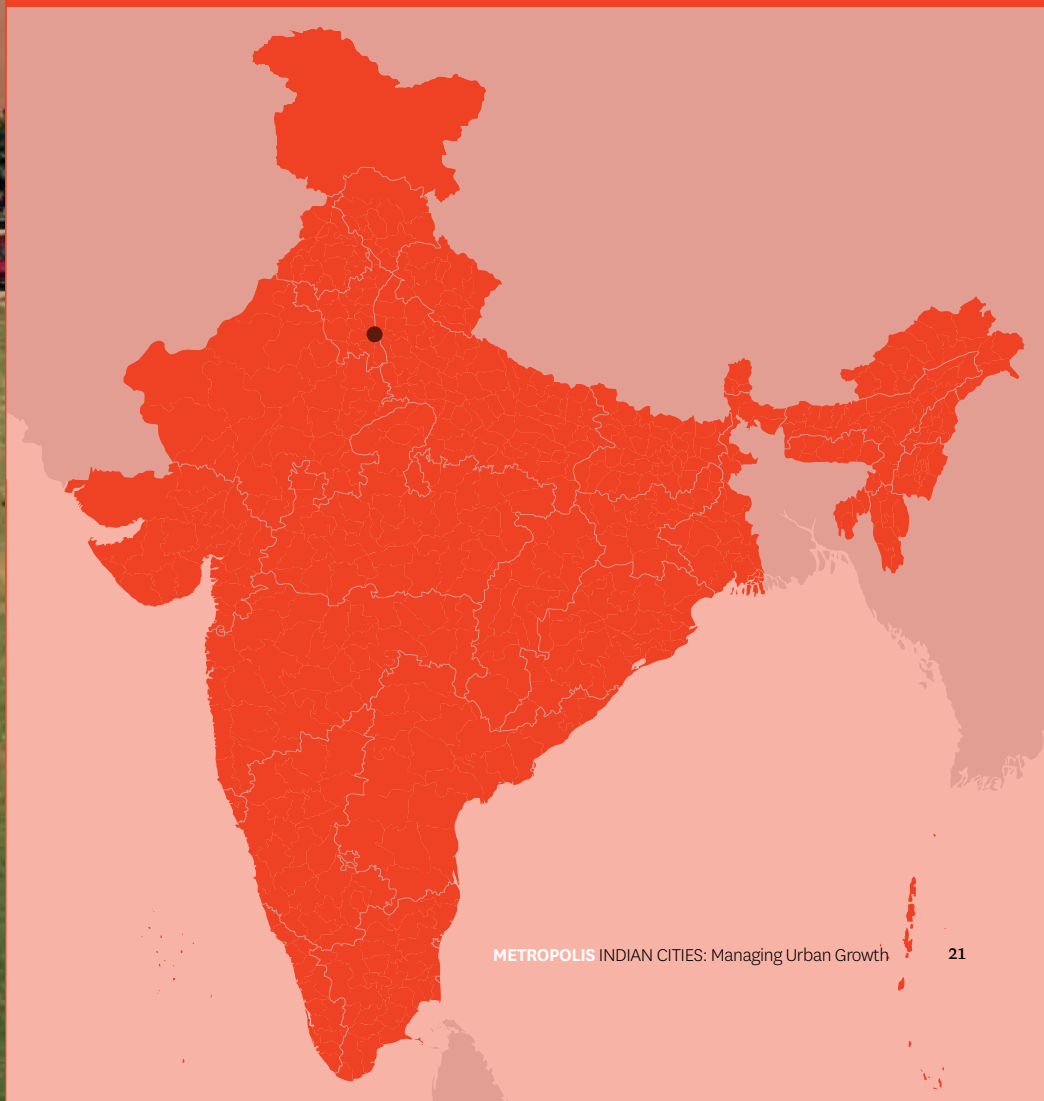
India is projected to be the world's most populous country by 2025, *surpassing China*, with a population exceeding 1,600,000,000 by 2050.

1

Urban India
Trends & Strategy

NATIONAL INSTITUTE OF URBAN AFFAIRS

Chetan Vaidya



Urban India: Trends and Strategy.

BACKGROUND

India has a large urban population which is the second highest in the world. The McKinsey Global Institute published a Report in 2010 on 'India's Urban Awakening—Building Inclusive Cities, Sustaining Economic Growth'. The report highlights the substantive infrastructure investment needed to take India to the next level of economic growth. It is clear that urbanisation is inevitable and India needs to improve its urban infrastructure and governance in order to increase productivity and create jobs for the poor. In this context, this paper briefly describes urban trends, identifies issues and suggests an approach for a future urban strategy in India.

URBAN TRENDS

In India, out of the total population of 1,027 million, in 2001, about 285 million persons lived in urban areas. The proportion of urban population has since increased from 19.9% in the year 1971 to 27.8% in the year 2001. The decadal growth of urban population was 31.2% in 1991–2001. At the country level, natural increase has been the principal source of urban population growth. The contribution of rural–urban migration ranges between 19–23% of the net increase in urban population.

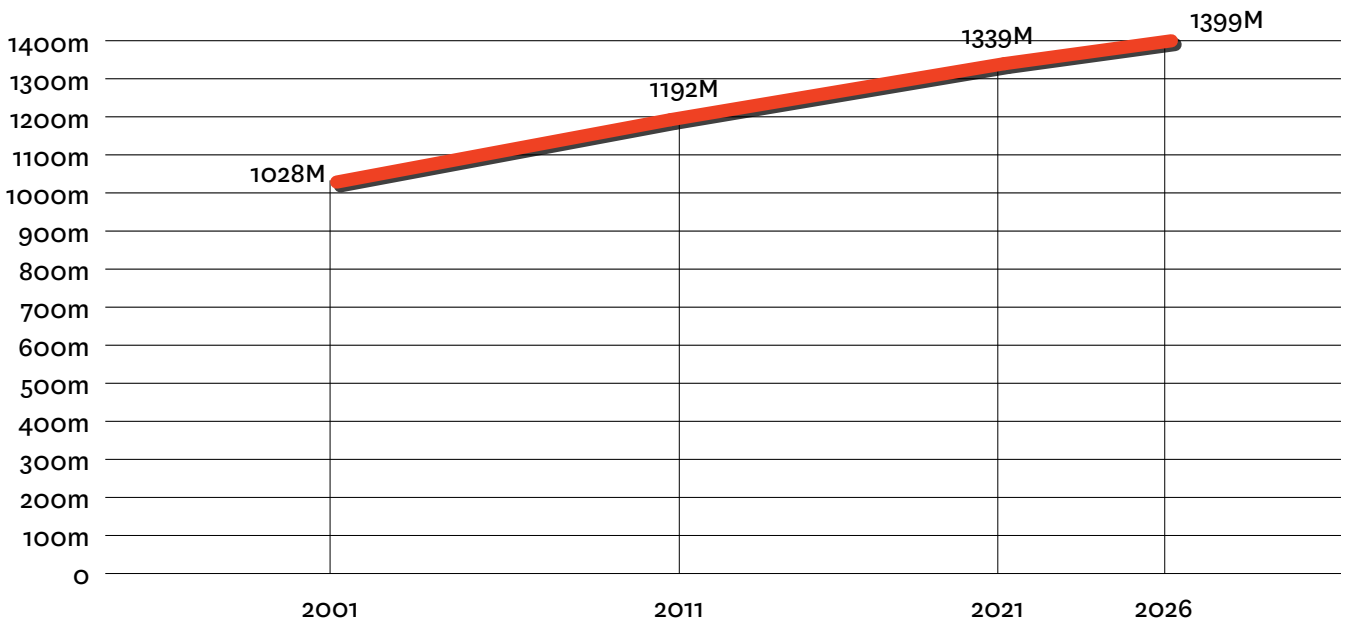
Increasing concentration of urban population in larger cities is one of the key features of urban India. The number of cities over 1.0 million population, in 2001, was 35 with a population share exceeding 37%. The urban share of Gross Domestic Product (GDP) in 1993–94 was 45.73% and the corresponding figure increased to 52.02% in 2004–05.

The Registrar General of India has projected the total and urban population for India and each state. It is interesting to note that 67% of total population growth in India in the next 25 years is expected to take place in urban areas. The urban population is expected to increase from 286 million in 2001 to 534 million in 2026 (38%).

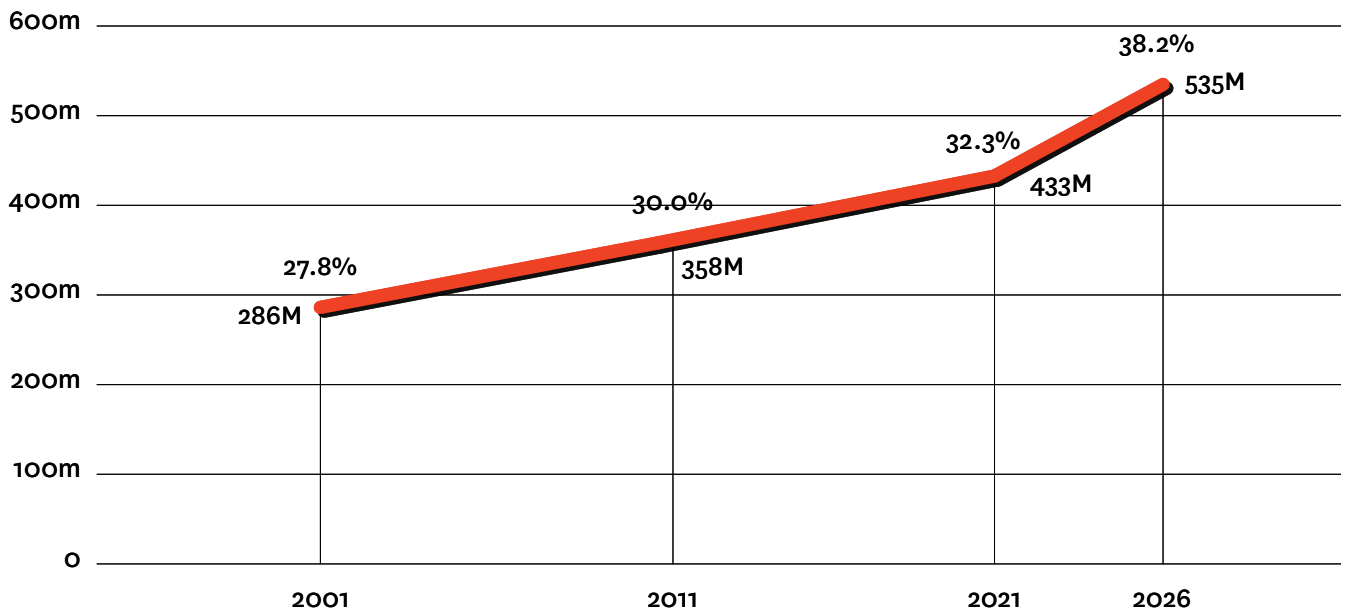
Urban India will continue to concentrate in cities of one million and above, as the number of these cities increase from 35 to 61 during 2001–2026. Moreover, according to UN Habitat (2008), eleven cities, namely, Ahmedabad, Bangalore, Kolkata, Chennai, Hyderabad, Mumbai, Pune, Surat, Jaipur and Kanpur will have populations of over 4 million in 2025 and these mega cities will have a combined population of 127 million (over 24% of total urban population).

It is pertinent to note that in the Western Region, there will be four mega cities and the corresponding number in Northern and Southern Regions will be three each. But in the Eastern Region, Kolkata will continue to be the only mega city.

TOTAL POPULATION GROWTH 2001–2026



URBAN POPULATION CHANGE 2001–2026



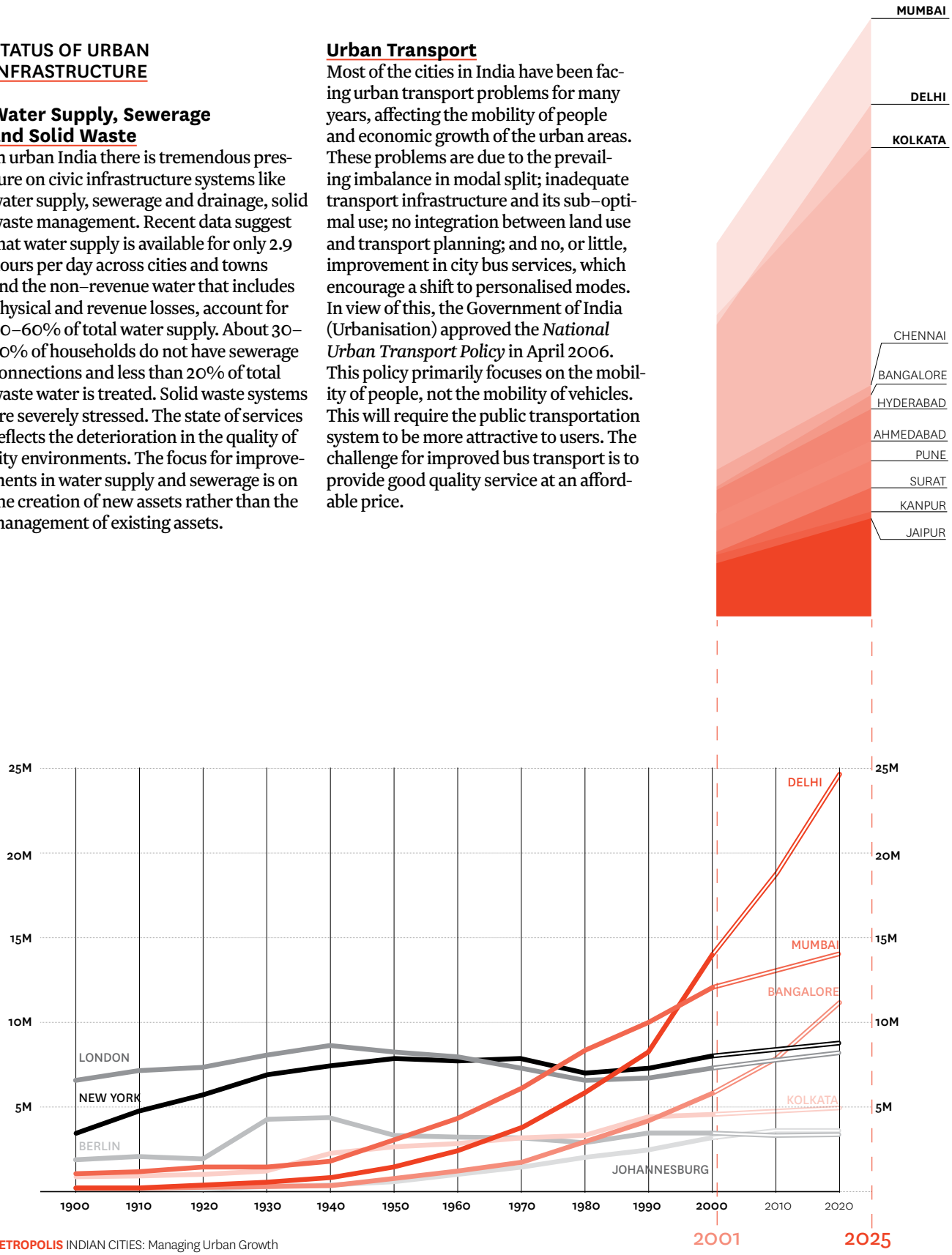
STATUS OF URBAN INFRASTRUCTURE

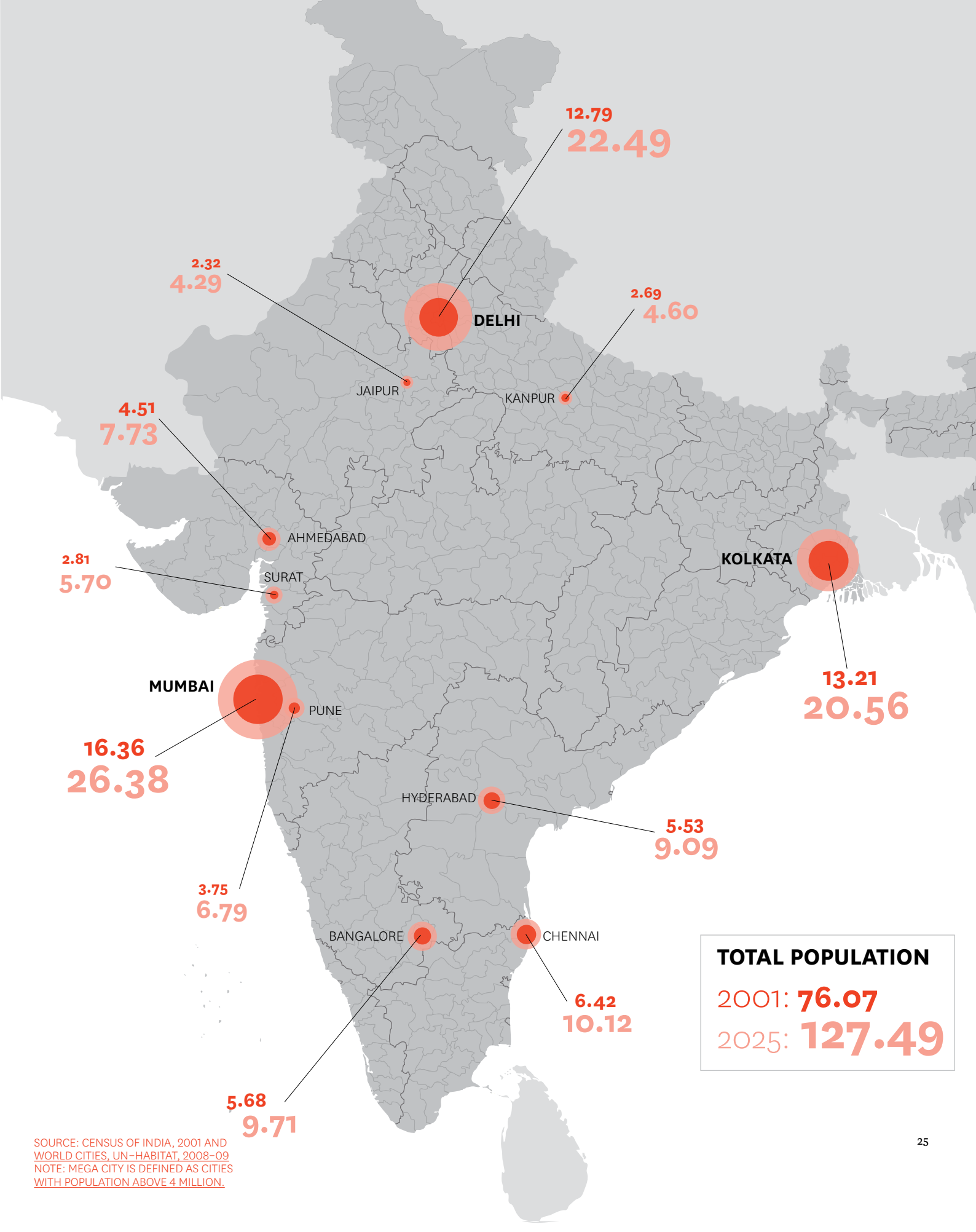
Water Supply, Sewerage and Solid Waste

In urban India there is tremendous pressure on civic infrastructure systems like water supply, sewerage and drainage, solid waste management. Recent data suggest that water supply is available for only 2.9 hours per day across cities and towns and the non–revenue water that includes physical and revenue losses, account for 40–60% of total water supply. About 30–50% of households do not have sewerage connections and less than 20% of total waste water is treated. Solid waste systems are severely stressed. The state of services reflects the deterioration in the quality of city environments. The focus for improvements in water supply and sewerage is on the creation of new assets rather than the management of existing assets.

Urban Transport

Most of the cities in India have been facing urban transport problems for many years, affecting the mobility of people and economic growth of the urban areas. These problems are due to the prevailing imbalance in modal split; inadequate transport infrastructure and its sub–optimal use; no integration between land use and transport planning; and no, or little, improvement in city bus services, which encourage a shift to personalised modes. In view of this, the Government of India (Urbanisation) approved the *National Urban Transport Policy* in April 2006. This policy primarily focuses on the mobility of people, not the mobility of vehicles. This will require the public transportation system to be more attractive to users. The challenge for improved bus transport is to provide good quality service at an affordable price.





TOTAL POPULATION

2001: **76.07**

2025: **127.49**

SOURCE: CENSUS OF INDIA, 2001 AND WORLD CITIES, UN-HABITAT, 2008-09
NOTE: MEGA CITY IS DEFINED AS CITIES WITH POPULATION ABOVE 4 MILLION.

STATUS OF URBAN INFRASTRUCTURE

Water Supply, Sewerage and Solid Waste

In urban India there is tremendous pressure on civic infrastructure systems like water supply, sewerage and drainage, solid waste management, etc. Recent data suggest that water supply is available for only 2.9 hours per day across cities and towns and the non–revenue water that includes physical and revenue losses, account for 40–60% of total water supply. About 30–50% of households do not have sewerage connections and less than 20% of total waste water is treated. Solid waste systems are severely stressed. The state of services reflects the deterioration in the quality of city environments. The focus for improvements in water supply and sewerage is on the creation of new assets rather than the management of existing assets.

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Institutional Arrangements

The Institutional arrangement for municipal governance and urban service delivery mainly comprise of the Constitutional Provisions, State Municipal Laws, State Finance Commissions (SFC) and Central Finance Commissions (CFC), ULBs and parastatals.

74th Constitutional Amendment Act (CAA), 1992

The 74th CAA came into force in June, 1993 seeking to strengthen decentralisation. However, many states are yet to transfer functions, funds and functionaries to ULBs. In 2001, there were about 3700 ULBs in the country. The consequences of the unfinished decentralisation agenda are different institutional frameworks for network services in Indian states—responsibilities are divided between ULBs, state departments and state or city level utility boards. Three broad institutional frameworks are discernible in Indian states with regard to water supply and sewerage services. First are the states where the entire system is with a department or a parastatal of the State Govern-

ment; second, where the ULBs themselves handle the entire activity; and, third, as in some large cities, exclusive water supply and sewerage boards have been set up for the city (Table 3). Irrespective of the institutional framework, the failure of the public sector to provide adequate service delivery has been ascribed to public monopoly, organisational inefficiency, technical flaws such as high leakages, lack of preventive maintenance, unaccounted for water as well as over–staffing and lack of autonomy. The state governments' inability to clearly assign the functions to municipalities has resulted in the overlap of responsibilities and no accountability to citizens for service delivery.

SFCs and CFC

As per the provisions of the 74th CAA, the state governments have to set up SFCs. Most SFCs have formulated the fiscal packages without access to a clear directive on the functional jurisdiction of municipalities. Absence of clarity in respect of the functional domain of municipalities constitutes a serious gap in the functioning of the SFCs. The Commissions have been reviewing the financial position of the rural and urban local bodies and suggesting ways and means to devolve the finances of the state governments to ULBs. However, estimating the resource gap and developing expenditure norms for various services are the important areas which need to be addressed by the commission while devolving funds to the ULBs.

The CFC has to address the issue of municipal finances. Based on the 13th CFC Report released in February 2010, total grants to ULBs have been increased from Rs 45,000 million in 2005–09 to Rs 231,110 million over the 2010–2015 period. Thus, total grants have increased by nearly four times. Part of the grants to ULBs will be linked to performance. The CFC divided the local body's grants into two components—general basic grant and general performance grant. The division is significant in terms of urban governance. The general basic grant can be accessed by all states as per the criteria laid down by the Commission. But the performance grant can be accessed only by those states which comply with the conditions it stipulated.

Weak Staff Capacity

Most ULBs in India do not have the capacity to promote cities as 'engines of growth'. The local agencies have weak institutional capacity to plan for spatial, social and economic development, have unstable revenue streams, and low capacity to plan, mobilise resources and implement urban infrastructure projects. There is a need for strengthening of ULBs to play a pivotal role in national economic growth.

MPC & DPC

Many ULBs are not in charge of urban planning. Moreover, Metropolitan Planning Committees (MPCs) and District Planning Committees (DPCs) have not been assigned a clear role in the preparation of regional and urban plans. The 74th CAA has mandated the State Governments to constitute MPCs and DPCs, which are responsible for the preparation of *Metropolitan Plans* and *District Development Plans*.

Reasons for slow progress of reforms

The main reasons for limited improvement in the functioning of ULBs despite the 74th CAA, are that functions, finances and functionaries have not been transferred to ULBs in most states.

1. In most states, elected mayors do not have executive powers.
2. Limited understanding of reforms in cities/states.
3. There is insufficient political consensus at state and municipal levels for the reform agenda, particularly regarding private sector participation and proper pricing of services.
4. Small and medium sized ULBs are not in a position to manage all the functions identified in the 12th Schedule of the 74th CAA.
5. There are no regulations requiring minimum pricing of services and for cost recovery.
6. Property tax, the main source of the ULBs own income, has not been able to achieve adequate buoyancy due to constraints like rent control, inefficiency in updating property rolls, resistance to periodic assessment, etc.
7. Limited project development and implementation capacity.
8. ULBs have weak revenue base as tax base is inadequate, user charges are relatively low and revenue collection is low.
9. State transfers to ULBs are often low and unpredictable.
10. Existing administrative structure does not require minimum levels of technical staff in ULBs.
11. The role of parastatal (such as utility boards) and ULBs is often not clearly defined for project planning, implementation, operation and maintenance.
12. Presently, DPCs and MPCs play a minimal role in urban planning and investment decisions.

Strategy for urban development

The High Powered Expert Committee on Urban Infrastructure chaired by Dr. Isher Ahluwalia submitted its report in March 2011. It has estimated investment requirement for urban services in the country over 2012–31 at Rs 39.2 lakh crore (US$ 871.11 billion) at 2009–10 prices. The operation and maintenance of old and new assets will account for half of total costs. The report argues that the challenge of managing urbanization will have to be addressed through a combination of increased investment, strengthening the framework of governance, and comprehensive capacity building program at all levels.

It can be said that urban India is at a crossroads. In this context, an urban strategy is suggested to address issues that are critical for sustainable improvement in city infrastructure and provide critical inputs for developing the urban development approach for the country. The key theme for the strategy may be 'Enabling Urban India to meet the challenge of Economic Development'.

KEY CONSIDERATIONS FOR URBAN STRATEGY IN INDIA

1. ***Constitutional amendments are required to achieve the objectives of urban decentralisation.***
2. ***Different approaches to supporting reform–linked investments are needed for different states based on the level of urbanisation.***
3. ***Focus of investments should be on asset creation as well as management.***
4. ***Continue focus on public urban transport and integrate urban transport with land use planning.***
5. ***Inter–government transfers should have built–in incentives to improve performance.***
6. ***Integrate various urban development and related programs at local, state and national levels to develop sustainable city or metropolitan regions.***
7. ***Strengthen urban institutions and clarify roles of different organisations. Capacity building should be an important component of the program.***
8. ***Second generation of urban reforms should further focus on regulation, innovative financing and PPP, and climate change initiatives.***

Innovative Financing & PPP

The Government of India is facilitating the cities and states in developing innovative financing mechanisms such as mobilising market–based funds, land–based sources and public–private–partnerships (PPP).

Municipal Bonds

The Ahmedabad Municipal Corporation was the first ULB to access the capital market in January 1998. It issued bonds for Rs 1,000 million. This was a remarkable achievement since it was the first municipal bond to be issued in India without a state government guarantee and represented the first step towards a fully market–based system of local government finance. Several ULBs and utility organisations have issued bonds thereafter that so far have mobilized over Rs 12,399 million through taxable bonds, tax–free bonds and pooled financing. (Vaidya and Vaidya, 2010).

Land as a Resource for Financing

Some countries have raised money for urban infrastructure by capturing land asset values in transaction with private sector, in terms of leases, sales, developer's exactions or betterment levies (Spence, Annez, Buckley, 2009). Several land based financing methods like higher Floor Space Index (FSI), Transfer of Development Rights (TDR), Impact Fee, Area Linked Development Charge, External Development Charge, Betterment Levy, etc. have been used as tools for financing urban development in India. Land as a resource had a very dominating role during the 1960s and 1970s. But this method of land value capture seems to be neither adequate nor feasible. Infrastructure increases the land value and therefore there is a need to capture it. Increase in land value in turn will lead to an Increment Tax. Examples are Town Planning Schemes in Gujarat and Maharashtra. The other approaches include additional FSI and TDRs.

The urban poor make up between 15–30% of the total population in urban India.

Public Private Partnership (PPP)

As a response to the lack of access to finance and restriction on recruiting new personnel, etc. a number of public private partnership options have emerged, as many ULBs have outsourced various tasks to other agencies that aim to increase access to these services. There are many examples of PPPs in solid waste management. For solid waste management, the Greater Mumbai Municipal Corporation has introduced the Advanced Locality Management model for middle and high–income areas and the *Slum Adoption Program* for low–income areas (Redkar, 2008). In Hyderabad and Surat, private contractors are engaged to clean main roads and markets.

As far as PPP options for urban infrastructure are concerned, the initial focus of new investments in water supply projects was for the provision of bulk supply. However, *Build Operate Transfer* (BOT) projects often did not address problems of existing water supply and sanitation systems such as high unaccounted for water, high expenditure on energy and low cost recovery. The focus is slowly shifting to improved management of existing systems. As part of the World Bank funded Karnataka Urban Water Supply Improvement Project, demonstration zones have been identified in the three cities Belgaum, Gulbarga, and Hubli–Dharwad and a performance based contract has been given to a Private Operator for carrying out water supply improvements in the zones with the prime objective of demonstrating provision of 24/7 water supply. Mysore City in Karnataka has signed management contracts with a private company for delivery of services. The BOT contracts for water supply and sewerage have also been finalised for Latur town in Maharashtra and the Salt Lake township in West Bengal. It should be mentioned here that water supply tariffs in India are low and base data of existing water supply systems are not always reliable.

Around Rs 1,000 billion (US$ 22 billion) will be invested between 2005–2012 for improvement of urban infrastructure and providing basic services for the poor in urban areas.

GOVERNMENT RESPONSE

JNNURM

In the face of increasing urbanisation and growing backlog in infrastructure investments, JNNURM was launched in 2005 to develop cities as 'engines of economic growth' by incentivizing urban reforms at state– and city–level through the provision of grants to fast–track infrastructure development in the major cities. Under the JNNURM, around Rs 1,000 billion (US$ 22 billion) would be invested during the seven year period 2005–2012 for improvement of urban infrastructure and providing basic services for the poor in urban areas. Access by the cities' to JNNURM funds for infrastructure development is linked to states and ULBs commitment to implement mandatory and optional urban reforms during 2005–12. These reforms relate to empowerment of ULBs and sustainable improvement in service delivery. The urban reforms include implementation of the 74th CAA; public disclosure law; community participation law; integration of city planning and delivery function with ULBs; accounting reform; property tax reform; user charges; administrative and structural reforms; and encouraging public private partnership among others.

Until November 2010, the Government had approved 527 projects spread over 63 cities at a total cost of Rs 5,99,180 million under the Urban Infrastructure and Governance component of the program. 764 additional projects had been approved under the program for small and medium towns, at a total cost of Rs 1,29,280 million spread over 641 towns. The Government has approved additional funding for public transport under JNNURM, and the commissioning of 15,260 buses at a cost of Rs 47,230 millions has been sanctioned.

JNNURM has also catalysed a number of landmark initiatives in states and cities across the country. Progress in implementation of the reforms in various states and the JNNURM cities varies. JNNURM has incentivized strengthening of local governance through the implementation of the 74th CAA. Generally, Gujarat, Andhra Pradesh and Tamil Nadu have made very good progress. The implementation is slow in many other states and cities.

Housing the Urban Poor

Cities have been engines of economic growth but they harbor a significant number of poor and the living conditions are far from satisfactory. The urban poor constitute between 15–30% of the total population in urban India. GOI has introduced Rajiv Awas Yojona (RAY) towards fulfilling its vision of slum–free cities. The scheme for affordable housing through partnership and the scheme for interest subsidy for urban housing would be dovetailed into RAY which would extend support under JNNURM to states that are willing to assign property rights to people living in slum areas. In addition to providing subsidised credit, it would provide basic amenities such as water supply, sewerage, drainage, internal and approach roads, street lighting and social infrastructure facilities to slums and low–income settlements by adopting a whole city approach.

CONCLUSION

Great progress has been made in developing the framework for reform–linked investment in urban infrastructure through JNNURM and recommendations of the 13th CFC. However, many ULBs are yet to develop themselves as autonomous city management agencies to dovetail urbanisation with economic development. There is also a need to improve the financial sustainability of ULBs by improved property tax administration, appropriate user charges, use of land as a resource, e–Governance and PPPs in improving service delivery. It must be recognised that along with additional funds, there is a need to improve soft infrastructure in the urban sector including technical assistance, capacity building, e–Governance, creating centres of excellence, peer learning, etc. Most importantly, to improve urban governance and delivery of services there should be policy changes as well administrative actions.

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He is working closely with the Ministry of Urban Development (MOUD) Government of India on various urban issues and assisting various city and state governments in the implementation of reforms under the Jawaharlal Nehru Urban Renewal Mission (JNNURM).

Through NIUA Chetan Vaidya coordinates the Peer Exchange and Reflective Learning (PEARL) program under JNNURM which has an online website(www.indiaurbanportal.in) and distributes a newsletter across India.

He is coordinating a large number of urban studies including the City Cluster Economic Development in the National Capital Region of Delhi; Sustainable City Form for India; Property Tax Reforms; City Sanitation Plan Preparation; and Implementation of the 13th Central Finance Commission Recommendations for Urban Local Bodies.

Chetan Vaidya is a member the Editorial Board of the Environment and Urbanisation Asia Journal and the Urban India Journal.

Between 1995–2008, prior to joining NIUA, he was Deputy Project Leader, Indo–USAID Financial Institutions Reform and Expansion Program (FIRE) and in which he worked on the Model Municipal Law, Municipal Bonds, Municipal Resource Mobilization and Community based Sanitation Project.

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www.niua.org

www.jnnurm.nic.in

www.indiaurbanportal.in

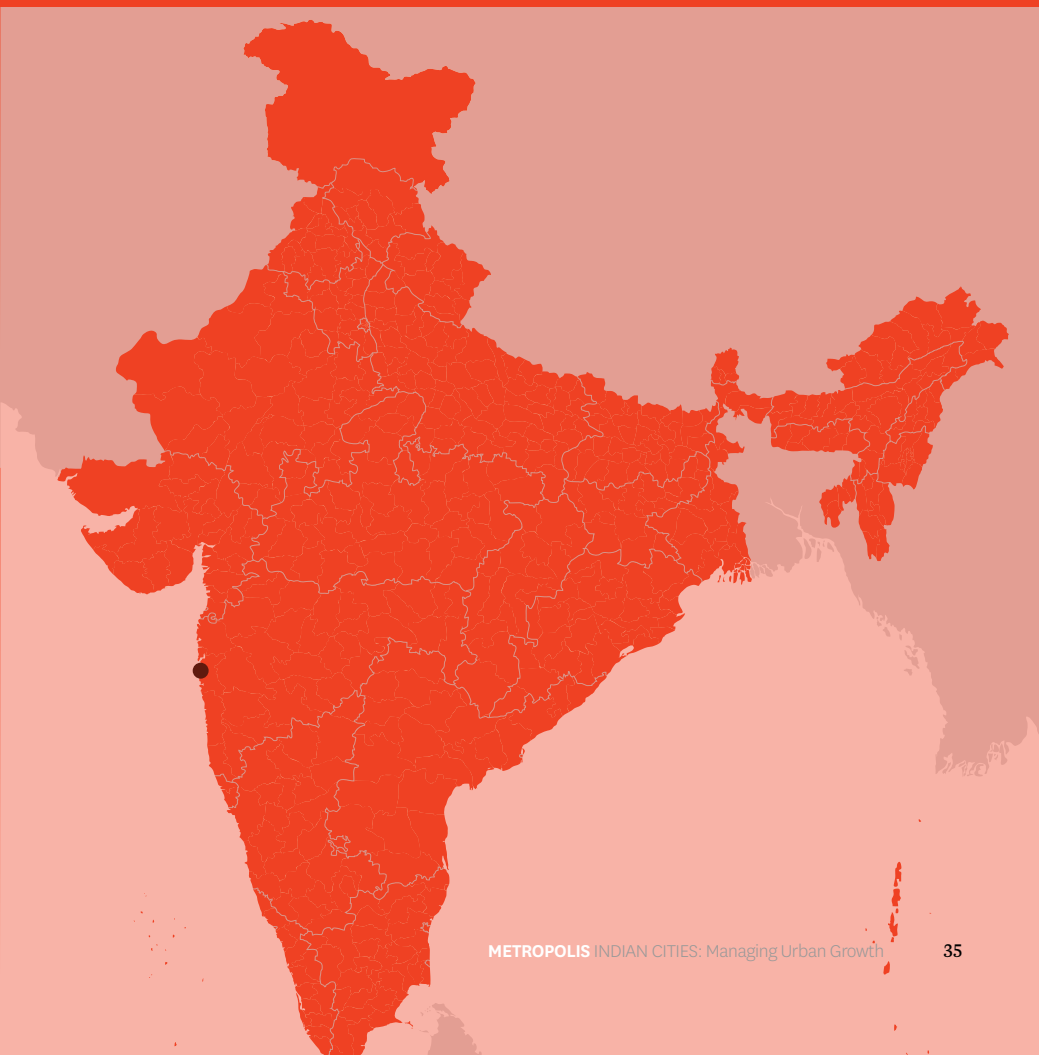
'Recycling oil cans' — Photo by Andreas Grosse-Halbuer

2

Millennium Development Goals and the Role of Indian Cities

ALL–INDIA INSTITUTE OF LOCAL SELF GOVERNMENT

Sneha Palnitkar



Millennium Development Goals and the Role of Indian Cities.

The *Millennium Development Goals* (MDGs) and Targets emerged from the *Millennium Declaration* adopted by 189 countries and signed by 147 heads of state and governments during the *United Nations Millennium Summit*, in September 2000. Since then, the MDGs have become the most widely acknowledged yardstick to measure development efforts by different governments. The importance of the MDGs lies in the linkages between them; they are a mutually reinforcing framework to encourage overall human development.

India has an important role to play in the achievement of the MDGs and the broader global objectives laid down in the *Millennium Declaration*. At the turn of the century, India alone accounted for nearly one-fourth (364 million) of the world's poor. The advancements made by India will significantly determine whether the world as a whole will be able to meet some of the most critical targets of the MDGs—such as those relating to infant mortality rates (IMRs), maternal morality rates (MMRs), school enrolment and retention, as well as universal access to water and sanitation. At the same time, India has an important contribution to make to the future global agenda, in line with ideals of human dignity and international cooperation—as outlined in the *Millennium Declaration*.

The effort to meet and better the MDGs in India is a stated objective in many of the key policy documents of the country, including the 10th Five Year Plan. These targets generally aim at higher accomplishments than those targeted in MDGs.

The first *India Country Report* (2005) on the MDGs released by the Ministry of Statistics and Programme Implementation, Government of India, describes India's achievements, challenges, and policies with reference to the goals and targets. It clearly reveals that over the years, there has been substantial improvements in the lives of people. This has been possible due to the planned implementation of welfare programmes like National Employment Guarantee Act; Sarva Shiksha Abhiyan; Total Literacy Campaign of the National Literacy Mission, 74th Constitutional Amendment Act, 1992; National Common Minimum Programme; National Health Mission; Total Sanitation Campaign; and Bharat Nirman; etc. It is hoped that India will be able to meet the challenges and achieve all the MDG targets much earlier than the targeted dates.

The MDGs that grew out of the agreements and resolutions of several UN world conferences have been generally accepted as a framework for measuring development progress. The first seven goals, directed at reducing poverty in all its forms, are mutually reinforcing. The eighth goal, global partnership for development, refers to the means to attain the first seven. This paper will focus on the goal of environmental sustainability.

'Factory Man' — Photo by Tom Parker

India has an important role to play in the achievement of the Millennium Development Goals

Goals & Cities

Goal 7 of the *Millennium Development Goals* aims at ensuring environmental sustainability as part of global, economic, and social wellbeing. The recognised targets for the monitoring of this goal of the MDGs include integrating the principles of sustainable development in policies and programmes and reversing the loss of environmental resources, increasing access to potable water and, generally, improving the quality of life of the poor.

If we look in the urban context, it is seen that cities have grown unevenly, showing signs of inadequate basic civic services, infrastructure, and employment potential. This manifests in congestion, inadequate water supply and sanitation, urban poverty, and environmental degradation, and poses a challenge to urban planners and citizens alike. The priority assigned to urban environmental issues has usually been low, resulting in considerable damage to human health and condensed productivity.

Cities are considered to be the development engines but growth bereft of environmental concern is self–defeating. Millions of poor in cities cannot meet their basic needs of housing, water, sanitation, healthcare, and education. Cities are harnessing the environmental resources at an infuriated rate taking their environmental footprints far away from their urban limits.

The impact of all this growth on urban space, environment, and quality of life is tremendous. The provision of infrastructure facilities required to hold such large concentrations of people is lagging far behind the pace of urbanisation. As a consequence, the urban environment mostly in big and large cities is worsening very rapidly. The impact of the urban environment may be measured in the background of urban infrastructure services comprising water supply; sanitation and solid waste management; land and urban environment.

Cities are considered to be the development engines but growth bereft of environmental concern is self–defeating.

'Recycling with city in background' — Photo by Andreas Grosse–Halbuer

Millennium Development Goals 2015

The UN Summit on the Millennium Development Goals concluded with the adoption of a global action plan to achieve the eight anti-poverty goals by their 2015 target date and the announcement of major new commitments for women's and children's health and other initiatives against poverty, hunger and disease

1. Eradicate extreme poverty and hunger

—Halve the proportion of people living in extreme poverty by 2015.
—Halve the proportion of people who suffer from hunger by 2015.

2. Achieve universal primary education

—Ensure that by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

3. Promote gender equality and empower women

—Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015.

4. Reduce child mortality

—Reduce by two-thirds the under-5 mortality rate by 2015.

5. Improve maternal health

—Reduce by three-quarters the maternal mortality ratio by 2015

6. Combat HIV/AIDS, malaria and other diseases

—By 2015 halt and begin to reverse the spread of HIV/AIDS. By 2015 halt and begin to reverse the incidence of malaria and other major diseases.

7. Ensure environmental sustainability

—Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources.
—Halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation.
—By 2015 achieve a significant improvement in the lives of at least 100 million slum dwellers.

8. Create a global partnership for development with targets for aid, trade and debt relief

—Develop further an open, rule-based, predictable non discriminatory trading and financial system.
—Address the special needs both of the least developed countries and of landlocked and small island developing countries.
—Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable.
—In cooperation with developing countries, develop and implement strategies for decent and productive work for youth
—In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries.
—In cooperation with the private sector, make available the benefits of new technologies, especially information and communications.

About 70% of all wastewater is untreated before disposal, affecting rivers, lakes, ground water and oceans.

Water Supply

The proportion of population without sustainable access to safe drinking water and sanitation is to be halved by 2015 and India is on track to achieve this target. The 2001 Census indicates that out of a total of 53.69 million urban households, 36.86 million households have a tap water source, the remaining households have water supply from other sources such as hand pumps and tube wells. Out of 36.86 million households, 26.67 million urban households have a tap water source within the premises, 8.08 million near the premises, and 2.09 million away (i.e., the source is located at a distance of more than 100 metres) from the premises.

About 89% of the urban population has been provided with water supply and 63% with sewerage and sanitation facilities, as of 31 March 2000. However, these coverage figures indicate only the accessibility. Adequacy and equitable distribution and per capita provision of these basic services are not as per the prescribed norms in some cases. For instance, the poor, particularly those living in slums and squatter settlements, are generally deprived of these basic facilities.

Though about 89% of the population in the urban centres is estimated to have access to some form of piped water supply, the level of service is very poor. Water is available for only two to six hours a day and the quality and quantity may not be as per the standard norms in some cases. Then, there are leakages of between 25% and 50% in the water supply system thereby creating shortages. Low water pressure and intermittent supplies allow back–syphonage and contamination. Since about 60% to 70% of drinking water is drawn from surface streams, their pollution by discharge of domestic and industrial wastes is a direct threat to public health in urban centres. Poor pricing policies also fail to promote the conservation of water. If these trends continue there is a real danger that more and more urban areas may face severe shortages of water, which will hamper the process of attainment of the MDG.

Only 77 of 393 Class 1 Cities have 100% water supply coverage.

Sanitation

The urban sanitation coverage according to the National Family Health Survey (NFHS)–3 is 83.2%. The all–India coverage of sanitation, according to the survey was 44.6% in 2005–6 which is an 8.9% increase from the 1998–9 survey of NFHS–2. However, field studies have pointed to low levels of latrine usage because of lack of awareness of the importance of sanitation, water scarcity, poor construction standards, and the government's past emphasis on expensive standardized latrine designs.

Initial indications of an evaluation by the Government of India and UNICEF's *Child Environment Programme* show that significant numbers of people, especially in below poverty line (BPL) households, are not using their latrines. If variables such as usage are also included in a definition of sanitation coverage, the national picture is likely to be worse with a corresponding impact on the number of people who need to be reached to meet the MDG target (WATER AID INDIA 2006).

The primary responsibility for providing drinking water and sanitation facilities in the country rests with the state governments and, more specifically, the ULBs in the urban areas as per all municipal acts. The Centre allocates funds and also ensures that funds are provided in state budgets, and progressively larger allocations have been made for water supply and sanitation in the various *Five Year Plans*. National policy guiding India's approach to water supply and sanitation in the Eighth, Ninth, and Tenth Plans broadly follows the guiding principles of the *New Delhi Declaration*, adopted by the United actions General Assembly in December 1990.

While the nodal agency for urban water supply and sanitation is the Ministry of Urban Development, Government of India, a variety of other institutions play direct or indirect roles at state and city levels. These include various ministries and departments, metro water boards, financial institutions, external aid agencies, NGOs, and the private sector.

Analysis of data from different sources shows that between 91–93% of India's urban population take their drinking water from protected sources, leaving an unserved population of between 7–9%. On the urban front, in Class 1 cities and class 2 towns, there is a huge disparity in the quantity of water supplied. Of the 393 Class 1 cities, only around 77 have 100% water supply coverage. Analysis of sanitation coverage data from various sources shows that between 75–81% of all urban households in India have toilets, an increase from the 1990 figures of around 64%. As in the case of water supply, disparities exist across states.

On the urban front, while access to household toilets in urban India is relatively high, sanitation beyond home toilets is a different picture. Out of the 300 Class 1 cities, about 70 have partial sewerage systems and sewage treatment facilities. Of the total wastewater generated in the metropolitan cities, barely 30% is treated before disposal. Thus, untreated water finds its way into water systems such as rivers lakes, groundwater, and coastal waters, causing serous water pollution.

Recognising the rapid rate of urbanisation and the poor conditions of urban

water supply and sanitation systems, as well as the vicious circle of low tariff, poor recovery rates, and therefore poor quality of services, the Urban Water Supply and Sanitation sector is also taking major policy reform steps. The reforms agenda also calls for substantial institutional development linked to support for improved services covering measures such as decentralising, commercialising, or corporatising of institutions; enhancements of technical and managerial capacity; unbundling/bundling of functions; appropriate forms of public–private partnerships; use of information technology; and improved private sector participation to achieve sustainability.

Water conservation in urban areas forms a major thrust area in the Tenth Plan, and several measures are proposed, including tariffs at appropriate levels to discourage excessive use; mandatory water–efficient systems for flushing, reducing leakages, and unaccounted–for–water; reuse and recycling of sewage; and rainwater harvesting. Centrally sponsored low–cost sanitation schemes continue to remain a key component of urban sanitation in the Tenth Plan and will continue to be propagated as not just a programme for urban poor or slum populations, but also as an appropriate intervention wherever the costly option of underground drainage is not feasible.

With the launch of the *International Drinking Water Supply and Sanitation Decade*, India has substantially increased its commitment to the water supply and sanitation sector, and remarkable progress has been achieved on many fronts. However, the future numbers are daunting, and to achieve stated national and global goals for water supply and sanitation, many more millions have to be reached by the years 2015 and 2025.

Other aspects of sanitation need equal attention. The adequate availability of potable water for all must be ensured, but at the same time it is too precious to be used without economizing on its usage. Hence, its reuse after treatment is becoming more and more important in cities. Many states and cities have mandated rainwater harvesting by amending their rules and statutes. These are necessary steps. Maintenance of open areas, greening through virgin plantations, and making tree cutting difficult are some other steps that cities need to take. A strong public transport system is emerging as a priority in order to reduce traffic snarls, reduce vehicular pollution, and transfer populations to public modes of transport instead of using individual transport. Density and zoning also have important impacts on urban environment and require careful handling.

Considering the growing size of the urban centres, the sheer numbers in terms of population, and the complex nature of urban centres, India has made significant strides in the water and sanitation areas. As the task is far from complete, much needs to be done.

Water Management

The gravity of water–quality deterioration in water–bodies' studies on the wastewater management in India with the changing urban pattern during the last three decades highlighted the need for urban wastewater management. The highlights on Waste Water Management by Central Pollution Board (2000) that the comparison of water supply; wastewater generation, collection and treatment during 1978–9, 1989–90, and 1994–5, indicates that the wastewater generation has increased from 7,007 mld in 1978–9 to 16,622 mld in 1994–5 in Class 1 cities (population 1 lakh or above).

However, the treatment capacity has increased from 2,755.94 mld in 1978–9 to 4,037.20 in mid 1994–5, which was only 39% and 24% of the wastewater generated respectively (Ministry of Environment and Forests 2003).

As per the status for the year 2003, out of 22,900 mld of wastewater generated, only about 5,900 mld (26%) is treated before letting out; the rest, that is, 17,100 mld is disposed of, untreated. Twenty seven cities have only primary treatment facilities and 49 have primary treatment facilities. The level of treatment available in cities with existing treatment plants in terms of sewage being treated, varies from 2.5% to 89% of the sewage generated.

Treated, partly treated, or untreated wastewater is disposed into natural drains joining rivers or lakes; or used on land for irrigation/fodder cultivation; or disposed into the sea; or a combination of these is used by the municipalities. The mode of disposal in 118 cities is indirectly but ultimately into the rivers/lakes/ponds/creeks; in 63 cities into the agriculture land; in 41 cities directly into rivers; and in forty–four cities, it is discharged both into rivers and agriculture land (Ministry of Environment and Forests 2003).

Sewerage System

Sewerage systems exist across 300 Class 1 cities, but where systems exist they cover the area only partially. Less than half of the total sewage is collected and only 30–40% of this is treated properly. In the circumstances, only 15% of the urban population has access to private toilets. More than half of the urban population, particularly in small and medium towns, resort to open defecation.

The provision of the sewerage system continues to be expensive particularly in regard to collection and conveyance. A national programme of low–cost sanitation aimed at elimination of manual scavenging has been taken up. The program seeks to replace about 6 million dry latrines with sanitary latrines in 3,600 towns.

Solid Waste Management

Today, most urban centres in India are plagued by acute problems related to SWM. Due to lack of serious efforts by municipal bodies, SWM has become a tenacious problem and this notwithstanding the fact that the largest part of municipal expenditure is allotted to it. SWM is still considered to be an inferior service and is many times overlooked by municipal bodies. It is estimated that about 1,00,000 MT of municipal solid waste is generated daily in the country. The urban solid wastes generally contain up to 20% of recyclable contents, whereas the compostable material may constitute around 40% to 50%, the rest being stones and dust. Part of this waste coming from hospitals and certain industries is of hazardous nature. Municipal SWM is an obligatory duty of the municipal body. Their responsibilities have been augmented through the *74th Constitutional amendment Act 1992* wherein its *12th Schedule* stated public health, sanitation, conservancy, and solid waste management as one of the main functions to be performed by the municipal body. This task has gained significance with the promulgation of the Municipal Solid Waste (MSW) (Management and Handling) Rules, 2000, wherein every municipal authority shall, within the territorial area of the municipality, be responsible for the implementation of the provisions of MSW Rules, 2000, and for any infrastructure development for segregation storage, collection, storage, transportation, processing and disposal of MSWs. The municipal bodies are faced with a challenge to meet the compliance deadlines put forward in the MSW Rules, 2000, within their limited resources.

Several innovative programmes can be listed for preparing road map by cities for poverty–linked SWM, where SWM, the informal sector, and urban poverty are inextricably linked.

As stated by Gonzenbach and Coad (2001), solid waste management is not mentioned explicitly in the MDGs, Targets and Indicators, but if we explore the links between solid waste management and the MDG goals and targets, it shows that the right approach to solid waste management can produce significant progress towards many of the goals.

GITANJALI

'Gitjanjali Industries' in Mumbai is an excellent example of a public–private partnership that is worth emulating. It is owned by Ms Jain, a lady entrepreneur. This privately owned industry works in coordination with the MCGM for dry waste recycling. It employs 350 waste pickers, who collect various kinds of wastes, such as, Bisleri bottles; scrap iron; polythene bags; and e–waste like televisions, computer screens and electric parts; from six centres 77 in the city. This is transported to the factory site (given by the MCGM) by six trucks and is then sorted by twenty sorters. Each category of waste has its own utility value. The industry has its marketing outlets in 10 cities—Bangalore, Belgaum, Gurgaon, Goa, Jammu, Bhubaneshwar, Sambalpur, Ranchi and Mumbai. The industry has adopted twenty–five gutters in the area surrounding its unit, which are cleaned by sweepers; they are also involved in maintaining community bins, from where dry garbage is collected by rag pickers.

Ms Jain pays the sweepers for keeping the area clean on a daily basis. She has been successful in rehabilitating several girls who had previously resorted to prostitution for livelihoods. For the welfare of the waste pickers, several schemes have been introduced, such as, extra payment and gifts for extra collection of waste along with other activities like distribution of sweets, saris, and utensils during festivals and regular medical checkups.

In urban centres, pollution of all sorts is widespread, leading to deep degradation of the urban environment. Sustainability of the cities with all the above constrains has become a big question mark and has been placed at the focal point of the millennium agenda.

Air Pollution

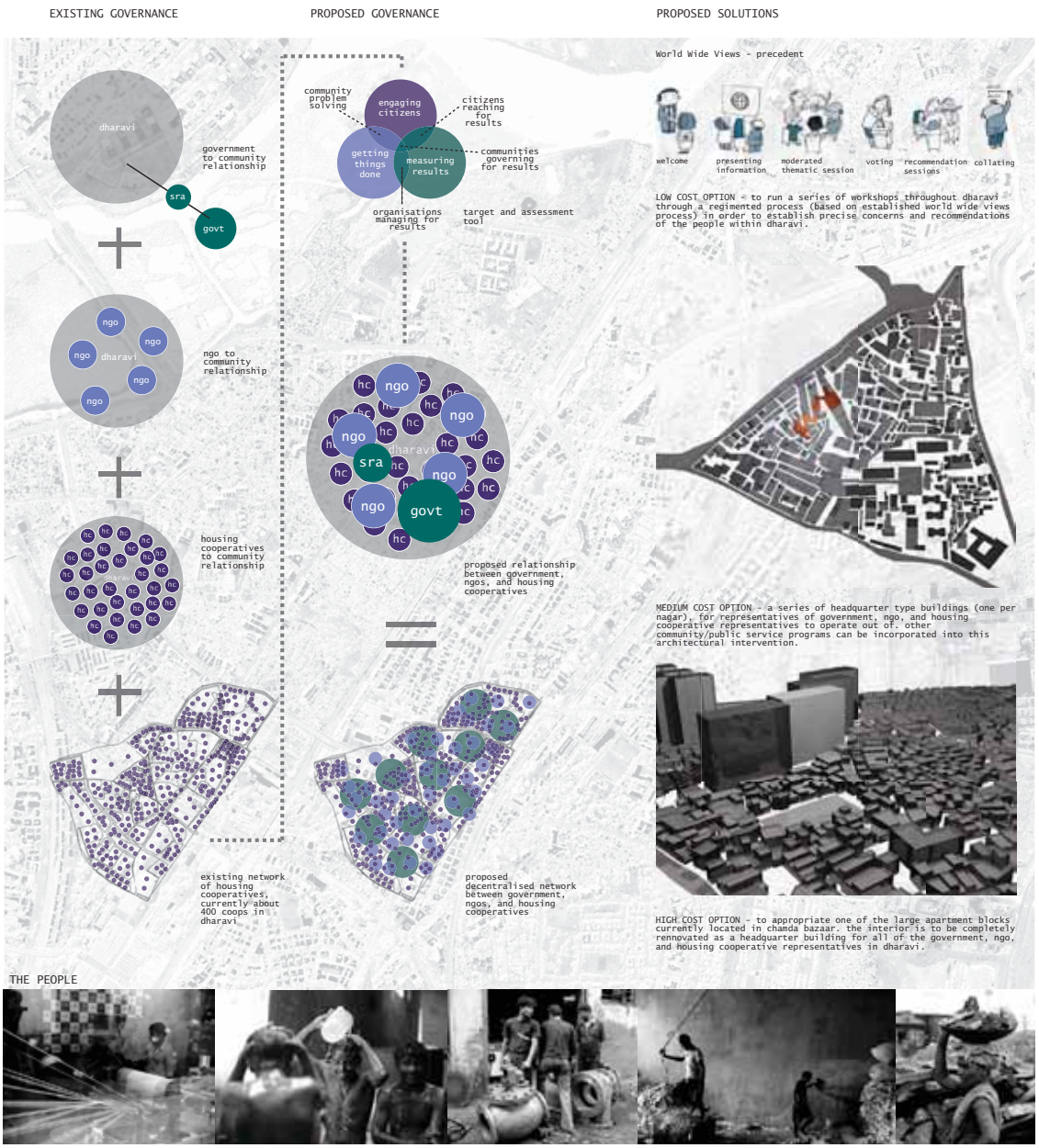
The major sources of air pollution in India Cities are still industries, vehicles and biomass burning. Some recent estimates also indicate that resuspended dust is one of the major contributors to the overall high particulate level in cities. Besides chronic eye irritation, more serious consequences include bronchitis and respiratory infections due to high levels of air pollution. In the past two decades, the number of vehicles on India's Roads has increased ten fold. Some of the air pollution components have shown a decline in Indian cities due to varied intervention taken up by the government, such as cleaner fuel, phasing out older vehicles, better technology vehicles, as also strict enforcement. India also completely phased out lead content in petrol by 1999.

Transportation

Among the several issues that the growth of cities has brought to the urban scene, transport has emerged as a main concern for environment management and sustainability. It critically keeps growing as we move towards the mega and large cities.

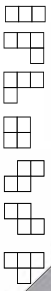
An area of a major concern has been the growth of motor vehicles. In cities, the existing status of personalised transport is affecting the cities by the continual decline of the mobility as well as deterioration of air quality. The severe nature of the problem is evident in metros and large cities.

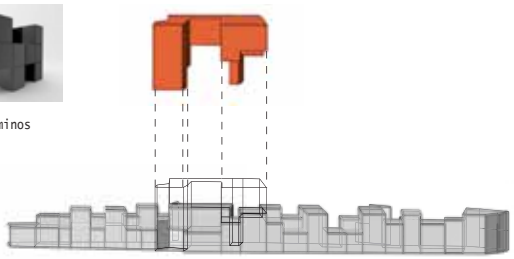
The necessity, therefore, is to examine the objective of improving public transportation in mega and large cities with the main focus on the sustainability of transport, particularly making public transportation as the main priority of the authorities. The transportation system has equal significance. In terms of city's life, a good, modern, and efficient transport system would enhance efficiency, productivity, environment, public health, and quality of life in the cities.



A student design project by Emma Trask of the University of Technology Sydney exploring options to improve the structure of the slum settlement of Dharavi in Mumbai. Supposedly one of the largest slum settlements in India Dharavi has been the subject of numerous schemes to develop the place ranging from high rise towers to low rise infil. Emma's approach was to work with the dynamic quality of the built form by adding layers like a tetris ribbon including the potential to use rooftops as public access ways.

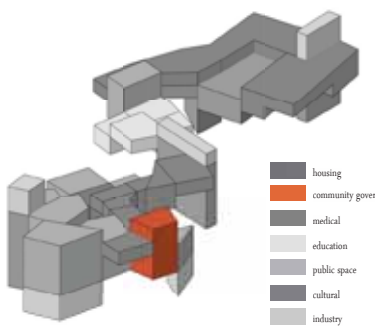
7 tetrominos





tetris in 3 dimensions

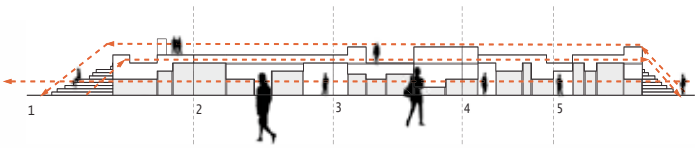
site plan 1.500



programmatic matrix

precedent studies

create another layer of vibrant street life



assembled section - circulation diagram 1.500

THE PUZZLE OF DHARAVI

Conclusion

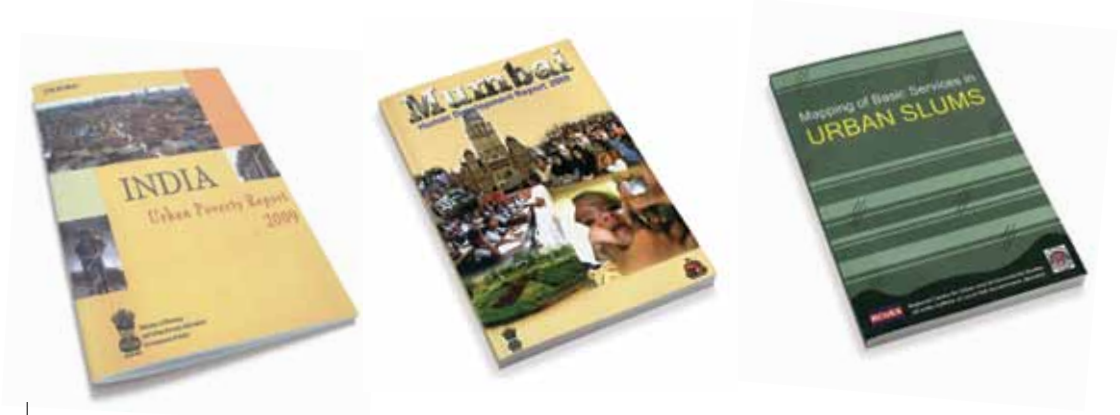
A large proportion of the people with unmet needs for water, sanitation healthcare, and schools live in urban areas, the absolute figure going up over the years. It is argued here that cities and ULBs have comprehensive role to play in making a difference in respect of MDGs. Addressing this will require urban local governments that are more competent, accountable, and able to work in partnership with all stakeholders, particularly with the urban poor and their organisations.

At the city level, the over arching strategies must be designed to provide good urban governance, stronger community participation, and stronger commitment for social justice. The quality of the impact of various interventions in a city would, in the ultimate analysis, depend on good urban governance. It is therefore, critical that cities devise institutional frameworks for themselves that satisfy the requirements of good urban governance.

Poverty alleviation programmes have tended to operate and be implemented at two levels. First, at the macro level, which involves policy and programme interventions defined and implemented by Government of India that include subsidy, credit, and assistance. Second, at the micro level, which involves working directly with urban communities in supporting a variety of activities including credit assistance, service delivery, slum upgrading, micro enterprises, and strengthening community participation, promoted and supported more by NGOs and CBOs working for poverty reduction activities at the local level.

It is essential that ULBs translate national policies and programmes into local actions. This, one of the key requisites for sustained poverty alleviation is decentralisation and capacity building at the municipal level. Poverty alleviation requires both attitudinal change and skill development among government and municipal officials, who need to regard the poor as their partners, rather than the 'governed'. The role of municipal officials should be facilitating the creation of supportive institutional mechanisms at the local level. The means to provide technical and extension services for the urban poor need to be developed and strengthened.

Cities and ULBs have an enormous role to play in making a difference with respect to the first seven MDGs: in education and health services, in environmental protection, in slum dwellings, as well as providing a strong local governance framework supporting implementation of the MDGs through planning, local strategic processes, and local community engagement. The MDG–8, however, is all about encouraging communities, local authorities, national governments, NGOs, and world governments represented by the UN and its institutions to work together in a range of partnerships to lend a hand to meet the MDGs. Understandably, the role of the city government would be critical in this. Given this macro perspective, it would be important to translate the MDGs into city–specific targets and use these for the setting of the urban agenda as the road map for the future.



Some of the publications produced by Sneha Palnitkar at the Regional Centre for Urban and Environmental Studies (RCUES) of the All India Institute of Local Self Government (AIILSG)

SNEHA PALNITKAR

Director of the Regional Centre for Urban and Environmental Studies (RCUES) of the All–India Institute of Local Self Government (AIILSG) based in Mumbai

She had a significant role in the research and production of *Mumbai Human Development Report 2009* as a member of the steering committee, heading up the research team and the preparation of the report.

Through RCUES she runs a series of specialised training programs, seminars and workshops on urban issues across India.

Sneha Palnitkar is the Director of the Research Team in RCUES which focuses on Urban Policy Research.

Through RCUES Sneha oversees publications on urban planning, gender budgeting, solid waste management, urban development, mapping of basic services, elimination of child labour and rainwater harvesting in selected cities.

Sneha Palnitkar is the editor of *The Urban World*, a quarterly publication on urban issues.

She established a *Mayors Forum for the Fight against Urban Poverty* to hold conferences and develop communication material.

Sneha Palnitkar wrote a key chapter on *The Millennium Development Goals and the Role of Cities* in the *India Urban Poverty Report 2009*.

www.aiilsg.org

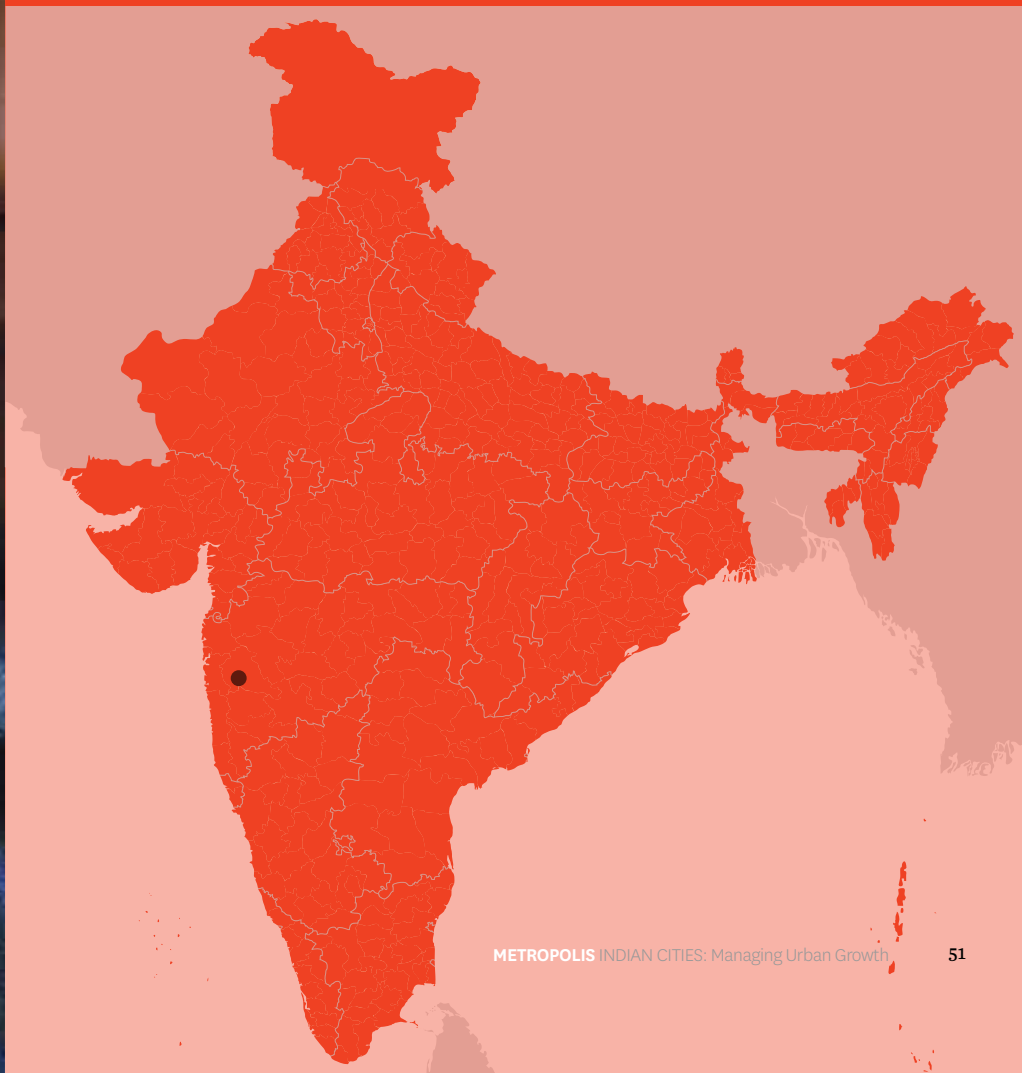
'Kids' — Photo by Andreas Grosse-Halbuer

3

City Planning through Slum Renewal

PUNE

Pratima Joshi



City Planning through Slum Renewal.

Shelter is a NGO working in Pune comprising architects, social workers, GIS experts, and community workers. The team of around a dozen people works with the urban poor, particularly women, to create improved housing with a focus on slum rehabilitation.

The organisation was launched in 1993 by Pratima Joshi with two architect friends to work with slum dwellers. *Shelter* is now working on a number of major slum renewal projects in India and Pratima Joshi has received much acclaim by receiving an *Ashoka Fellowship* in 2006 and becoming a *Google Earth Hero* in 2009. She is clearly someone leading in her field.

Shelter's pioneering approach to social housing is people-centric—a holistic view of slum dwellers as equal stakeholders in any projects.

Shelter creates a better standard of living for the urban poor resolving issues of health and clean sanitation. Slum surveys and GIS technology are used as tools for integrating low-income settlements into urban planning and development.

Research documents are made available to involved stakeholders for the purpose of planning projects and impacting policy.

Shelter Associates are as much about people as they are about buildings. A fascinating story about Dattawadi emerges as we meet mainly women and hear their story.

SOLUTIONS

Harnessing technology

Shelter Associates have been instrumental in using new technologies to solve perennial problems.

Google Earth Hero video
bit.ly/hopjUC

Shelter Associates YouTube Channel
www.youtube.com/user/ShelterAssociates

Dattawadi Housing

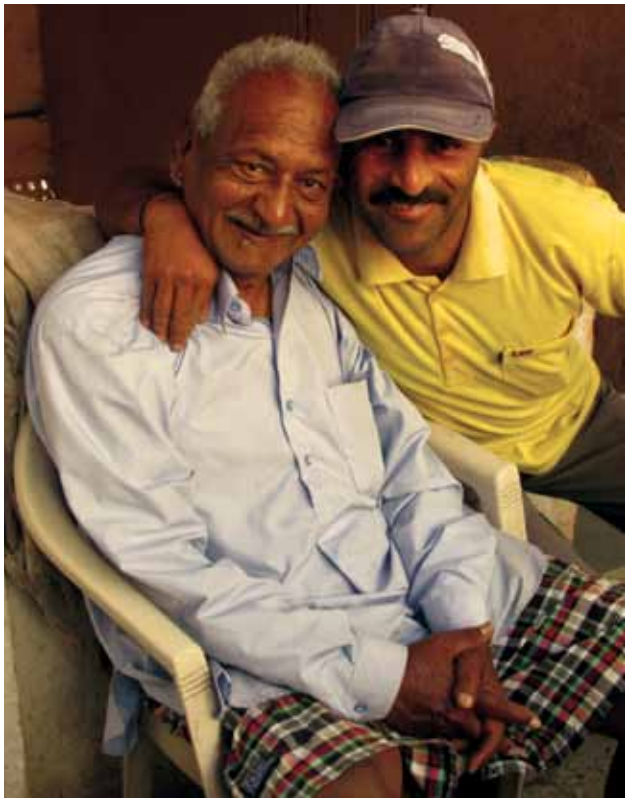
—PUNE

In May 1996 the slum houses that the families now living in Dattawadi occupied were demolished by the city authorities. The communities were in total despair but a group of women formed a strong collective of about 50 families with the support of Shelter Associates and the Society for the Promotion of Area Resource Centres (SPARC). By January 1997 they had secured some land from the Pune Municipal Corporation ten minutes from the old slum. From here on the women led the way by making concrete slabs, beams and blocks all as prefabricated components. Working to Pratima Joshi's design drawings, columns were poured and a two–storey block of 56 flats was created that now houses 300 people.

The key design initiative was to make the ceiling heights around four metres so that a small mezzanine sleeping area with a ladder access could be built in.

Each unit has a small kitchen and a wet area but toilets are provided centrally separated for men and women. On walking around the building it was amazing how happy everyone seemed and how proud each person was to show us into their home which would have been about 5 x 5m. A large courtyard is a central gathering place with the common water tanks below. Clearly there must be a communal approach to living in such tight conditions and the kids and the women seemed to enjoy their housing.

In Pune over 40% of the population live in slums. The plans for the future of Pune must therefore take into account how to renew the slum areas by allocating land for renewal now. This will require a 'whole of city' planning approach of national funding for cities. Cities would need to prepare *City Development Plans (CPD)* that map out the slum renewal process.



The Dattawadi housing in Pune was the first project designed by Shelter Associates and built by the community. It houses 300 people in a two storey block of 56 flats. The four meter high ceilings allow a small mezzanine sleeping area with ladder access.

Kitchen and sleeping mezzanine in Dattawadi housing.

Shelter Associates work closely with communities by explaining house designs with cardboard models and using images on laptops.

Flooded Slums
Pune, River 1996

Rebuilding opportunity

Slum Database
Research and surveying

Floods, slums, & Baandhani

—PUNE

Pratima Joshi's next project was a much bigger one that followed the devastating floods of 1997, the worst since 1961. The Pune Municipal Corporation (PMC) asked Shelter Associates to carry out a detailed survey of six slum pockets along the river. Kamgar Putala, one of the oldest slums, was the worst hit with 379 houses submerged for over 15 days. 175 families banded together to look towards re–settlement on an alternative site and they became part of the 'Baandhani' federation, an activist group started by Shelter.

Baandhani is a collective of many poor individuals who band together so they can be in control of their own development. Baandhani are generally run by women who see it as their responsibility to look after the settlement. The Kamgar Putala Baandhani looked at various sites suggested by the PMC based on their perception of where people worked. Shelter worked with the community to develop a sophisticated database of the settlement including the various skills people had. This gave the community much more leverage in relating to the authorities and Shelter began a process of using GIS data as the building block of the planning system. Different civic leaders came and went but the data assembled by Shelter proved persuasive and a new site was found for 176 tenements based on clusters of eight units around small courtyards.

On 28 April 2003 the community —with Shelter's help—hosted a model house exhibition at the new site of Hadipar. This was based on a design by Shelter Associates for a house of 20 m² including a toilet. The ceiling of one of the two bays was 4.2 m high to accommodate a mezzanine of 10 m². Although there were disputes over funding and what portion the authority would pay, most tenants were able to get small loans. Houses were allocated by drawing lots and all are now happily settled down in new accommodation.

Shelter Associates are now planning slum renewal for 29 settlements in Sangli also based on GIS data. In May 2010 a model house exhibition was held at the Indira Nagar slum. The exhibition included architectural drawings, illustrated plans and views of three storey buildings with eight housing units on each floor, planned around a common courtyard. Walls were marked out on the pavement so that

Children get involved in projects by drawing their ideas about new housing.

BAANDHANI WORKS ON THREE SIMPLE POWERS

1 **Power of Numbers**
which leads to community management and community organisation.

2 **Power of Having Money**
often through many small amounts of money from individuals building up as a crisis saving account.

3 **Power of Information**
where people know their rights, collect data and use this for bargaining their position.

people could grasp the scale of the home they would get.

The Sangli project is under the IHSDP of the JNNURM program covering 3,800 families. Twenty–two slums are being relocated and seven are being rehabilitated in–situ. This project was lauded by the Government of India for its city–wide approach to planning for the poor using GIS and remote sensing technology. This approach is what the *Rajiv Awas Yojana (RAY)* program requires as mandatory policy for cities by mapping the poor across the city and then developing city level strategies for rehabilitating the slums.

While Shelter Associates are often at the grass roots working with communities on getting better housing, they are also involved in research about the bigger picture policy issues of urban development and renewal in India. In November 2007 they produced a research publication titled *Study on Comprehensive Rehabilitation Strategies for the Urban Poor in Pune City*. The detailed report of 100 pages is on their website. The value of the document is in its ability to explain in simple language the complex layers of Indian Government support for slum renewal.

The research examines the different approaches of the Slum Rehabilitation Authority (SRA) and of the Jawaharlal Nehru National Urban Renewal Mission —Basic Services for the Urban Poor (JNNURM–BSUP).

The SRA are very focused on Transfer of Development Rights (TDRs) which often lead to high–rise buildings to replace slums. The approach is to lift the current Floor Space Index (FSI) from around 1:1 up to 2.5:1 and offer this new development potential to private developers provided they re–house the slum dwellers as part of the package. Shelter Associates are not great supporters of this approach and prefer a lower rise, but still dense, approach to slum renewal. This preference is based on their now very detailed knowledge of the 564 slum pockets in Pune and the numerous slums they are working with in other cities.

New Housing Project
in Hadapsar, Pune that rehouses people from the Kamgar Putala settlement.

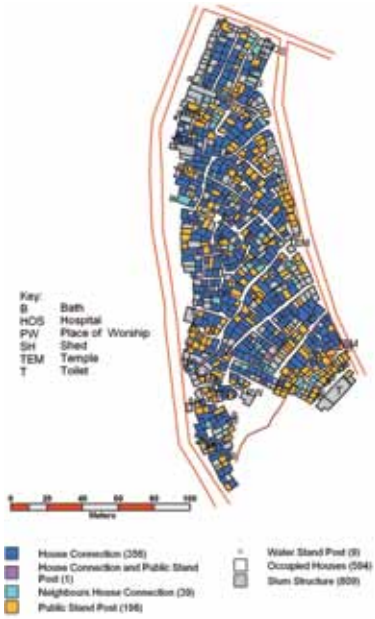
Organisation of housing and families in new relocations.

Location
Chaitraban

Field analysis. Shelter Associates uses Geographical Information Systems (GIS) to map spatial data about existing slum settlements. The colour coding gives an easily understandable analysis of the various castes, the extent of water supply and of electricity supply.

Caste Code
Chaitraban

Primary Water Supply
Chaitraban

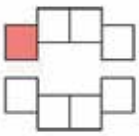


Structure Size
Chaitraban

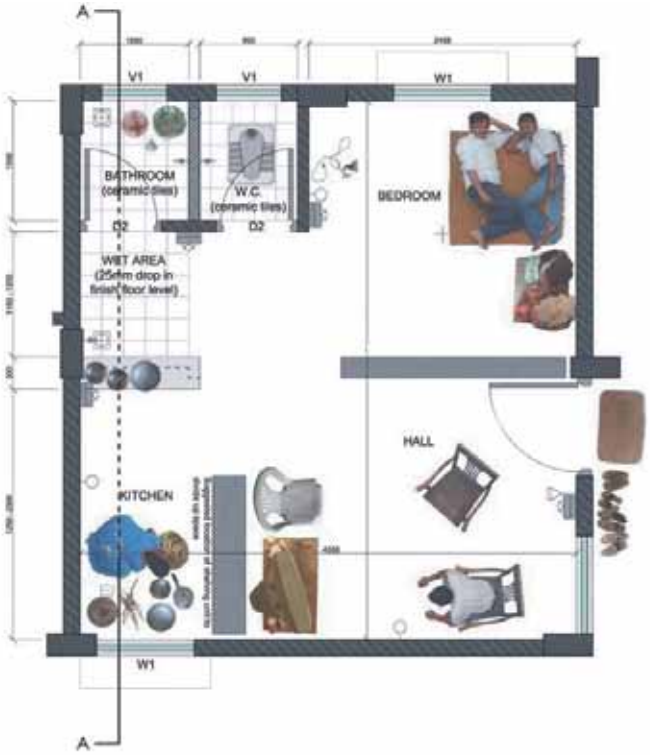
Structure Type
Chaitraban

Electricity Supply
Chaitraban

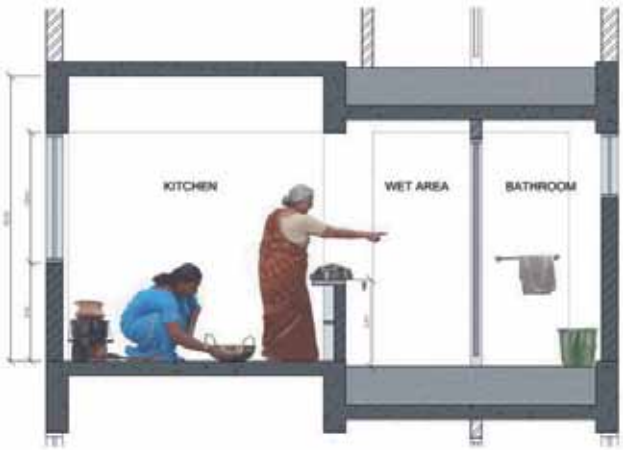
Working Drawing
Site Plan

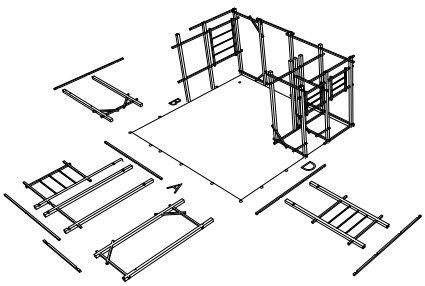


Working Drawing
Plan of Typical Unit



Working Drawing
Section of Typical Unit





House Design Shelter uses plans that the community can easily understand. These are then marked out on the pavement for the community to walk through.

The JNNURM–BSUP is part of a massively funded national program of reforms focused on cities. The BSUP has set out a series of objectives:

The integration of basic services to the urban poor.

Security of tenure at affordable prices.

Housing for urban poor near their place of occupation.

Shelter Associates has focused on the following outcomes from the BSUP program:

Integrated development of slums through projects for housing, basic services and other amenities.

A citywide framework for planning and governance.

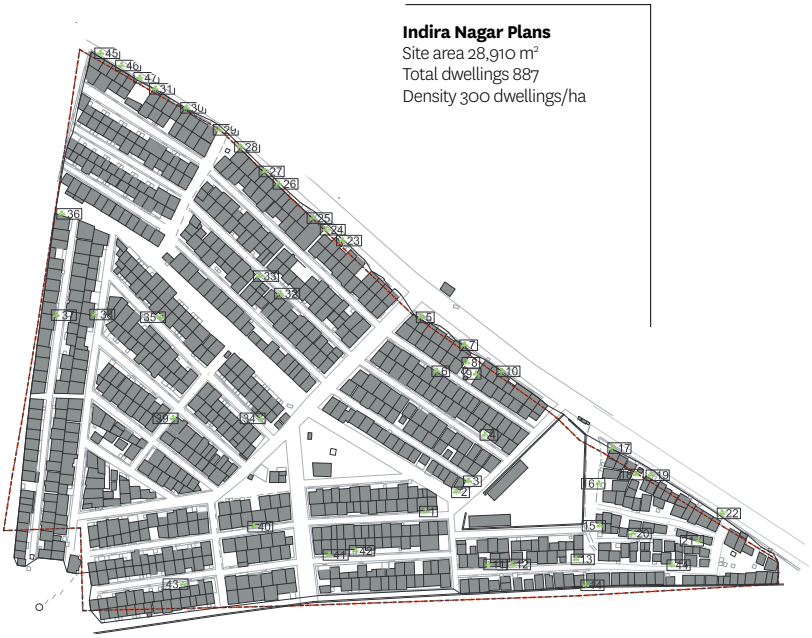
Community participation, a people–driven approach.

Transparency and accountability in the way local services are provided and governance is conducted.

Shelter Associates are particularly supportive of *Article 4.2* which stresses that housing should be near work. Too often slum dwellers have been relocated to the very edge of cities far from any work opportunities.

Beginning with one small development of 56 housing units Pratima Joshi has moved into overall policy issues involved with slum renewal. With up to 40% of people in major cities living in slums, planning of India's cities in the future must focus on systems that improve conditions in a sustainable way. Collecting data on slum dwellers and of potential sites for renewal is a necessary first step. But she has moved from data collection to new methods of presentation through GIS and computer technology. As an architect she recognises that lists of numbers in a database are not compelling. It is the visual representation of data as a spatially–organised system that is critical to effective urban planning. And balanced alongside this use of technology is the very real human and social involvement with communities through the Baandhani.

Indian cities can learn from Shelter Associates' use of data, of mapping and of the public involvement of communities in making cities work for all—particularly for the urban poor. The examples in Pune and Sangli could spread to many Indian cities and influence their City Development Plans.

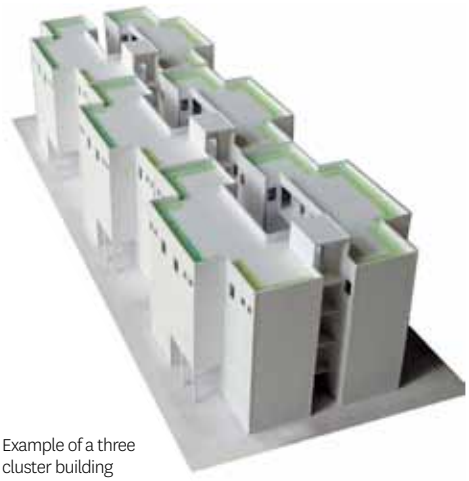


Indira Nagar Plans
Site area 28,910 m²
Total dwellings 887
Density 300 dwellings/ha

Mehtar Samaj
Existing Site Plans

Aba Dotre
Three cluster building with 62 dwellings on 860m² site, achieving 420 dwellings per hectare

Aba Dotre
Three cluster building with 93 dwellings on 2582m² site, achieving 360 dwellings per hectare



Example of a three cluster building

CASE STUDY

Smokeless Chullahs

Shelter Associates found that traditional cooking in slum dwellings was often undertaken by inefficient firewood fueled chullahs that generated significant amounts of smoke. In the settlement of Indira Gharkul in the Sangli area 40% of families were using smoke intensive cooking devices. Across India Shelter states that 500,000 people die annually as a result of indoor air pollution. Many of these victims are women and children who develop bronchitis, emphysema and asthma. The World Health Organisation estimates that around three billion people cook their meals indoors over biomass–fueled open fires called chullahs. Twenty per cent of the waste is converted into toxic substances like carbon monoxide. To help solve this problem Shelter Associates developed a low cost smokeless chullah. The chullahs are 30 cm diameter by 30 cm high and weigh 7.1 kg. They reduce carbon monoxide by 50% and particulate matter by 50% and use 30% less firewood. The unit is small enough to store away and it uses small sticks which can be stacked away. This also eliminates the need for a stand–up kitchen and so reduces the cost of a house.

The smokeless chullah does not sound like the most important innovation in urban planning but it has a big impact on house design and on health. Shelter Associates sum up the philosophy of the chullah this way. 'It is not the chullah that is important. It is the understanding of local needs and using appropriate technology to support those needs in order to ensure healthy living conditions, a fundamental human right to dignity.'

Pune

Population	3,446,330
Urban Density	7,214 /km²

Pune, formerly called Poona, also known as Punya–Nagari, is the eighth largest metropolis in India, the second largest in the state of Maharashtra after Mumbai, and the largest city in the Western Ghats. Once the center of power of the Maratha Empire, it is situated 560 metres above sea level on the Deccan plateau at the confluence of the Mula and Mutha rivers, Pune is the administrative capital of Pune district. Pune is known for its educational facilities and relative prosperity. Pune is the cultural capital of Maharashtra, and the notional seat of the Marathi language. Pune has well–established manufacturing, glass, sugar, and forging industries since the 1950–60s.

PRATIMA JOSHI
Shelter Associates

A 2009 *Google Earth Hero*—Pratima was awarded for her use of GIS mapping and data collection to help the urban poor of India. She is also an Ashoka Innovator for the Public and elected to the Ashoka Fellowship in 2006 for her use of technology for the provision of essential public services to slum inhabitants in Pune.

She is an architect who graduated from Anna University in Chennai, and was the recipient of an Aga Khan Scholarship to undertake a Masters degree in 'Building Design for Developing Countries' at the Bartlett School of Architecture and Planning in London in 1986–87. In October 2005 the BBC identified her as one of the leading slum architects of India in a feature on her in India Week. The Straits Times of Singapore featured her in the series 'New Asian Heroes in 2008'.

Pratima has been the Executive Director of Shelter Associates since 1993 and has an office of around a dozen people including architects, social workers, community workers and GIS specialists as well as a growing number of overseas students wanting to work with her. She has developed her practice to span between architecture, community activities, research and policy setting.

She is a person endowed with great energy and drive who has had to battle at every step on many projects, yet she has persevered on behalf of the slum dwellers. Her major projects are slum renewal in Pune and Sangli.

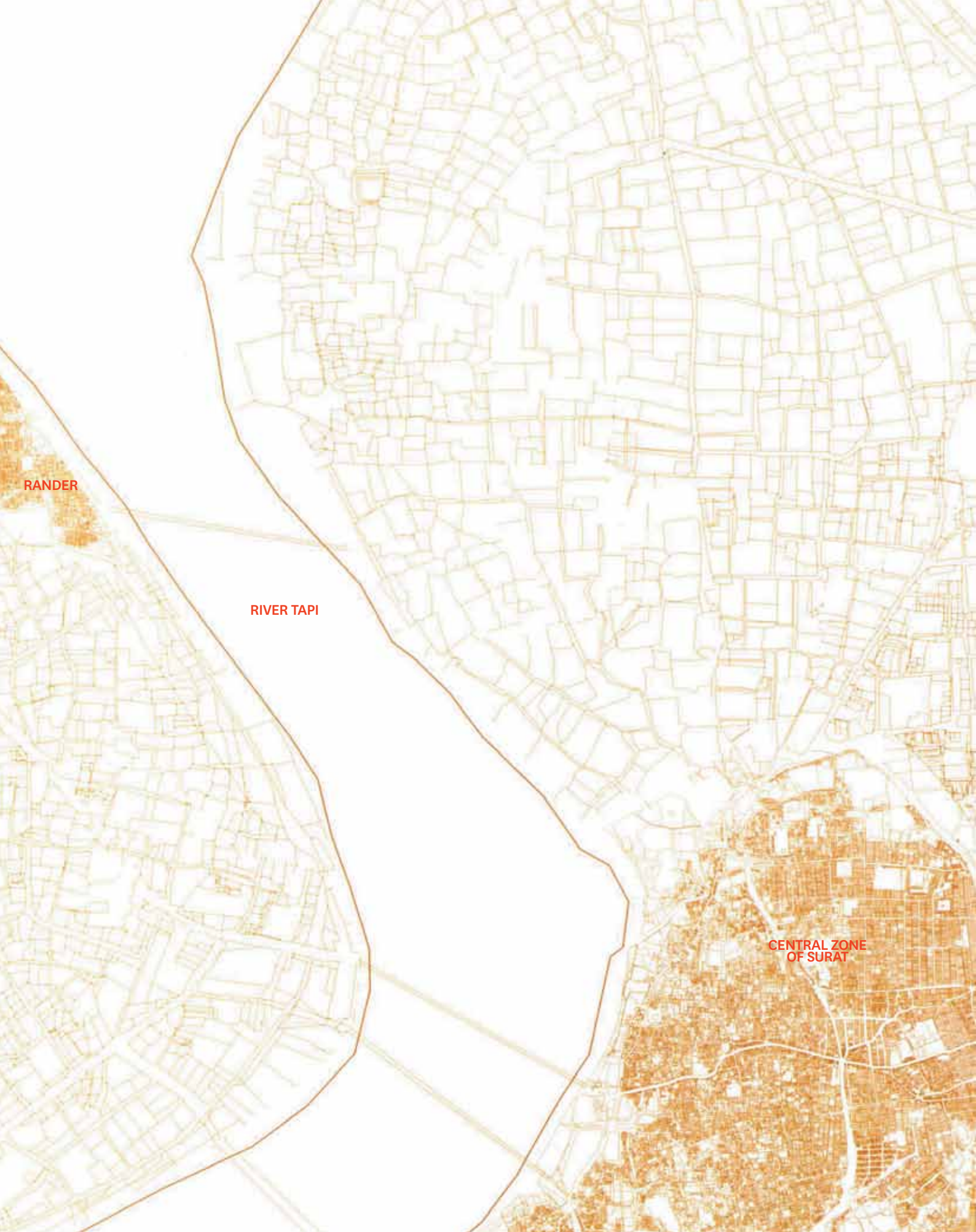
Her approach is to work from the bottom up and to link individual projects into a city– wide approach. She was a Chief Co-ordinator for Poverty Reduction Strategies for Pune City for the National Institute of Urban Affairs (NIUA) in 2007.

In 2006 she worked with the All India Institute of Local Self Government (AIILSG) on the Mumbai Transformation Project for the World Bank on the settlement at Thane. She established a federation called Baandhani—a self–help network of slum–dwellers, mainly women, which helps realise new developments.

She was co–author of Study on Rehabilitation Strategies for the Urban Poor in Pune City, published in November 2007.

Pratima Joshi lives in Pune with her husband and two children.

www.shelter–associates.org

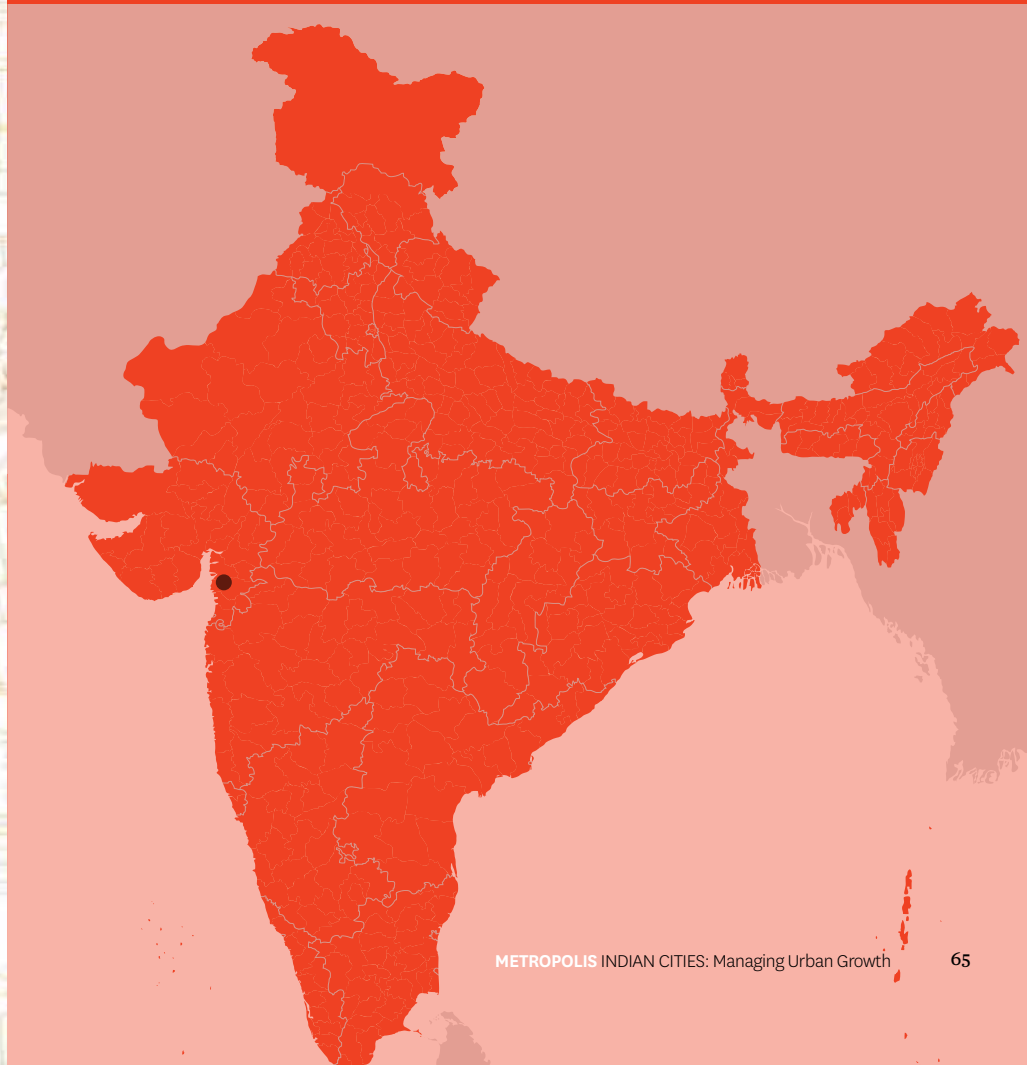

RANDER
RIVER TAPI
CENTRAL ZONE
OF SURAT

4

Heritage and Urban Management

SURAT

Manvita Baradi



Heritage and Urban Management.

Manvita Baradi heads the Urban Management Centre (UMC) in India with her deputy Meghna Malhotra. They facilitate formation, conceptualisation and establishment of local government associations across India, advocating on behalf of cities, driving improvements in the management of cities and setting up networks for information exchange and professional development.

And India is not alone on their map, they are undertaking projects in a number of Asian countries including Sri Lanka, Nepal, Indonesia and Afghanistan. The UMC's prime objective is to 'work towards professionalizing urban management in India and South Asia'. At the core of this objective is the need to assess the performance of cities and then assist to make improvements.

The Urban Management Centre is also known as ICMA–South Asia; since they are a legacy organization of ICMA projects in India.

Within the UMC is the City Diagnostics Lab, which is responsible for the Urban Indicators and Performance Measurement Program (UIPM) across India. It is very important for cities to have adequate information so as to enable authorities to make informed decisions. UIPM was initiated for the purpose of putting together such data. UMC has also undertaken a similar project for the World Bank Institute across 30 Urban Local Bodies (ULBs) in India where they were given a tool for self–analysis and decision–making that made urban governance transparent and accountable.

Manvita spearheaded the formation and operationalisation of City Managers' Association of Gujarat (CMAG)—a local government association modeled after the International City/County Management Association (ICMA). CMAG today has a membership base of 166 cities and towns in Gujarat to exchange information and best practice documentation. The network has spread to 13 states across India involving hundreds of Urban Local Bodies (ULBs). One of the projects undertaken by UMC was a mapping exercise of the heritage buildings in the city of Surat in Gujarat.

Surat is the ninth largest city in India and second largest in Gujarat state with a population of 2.5 million people. The city has a proud history dating back to 300 BC.

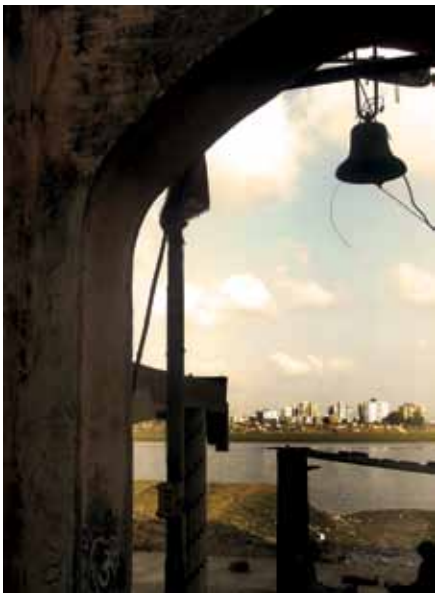
In Surat, UMC, at the request of the Surat Municipal Corporation (SMC), has surveyed over 3,000 heritage buildings in the Central zone and in Rander ward across the River Tapi. Surat is the ninth largest city in India and second largest in Gujarat state with a population of 2.5 million people.

The city has a proud history dating back to 300 BC. It grew from the old Hindu town of Suryapur between 1500 and 1520AD. From 1573 to 1733, Surat was administered by officers appointed by the court of Delhi. Up to the end of the reign of Emperor Shah Jahan, the city enjoyed great prosperity. During the town's development, the chief buildings, including the fort (1546) and the Customs House, were built along the banks of the river. In 1644, a rest house for Muslim travelers was constructed. It now houses municipal offices. With the castle at the centre, the city developed to form an arc of a circle adjacent to the river. In 1664, a mud wall was constructed to contain the city and an outer wall was added between 1717 and 1719. The entrance to the walled city was through twelve gates. While the original walls have now gone, the shape of the city they contained is still apparent. Surat was India's chief trading port until the East India Company moved to Bombay (Mumbai). The layers of this proud city can still be found today.

Across the River Tapi is Rander, which served as a port even before Surat. Arabs settled here around 1225 AD and became the town rulers. They traded with Malacca, Sumatra and China in spices, silk and musk. Today, Rander has a mix of Muslim and Hindu communities and has a relaxed lifestyle, as though it has been frozen in time. Rander has a population of 90,000 people and is spread over an area of 5.12 km^2. UMC established a systematic approach to recording the heritage of Surat and Rander. The first step was to organise a workshop with stakeholders with background in history, culture and the heritage of Surat.

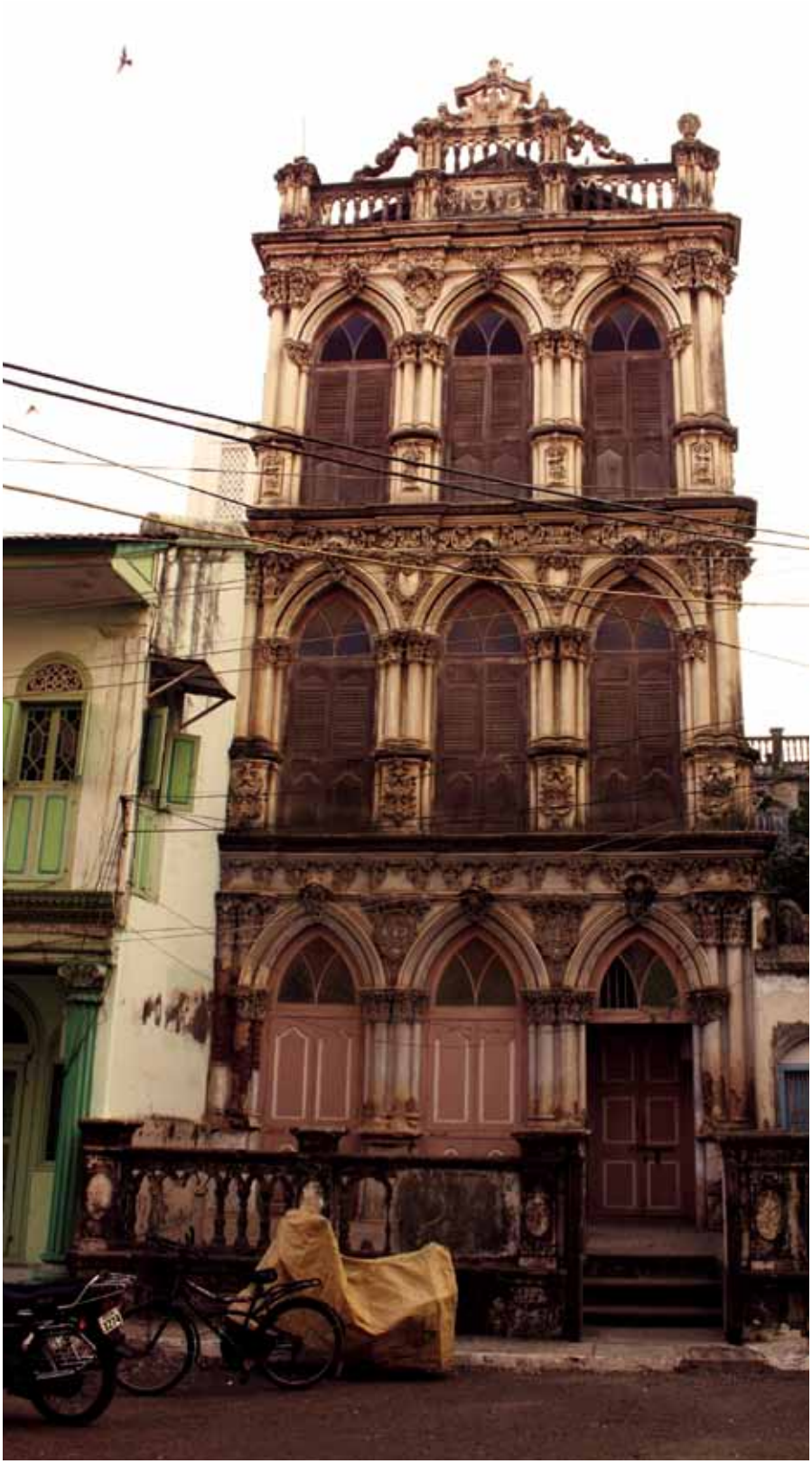
The next step was a visual survey that identified 4,450 potential heritage properties. Using photographs of each building, these were reduced to 2,417 properties in

Street in Rander



Top: Ghanta Owara — ghat on Tapi riverbank
Bottom: Ship motif resonating the importance of the port

Rander Twin house



Floral pattern on wooden columns

Rander facade

Woman making rangoli–rice powder on street as good omen

Surat and 574 in Rander. From the large number of buildings recorded, a typology study was conducted that identified typical building Forms. A series of survey forms revolving around typical building types was developed. The forms identified typology, building materials, age, ownership and the building's condition and structural stability. A series of consultative meetings at the ward level were organised to gain people's participation in the documentation process and to get local insights. Survey teams took the templates with their typical elevations of vernacular, art deco or colonial types and typical plan forms. Each of the 3,000 buildings was then assessed as part of the city's organic heritage precinct. The data was recorded in an Excel format and then mapped using a GIS platform onto the city map. Where plans of individual buildings varied from the template, these would be recorded on the information sheets. The data also assess the significance of buildings under six criteria. These are architectural, scientific, social, environmental values and representativeness.

UMC links its data collection to the significance criteria and also to Global Habitat Agenda for Conservation and Rehabilitation of Historic and Cultural Heritage. This agenda calls on governments to identify, promote, support and ultimately preserve historic and cultural heritage.

The key Global Habitat Agenda statement is to identify and document, wherever possible, the historic and cultural importance of areas, sites, landscapes, ecosystems, buildings, other objects and manifestations, and establish conservation goals relevant to the cultural and spiritual development of society.

Having amassed the data for 3,000 heritage buildings in Surat and Rander, UMC's next task was to work with the SMC to implement heritage policies for the future. The most important issue is the integration of heritage into the city's overall planning process with specific conservation plans and land use controls. The concept of Transfer of Development Rights (TDRs) that is used for slum redevelopment could also be considered as a way to give financial incentives to retain heritage. The TDR system would facilitate the transfer of floor space development potential from a heritage site to another development site and the recipient would

HERITAGE SIGNIFICANCE CRITERIA

Architectural Value
Significant in exhibiting particular aesthetic and architectural characteristics evolved in the city/region/state.

Historic Value
Significant in the evolution, pattern or an incident of the history of the city/region/state.

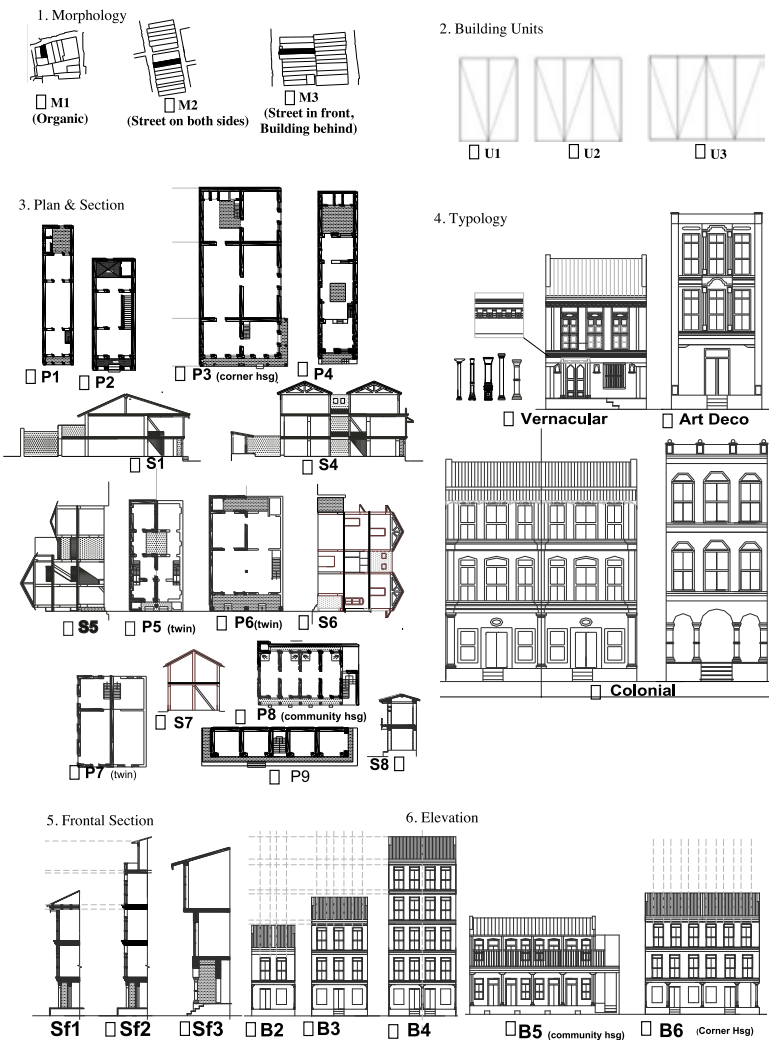
Scientific Value
Demonstrated potential to yield information that will contribute to an understanding of the natural or cultural history of the city/region/state.

Social Value
Significant association for a community/cultural/religious group for social, cultural,educational or spiritual reasons.

Environmental Value
Significant as a natural environmental feature with which the city/region/state is associated.

Representativeness
Significant in demonstrating the characteristics of a class of cultural places or environments in the city/state/region.

IX Typology



The Urban Management Centre developed a series of survey forms based on typical building types to guide the collection of data on historic buildings.

These typology studies are part of the survey sheet to record the house form being surveyed.

compensate the heritage site.

There is also great potential to celebrate a city's heritage through books, reports, guides, maps and audio–visual material. Many Indian cities now have guided walks through old quarters so visitors can understand the rich layers of history.

UMC with International City/County Management Association (ICMA) and United States Agency for International Development (USAID) support, has also helped form the Mega Cities Association (MCA) that includes India's seven largest cities. The MCA has city managers as members and information is exchanged on governance tools, planning and economic development. The UMC was the knowledge manager for compiling a catalogue of leading practices for MCA. This voluminous publication, *Mega Cities...Poised for Change*, was released at MCA's leading practice symposium held in Kolkata in October 2007.

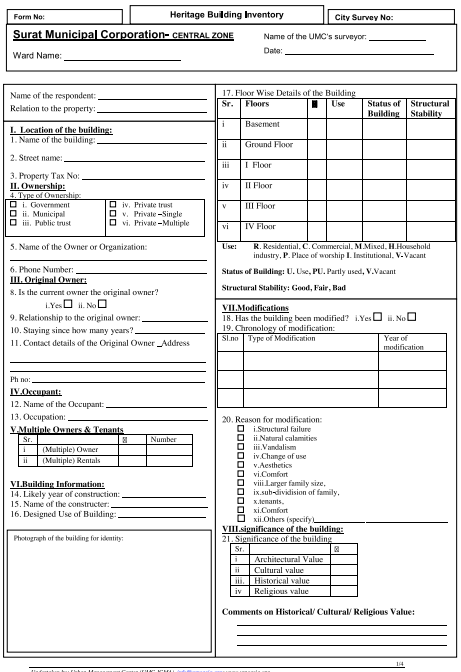
The Surat project is a good example of UMC's work. The heritage study involved enhancing skills of the people who collected data and encouraging municipal corporation staff to be part of this process. A clear message is the need for rigorous evidence–based decision–making approach with good data as the first step. At the centre of UMC's approach has been working 'with' city governments to make change happen instead of a consultant's approach. The organisation sees its role in strengthening skills and capacities of ULBs and in influencing the way a policy is developed. The UMC then exchanges ideas and processes from a project like the Surat Heritage Study to other cities with heritage precincts. Professional management skills and processes are improved as a result.

Manvita Baradi explains that some cities still use maps which are more than hundred years old. Such maps are of no use in the planning process. What is required is updated maps. 'We must bring the planning systems into the twenty–first century,' she says, adding, 'Modern mapping with GIS will help this'. In partnership with Meghna Malhotra, Manvita Baradi has developed a very focused and productive approach to bring change in Indian cities. They both strongly believe that heritage management is not for aesthetic sake alone, but is a dynamic process to improve the overall quality of life of citizens. Heritage management needs to be fully integrated in the development planning processes.

SURAT

Population (2010)	2,500,000
Urban Density	14,658/km²

Surat, also known as Suryapur, is the commercial capital of the Indian state of Gujarat. It is the administrative capital of Surat district and one of the fastest growing cities in India with a population in 2010 nearly double what is was in 2001. The city is ranked 36th in the list of world's largest cities. Surat Metropolitan Region is widely regarded as one of the cleanest Metropolitan Regions in India.



Form No: | Heritage Building Inventory | City Survey No:

Surat Municipal Corporation- CENTRAL ZONE

Ward Name: _____

Name of the UMC's surveyor: _____

Date: _____

Name of the respondent: _____

Relation to the property: _____

I. Location of the building:

1. Name of the building: _____

2. Street name: _____

3. Property Tax No: _____

II. Ownership:

4. Type of Ownership:

☐ i. Government ☐ ii. Municipal ☐ iii. Public trust ☐ iv. Private trust ☐ v. Private –Single ☐ vi. Private –Multiple

5. Name of the Owner or Organization:

6. Phone Number: _____

III. Original Owner:

8. Is the current owner the original owner?

i.Yes ☐ ii. No ☐

9. Relationship to the original owner: _____

10. Staying since how many years? _____

11. Contact details of the Original Owner _Address

Ph no: _____

IV.Occupant:

12. Name of the Occupant: _____

13. Occupation: _____

V.Multiple Owners & Tenants

Sr.		Number
i	(Multiple) Owner	
ii	(Multiple) Rentals	

VI.Building Information:

14. Likely year of construction: _____

15. Name of the constructer: _____

16. Designed Use of Building: _____

Photograph of the building for identity:

17. Floor Wise Details of the Building

Sr.	Floors		Use	Status of Building	Structural Stability
i	Basement				
ii	Ground Floor				
iii	I Floor				
iv	II Floor				
v	III Floor				
vi	IV Floor				

Use: **R**. Residential, **C**. Commercial, **M**.Mixed, **H**.Household industry, **P**. Place of worship **I**. Institutional, **V**-Vacant

Status of Building: U, Use, **PU**. Partly used, **V**.Vacant

Structural Stability: Good, Fair , Bad

VII.Modifications

18. Has the building been modified? i.Yes ☐ ii. No ☐

19. Chronology of modification:

Sl.no	Type of Modification	Year of modification

20. Reason for modification:

☐ i.Structural failure
☐ ii.Natural calamities
☐ iii.Vandalism
☐ iv.Change of use
☐ v.Aesthetics
☐ vi.Comfort
☐ viii.Larger family size,
☐ ix.sub-division of family,
☐ x.tenants,
☐ xi.Comfort
☐ xii.Others (specify)_____

VIII.significance of the building:

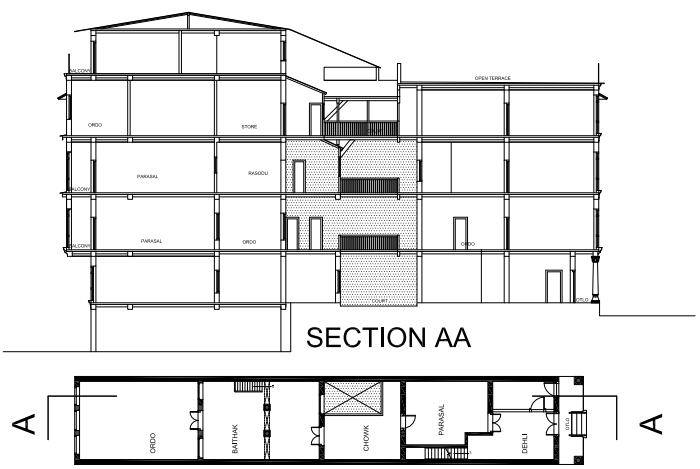
21. Significance of the building

Sr.		
i	Architectural Value	
ii	Cultural value	
iii.	Historical value	
iv	Religious value	

Comments on Historical/ Cultural/ Religious Value:

1/4

Undertaken by: Urban Management Centre (UMC-ICMA)



Manvita is also member of Heritage Committee constituted by the Ahmedabad Municipal Corporation under a Government notification to guide and advise on built heritage of the city.

Manvita Baradi and Meghna Malhotra authored *At the Core—Understanding Built Heritage of Surat and Rander*, 2011, Ahmedabad

MANVITA BARADI

Founder Director
Urban Management Centre

Qualified as an architect and urban planner, she is the founder of Urban Management Centre in Ahmedabad, India.

She has two decades of technical experience in developing and administering programs for local governance, citizen participation, capacity building of local government associations, urban planning, performance measurement, international development, and heritage management.

She has served as Director for South Asia programs of the International City/County Management Association (ICMA).

She continues to provide technical assistance for USAID funded local government programs in Afghanistan.

Much of her professional work has involved conceptualising and operationalising City Managers' Associations in India.

She founded the first Indian City Managers' Association of Gujarat State. This work focused on building capacity for local government, and Local government associations in 13 states of India, Sri Lanka, Indonesia and, Afghanistan and Thailand.

Being an accomplished theatre director and recognized actress on stage and television since her childhood, she uses her knowledge of developmental communication for improvements in local governance. She has performed at national festivals and is recipient of Fellowship from the Department of Culture, Government of India.

MEGHNA MALHOTRA

Deputy Director,
Urban Management Centre

An architect and an environmental planner, she has a decade of work experience in program management and administering donor funded programs in consultative mode for local governments and local government associations.

Key areas of her expertise have been urban health management, heritage management, urban planning and performance measurement.

Much of her work involved providing hands on support to local governments and associations though setting up best practices documentation, urban indicators and performance measurement programs and city–city partnership programs across South Asia.

She has also been involved in several capacity needs assessment exercises for state and local government institutions.

She also takes the lead in documentation and dissemination of urban management leading practices from the South Asia Region.

She provided significant inputs on project on GIS based analysis of living heritage of Surat, India.

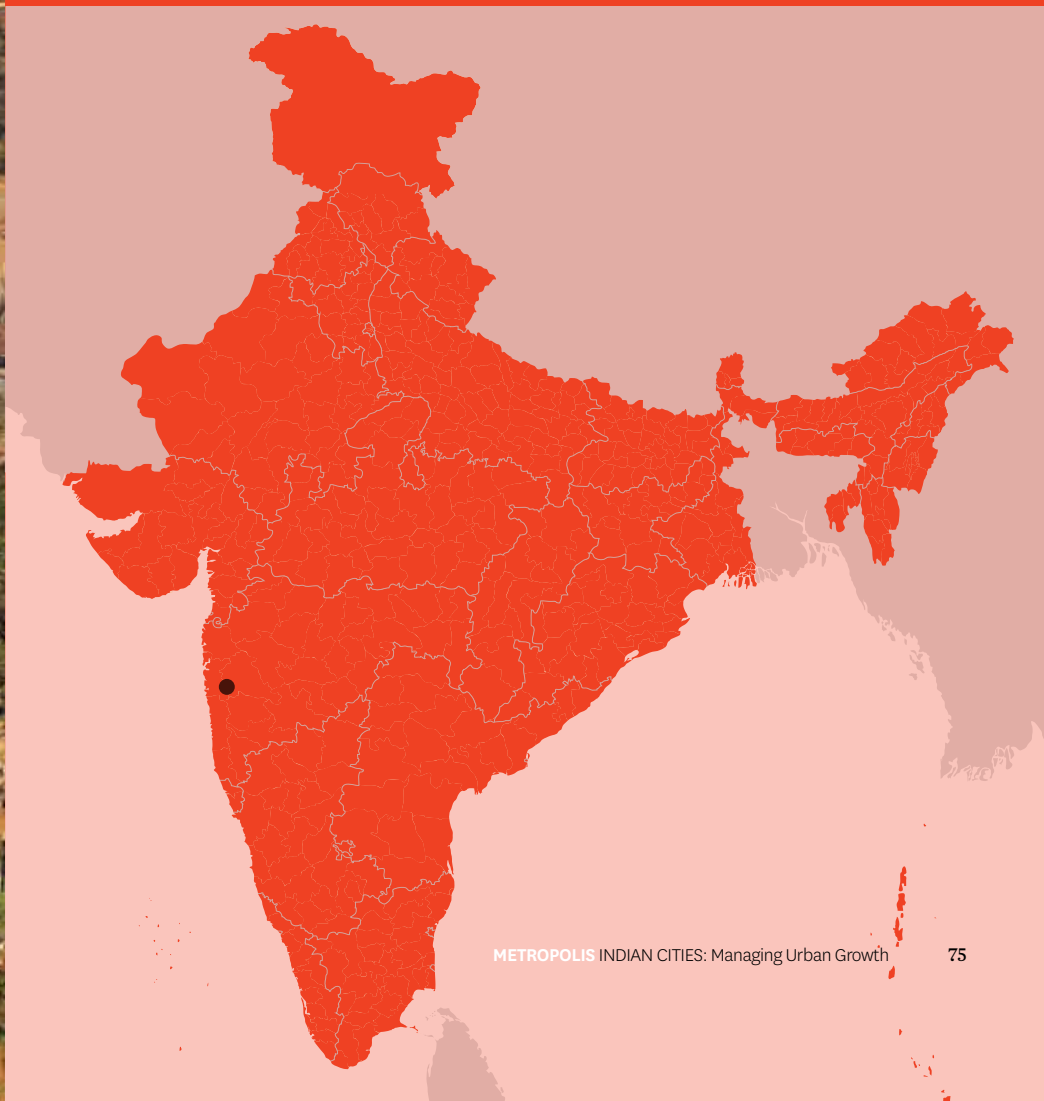
She is currently involved in preparing a Municipal Management Manual for Afghan city managers.

5

A new eco-city

LAVASA

Lavasa Corporation



A new eco–city.

India's urbanisation will continue unabated. The forecasted increase in urban population of 400 million people over the next 40 years will further exacerbate the problems besetting cities. With 70% of India's population living in rural areas, urbanisation problems will not be solved by focusing solely on growth in existing cities. The experience so far has been that villages and rural towns have generally been more environmentally sustainable than mega cities. To manage the continuing growth of major cities like Mumbai and Pune a new approach is emerging, looking at eco–friendly solutions and to building sustainable cities.

Lavasa is India's first eco–city. Located three hours drive from Mumbai and one hour drive from Pune, it is being developed by HCC (Hindustan Construction Company) as a place where people can live and work, in harmony with nature. Rajgopal Nogja, President, Lavasa Corporation reinforces the connection to nature: 'New cities will need to be green and sustainable, our children will demand it'.

India does have a tradition of hill towns from the days of the British but Lavasa is the first to be built in recent years. Dasve in Lavasa is the first of half a dozen town centres strung out around a lake that is nearing completion. A cluster of buildings with housing threaded along the contours rise above the town centre. The extent of construction activity including a small dam that will keep the water for the town centre at a constant level is impressive. This is because the overall Warasgaon Lake will have major fluctuations in level from the dry to the monsoon season.

The Lavasa City project is a bold experiment in creating a new urbanism. Rajgopal and his team have gone out of their way to make the project an urban laboratory that tests new ideas in how cities of the future can be innovative, eco–friendly and sustainable. The core approach is about partnerships. Lavasa has partnered with American urban planners HOK to champion the use of New Urbanism in cities design, with the Biomimicry Guild to explore ways to learn from nature, with Wipro Limited to develop E–Governance systems, with research bodies like Space World and an ever growing number of partners in the fields of education, hospitality, retirement living and new technologies.

'New cities will need to be green and sustainable, our children will demand it'.

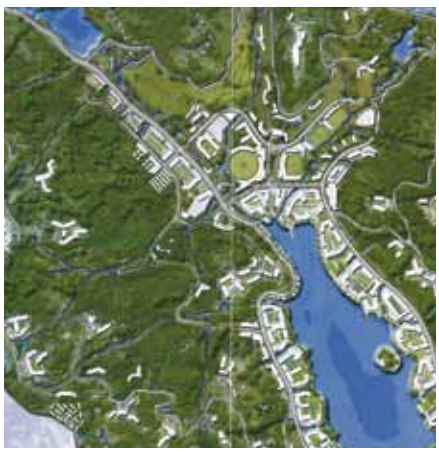
As the city is being built from scratch on a new greenfield site the opportunity to use a data system to record every layer has been used. A 3D–enabled Geographic Information System has built every intervention into the landscape from the contours to the roads and the building plans.

The city has state of the art optic fibre cable network and telecom infrastructure to enable e–governance. All residential units are designed as smart homes with music and picture libraries and videos on demand. Rajgopal Nogja is particularly proud of the advances in technology; 'For a completely new hill city like Lavasa, technology leadership is a key driver of city development and management. Our partnerships with companies like Wipro will ensure a quantum leap in not only being technologically proactive but also realising our vision in becoming a completely e–governed city'.

Lavasa sees the 74th amendment to India's constitution that delegated more responsibility, including financial, as the key to exploring new governance models. After a decade of the Act's influence it seems that the states have not delegated full financial and functional powers to urban local bodies. In the early stages of Lavasa's development a City Manager had been appointed to coordinate the management and governance issues as Dasve, the first town centre, builds up its population. As the overall complex is run by the private sector there are opportunities to re–think governance and management issues. One of the first buildings to be completed has been the Town Hall and when the population grows an elected Mayor will take a key role in the city.

When completed, Lavasa will have five town centres located around the lake and will have a permanent population of around 300,000 people and 95,000 jobs with visitors of two million a year.

Almost 70% of the 12,500 acre site will be left as vegetation. 800,000 trees have



When completed, Lavasa will have five town centres located on the lake and will have a population of around 300,000 people and 95,000 jobs with visitors of two million a year.

already been planted of an eventual three million trees and a significant hydro–seeding program has been initiated.

Another initiative for Lavasa has been the adoption by the American planners, HOK, of New Urbanism. This planning approach is based around traditional concepts of a town where the Town Hall is a familiar focus, where walking is easy, where there is a civic focus and the town scales down in density as it moves out from the centre. This is called the 'transect' by new urbanists, with an eight storey, or so, core stepping down to four storeys and then two buildings are located out from the centre. Woven into the town centre are the four key ingredients Lavasa promotes as being integral to the vitality of a real, fully fledged city: *Live, Work, Learn, Play*. A new Town and Country Club has just been opened with a glamorous gathering including 18 Miss India contestants. A new hospital is complete, and hotels and a convention centre are underway. Oxford University, Berlin University and Symbiosis University are partners along with Space World. And then there is Bollywood and the performing arts to come.

One of the most interesting initiatives at Lavasa has been the use of biomimicry (or biometics)—a design principle that studies nature's best ideas and imitates them. The second town centre, Mugaon, will be the world's first city to set standards using biomimicry. Speaking at a workshop organised at Lavasa, Janine Benyus, co–founder of the *Biomimicry Guild*, described the incredible designs coming out of nature that can inform our own design process.

'Today we need corporate and business leaders to choose the path less trodden. We need new ideas and we need to revolutionise the way we live, create and exist. Lavasa is a brilliant attempt towards creating a human dwelling to emulate nature's ideas. We need many more Lavasas in the world in order to ensure we last longer on planet earth'. (LAVASA WEBSITE–MEDIA RELEASE 9 MARCH 2010)

While most of the activity at Lavasa is about building a new city for new inhabitants there are a number of local villages

'How do hummingbirds cross the Gulf of Mexico on less than one tenth of an ounce of fuel? How do ants carry the equivalent of hundreds of pounds in dead heat through a jungle? How do termites maintain constant temperature of 86°F in their habitat through heat and cold? The answers to these questions will be the solution to so many of our problems. It is time we learnt about nature, not with an intention to control, but with an intention to fit in and last for good'.

Lavasa is a new hilltown built on the hills surrounding Warasgaon Lake designed to blend with nature.

NEW URBANISM PRINCIPLES AT LAVASA

COMMUTING
Walkability with everything within a 10 minute radius from work or home.

CONNECTIVITY
A network of streets, boulevards and alleys to easily disperse traffic.

MIXED USE AND DIVERSITY
A mix of commercial and residential premises within neighbourhoods and blocks.

MIXED HOUSING
A range of living spaces based on a variety of factors, size, proximity to the town centre, pricing, etc.

QUALITY ARCHITECTURE AND URBAN DESIGN
Detailed attention to aesthetics and human comfort.

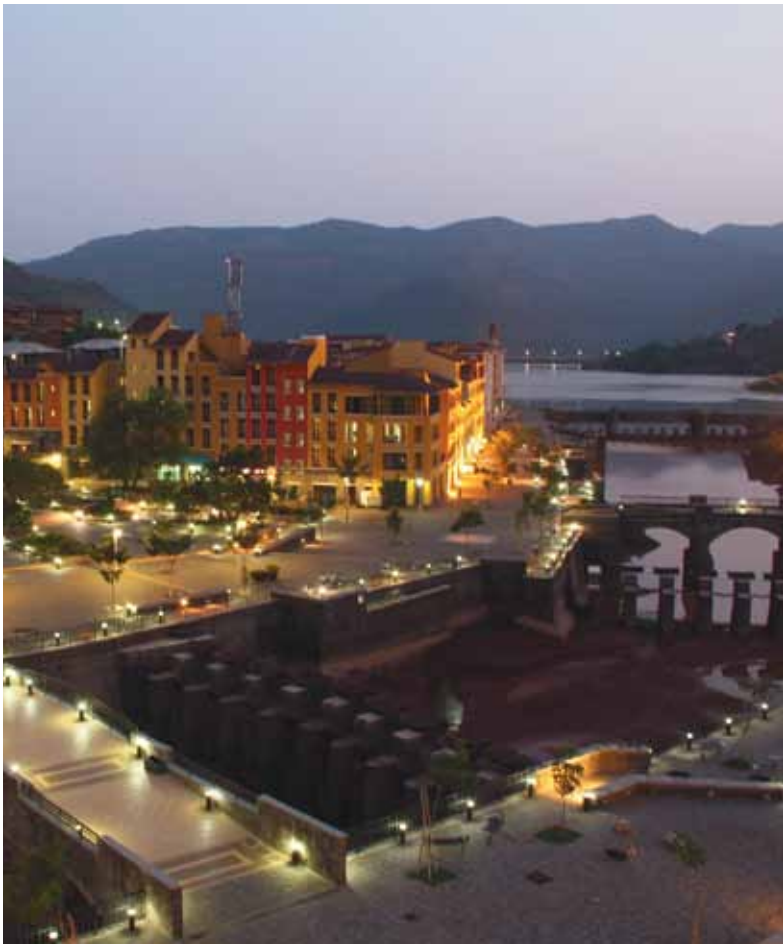
TRADITIONAL NEIGHBOURHOOD STRUCTURING
A discernible city centre and more open spaces that encompass a range of uses and densities.

PLANNED INCREASED DENSITY
Transect planning so that population density decreases progressively as it moves away from the town centre.

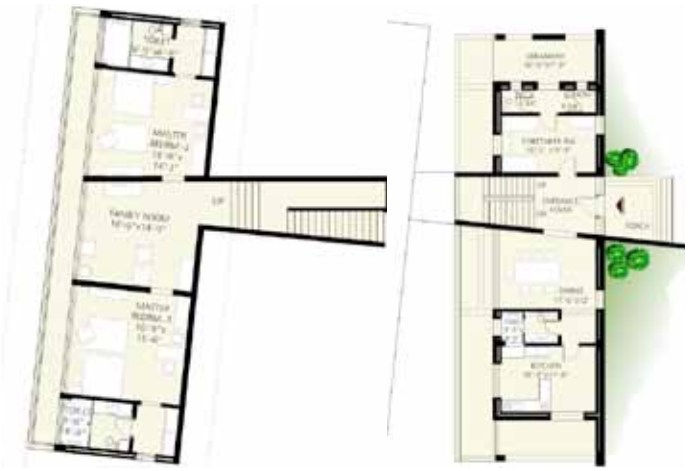
SMARTER TRANSPORTATION
An advanced commuting network for enhanced efficiency.

SUSTAINABILITY
Minimal impact on the environment.

QUALITY OF LIFE
A better life and soulspace.

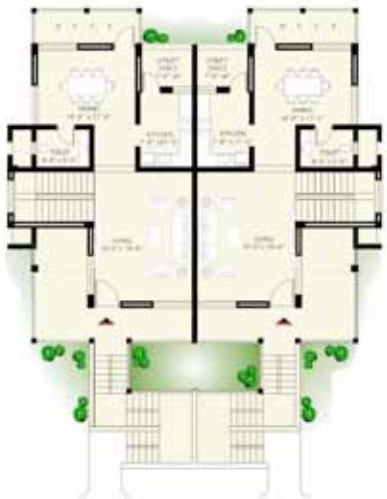


The town centre has been designed to reflect the character of an Italian fishing village.



Villa
NP3 Up Hill Type 1

Ekaant Country Club



Villa
NP1 Uphill Type 1

Villa
PK4 Down Hill Type 2

that were located in the area. These communities will become part of the overall community and already a system is in place to build on local crafts. Bamboo Crafts Ltd is a company established to use the plentiful (and renewable) bamboo from the area in making crafts and furniture for sale. Thirty people are currently employed in a workshop working on everything bamboo. There is certainly an opportunity to harness these local skills but perched on a hilltop it seems to be more part of the existing landscape than the New Urbanism town clustered around its harbour.

One of the key opportunities that a greenfield site creates for a new city is to get an appropriate balance with nature. Most of India's existing cities (with the exception of New Delhi) have seen a continual loss of greenery as urban populations grow. By planning a new city alongside a lake and surrounded by hills and forests means the green corridors can be built in from the beginning. It also means that waste management, energy use and water management can be planned from the beginning. A new approach to city design called eco–cities is taking shape in China and across the world. Lavasa is an Indian example (as is Magarpatta in Pune) where the principles of an eco–city are planned from the beginning. This planning goes right down to the inclusion of energy ratings for individual buildings, recycling sewage for irrigation and composting and generating energy through renewable sources. The ultimate aim is to reduce the ecological footprint.

As well as planning and building a new city, Lavasa has formed an association with the Times of India titled *Future Cities*. This has led to a number of conferences on India's urban problems and a number of information articles in the Times. These articles take a big picture view of India's urbanism and tackle issues like the relationship of cities to nature and the role of technology in city management. A training centre for the Times has been established in Lavasa and research into city development occurs here.

It is important for the broader community in India to be involved in the debate about the future of cities. With 400 million new people moving into cities over the next 40 years India will need many models of urban development. The eco–city approach as a new live, work, learn, play integrated city of around 300,000 people is certainly one model that needs to be tested … and that is exactly what is happening at Lavasa.

RAJGOPAL NOGJA
President, Lavasa Corporation since 2007.

He has over 15 years experience in real estate and the construction industry and heads HCC Real Estate Co. a 100% subsidiary of HCC Ltd that develops high–value projects.

Rajgopal Nogja has had the task of transforming the Lavasa vision into reality and has built a robust and successful business model. Previously, he assisted the Chairman and Managing Director of HCC Ltd in strategic decisions and initiatives for new businesses.

Other earlier roles were with Mahindra Realty and Infrastructure Developers Ltd. and Gammon India Ltd.

Rajgopal Nogia holds a Bachelor's Degree in Civil Engineering and a Masters in Construction Management.

Over his career he has managed residential, commercial and industrial developments, property management, project finance negotiation and feasibility studies.

www.lavasa.com

www.biomimicry.net

www.biomimicryguild.com

www.hokplanninggroup.com

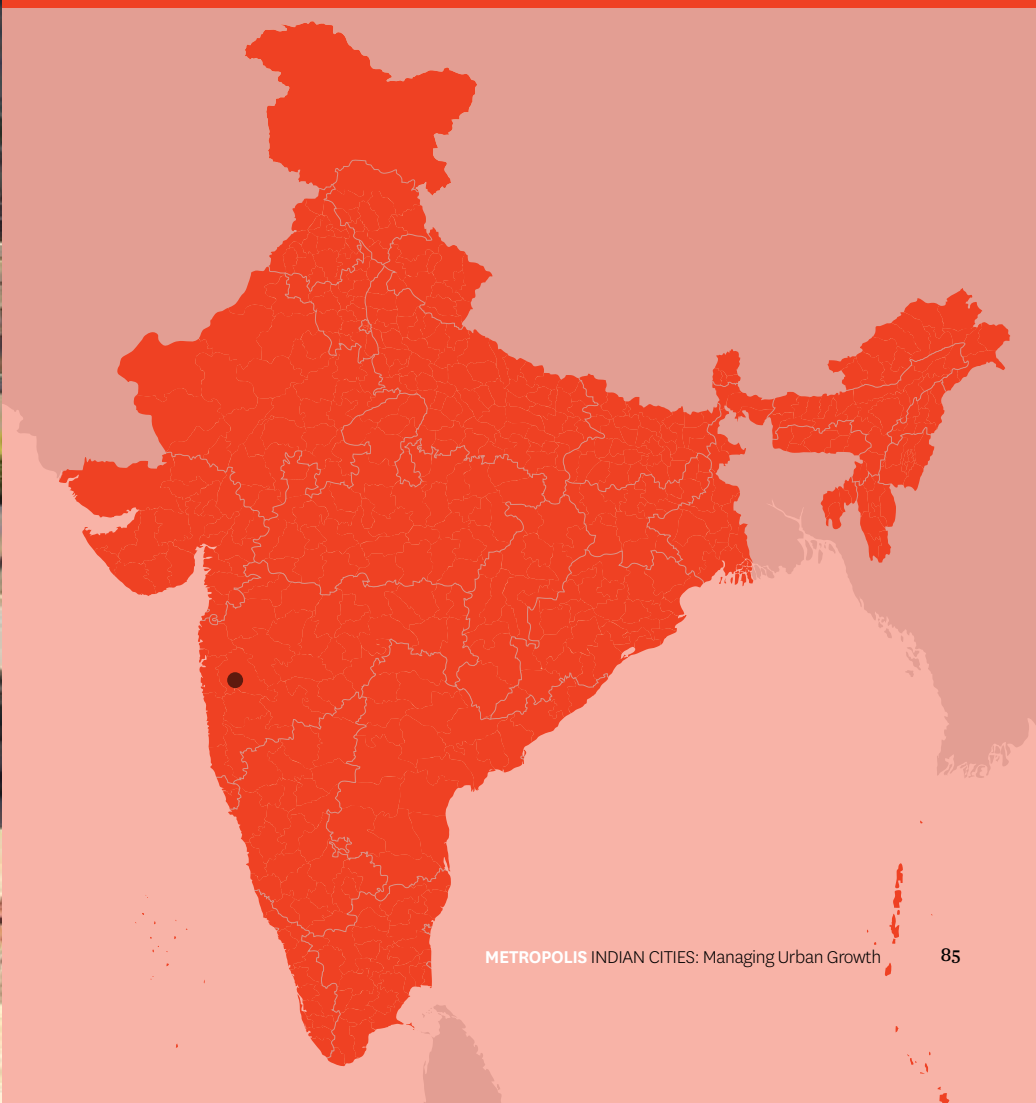
www.lavasafuturecities.com

6

A modern work–live city.

MAGARPATTA

Satish Magar



A modern work–live city.

Magarpatta City is a new IT city on the edge of Pune. It is a self–centred city of 40,000 residents and 50,000 jobs. The city's aim is to have people working close to where they live. But Magarpatta is much more than this: it also is an ecological city with key environmental initiatives; it is a social city with 120 farming families now stakeholders in the future of the city and it is a cyber city with the worlds major IT companies located here.

Magarpatta City evolved through the vision and drive of Satish Magar. Through investigations he learnt that the Maharashta Government was planning to expand cities like Pune and that farming land on the edge of cities like that owned by his family were likely to change.

Rather than letting small lots change in an uncoordinated manner Satish Magar believed there was a better way to get more coordinated development. Most of the farmers in the area came from the Magar family, the same family that Satish Magar came from. He formed a co–operative and eventually organised 120 farming families to become the owners and developers of a new city. With the land pooled, Satish Magar (whose family owned around 40% of the 400 acres) took the lead role in negotiating with state and city governments.

An integral part of the process was to have the families and their next generations gain from the project. The Magarpatta Township Development and Construction Company Ltd was formed with the objective of getting many of the farmers and their next generation to learn new entrepreneurial skills. After six years of working up the project with governments, Magarpatta began to take shape. An important step was Satish Magar's visit to Silicon Valley in California where he saw the value of clean green jobs. He therefore set out to establish his own Silicon Valley, or Cybercity.

The new housing at Magarpatta provides for a range of lifestyles.

Representatives of the 120 farming families that are still joint owners of the development of the new town.

Magarpatta's key objectives then developed—walk–to–work, walk–to–shop, walk–to school. All these capabilities, and many more health and wellbeing benefits, are incorporated into the new city. Yet without the jobs established at Cybercity, the whole development could have been just another dormitory suburb.

The design of the city is focused on integrating buildings with nature. At the centre is a 25 acre circular park, Aditi Gardens, which symbolises the importance of nature and ecological issues in Magarpatta. It is surrounded by the Cybercity circle of gleaming glass office buildings, around seven storeys high.

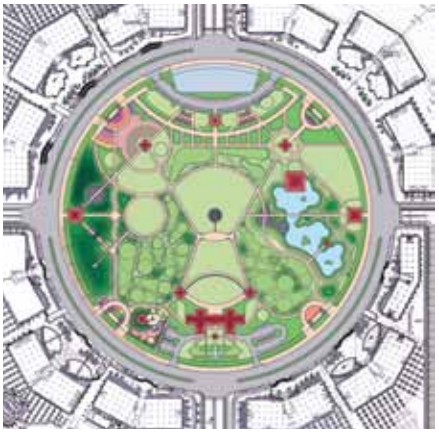
About 120 acres of the city are landscaped with 32,000 new trees. The landscape is planned around the concept of 'Rutu Chakra'—the eternal time–wheel of nature, where every season gives a new character to the landscape. As well as being a place of retreat with trees, grass, a lake and a large mist fountain, the central park is also the location of the city nursery and the waste disposal centre.

Rather than being a service facility normally hidden from view, the waste disposal centre has become a tourist attraction. It demonstrates to Indian and international visitors the careful separation of waste into dry and wet and into different materials, i.e. glass, paper, plastics.

The first section is vermiculture where worms are munching away at waste to break it up into compost that then goes to the nursery. Biocompost pits that are raised above the ground and edged with concrete walls contain the worms. Next to the worm farm is the two tonne biogas plant where biodegradable waste goes through a process that generates non–polluting biogas which then is used to generate power to operate the garden pumps.

Rainwater is harvested across the complex with eight natural wells, 515 recharging bores and a 1.25 acre lake. To minimise the raising of ground water levels most of the paved areas use interlocking pavers with cutouts for grass. This allows much of the rain water to soak into the ground.

Waste water is recycled with three



Magarpatta City has a ring of office buildings located around the cities centre piece the 25 acre Aditi Gardens. A variety of housing types from villas to apartments surround the office buildings enabling all to walk to work.

Magarpatta City has one of the largest residential solar water heating systems in India.

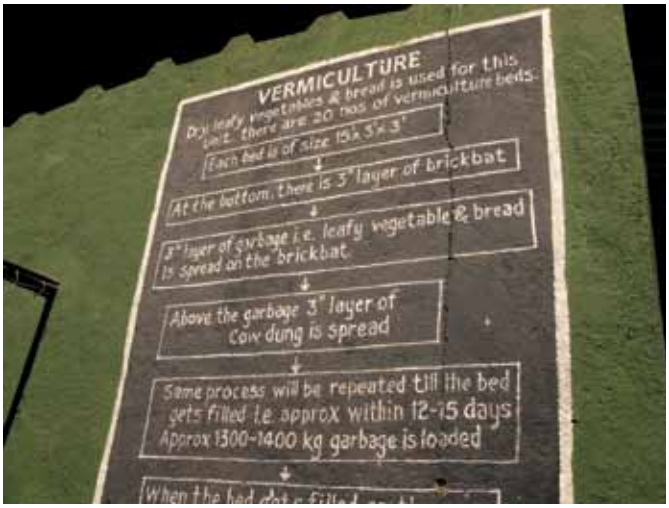
sewage treatment plants with a capacity of two million litres a day. The recycled water is used for gardens to keep them lush and to therefore help with lowering temperatures in the hot summer. Located in Aditi Park is Pune's largest mist fountain which helps enhance the micro climate.

Magarpatta City has one of the largest residential solar water heating systems in India. All residential flats have solar panels and these will ultimately heat up to 700,000 litres of water a day. The power saving is estimated to be about 37 Kwh each day.

With the National Institute of Construction located in Pune youngsters from the farming families were sent to study there. The project decided to have its own quarries. The sand was supplied by the farmers. The second generation farmers became entrepreneurs.

Magarpatta made its own bricks. Except for steel and high–quality glass everything else was made by the construction company. In making their own bricks there was an opportunity for innovation by recycling fly–ash which is a pollutant from thermal power plants. For every tonne of fly–ash used in construction approximately one tonne of carbon dioxide emissions to the environment is saved. With 130,000 tonnes of fly–ash to be used at Magarpatta this should save 130,000 tonnes of carbon emissions.

The central park includes a plant nursery, vegetable gardens and the town's recycling centre.



Two bedroom apartments opening onto large outdoor terraces.

Apartment complex and playground


ATRIUM


GARDEN
FIRST, THIRD, FIFTH FLOOR PLAN

The key to the walkable city is having jobs close to the residential areas. Cybercity comprises over six million square feet of high quality office space with some of the world's major IT companies located in a ring of buildings overlooking the central park. They have a sophisticated telephone exchange with fibre optic connections and excellent broadband. For enterprise communication there is a dedicated earth station that offers satellite and terrestrial links for voice–data, video conferencing and worldwide connectivity. There is 100% power backup for any length of time.

Magarpatta has been able to attract the top IT and ITES companies by having added attractions for employees. On their doorsteps are parks, recreation facilities including golf, gymnasium, tennis, retail and residential facilities. The residential precincts offer a wide range of flats, bungalows and row houses. The names of the residential neighbourhoods are based on flowers to continue the nature theme. You can live in Daffodil, Acacia Gardens, Grevillia, Iris or Mulberry Gardens. Acacia Gardens is mainly bungalows at the higher end of the market. These range in size from 2000 to 3500 square feet. Daffodil is a series of two and three bedroom residential towers of six to eleven storeys high set around a three acre garden.

Magarpatta City includes all the facilities expected in a vibrant city. There are schools, hospital, cultural facilities, sports halls, multi–cuisine restaurant, retail and shops all located within walking distance. Festivals are arranged to celebrate special occasions like Diwali and Ganesha.

Understandably Magarpatta has been approached by other groups of farmers to form collectives to develop their land. The most advanced is Nanded City on 700 acres along the banks of the Mutha River in Pune. Again a number of families have joined together to form a cooperative and a master plan has already been developed —another success story in the making.

Restaurant pavilion located in the central parklands

Examples of villas at Magarpatta

SATISH MAGAR

Chairman and Managing director of the Magarpatta Township Development Company.

Satish Magar came from a farming family where his uncle was very influential in politics. After attending one of the better colleges in Pune he decided to learn more about agriculture by studying at Pune's well regarded Agriculture College. Here he spent many years with people from simple farming backgrounds. He found these students very driven to learn and to improve their lot in society.

He is President of the Confederation of Real Estate Developers Association of India (Pune). He is President of the Promoters and Builders Association of Pune.

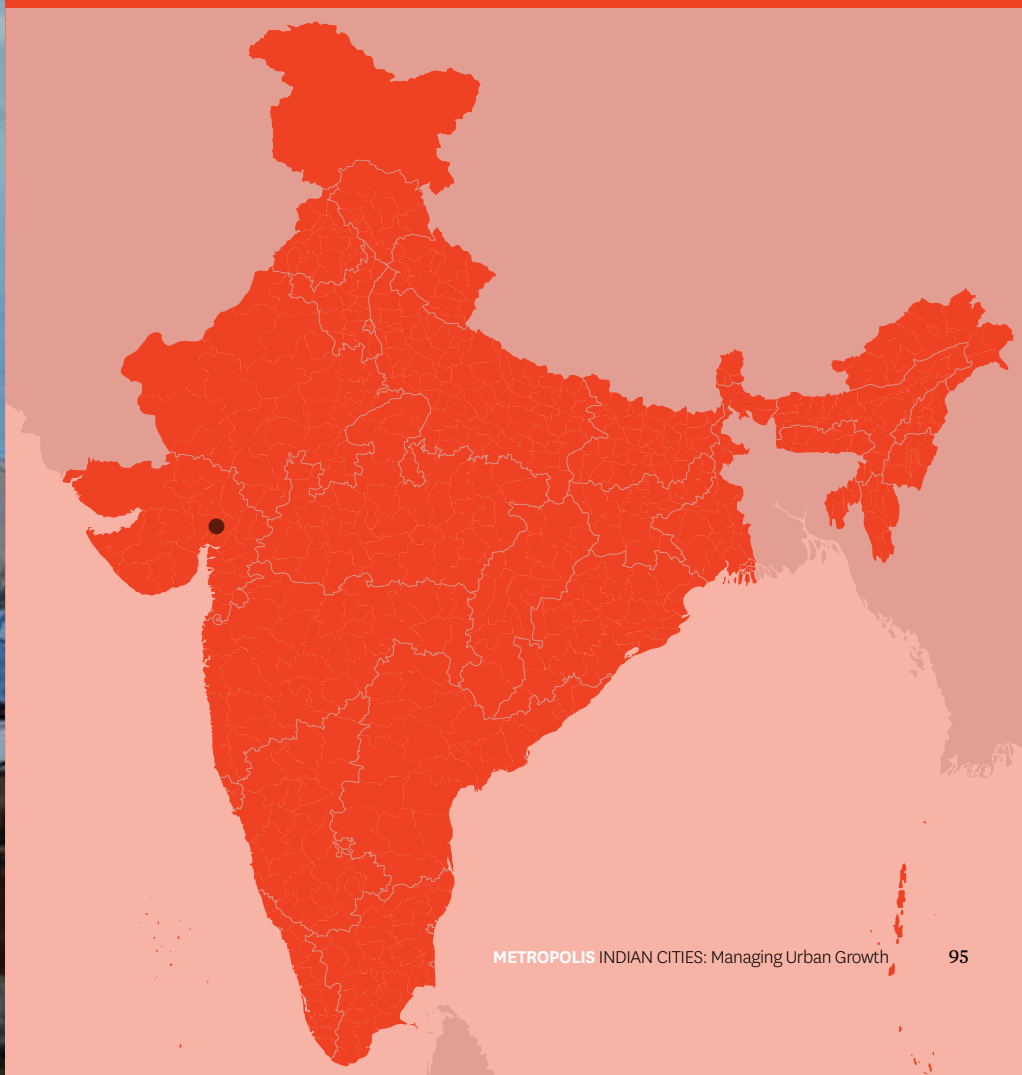
www.magarpattacity.com

7

Riverfront Renewal

AHMEDABAD

Bimal Patel



Riverfront Renewal.

The Sabarmati Riverfront Project by the Ahmedabad Municipal Corporation is a good example of changing the character of a city from the centre outwards in a way that is environmentally and socially responsible.

In August 1997, the Environmental Planning Collaborative, headed by Bimal Patel, was appointed to prepare a master plan for the river. The aim was to transform the river from being an environmental and social problem into a city asset.

The project has five stages of evolution.

1. Understanding the issues and preparing the feasibility study.
2. Laying sewage infrastructure, building flood protection walls, creating a public realm.
3. Improving access to the river, strengthening the city's transport network.
4. Building public promenades, gardens and play fields.
5. Building public facilities and financing the project.

The historic layer is the first to understand. Ahmedabad was founded as a walled city on the eastern banks of the Sabarmati River in 1411. The city has always had a strong relationship to the river. Even today the structure of the old city can be seen and there are a number of tours that explain its heritage (see box).

AHMEDABAD

City Population	5,670,000
Metropolitan Region Population	6,580,000
Urban Density	22,473/km²
River frontage	23 km

Ahmedabad is the largest city in Gujarat, India. It is the seventh largest city and eighth largest metropolitan area of India, with a city population of approximately 5.67 million and metropolitan population of 6.58 million. Ahmedabad is the fastest growing city of India, and ranked third as the fastest growing city worldwide. It is located on the banks of the River Sabarmati, 32 km from the state capital Gandhinagar.

In the second half of the nineteenth century about a dozen textile mills were established in Ahmedabad and the first span across the Sabarmati River, Ellis Bridge, was constructed. By the end of the first half of the twentieth century two more bridges were constructed across the river. Following partition of the sub–continent in 1947 a large influx of population from the Sindh region led to urban growth on both sides of the river.

The river banks became sites for squatter settlements and slums and the city's sewage often overflowed into the river. But the major problem was the seasonal flooding that created chaos for the city and particularly for the slums.

In May 1997 the Ahmedabad Municipal Corporation established the Sabarmati Riverfront Development Corporation Ltd with the objective of 'reviving the city by reconnecting it to the river.'

In August 1997 Bimal Patel's organisation, the Environmental Planning Collaborative, was appointed to prepare a feasibility study for the river. After many options were debated a 11.5 km stretch was chosen for the project. Studies showed that the width of the river varied from 675 metres to 325 metres. Water flow studies showed that if the water channel was contained at a consistent height with solid concrete edges then a uniform width of 275 metres was adequate to maintain the current flood carrying capacity of the river. This structure returned 202.79 hectares of land back to the city with the potential for a variety of land uses.

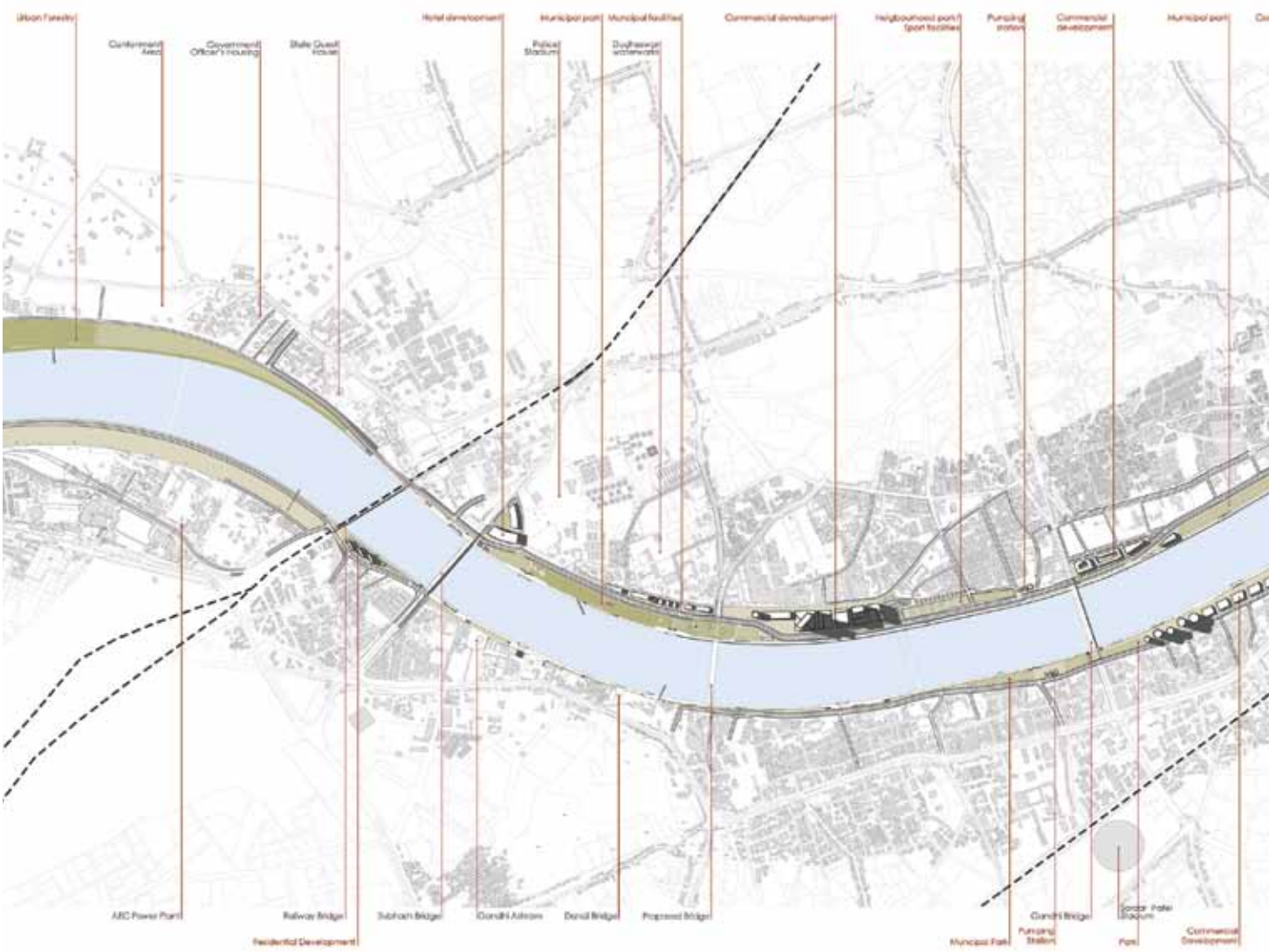
Water is channeled into the river from the Narmada canal, which intersects the river upstream from Ahmedabad and is retained in the river using the Vasna Barrage which is located downstream. To prevent untreated sewage from flowing into the river, two sewage interceptor lines with new pumping stations have been constructed along both the reclaimed banks.

The new reinforced concrete diaphragm walls built from 10 metres below the river bed and retaining walls built up to the high flood level of 4.75 lakh cusec flood, protect the river banks from flooding and erosion. The project provides Ahmedabad with 11.5 kilometres long pedestrian promenade with trees and seating at the water's edge.

The land use strategy is to sell 14.5% of the land for residential and commercial purposes to finance the project. The rest will be used to set up promenades, informal markets, gardens, an extended road network and many new public facilities. Around 14,555 slum dwellers living on the riverbed are affected by the project. They will be relocated and provided with 'pucca' housing with secure tenure, access to roads, infrastructure and services.

The riverfront will be developed as a

SABARMATI RIVERFRONT MASTERPLAN



The Sabarmati Riverfront project transforms the private river edge into a public asset, redefining the city's relationship with its river. Various developments are planned along the reclaimed land ranging from parklands to commercial development.

RIVERFRONT BEFORE

Clothes washing areas on the riverbank before commencement of the project. The project resettles squatter areas in new housing on sites nearby.

Previously the banks of the river often flooded squatter settlements and left muddy flat edges of the river in an unhealthy state.

DURING CONSTRUCTION

The restructuring of the riverbank has been a major engineering feat.

COMPLETED LOWER PROMENADE ALONG THE RIVER FRONT

The sample stretch of the riverside promenade awaiting the planting of trees.

mosaic of unique precinct plans. One will be a large heritage park located near Lal Darwaza, the historic centre of the city, while another is the *Cultural Mile* incorporating the National Institute of Design, which will provide the city with an array of contemporary cultural institutions and museums. The most dramatic will be the Ashram Road precinct where there is potential for commercial buildings of up to 40 floors to help pay for the improvements. The Ahmedabad Municipal Corporation opened an information centre on the Sabarmati redevelopment project in early 2009 during the *Vibrant Gujarat Global Investors Summit* to create public awareness of the project and test interest in the commercial development of some of the sites.

Bimal Patel is driven by the goal to 'make city planning work' for improving the quality of urban environment in Indian Cities. He is a Director in HCP Design and Project Management Pvt. Ltd., a 50 year old firm which has fully fledged divisions for planning, architecture, interior design, furniture design and project management. He has developed a number of other firms including the *Environmental Planning Collaborative*, a not–for–profit company pioneering research and policy development in urban planning. *Geographis* was established in 2000 to undertake work in surveying and mapping, a furniture company and an Interior Architecture company also drive specialist work.

This multi disciplinary thinking is apparent in the Sabarmati Riverfront project, which is a multidimensional, environmental improvement, social uplifting and urban rejuvenation project. Many cities in India have a major river at their heart and have seen its deterioration with untreated sewage flowing into it, development of slums along the banks, and monsoonal floods causing major chaos. The Sabarmati Riverfront project is a good example of changing the character of a city from the centre outwards in a way that is environmentally and socially responsible.

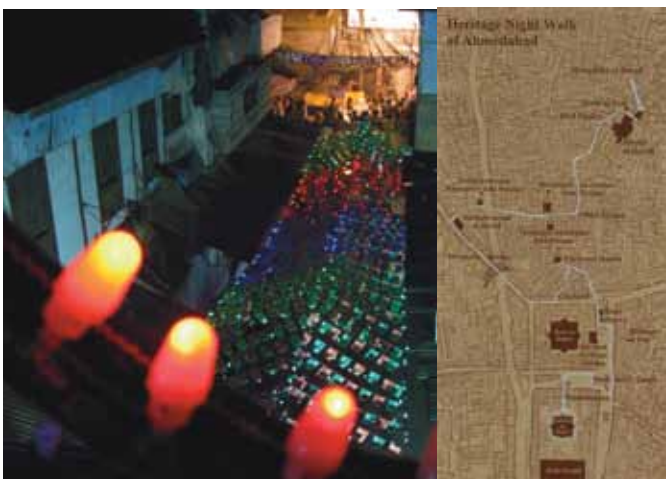
The new riverside promenades will be places for celebration and entertainment.

Ahmedabad's Heritage

One of the best ways to appreciate the structure of the old walled city of Ahmedabad is to take a guided heritage night–walk through the twisting alleyways. Here the visitor can appreciate the sub–structure of the city with its clusters of houses around an alleyway accessed by a single gate. These clusters are called *Pols* and they originally housed people of the same community and caste or similar trades or professions.

The walk starts at 10pm because citizens were reminded to close their Pol gate by loud drumming that also signaled the closing of the city gates. Each night the drums beat out a rhythm from above the gateway to the Manek Chawk food court at 11pm. After exploring the twisting alleyways and the surrounding hovels and monuments the heritage nightwalk arrives at the entry to the food court with the drummer in full flight. A tradition dating back 600 years continues on.

www.houseofmg.com



BIMAL PATEL

Bimal Patel is actively engaged in transforming the quality of life in Indian cities through more effective urban design and urban planning practices.

He received the Prime Minister's (India) National Award for Excellence in Urban Planning and Design in 2003 and the Aga Khan Award for Architecture in 1992.

He is the Director of HCP Design and Project Management Pvt. Ltd., a 50 years old firm based in Ahmedabad, Gujarat.

Bimal Patel established the Environmental Planning Collaborative to look at better ways to plan and develop cities.

He is committed to making his studio building on the banks of the Sabarmati River, called Paritosh, an innovative laboratory of design, planning and development management ideas and practice.

He has completed his Doctorate (PhD) in City and Regional Planning from the University of California, Berkeley USA and has also gained dual Master's Degree in Architecture and City Planning from the same university.

He graduated with a Diploma in Architecture from the Centre for Environmental Planning and Technology, School of Architecture in Ahmedabad.

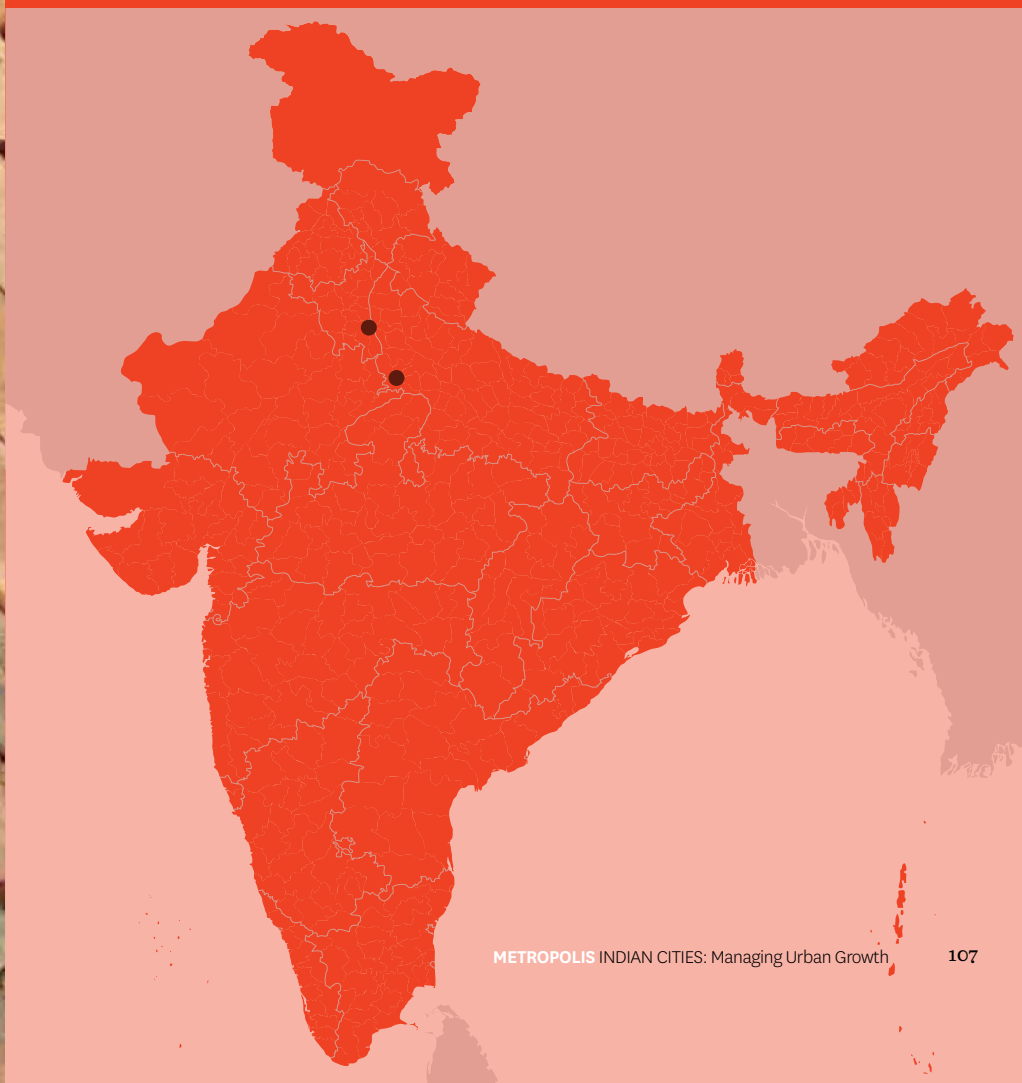
www.hcp.co.in
www.sabarmatiriverfront.com

8

Making Slum Renewal Work

NEW DELHI & AGRA

Renu Khosla



Making Slum Renewal Work.

Renu Khosla is the Director of the Centre for Urban and Regional Excellence (CURE) which is involved in urban community development in a number of Indian cities. CURE's philosophy is about 'inclusion' and 'empowerment', as it is the empowerment of the local community that leads to change.

The role of change agents like CURE is to be flexible and to have no preconceived solutions requiring many different approaches to improve conditions in slum areas.

There are four key activities that CURE is involved in that are all inter-related. The first is IMPLEMENTATION to undertake actual projects. The second is in the area of POLICY so that lessons learnt can improve the system. The third is RESEARCH so that issues are critically examined and the fourth is to develop DATA BASES so that information is collected to inform the projects. This has led to the development of Community Based Information Systems (CBIS) that save and display information collected from communities and surveys.

CURE lists a series of core competencies the team members have including CBIS. These include research, community mobilization, participatory planning assessment, slum upgrading and capacity building. These competencies are then focused on six key development themes of water supply, sanitation, sustainable urban livelihoods, housing, community based tourism, health nutrition and urban education.

Assisting Renu Khosla are a number of people, including Nandita Gupta, who integrate the survey data into a spatial platform using the Geographical Information System (GIS) so that data can be easily viewed and understood.

Renu Khosla has written a paper on data collection called *'Leaves, Pebbles and Chalk'*. The title refers to the on-the-ground methods used to collect data in slum settlements. At community meetings a rough plan of streets and houses is marked on the pavement in chalk. The community members, mainly women, then place a leaf on the location of their house for each woman in the house. In a similar manner a stick is placed for each man and pebbles to represent the number of children. The data is then recorded on paper maps and then digitized through AutoCAD and converted into spatial data layers on the computer.

One of the major projects CURE is involved in is at the Savda Ghevra resettlement colony located near the Delhi–Haryana border on the northwest outskirts of Delhi. Ultimately the colony is expected to house more than 20,000 families from various slum areas across Delhi. Already over 8,500 families have been relocated to Savda Ghevra.

CURE has been brought in by the Government of Delhi to help the people relocated to Savda Ghevara but is concerned about the resettlement being so far from the original slum locations as many of the men have to live closer to work opportunities and only return to their families on weekends.

Walking around Savda Ghevra was certainly an eye–opener. The houses are very small on lots of 12.5 m^2 or 18 m^2 with the opportunity for windows on one side only facing the laneway.

The houses often start as a single storey and then grow to two or even three storeys with very steep internal access as owners save enough money to build. Water supply is delivered by tankers that fill up people's containers on the streets. The toilet facilities are located in a couple of community toilet blocks where residents are expected to pay a small amount of money for their use. Most people seem to defecate in the open rather than use the community toilets which is a serious health hazard.

CURE has stepped into this difficult situation to develop programs to improve people's lives. Their first exercise was to prepare the Socio–Economic Study Report of the Resettlement Colony. This study presented some very useful data that came from community surveys. At the time of the survey there were 3,317 families at Savda Ghevra totalling 17,189 people. The population had a high illiteracy rate with 38% of men and 56% of women being illiterate.

Ninety five percent of the houses were single storey although many of these will gain extra storeys over time. Each household paid Rs 7,000 for their land and often have to pay more to speed up their approvals. Toilet facilities are difficult to build in small spaces and with no underground sewerage. Only 3.8% of families therefore have a toilet facility in the house and half of these discharge directly into open drains exposing residents to health risks. Only 7.7% use the community toilets.

Ninety nine percent of households get their water from a water tanker. Only 55.7% of houses have electricity and only 18.6% have television. Of the people of working age in Savda Ghevra only 48% are employed and more than a third of these only get work on a daily basis. Most of those with work must commute back to jobs where their original slum dwellings were located. The types of jobs are

New bags in recycleable material made by women in Savda Ghevara as part of a new business venture to generate jobs.

of a lower order dominated by labourers, domestic help and vendors. Thirty nine percent of families have an income of less than Rs 2,000 per month.

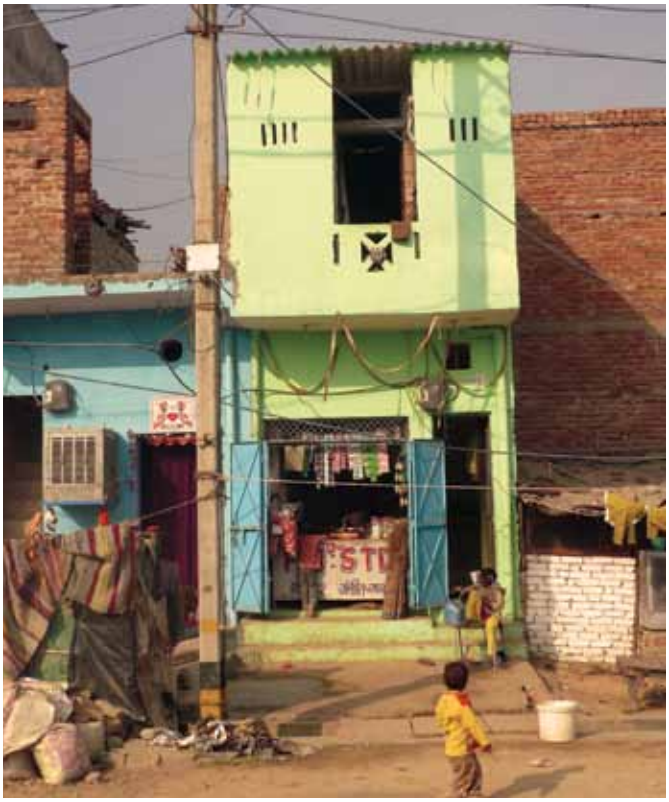
All of this data was collected by 10 facilitators from SG who were trained to interview people. With this data CURE developed a number of programs at Savda Ghevra. One was a Livelihood Value Chain Analysis that examined work opportunities for residents along National Highway 10 within 10 kilometres of where they lived.

This included detailed mapping and analysis of employment opportunities from hawkers and vendors to retail shops and wholesale traders. The data was broken down to garment, footwear, electrical or plastics shops to determine skill levels. Out of this study came a potential for home–based jobs to produce garments and jewellery.

CURE is concentrating on sustainable livelihood pathways for residents to generate employment opportunities. A training program has led to 112 people being certified by the Construction Industry Development Council as electricians (60), masons (35), welders (7), carpenters (6) and painters (2). Out of the 60 electricians, 45 are now employed with contractors and the rest have been able to find continuous freelance work within SG. A local housing trust provided training for the masons, which included 15 women, 9 of whom are now earning more than double their previous wages.

Women in Savda Ghevra are producing brightly coloured carry bags. The recent banning of polythene bags by the New Delhi government has created new opportunities for the women at Savda Ghevra. One of the skill assessment surveys had indicated that a large number of women knew how to sew and had a sewing machine. CURE engaged a trained designer to create some impressive colourful designs for bags made from environmentally friendly material.

From a small beginning with an initial order from a shop owner for 1,000 bags the business has grown to now employ-



New housing at Savda Ghevara

ing 30 women. The group is doing its own marketing, production and accounting and the monthly income of the members has quadrupled. For printing shop names on the bags a screen printing unit was also initiated that provides income for an additional five people.

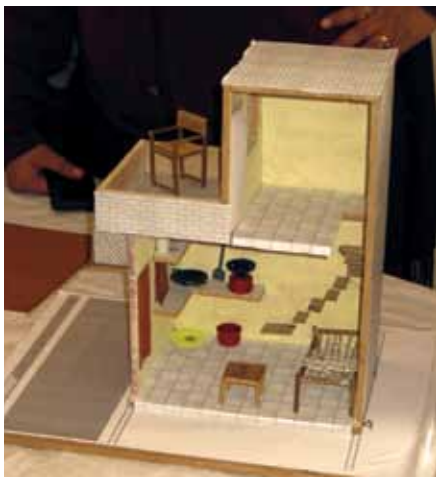
Another initiative by CURE was to set up a day care centre to look after children when both the mother and the father go out to work. The centre staff are specially trained local residents and even the building was partly built by the community. Parents pay Rs 50 a month for each child and numbers are growing.

Residents of one of the precincts wanted a better waste collection system and have now set up a combined collection system for 500 households. A waste collector comes each morning to collect waste and households contribute Rs 10 a month. It is these small steps forward that are improving the lifestyles of the residents of Savda Ghevra.

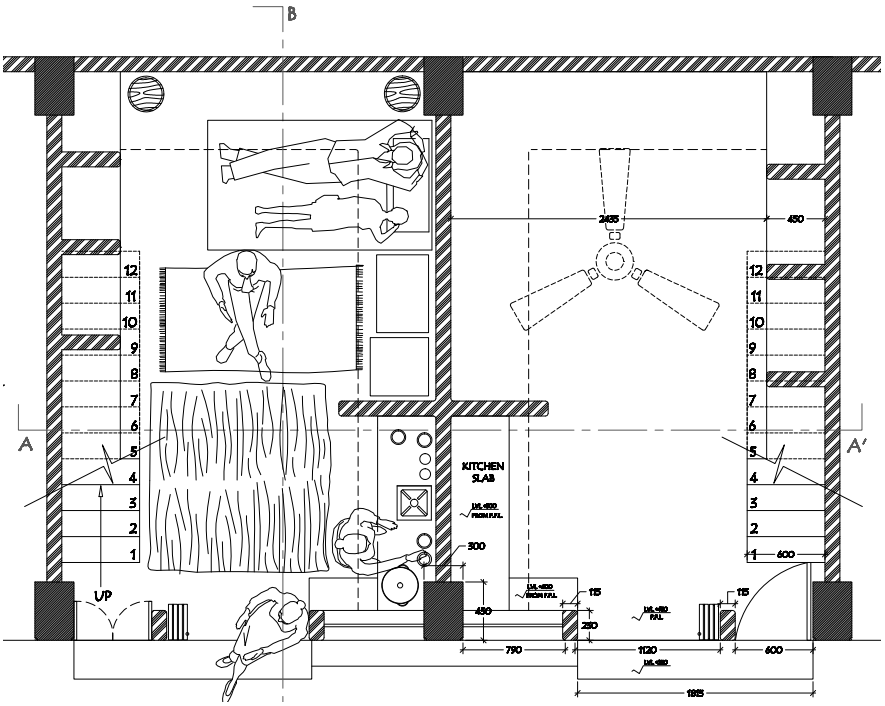
Cure was contacted by the Aga Khan Foundation to help resolve a problem at one of Delhi's protected national monuments: the saving of the moment by relocating a number of squatter houses that had been built too close to the wall of a stepped well.

This gave CURE the opportunity to work closely with the families to develop prototype houses to be built at Savda Ghevra. Students of architecture were involved in meeting the families and developing the designs for the new houses. In this way the process was more 'bottom up' than 'top down' and some useful research into family needs contributed to the end product.

Site Plan of Savda Ghevara



Models of new housing
for Savda Ghevara



Plans for new housing at Savda Ghevara by students from the University School of Architecture and Planning, New Delhi.

Men making fishing nets as a new business.

Map of the area around Savda to identify employment opportunities.

CROSS–CUTTING AGRA PROGRAM

The philosophy of this innovative program is to link some of the special tourist features of Agra with an improvement program of slum areas located near the ancient monuments. Five low income settlements have been connected through a heritage trail that visits a number of heritage monuments. The one kilometre walk takes tourists on a journey through agricultural fields, along the riverbank and past a number of villages. A series of heritage sites are visited including the Moonlight Garden (Mehtah Bagh), the Mughal aquaduct system, the Humayun Mosque and the Gyara Sidi (Astronomical Observatory).

The Mughal Heritage Walk Enterprise involves a group of young boys trained to take tourists along the walk and to explain the heritage story. Local art souvenirs are made by the women in the community and even home stays can be arranged. Visitors on the walk can spend time in the villages seeing how local markets function and get a feel for village life. The brochure promoting the Mughal Heritage Walk begins: *'There is more to Agra than the Taj'.*

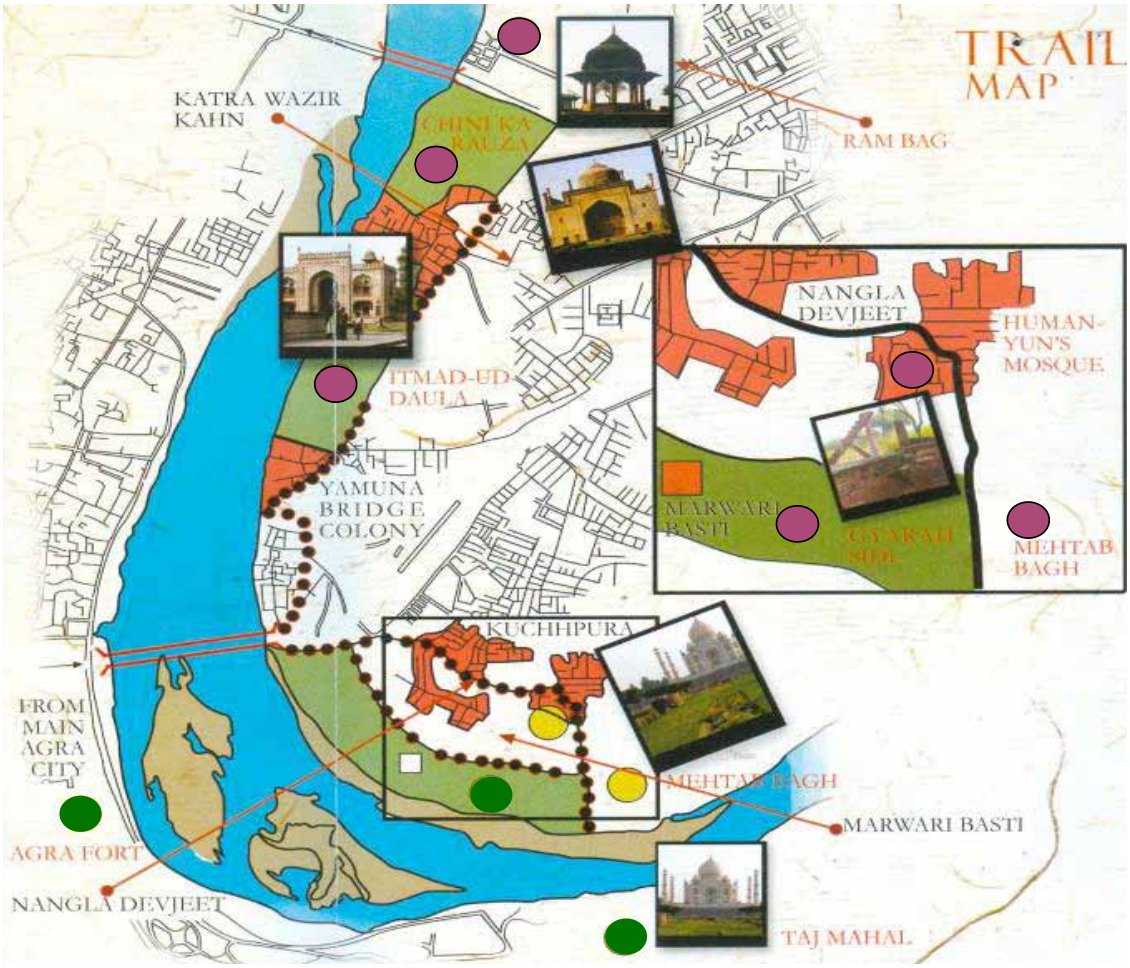
The enterprise's profits go back into upgrading sanitation, water management and the provision of toilets. A special credit mechanism has been established to fund new home toilets and up to 70 have now been constructed. The enterprise is branching out to street theatre with youth groups performing for five or six minutes. Much has been achieved by the Agra program but there are still policy issues that need to be overcome. For example, the Archaeological Survey of India has very strict controls about settlement near national monuments which restricts the potential for slum areas to interact with tourists or upgrade their houses. This means new challenges for CURE, to work at national policy levels as well as at the local level.

Many of CURE's projects feed back into national activities through the JNNURM and through NIUA's knowledge sharing platform PEARL (Peer Exchange And Reflective Learning). Agra is now leading the heritage conservation area of PEARL and has showcased the Crosscutting Agra Program as part of this. The Community Based Information System (CBIS) devel-

The tourist Mughal heritage walk from the Moon Light Garden to the village of Kachhpura. The Moon Light Garden is across the river from the Taj Mahal. Funds from the walk enable new paving and drainage to be constructed in the village.

Taj Mahal

Tourist maps of Agra showing how close the tourist sites are to the slum settlements that the Mughal Heritage walk passes through.



oped for Agra is now becoming the basis for the mapping of all heritage monuments through a Heritage Cell established by the Agra Municipal Corporation.

The steady build up of data from bottom up implementation is now being presented spatially and starting to influence policy. But ultimately it is networking with the local community and local government that leads to change. And it is the focus on inclusion, empowerment, pluralism, and incrementalism that makes the change happen.

AGRA	
Population	1,686,976
Metropolitan Region	5,410,000
Urban Density	8,954 /km²

Agra is a city situated on the banks of the river Yamuna in the northern state of Uttar Pradesh, India. It is located at the banks of river Yamuna, 363 km west of state capital, Lucknow and 200 km south from national capital New Delhi. With a population of 1,686,976 (2010 estimate), it is one of the most populous cities in Uttar Pradesh and the 19th most populous in India. Because 80% of the city's sewage flows into the river, it is the 20th most polluted city in India.

New businesses being developed in the low income areas.

RENU KHOSLA

Renu Khosla is the founding Director of CURE which she established as a non–government organisation (NGO) in October 2003 after moving on from the NIUA, where she headed the Urban Poverty Unit. She has over 15 years experience working in the sector of urban poverty alleviation and slum development.

Renu Khosla has contributed to the understanding of urban slum living, in particular among women and young girls and explored the challenges faced by local and state governments in expanding access by the urban poor to basic services such as water supply and sanitation, housing, livelihood, education and health services.

Her special areas of expertise are in inclusive planning, pro poor policy and governance and the promotion of multidisciplinary research for the well being of the poor. She is currently Senior Consultant for Social Development at USAID under the FIRE (D) project for slum upgrading strategies and implementation plans.

The development of the CBIS was documented as best practice in a Metropolis Commission on urban indicators.

Renu Khosla is driving the Sustainable Livelihoods Project 'Ajeevika' in Delhi based on the resettlement site at Savda Ghevra. She is also driving the Crosscutting Agra Program that includes the Heritage Trail, a youth project, slum upgrading and a sanitation plan.

Other projects include the national programme for Urban Basic Services for the Poor, Citywide Slum Upgrading Project in Bhubaneswar in Orissa State, the Water Kiosk Project in Delhi supported by *The Energy Resource Institute* (TERI) and a *Primary Education Enhancement Project* (PEEP) at NIUA supported by AusAID and UNICEF.

Under her leadership CURE has undertaken research on the Economics of Resettlement of Urban Poor Communities supported by the *South Asia Network of Economic Institutes*, a *National Urbanisation Strategy for Bhutan* and the *Kolkata Urban Services Project*. In Kolkata she was social consultant to the Health Improvement Project and the Environmental Improvement Project.

Renu Khosla was a member of the Tenth Plan Committee on Urban Poverty and the Livelihood Committee of the American India Foundation.

She has been Associate Professor and Coordinator of Urban Policy at NIUA and Deputy Director and Unit Head (Preschool Education) of the National Institute of Public Cooperation and Child Development.

NANDITA GUPTA

Nandita Gupta is a Project Officer at CURE. She is currently finishing her Professional Certificate in Urban Planning at CEPT University in Ahmedabad. She has an MA in Development Studies from the Institute of Development Studies in Sussex, UK and a BA in Sociology from Delhi University where she was the Gold Medallist.

She has been with CURE since 2008. She was previously an Intern at the National Human Rights Commission in India.

Nandita Gupta is closely involved in the Savda Ghevra project in New Delhi.

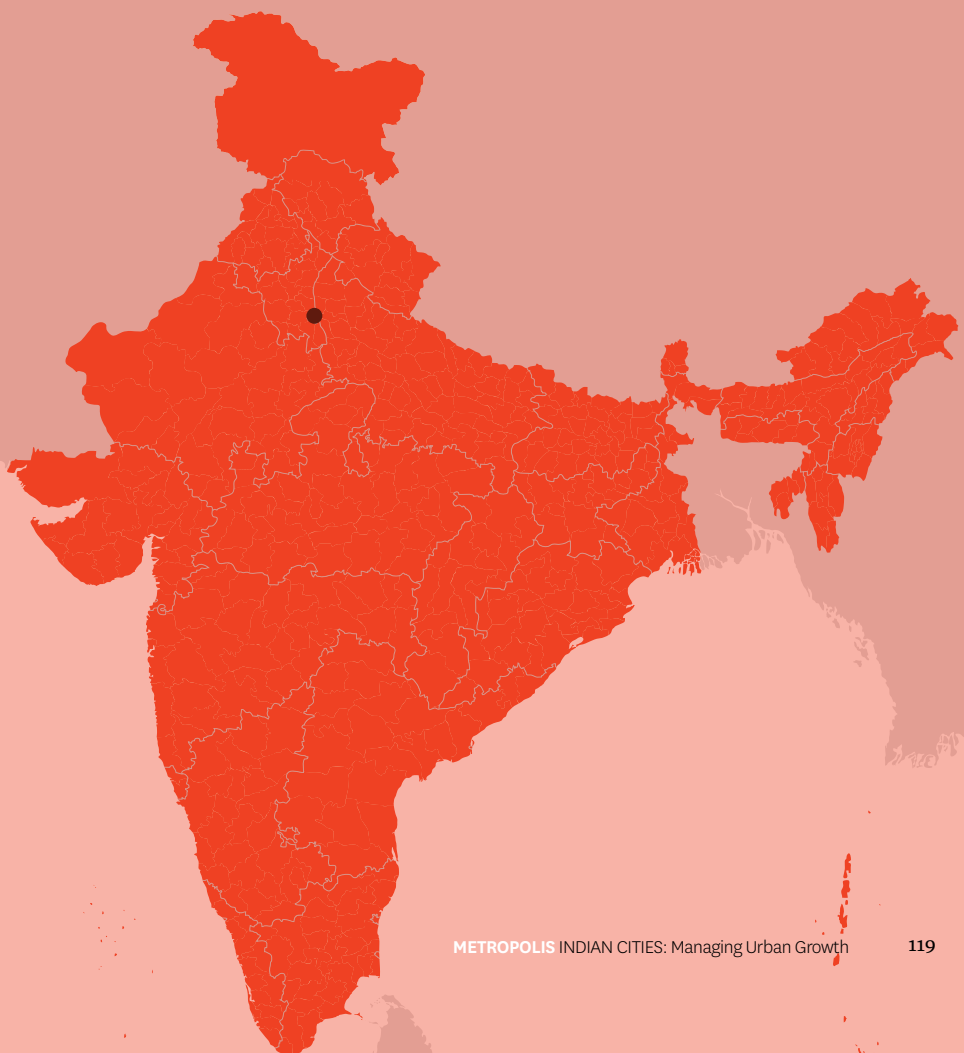
www.cureindia.org

9

Strategic Interventions In City Planning

NEW DELHI

Anupam Yog



Strategic Interventions In City Planning.

While most of the people driving urban change in this book are hands–on activists working on real projects, Anupam Yog represents a different approach. He is filled with ideas and visions and many of these come from outside the box. He has established a company called Mirabilis Advisory that advises governments on competitive positioning, economic development programmes and marketing strategies. He defines the company as a consultancy that works in the areas of Globalisation, Entrepreneurship and Urbanisation.

Mirabilis recently completed a study titled *The Alternative Urban Futures Report* on India's urbanisation for the World Wide Fund for Nature (WWF India). To conduct their investigations, and in a departure from the typical research approach, the Mirabilis team established an *Urban Habitats Forum*, where they convened a wide range of multi–disciplinary experts to have a series of conversations (symposia, roundtables and seminars) to uncover creative solutions to seemingly unsurmountable challenges posed by India's urbanisation.

The Urban Habitats Forum also hosted the First Habitat Summit (www.habitatsummit.org) in Delhi in 2009 with the theme "Alternative Urban Futures for India". The Summit included a keynote by Arun Maira, a member of the Planning Commission, Government of India, and a prolific speaker on India's urbanisation.

It is from this creative, brainstorming background that Mirabilis' input into urban India has led to a range of new ideas and lateral concepts. The focus is very much on 'urban software' as catalysts to rethink existing systems.

The approach is summarised in the *Alternative Urban Futures Report* under the heading, 'Strategic Interventions versus Master Planning'. Here, the story of Delhi's master planning is laid out and compared to the cities actual development in unpredictable ways.

The flaw with traditional master planning, the Report believes, is that it cannot deal with the organic evolution of a living and vibrant city. It is ultimately strategic interventions like the Delhi Metro that cut through the 'intractable gridlocks in the urban eco–system'. The Report concludes: *It is very difficult to maintain a master plan in the best of times but in a rapidly evolving urban environment it is near impossible and probably counter–productive. This does not mean that India abandons all effort to guide its future urban trajectory. Instead, it may be easier to identify simple design paradigms that encapsulate the overall strategy and then implement them through strategic interventions that have multiplier effects.*

It is within this philosophy that Anupam Yog has become involved in two projects that, as potential strategic interventions, could have multiplier effects. Mirabilis is involved in both projects through research support and marketing, actively promoting them at conferences, in publications and media.

One project is about finding new uses for an under used railway track that encircles Delhi. The other is to rescue Delhi's historic network of stinking drain ways (Nullahs) by turning them into an environmental and social asset. Both projects are big visionary ideas about revitalising existing infrastructure in the city, and both will take a lot of advocacy to become reality.

MIRABILIS MATRIX

Anupam Yog and his Mirabilis team put together their own exhibit for the Habitat Summit in the form of a matrix that set an analytical framework for urban thinking. The matrix is structured around three horizontals of Liveability, Economic Competitivity and Environmental Footprint and three verticals of Hardware, Software and Governance. The rationale is that most urban thinking in India is only about hardware: the buildings, roads and physical form of the city. The matrix reinforces the importance of software, which includes economic activity and social–cultural interactions. It is the software that relates to the activities of people and how they interact with cities. The area of governance is also seen as important by Mirabilis. There is concern that the layers of national, state and local governance are not giving the best outcomes for cities.

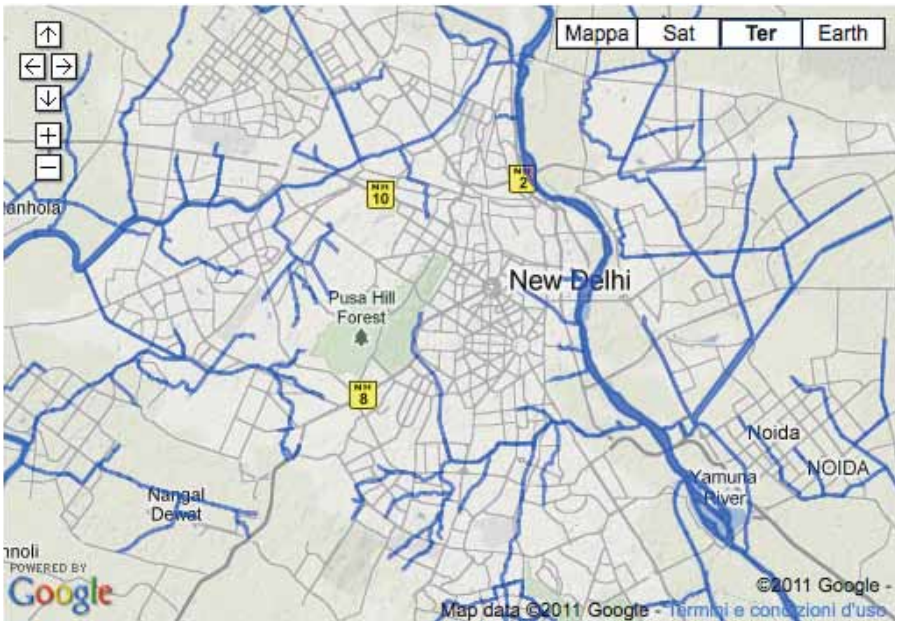
	HARDWARE	SOFTWARE	GOVERNANCE
LIVEABILITY	*Good quality housing and amenities like parks, hospitals, clubs and schools.*	*Social networks and interactions, clustering of amenities to create 'urban buzz', a sense of place and history*	*Safety and enforcement of Law Simple and well enforced system of municipal legislation*
ECONOMIC COMPETITIVITY	*Transport and communication links. Quality of office/ commercial space.*	*Clustering of human capital and ability to attract talent, socio–cultural openness*	*Reasonable tax rates, efficient governance structures*
ENVIRONMENTAL FOOTPRINT	*Public transport, density, green spaces, waste management.*	*Environmental conservation consciousness, low impact lifestyles*	*Air and water quality. Sustainable practices with regards to water supply and use*

DELHI NULLAHS

One of the strategic interventions that Anupam Yog is backing is the revival of Delhi's ancient drainage network called 'nullahs'. This is an elaborate 350 km network of open drains, built 700 years ago, to carry storm water into the River Yamuna, and serve as ground water recharging bodies. The 'nullahs' are currently used as drains to dispose garbage, and are a health hazard. The catalytic idea is to transform the open drainage system into a useable transportation and recreational network. The key driver of the 'Delhi Nullahs' project is Manit Rastogi, Founder and Managing Director of architectural firm, Morphogenesis.

Most proposals made for the 'nullahs' are to simply cover the drains. In fact, several drains were covered for the Commonwealth Games held in New Delhi in 2010 and used for parking. However there are several examples around the world where covered drains have been restored. A well–known example is in Seoul, Korea. In the 1970's, the degraded Cheonggyecheon river was covered up to make an expressway. Years later, in a major effort in urban renewal by President Lee Myung–ba, the expressway was removed and replaced by a landscaped canal that now functions as a clean lung for the city.

The Delhi Nullahs project, as conceived by Manit Rastogi, has been visioned in several phases to deal with the large scope of the project. The first phase consists of a detailed feasibility report to map the 'nullah' network in the city. The second phase of the project deals with cleaning the nullahs of garbage and treating the waste that flows



Map of the Delhi Nullah system.

The drains of Delhi are often in a state of disrepair even next to historic monuments. These can be cleaned up and quality walking tracks provided.

into them at source with micro sewage treatment plants (STP's). New technologies will be used to clean the Nullahs from their current unhygienic condition. The next phase of the project is transforming the 350 km system into a transport network with cycling and walking pathways.

Early design concepts were presented at the Habitat Summit and are displayed on the Delhi Nullah website, *www.delhinullahs.org*. A major planting program of native plants has also been envisioned to slow down surface run–off and to allow storm-water to filter into the ground recharging the water table.

The project website is an exciting display with an interactive map showing in bright blue the network of drains across the city. The viewer can zoom in to key drains and click from satellite maps to terrestrial maps and even to Google Earth. A photo gallery displays before and after images of degraded Nullahs restored to beautiful green places used by the local community.

A slide display demonstrates graphically how the new network would provide an alternative to Delhi's increasingly dangerous roads and how the city's water table is being driven deeper. A restored system of interconnected Nullahs would become green walkable arteries spanning the whole city to function as last–mile connectors. The website also surveys the degree of support for concreting over the drains, with 79% of respondents rejecting the idea.

The project now needs some champions in government and funds to make this important strategic intervention become a reality.

DELHI NULLAHS: AN OPPORTUNITY FOR A SUSTAINABLE BLUEPRINT FOR THE CITY

www.morphogenesis.org

The aim of this initiative is to present the hidden opportunity that lies within Delhi by establishing a green and sustainable network through the city.

The Proposal: To use Delhi's neglected *Nullah* network to fundamentally transform the city. Delhi has 18 main *nullahs* with over 15,000 branches, which were constructed seven centuries ago by the Tughlaq dynasty. The *nullah* network is 350km long, contiguous and criss–crosses the national capital. Currently, the *nullahs* are just unhygienic drains that are seen as a problem by the citizens of Delhi—they smell, breed mosquitoes, pollute the Yamuna and so on. However, a relatively small investment can turn the *nullahs* into a valuable asset for the common citizen. The necessary changes are:

1. *Alternative Transport Network:* Create walking/cycling paths on these *nullahs* to provide commuters with last mile connectivity to public transport (buses and metro). This will significantly improve the effectiveness of the existing public transport. Furthermore, people will be able to walk/cycle for short distances (and it will be an enjoyable experience). Since the *nullah* network is 350km long—this would be a very important contribution to the lives of the common citizens.

2. *Alternative Environmental Network:* Use a system of organic reedbeds and aerators to clean the sewage entering the *nullahs*. This is a well established system and it is both environment–friendly and cheap. This will dramatically improve public health in the city as well as help replenish aquifers. This will also reduce the need to spend large sums on building sewage plants at the Yamuna.

3. *Alternative Cultural Network:* The new network could be used to trigger a number of new urban activities ranging from tourism to sports. For instance, some of the *nullahs* are 700 years old and were built to provide water to Delhi's old cities. Thus, many of the city's famous archaeological sites are situated on the *nullah* network. Most major cultural venues in the city can be interconnected through this network, including Commonwealth Games venues, historical monuments, museums, theatres, stadiums, etc. We could use the new walking network to drive next generation tourism.

The initiative aims to reuse the neglected water drainage system of Delhi; the 'nullahs' to progressively bring about a strategic and sustainable change within the city. These *nullahs* can be transformed to enhance the social, cultural and transport (pedestrian and cycling) networks of Delhi as well as to restore the River Yamuna. Water and green being natural attractors; the condition would be set to weave an eco–sustainable system in the city through this network.

DELHI RING RAIL

Anupam Yog has helped create opportunities for taking this rail–to–trail project from the drawing board to the public domain. He helped the Ring Rail Project, conceived by Madhav Raman of Anagram Architects, find support within government (Ministry of Urban Development of India) and community (National Association of Street Vendors of India).

The Ring Rail is an under used circular rail corridor New Delhi on which a passenger service was conceived for the 1982 Asian Games. Like the Delhi Nullahs project, the Ring Rail was exhibited at the Habitat Summit with a series of display panels with the title 'Changing Tracks'.

The exhibition text explains: In the mid 1970's, work began on laying a rail line that would circumscribe the extent of Delhi. Originally called the 'Delhi Avoiding Line', it was meant to decongest the existing interstate lines between Hazrat Nizamuddin Station (HZN) and Sarai Rohilla Station (DEE) so this zone could more effectively serve passenger trains by using this line to limit goods traffic.

The idea was to connect HZN and DEE stations with the newly settled residential colonies of West Delhi and the vast central government housing areas of South Delhi. The Northern Railways then introduced the Ring Rail Sewa as an augmentation of the existing public transport network of DTC buses in time for the Asian Games. The manner in which the city has grown subsequently, the development of other transport networks and numerous systemic issues have left this urban transport system grossly under utilised. In fact, the

Delhi's Ring Rail passes through a rich variety of precincts including residential, industrial, commercial, institutional, heritage and parklands

Delhi's under used Ring Rail could be turned into a vibrant people place with markets and bicycle paths.

city has slowly turned its back on the Ring Rail and it has become a forgotten asset that is hidden from view except for an occasional glimpse from an overpass.

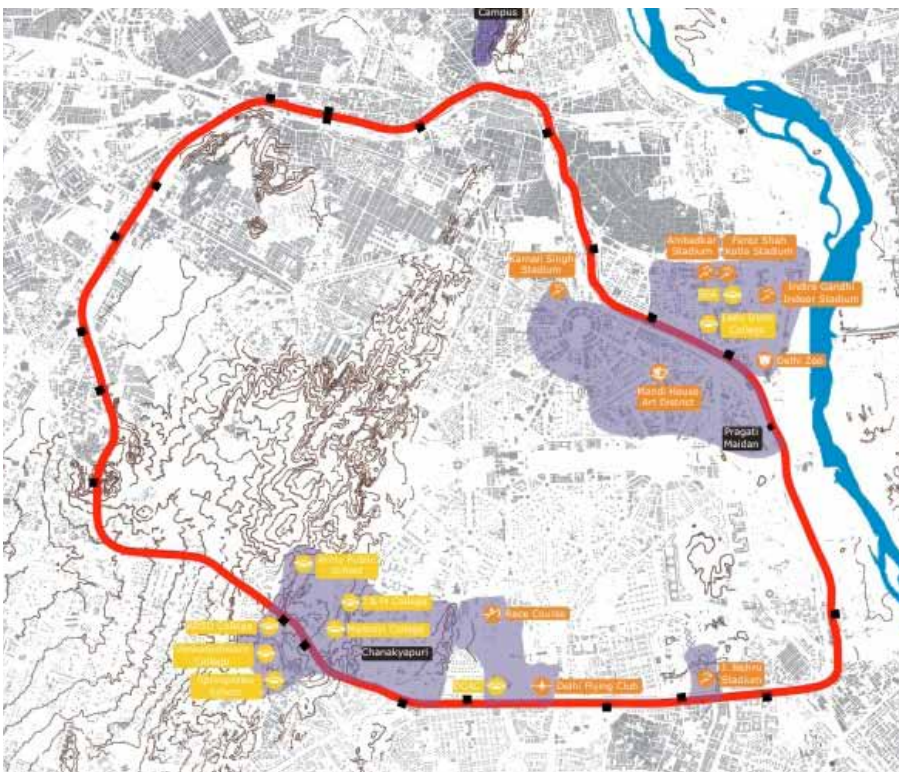
The exhibition proposed a reworking of the Ring Rail corridor to suspend the passenger service, re purpose it for bicycles and walkers, a place for markets and hawkers and a place for greenery. The proposal essentially gives the under utilised land back to the people living in the area, making it environmentally and socially useful.

The Ring Rail is 35.2 km long but only 20 per cent of its capacity is utilised. Unfortunately, the line does not connect with any other transport network. In Tokyo, by contrast, the 34.5 km–long Yamanote Circle Line has 29 stations and 27 of these connect with other transport networks.

There are a number of precedents for rail systems that have become redundant and then turned back to the community. For example, the Bristol and Bath Railway path is a 24 km–long route that is now a bicycle track, and the High Line in New York is a spectacular conversion of a disused elevated railway into a network of parks and walkways.

Delhi's Ring Rail passes through a rich variety of precincts including residential, industrial, commercial, institutional, heritage and parklands. Each precinct could develop its own special character relating to the surrounding area. The project aims to take the relatively quiet space hidden from the chaos of the roads and make it a useful environmental and social asset.

Some areas along the former Ring Rail could be for informal markets, some

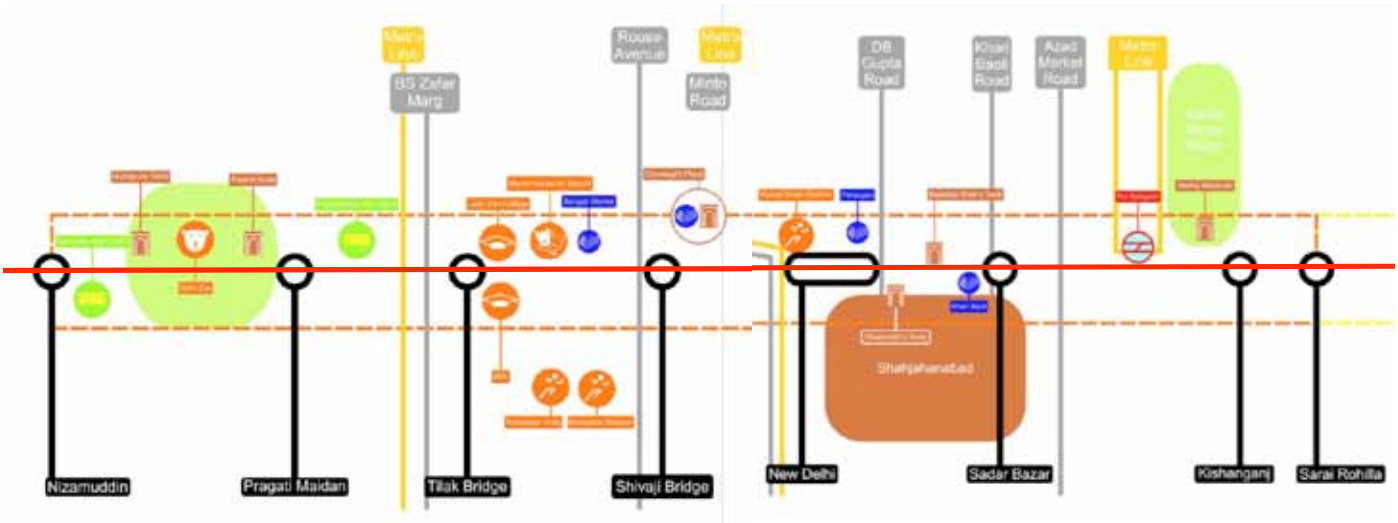


The Ring Rail system surrounds New Delhi and is vastly under used. It could be made into an asset for the community.

for entertainment, some zones would suit urban sports and some relate to the natural environment. New forests could be planted and an eco–sensitive culture developed. Some areas near Delhi Zoo would be ideal for bird watching. Compared to the current occasional train rumbling along the line, this rich combination of community uses could become a very positive symbol to Delhi's urban population.

NEW DELHI	
Population	15,926,000
Metropolitan Region	5,410,000
Urban Density	9,294 /km²

New Delhi is the capital city of India. It serves as the centre of the Government of India and the Government of the National Capital Territory of Delhi. New Delhi is situated within the metropolis of Delhi and is one of the fastest growing cities in the world. It is one of the nine districts of Delhi Union Territory. The total area of the city is 42.7km². The foundation of the city was laid on 15 December 1911. It was planned by two leading 20th century British architects Sir Edwin Lutyens and Sir Herbert Baker. The city was inaugurated on 13 February 1931, by British India's Governor–General Lord Irwin. New Delhi is known for its wide, tree–lined boulevards and is home to numerous national institutions and landmarks.



Diagrams by Anagram Architects of how the Ring Rail could activate areas along its path if it was rethought.

ANUPAM YOG

Anupam Yog is a graduate of Delhi University. In 2000–2001, he was India Chapter President of AIESEC, the world's largest student organisation.

He was the lead strategy consultant with the India Brand Equity Foundation (IBEF), a public private partnership between India's Ministry of Commerce and Industry and the Confederation of Indian Industry.

At IBEF Anupam Yog developed a number of positioning strategies for Brand India including 'Fastest Growing Free Market Democracy'.

He led the development of the India Resource Centre, an online platform for global investors and international media to access information on the Indian economy.

He managed international marketing campaigns for India including the '1st India–ASEAN Car Rally' and 'India Everywhere' at the World Economic Forum, Davos.

He is Founder of Mirabilis Advisory, an international economic development consultancy that has worked on projects for the Mayor of London, Volvo Ocean Race and the Bay Area Council Economic Institute (USA).

Mirabilis has produced the publication "Alternative Urban Futures for India" for the World Wildlife Fund for Nature (WWF India). Anupam was the key organiser of the First Habitat Summit in September 2009 in Delhi.

www.habitatsummit.org

www.mirabilisadvisory.com

www.delhinullahs.org

MANIT RASTOGI

Manit Rastogi is Managing Director of Morphogensis since 1996.

He graduated from the Architectural Association,London with Distinction in Energy and Environmental Studies.

Manit Rastogi is a founding member of the Association for Development and Research of Sustainable Habitats, New Delhi.

Morphogensis is an architectural laboratory looking to expand the boundaries of architecture and environmental design.

www.morphogenesis.org

www.delhinullahs.org

MADHAV RAMAN

Madhav Raman founded Anagram Architects with Vaibhav Dimri in 2001 in New Delhi.

He graduated from the School of Planning and Architecture, Delhi in 2001.

Anagram is a practice based on a philosophy of holistic sustainability.

Anagram is also involved in design for film, television, theatre, installation art and planning.

www.anagramarchitects.com

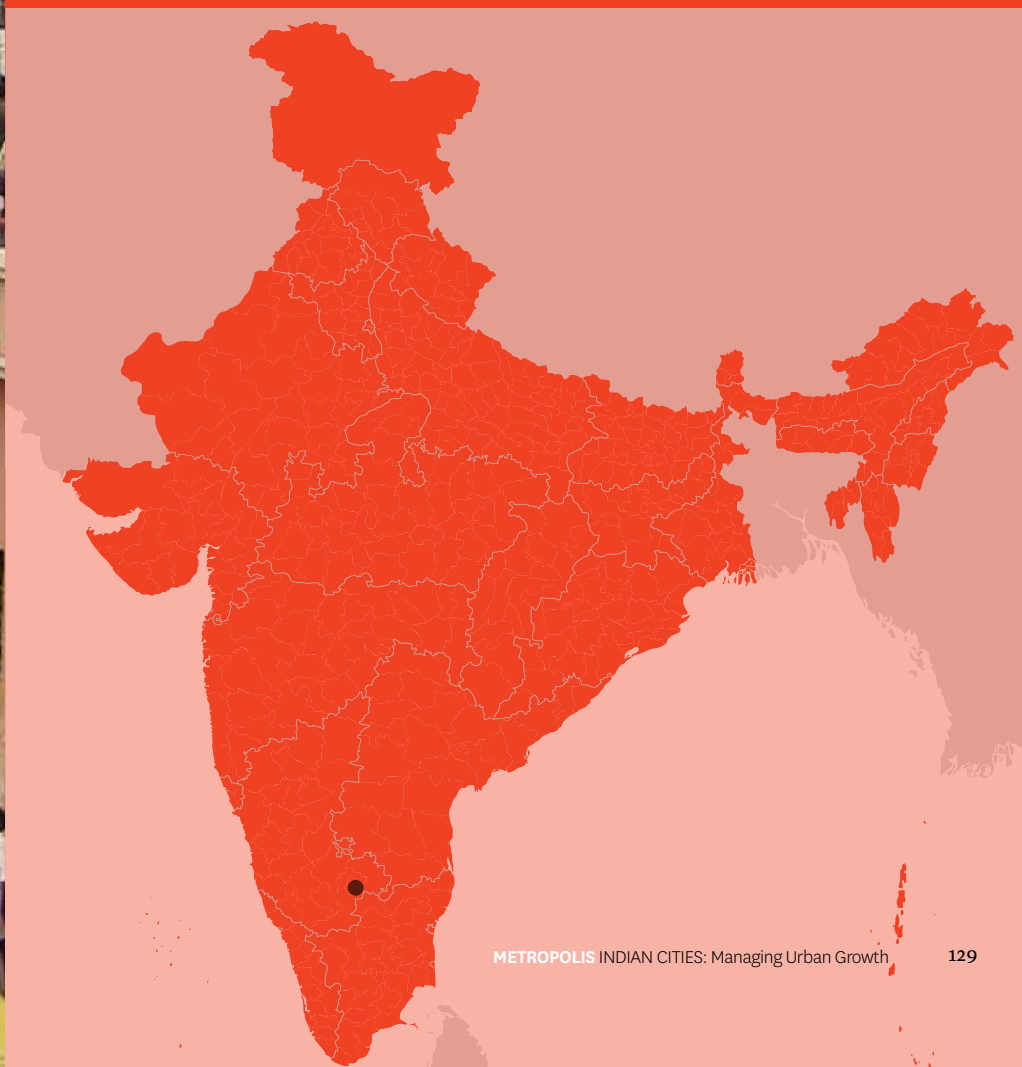

SAHMAN LODGE
RESIDENCY LODGE

10

Transport Information Systems

BANGALORE

Ashwin Mahesh



Transport Information Systems.

Ashwin Mahesh is the co–founder of Mapunity Information Systems which develops and uses technologies for tackling social problems. One of the most interesting and advanced programs is the Bangalore Transport Information System (www.btis.in). The BTIS website connects viewers to real time Bangalore. Three key headings list the array of applications available.

INFORMATION
Traffic, directions, buses, fines, RTO, public offices, safety, parking.

PARTICIPATE
Start carpool, feedback, submit your traffic idea.

MOBILE
BTIS on mobile, download application, 3G phase.

Further headings then list FIND PLACES, TRAFFIC, BUSES, CARPOOL. These are the entry points for Bangalore's citizens to access information on the transport system from their mobile phone. These systems are all about developing citizen–centric governance. By clicking onto 'Live Traffic' a map of the city appears with many green, orange and red dots on various roads. The red indicates a delay, orange indicates slow traffic and green smooth traffic. As one zooms into a more detailed map, the orange and red turn into strips of colour along the affected road indicating exactly where the delay or the slow traffic is thus encouraging drivers to avoid this area.

It is also possible to access online any one of a large number of live cameras to get a view of the current action. But the BTIS system goes further. It has a directions component where one can type in starting and destination points to get a clear route on the city map. Similarly, the Bus Search button allows one to type in start and finish points to obtain the best bus route to catch. Another button is the 'Car Pool' to find a partner to travel a certain route. To join the pool one must enter a mobile number to make contact with potential companions who want to share their car.

The system also gathers an enormous amount of data which enables the transport authorities to fine–tune the whole system. This has led to a restructuring of the Bangalore bus system to add a direction based system rather than a destination based approach. Now 12 direction–based bus routes ply roads in particular directions. These buses have different logos from the normal bus system announcing themselves as BIG 10. There are green BIG 10 buses that run on a single main road and blue BIG 10 buses that connect across a number of main road systems. To complement the radial movement of the BIG 10 buses the BIG CIRCLE buses travel round a number of ring roads.

Mapunity develops technology to tackle social problems and development challenges.

Mapunity has used their technology to build a bus route query system and tracking tools for these special bus services. Through cell phones and SIM cards on the buses their actual location can be mapped in real time. The Mapunity team also developed the branding and graphics for the new buses. For car drivers another button on the BTIS map gives updates every five minutes on the capacity of carparks across the city.

While being mainly focussed on the public the BTIS can also be used by government including the cities police. They can record fines online and drivers can enter their vehicle number in the fines section to check whether they have any pending fines. This can even be done from the driver's mobile phone particularly after receiving an SMS message that a fine has been issued. The driver can also challenge the fine online.

The accumulation of so much data has enabled hot spots to be determined so that the Greater Bangalore Municipal Corporation can undertake improvement works. There is even an area where drivers can submit their own traffic. The Bangalore Municipal Transport Corporation (BMTC) found that 204 people complained on line about incorrect ticketing on the buses. The BMTC has now developed a '*Correct Ticket/ Collect Ticket*' campaign and developed an online form for passengers and BMTC staff to report observations and complaints.

The benefits of integrating web based GIS with Telecom onto mobile phones is of great value to cities. With GPS access now being available on mobile phones, which are surprisingly cheap in India, many new opportunities are opening up. Mapunity sees its role as ... '*Mapunity develops technology to tackle social problems and development challenges. Our GIS, MIS and mobile technologies are used mostly by government departments and civil society organisations and in the R&D iniatives of commercial ventures.*'

As well as in Bangalore, their Urban Transport Information System is now being used in Ahmedabad, Delhi, Mumbai and 13 other Indian cities.

The Bangalore Transport Information System enables the tracking of bus movements and traffic delays. Live cameras at critical junctions enable commuters to assess traffic conditions.

BANGALORE

Population	5,438,065
Urban Density	7,665/km²

Bangalore also known as Bengaluru is the capital of the Indian state of Karnataka. Bangalore is nicknamed the Garden City and was once called a pensioner's paradise. Bangalore is India's third most populous city and fifth–most populous urban agglomeration. In 2009, Bangalore was added to the list of global cities and ranked as a 'Beta World City' alongside cities such as Dallas, Miami, Boston, Kuwait City, Lima, Munich, in studies by the Globalization and World Cities Study Group and Network in 2008. (GaWC)

Mapunity has developed a City Management System to help administrators build competitive cities. A single platform brings together the fields of transport, public safety, emergency services, environment and economic development. The platform will also help make democracy more open with the ability of elected leaders to engage with their constituents on issues. A new component is being developed for spatial and temporal simulation to help city planners forecast and manage the growth of urban areas.

While the detailed implementation of projects using technology is the aim of Mapunity, conceptual frameworks support the individual projects.

The challenges for urban transport information systems are:

Network Problems

Modelling and analytical challenges.

Millions of Small Decisions

Demands optimisation of supply and real-time delivery options.

Supply-Side Limitations

Needs emphasis on land-use planning, different modes of travel, prices, and response mechanisms.

To help solve these challenges three kinds of infrastructure are needed:

Information Infrastructure

City-wide systems for collecting live traffic information.

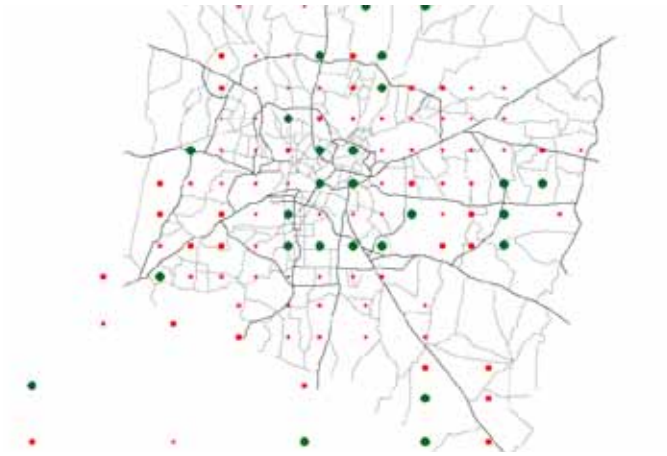
Response Infrastructure

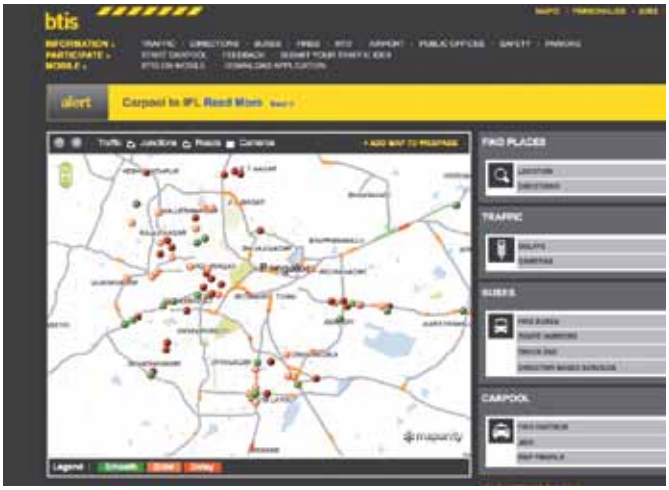
Physical as well as technological answers to the problem, with seamless connectivity between 'knowledge of problem' and 'decision on how to respond to the problem'.

Communication Infrastructure

Letting millions of people know what decisions are being taken by administrators and field personnel, so that they can plan their travel accordingly (because people make their own choices in real-time). Bangalore, as one of India's IT hubs, is an appropriate place for Mapunity to come from. It is being incubated at the International Institute of Information Technology, Bangalore, and its impact is spreading across India.

A single platform brings together the fields of transport, public safety, emergency services, environment and economic development.





ASHWIN MAHESH

Ashwin Mahesh is co–founder of India Together, an online public interest portal

www.Indiatogether.org

He is a researcher at the International Institute of Information Technology, Bangalore.

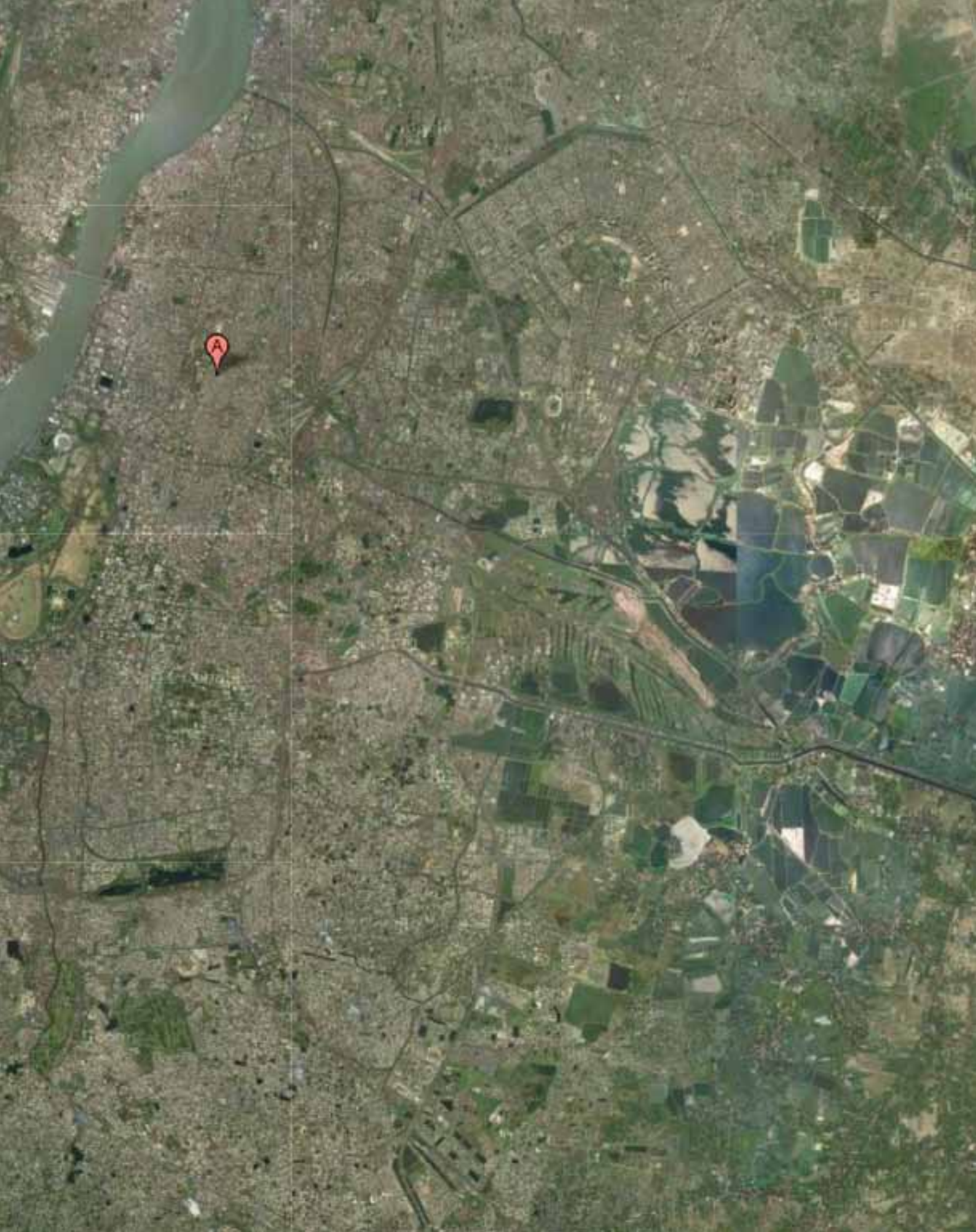
He is a director of Mapunity where he explores ways in which technology can help meet challenges raised by social and economic problems.

www.mapunity.in

Ashwin is a researcher for the Government of Karnataka.

He spent 10 years as an atmospheric scientist studying clouds and snow in Antarctica and working on satellite– based detection technologies. In his days as an astronomer, Ashwin discovered a star known as the companion of LkHa234. In his early years he attended business school.

www.btis.in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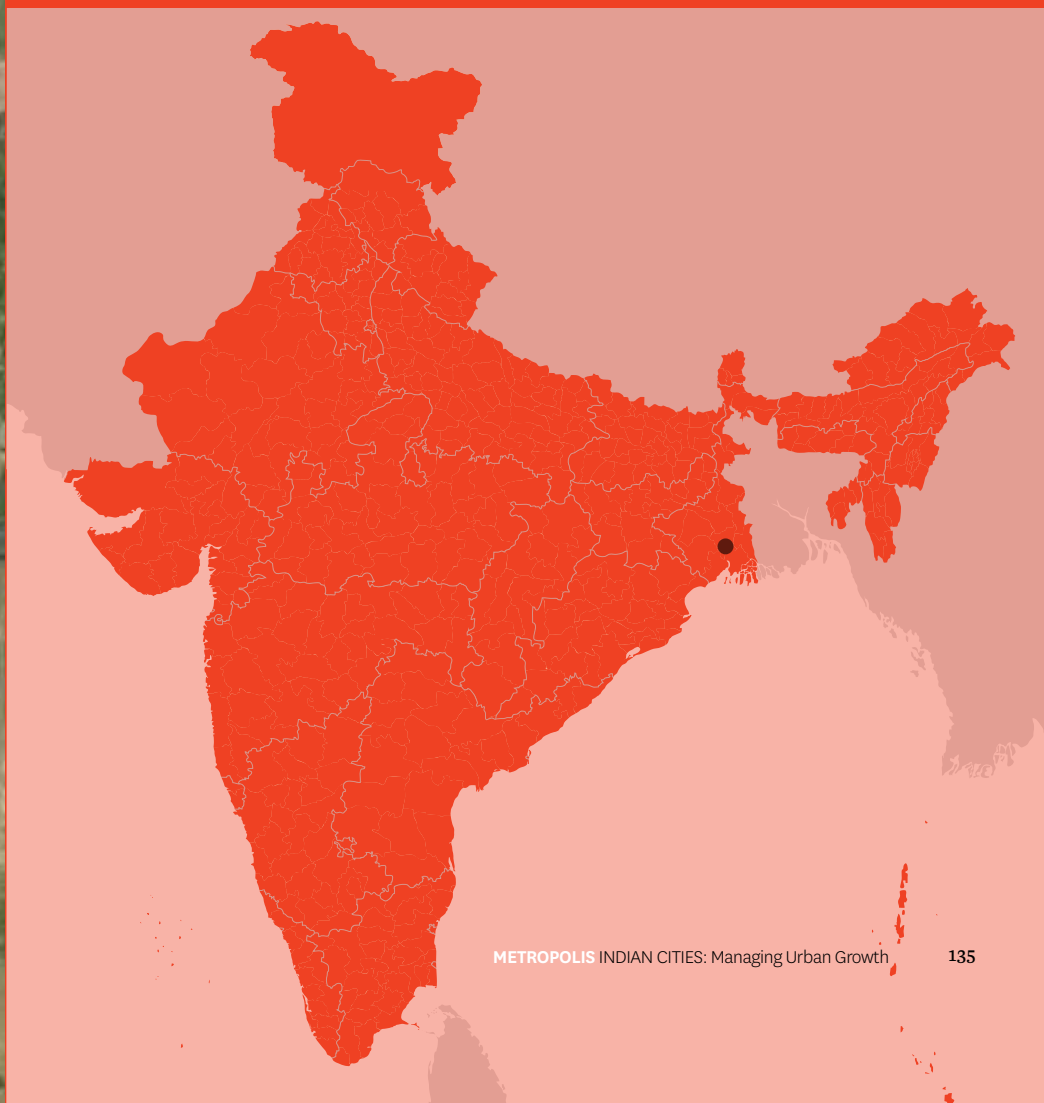
11

Urban Environmental Improvement Project

KOLKATA

Ashwajit Singh



Urban Environmental Improvement Project.

The Asian Development Bank (ADB) and The Department for International Development (DFID), Government of UK provided financial and technical assistance to the Kolkata Municipal Corporation (KMC) in 2000 for the Capacity Building Programme (CBP) for the Kolkata Municipal Corporation. The CBP was aimed at improving the overall efficiency of the KMC ultimately leading to sustainable and equitable provision of urban services in the city. The project titled, the Kolkata Environmental Improvement Project (KEIP), had core objective to institutionalise good urban governance, through increased efficiency and effectiveness over the entire range of KMC's functions.

The objectives were to:

1. Improve the urban environment in outer areas of Kolkata Municipality.

2. Reduce poverty in the low–income areas through affordable access to basic urban services.

3. Facilitate community empowerment through a participatory process.

4. Protect the environment from adverse development impact.

5. Help KMC develop as a proficient and autonomous municipality.

The program ranges across a number of areas including improvements in sewerage and drainage, solid waste management, slums and canals. An important part of this was a resettlement plan to address the displacement of squatters living along the canal banks. By October 2010, 2739 families had been resettled in nearby sites in new apartment buildings. Altogether 3365 new flats were built.

The project has two key drivers. One is about environmental improvement and the other about improving the quality of life in Kolkata. The work is mainly in the outer areas of the city where sewerage and drainage systems are very inadequate with many canals chocked by silt.

A key goal is to better utilise the East Kolkata Wetlands an area of 12,700 hectares of a third of which are ponds that receive settled sewage and wastewater from the city of Kolkata

KOLKATA	
Population	14,787,000
Urban Density	27,462/km²

Kolkata formerly known as Calcutta, is the capital of the Indian state of West Bengal. Kolkata is the commercial capital of Eastern India, located on the east bank of the Hooghly River. The Kolkata metropolitan area, including suburbs, has a population exceeding 15 million,making it the third most populous metropolitan area in India and the 13th most populous urban area in the world. The city is also classified as the eighth largest urban agglomeration in the world. Kolkata served as the capital of India during the British Raj until 1911. The city is noted for its revolutionary history, ranging from the Indian struggle for independence to the leftist and trade union movements. Once the centre of modern education, science, culture and politics in India, Kolkata witnessed economic stagnation in the years following India's independence in 1947. However, since the year 2000, an economic rejuvenation has led to an acceleration in the city's growth. Like other metropolitan cities of India, Kolkata continues to struggle with urbanisation problems like poverty, pollution and traffic congestion.

The program methodology follows a dual approach; to identify priority activities on which consensus has been obtained and initiating processes which are expected to yield results over the life of the *Capacity Building Program* (CBP). Some of the initial activities, inter–alia the Benchmarking Study and the Citizen Survey will also provide inputs to further the CBP. Whilst the program design is aimed to be appropriate for implementation, and has listed specific priority interventions, it has retained adequate flexibility to make it easy to refine or revise, as appropriate. The initiatives proposed under the CBP have been divided in to four broad categories: Governance, Organisational Development and Social Inclusion, Resource Mobilisation and Improved Financial Management, Urban Planning and Improved Environmental Management and Computerisation of KMC.

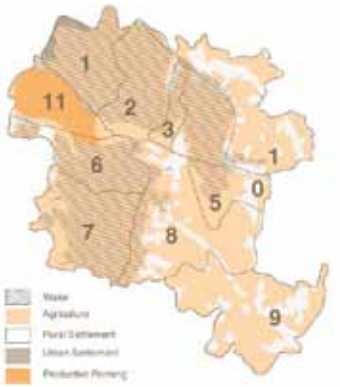
The initial project feasibility report suggested that the *Capacity Building Program* be implemented through the Project Management Unit set up for the KEIP. However, the scope of the CBP is much wider and will directly involve staff from all departments of the KMC. Therefore, a proposition was made to position the CBP under the direct control of the Commissioner of KMC through a Capacity Building Manager (CBM). The recommended CBP Cell included the City Commissioner, the CBM and employees, seconded from key departments in the KMC, to look into the core areas of the programme (IT, finance, social, organisational, training, engineer/planner). A CBP Coordination Committee,comprising of elected representatives and chaired by the Mayor would provide overall guidance to the CBP.

One of the outcomes of the KEIP was to better utilise the East Kolkata Wetlands (EKW) an area of 12,700 hectares of which 4,000 hectares are ponds that receive settled sewage and wastewater from the city of Kolkata. The ponds were established 100 years ago to treat sewage and to support a large freshwater fishery managed by the local community. The process of settled sewage is to convert organic matter into algal material which is the predominant food source for fish.

The Kolkata Environmental Improvement Project will provide a more efficient water management system.

The East Kolkata Wetlands were established a 100 years ago and are a thriving fish farming area that receives treated water from Kolkata's canals.

LAND USE AREA
Water bodies 5,852 ha
Agricultural land 4,960 ha
Garbage farming 603 ha
Rural settlement 1,235 ha
Urban settlement 91.5 ha
Total Area 12,500 ha



Balancing the quality of the settled sewage as it flows into the wetlands with acceptable levels of nutrients in the fish is clearly an important task that requires constant monitoring.

Tests over the past six years have shown that the water quality at the final discharge meets the standards required for inland waters. Around 1,100 million litres a day flow from two sewage pumping stations into the wetlands. Detailed studies have shown that the Biochemical Oxygen Demand (BOD) is well below Indian standards and that the wetlands have a large capacity to treat even more sewage.

Currently 6,000 kg/hectare of fish are produced per annum and this could be safely increased substantially. The quality of sewage that flows into the wetlands is carefully controlled so that high polluting industries do not connect to the system. The wetlands are the largest sewage fed aquaculture in the world. The studies show that the proposed improvements to the Kolkata sewage system can be discharged into the wetlands through the natural treatment of the wastewater by the fisheries system.

The resettlement program required families to be relocated to contribute five percent of the cost with an upper limit of Rs5,000. Families then got 190 square feet of space with basic amenities including water, electricity and internal toilets. The families then had a legal title in the form of a 99 year non resalable lease in the name of the female head of the family. To further assist with the relocation, a shifting allowance of Rs 300 was given to families.

Highly vulnerable people, single mothers, elderly and disabled people were allocated ground floor flats with commercial possibilities. They also have access to land for forestry and vegetable production along the rehabilitated canal banks. Shop owners were also given a priority in the allocation of ground floor flats.

The resettlement process involved NGOs to help facilitate the change and consultants have reviewed the process to measure its effectiveness. Prior to resettlement Canal Resettlement Groups were formed for each resettlement. Each group elected office bearers and Self Help Groups were formed to motivate members. This included training to increase members capacity as self employed skilled workers.

Information centres were established and brochures distributed. At the sites of the new apartments, Building Committees were formed to ensure that the operation and maintenance of the shared assets were properly managed. In the first stage of resettling 1,120 families, 23 Canal Resettlement Groups and 34 Self Help Groups were formed and 27 Information Centres established. Bank accounts were opened

The banks of canals are being upgraded.

for 165 affected families and 35 Building Committees were established.

A monitoring team collected data to measure pre and post relocation situations for families. These situations included livelihood and civic amenities. The previous employment for men was mostly as rickshaw pullers, day labourers or self employed masons. Their incomes ranged from Rs 1,200 to Rs 3,200 per month. The women,generally, worked as domestic help with average monthly incomes of around Rs 600–1,000.

After resettlement, most have continued with similar incomes. There is also the possibility of higher incomes through the sale of products from people who received training and from the potential of industrial jobs in the new neighbourhoods. In the area of civic amenities, access to schools is similar to that before resettlement. Drinking water quality is also similar although some resettled families initially had problems with water overflow from rooftop tanks. Garbage disposal is now on alternate days, whereas this did not exist in the canal settlements leading to pollution in the canals.

The major improvement is that each affected family now has a personal toilet built within their flat, previously not available at the canal settlements which led to pollution of the canals. At the same time that the canal settlements were being relocated, the canals also were being upgraded. Over time, the canals had become polluted and filled with solid waste from the adjacent settlements. Once the settlers were relocated the canal banks were re–excavated, bridges improved and excessive silt and rubbish removed.

Clearly the *Kolkata Environmental*

Kolkata Citizen Centres

The objective of these centres, established in partnership with DFID and Tata Consultancy Services, is to provide multiple services to the citizens of Kolkata under one roof, where they can pay their bills, property tax, license fees and renewal, etc. Establishing these e–Kolkata centres is an important milestone in the ongoing e–governance program that KMC had taken up since 2005. Introduction of bar coded bills had made the bill payment process very simple; it reduced the time taken by the data entry operator without any possibility of errors. The computers at these centres are connected to the KMC Headquarter through KMC–Net, all the data are stored in the central server, hence offering a very high security to citizen's vital and confidential information. These centres have multiple counters, one of the counters being dedicated for issuing Birth and Death Certificates. These centres are also equipped with drinking water facilities, comfortable seating arrangement in air conditioned waiting lounges, large screen LCD television sets, etc. Citizens visiting the centre need to collect a token from an automated machine and wait till his/her token number is displayed at the large electronic display board with a counter number.

SOURCE KOLKOTA MUNICIPAL CORPORATION & TCS

the Kolkata Environmental Improvement Project is a win/win:

a win for the quality of the environment and a win for the quality of life of many slum dwellers

New apartments have been constructed to rehouse the squatters who lived on the banks of the canals.

Improvement Project is a win/win: a win for the quality of the environment and a win for the quality of life of many slum dwellers. It is, however, the scale of the project that is most impressive as it has improved the sewage and waste water management of vast areas of Kolkata while making the world's largest sewage fed aquaculture project even bigger. Another bi–product of the de–silting of many of the cities trunk sewers has been the reduced incidence of flooding. Up to 60 percent of the sewer capacity in the system had been blocked by silt leading to significant flooding particularly in the monsoon season.

The KEIP is also impressive for its approach to monitoring and assessing the project's performance relative to the original objectives. Many external reviews were conducted on water quality, environmental improvements and the success of the resettlement program. A benefits monitoring process was established beginning with a baseline data base. A team of 15 field surveyors were trained in survey techniques and in Participatory Learning Activities to gather detailed pre and post implementation information. Much of this thorough process is required by the Asian Development Bank to ensure effective use of resources.

The Kolkata project is an excellent demonstration of how Indian cities can improve infrastructure and reduce poverty in low–income areas.

ASHWAJIT SINGH

Ashwajit Singh was the Team Leader for the *Kolkata Environmental Improvement Project*—Capacity Building Component—Inception Phase in 2002–2003. He lead a team of 22 consultants.

He has been the Managing Director of Infrastructure Professional Enterprice Ltd since 1998.

He is a qualified Chartered Accountant, and an experienced financial management expert, he possesses a strong track record in urban management, public administration, health systems strengthening, public administration, performance evaluation, policy development and regulation, institutional strengthening and management information systems, etc.

A Development Sector Expert, he is experienced in managing all aspects of project interventions and brings forth effective communication and exceptional leadership style, capable of mentoring a diverse group of multi ethnic professionals and building effective working relationships across geographic and cultural borders.

Working as an international consultant over the years, he has worked extensively across Asia, Middle East and Africa for donors like DFID, World Bank, ADB, ACBF, UN, EC, etc.

At present, he is involved as a Peer Review and Governance expert on four major DFID funded health sector reform programmes in India across West Bengal, Madhya Pradesh, Orissa and Bihar. Besides this, he has also previously provided technical guidance and support to ACBF on key reform areas related to public administration, financial management and resource utilization.

He is involved as a Finance and Governance Expert with the Global Fund to Fight AIDS, Tuberculosis and Malaria for the South West Asia region (India, Sri Lanka, Pakistan, Nepal, Afghanistan, Iran, Maldives, Bhutan and Bangladesh)

Ashwajit Singh has a BCom (Hons) from Delhi University and a Msc Analysis, Design and Management of Information Systems from the London School of Economics.

www.keip.in

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GLOSSARY

ADB
Asian Development Bank

BOT
Build Operate and Transfer (BOT)

BMTC
Bangalore Municipal Traffic Corporation

BSUP
Basic Services for the Urban Poor

BTIS
Bangalore Transport Information System

CBIS
Community Based Information System

CBP
Capacity Building Programme

CCA
Constitution Amendment Act

CFC
Central Finance Commission

CMA
City Management Association

DPC
District Planning Committee

FSI
Floor Space Index

GDP
Gross Domestic Product

GIS
Geographical Information System

GOI
Government of India

IMR
Infant Mortality Rate

JNNURM
Jawaharlal Nehru National Urban Renewal Mission

MCA
Mega Cities Association

MDG
Millennium Development Goals

MMR
Maternity Morality Rate

MPC
Metropolitan Planning Committee

NSS
National Sample Survey

PEARL
Peer Exchange and Reflective Learning

PEEP
Primary Education Enhancement Program

PPP
Public Private Partnership

RAY
Rajiv Awas Yojana

SFC
State Finance Commission

SWM
Solid Waste Management

TDR
Transfer of Development Rights

TERI
The Energy Resource Institute

ULB
Urban Local Body

UMC
Urban Management Centre

UN-HABITAT
United Nations Human Settlements Program

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metropolis

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