Large-Scale Urban Development in India - Past and Present

Sagar S. Gandhi

CRGP | **Collaboratory for Research on Global Projects**

The Collaboratory for Research on Global Projects at Stanford University is a multidisciplinary center that supports research, education and industry outreach to improve the sustainability of large infrastructure investment projects that involve participants from multiple institutional backgrounds. Its studies have examined public-private partnerships, infrastructure investment funds, stakeholder mapping and engagement strategies, comparative forms of project governance, and social, political, and institutional risk management.

The Collaboratory, established in September 2002, also supports a global network of scholars and practitioners—based on five continents—with expertise in a broad range of academic disciplines and in the power, transportation, water, telecommunications and natural resource sectors.

Collaboratory for Research on Global Projects
Yang & Yamazaki Energy & Environment (Y2E2) Bldg
473 Via Ortega, Suite 242
Stanford, CA 94305-4020

http://crgp.stanford.edu

About the Author

Sagar Gandhi[1] is a Building Information Modeling expert working with DPR Construction Inc. He is interested in implementation of BIM tools in practice for large scale developments. He has an experience in Indian Construction industry for past 5 years and has been a successful partner at Gandhi Construction. He worked closely with Dr. Orr on understanding the urban development in India. Mr. Gandhi holds a Masters in Construction Engineering and Management from Stanford University and B.E. in Civil Engineering from Maharashtra Institute of Technology, Pune University..

---

[1] gandhisagars@gmail.com

Index

Abstract

The research study provides a retrospective analysis of the success and failure of the historically developed cities of Bangalore and Chandigarh. It further investigates the upcoming urban developments like Sahara's Aamby Valley (Lonavala), Sabeer Bhatia's Nanocity (Panchkula), Reliance's SEZ (Navi Mumbai) and Lavasa Corporation's Lavasa city (Pune). The research emphasizes the financial and infrastructural aspects of these emerging developments in the context of the existing historical city structures.

In sum, the findings of this research are intended to be helpful for understanding how new developments are being positioned relative to one another. The study presents the various causes of distress/failure of cities and provides recommendations to avoid these pitfalls in the future.

Introduction

The urban population of India is growing at a much faster rate than the overall rate of population growth. Many people are moving to cities because of the available opportunities and the availability of infrastructure facilities. The economic growth of India has also brought in foreign investments and hence is increasing opportunities for locals. However, infrastructure facilities are way behind and a bottleneck to this rapid growth and consequently there has been an infrastructure crunch in many big cities in India. The public and private sector together are taking measures to avoid the failing of big cities. Along with the rebuilding of the old cities the public and private sector are developing new cities across India. Some of these cities are being planned on the Special Economic Zone (SEZ) model, essentially creating a "country within a country" by buffering the new SEZ-contained city from the old bureaucratic institutions. This research study identifies the success parameters learnt from old developments in order that they can be applied to the new developments. This was a desk study to analyze and understand urbanization in India. The paper contains four primary sections: background of urbanization in India, historical large-scale developments, modern developments and cross-case analysis.

Background of urbanization in India

The urban population of India stands at 300 million which is approximately a third of the total population. The urban population in India has increased by 5 times as compared to the population growth of 2.5 times during last 5 decades. It is estimated that about 410 million Indians will be living in the cities by 2011 and 800 million by 2045.[1] The number of metropolitan areas in India grew from 5 in 1951 to 23 in 1991 and is estimated to grow to 52 by 2011.[2] The infrastructure in the metros of India is under sever stress and will crumble in a few years if there are no suitable measures taken. Pollution is increasing; transportation systems are in disorder; water and sewage systems are decrepit and failing.

Urbanization is a concept that emerged in the twentieth century. Only two cities, Rome and London, were populated with more than 1 million people prior to 1800 BC. Only two percent of the total population were urbanised in 18th century which increased to fifteen percent in 19th century and to forty nine percent in 20th century. India has yet to join the urban century, as India is still a mosaic of 500,000 villages[3] with sixty percent of the population dependent on agriculture. Fewer than 30 percent of Indians are presently urbanized.[4]

Social Conditions:[5]
Urbanization is both a resultant condition and a determinant of economic growth. Yet urbanization in India has progressed at a far slower rate than the economic growth rate generally. India has severe problems in both management and financing of cities. The service industry, IT industry and manufacturing industry were leading reasons to the economic growth. The reasons for slow urban development include policy biases against: replacement of labor with industrialization, location of industries in urban areas, and urban concentrations. Other reasons for slow growth in urban areas are as follows:

Inadequate Increase in Rural Productivity: India's major population is residing in rural areas with low income. A relation between urbanization and per capita income is developed by researchers.[6] The low productivity in agriculture except in some regions is restricting the flow of agricultural labor in rural areas.

Inappropriate Technology Choice in Industry: Selection of appropriate technology and product could be another reason for less rural population attracted to the industries. The tariff structure favored more towards generating capital intensive industries, which were corrected after the tariff reforms in 1990's.

Labour Legislation and Small Industries Reservations: On comparing the development rate and urbanization rate with other countries, India's lack of growth may be explained

---

[1] "Urban Crisis in India" – P. G. Dhar Chakrabarti
[2] Singh and Steinberg 1996
[3] "A tale of two Indias" – The Guardian, http://www.guardian.co.uk/india/story/0,,1746948,00.html
[4] "Asia's Urban Century: Emerging Trends" – by Rakesh Mohan
[5] "Urban Development in India in the 21st Century: Policies for Accelerating Urban Growth" – Rakesh Mohan and Shubhagato Dasgupta (Oct 2004)
[6] Studies in Indian Urban development – Edwin S. Mills and Charles Becker and National Urbanization Policy in Developing Countries – Bertrand Renaud

by slow growth in manufacturing as well as labor rigidity and policies on expansion of small scale industries.[14]

Location Restrictions on Industries: Another government policy restraining urbanization was the policy barring industries from urban areas, which was not removed until the industrial policy reform of 1991. The industries didn't expand in rural areas because of the lack of infrastructure facilities and skilled laborers. So the policy affected both the industrial expansion as well as urbanization. Another factor slowing down both industries and urbanization was the additional cost on the emerging industries by perverse industrial location policies.

Urban Infrastructure Investment: The high cost in moving to urban areas with poor infrastructure facilities like water and sanitation facilities, lack of affordable urban transport, and expensive land development could have been another possible reason for slow urbanization.[7]

Rigidities in Urban Land Policy: The urban land cost grew high because of the policy introduced in mid-1970's Urban Land Ceiling Act. The act made it difficult for people to change the use of land, reducing the availability of land and increasing the prices in urban areas.

To summarize, many policies formed by the government in the 1970's led to slow urbanization even during a period of rapid economic growth.

Emerging Markets

India is one of the fastest growing economies in the world, and it entered the 21st century with an urban population of about 300 million, which will further increase to over 400 million by the year 2011 and 553 million by the year 2021.[8] The rate of growth of the country has increased from 5.4% in the 1980s, to around 7–8% in last three years. As a result of steady growth, poverty fell to 26.1% in 1999–2000, from 36% in 1993–1994.[9]

Industrial and service sectors are the major contribution to the Gross Domestic Product (GDP) and grew from 45 percent in 1961 to 70 per cent of GDP in 1981 and to 80 percent by 2001. The service sector companies started seeking more space to service the outsourcing boom. Salaries in industrial and service sectors increased leading to a rise in spending power, which in turn lifted other sectors as well, such as housing and real estate. There are proposals for 185,000 acres of land for SEZ development which will increase employment opportunities.[10] This growth in industrial and services sector caused cities like Bangalore, Chennai, Pune and Ludhiana to grow.

---

[7] Expert Group on Commercialization of Infrastructure Projects (EGCIP) the India Infrastructure Report: Policy Imperatives for Growth and Welfare, New Delhi: National Council of Applied Economic and Research, 1996

[8] "Municipal Finance & Municipal Services in India Present Status & Future Prospects" – Dr. Mukesh P. Mathur

[9] "A Fact Sheet: India and ADB" – ADB.org http://www.adb.org/Documents/Fact_Sheets/IND.asp

[10] "RBI criticism on SEZ positive" – Financial Express, http://www.financialexpress.com/print.php?content_id=139022

Government Policies:

Considering the need to enhance foreign investment and promote exports from the country and realizing the need to create a level playing field for domestic enterprises and manufacturers to be competitive globally, the government had in April 2000 announced the introduction of Special Economic Zones policy in the country. SEZs are deemed to be foreign territory for the purposes of trade operations, duties and tariffs.

According to vide Press Note 2 (2005) dated March 3, 2005 the Government of India has decided to permit Foreign Direct Investment (FDI) up to 100 per cent under the automatic route, in townships, housing, built-up infrastructure and construction development projects which is expected to attract foreign companies to invest in India.[11]

Government of India is taking financial as well as technical help from International Institutions like Asian Development Bank, Overseas Program for Economic Co-operation (OPEC) and others.[12] It also receives bilateral assistances in form of funds from countries like UK, USA, Canada, and France. The government also permitted Indian Corporate for External Commercial Borrowings to finance old as well as new investments. Government is involving private companies in major projects as well and adopting policies like Public Private Partnerships (PPP's) and Public Private Funds for urban development. Delhi and Mumbai Metro projects are successful examples of PPP's.[13]

The various urban population growth projections suggest that, in terms of magnitude, the accretion to urban population in India over the next 30 years will be about equivalent to that experienced in the last 50 years. It has been projected that by year 2030 there will be 70 cities with more than a million inhabitants.[14]

The Central government used to spend Rs.[15] 4-5 billion annually for city development. Now, with programs like Jawaharlal Nehru National Urban Renewal Mission, the budgeted amount is Rs. 500 billion. It's huge, and it should be used for implementing major upgradation of cities to sustain a 10% GDP growth rate, and not just to cover the existing maintenance. Along with the central government, the state governments and the private sector need to make significant contributions towards redeveloping cities.[16]

---

[11] "FDI in Construction Development Sector" – Vijay Baijlal (2005) RBI/2005/127 A.P. (DIR Series) Circular No. 07 Page 1, 2nd point
[12] "External Sources of Financing For Urban Development In India" – Supreena Narayanan
[13] "Government for private sector participation in urban development projects" – Hemendra Singh Bartwal
[14] "Urban Development in India in the 21st Century: Policies for Accelerating Urban Growth" – Rakesh Mohan and Shubhagato Dasgupta Oct 2004
[15] Rs. = Indian Rupee
[16] "Will India have cities of future?" – Economic Times,
http://economictimes.indiatimes.com/articleshow/2393878.cms

Bangalore [Bengaluru] – "The City of Future"[17]

Bangalore, the Silicon Valley of India is capital of the State of Karnataka. It is located on Mysore Plateau in the south western part of State of Karnataka. The city is fifth mostly populous metropolitan in India with a population of about 6 million.[18] The history of the city predates to 9th century but continuous settlement started since early 15th century. Important dates in history of Bangalore are listed in Appendix A and important geographic and demographic data in Appendix B.

After independence there was a high migration in Bangalore since it had many infrastructural facilities and it was one of the developed cities then. The central government supported large public sector units in Bangalore because of the state's tradition of supporting industrialization, cheap electrical power, salubrious climate, presence of Indian Institute of Sciences (IISc) and other engineering colleges that provided work forces. They also intended to place important military and technological facilities out of range of potential Pakistani air raids. Bangalore grew initially with manufacturing based industries in 1960's and then because of the real estate boom of 1980's. This resulted in entry of international banks like ANZ bank and Citibank. At the same time Wipro Limited and Infosys, India's leading software companies, were established in Bangalore. Infosys was growing and started its first international office in USA in 1987 which positioned Bangalore as an IT city on the world map. This caused the international software companies like Hewlett-Packard and startups in USA and around the world to start looking to Bangalore as an investment option. Now, Bangalore accounts for 35% of the software export from India. Multinational companies report various reasons for investment in Bangalore over other cities:
1. Software boom;
2. Higher literacy rate in Bangalore ;
3. Educational and academic institutes like IISc;
4. Climate;
5. Growth of local software companies like Infosys and Wipro;

Silicon Valley was preferred over other similar planned cities in US and Europe because of:
1. Inter firm networking;
2. Horizontal coordination;
3. Transfer of competence;
4. Renowned universities like Stanford University, University of California, Berkeley and San Diego;
5. Climate;[19]

Bangalore is developed in five concentric belts:[20]
- **1st Belt** - The core area consisting of the historic Petta, the Administrative Centre and the Central Business District;

---

[17] So called by Pandit Jawaharlal Nehru, First Prime Minister of India
[18] Bangalore IT – the official website of the department of IT and Biotechnology, Gvt. of Bangalore
[19] "Network City" – Heitzman
[20] Bangalore Development Authority

- **2nd Belt** - Peri-central area with older planned residential areas surrounding the core area;
- **3rd Belt** - Recent extensions (2003) of the City flanking both sides of the Outer Ring Road, a portion of which lacks services and infrastructure facilities and is termed as a shadow area;
- **4th Belt** - New layouts with some vacant lots and agricultural lands; and
- **5th Belt** - Green belt and agricultural area in the City's outskirts which include small villages.

The local government has also supported in the growth and planning of the city since city's early growth from 1952 as follows:

1952 - Bangalore Development Committee founded
1961 - Karnataka Town and Country Planning (KTCP) Act enacted
1963 - Outline Development Plan (ODP) submitted to Govt.
1965 - KTCP Act enforced
1972 - ODP approved and adopted under the KTCP Act 1961
1976 - Bangalore Development Authority constituted
1984 - 1st Comprehensive Development Plan (CDP) for 1985 approved
1995 - 2nd CDP for 2005 approved
2005 - 3rd CDP for 2015 prepared

Bangalore now faces a severe infrastructural crunch because of improper planning after the high growth in population. The population is growing at 3.25% per annum.[20] It is expected that the population of Bangalore would grow by 4 million to 10 million by the year 2021.Other concerns that need immediate attention in Bangalore are providing houses, civic amenities, and proper transportation.

The situation in Bangalore has become worse because of growth in use of two wheelers. This has caused serious traffic problems and environmental hazards since the traffic grows at about 10% per annum. The infrastructure problems have caused reduction in investments and have attracted extreme comments from software industry. Narayan Murthy, Ex-CEO of Infosys commented, *"If we don't do something very quickly, fallout as far as foreign investment goes could be serious"*. Azim Premji, Chairman of Wipro Limited, noted: *"We don't see the scene improving. Hence, our decision to look beyond Bangalore"*[21] and T. Kurien, CEO – Wipro's BPO unit, *"Some years back it was just bad roads, but now it's irregular power, blocked drains and mismanaged transport."*[22]

Deterioration of infrastructure in Bangalore is a growing concern. The State and the local government are taking various measures like the construction of Metro Rail, flyovers, widening of roads and financing of a new international airport. There are many flyovers/underpass like Sirsi Circle Town Hall Flyover, Richmond Circle Flyover and Mehrki Circle Underpass that have come up in Bangalore:[23]

---

[21] "Bangalore crumbling" – Indian Express, http://www.indianexpress.com/india-news/full_story.php?content_id=60231
[22] "Bangalore infrastructure woes worsen" – CIO news, http://searchcio.techtarget.com/originalContent/0,289142,sid19_gci1150196,00.html
[23] Bangalore International Airport Ltd. website

The international airport will be constructed at Devanahalli, 35 km from Bangalore. They plan to complete the phase 1 of Airport by 2008. Some salient features of the airport:

- Area: 4,000-acre plot in Devanahalli, 35 km Bangalore
- Airport project cost: Rs 19.30 billion
- State's share: Rs 3.50 billion
- Passenger capacity: 11.4 million annual passengers by 2015
- Cargo capacity: 0.3 million tons per year by 2015
- Additional jobs: 1,000 jobs per million passengers
- First phase by : April 2008[8]

The Government is planning to have a high-speed rail link between the city and the airport. Three originating points have been suggested: the Cantonment, Byappanahalli or Bangalore East stations and it appears that Cantonment station is likely to be the choice. There are plans to have a check-in and check-out facilities at these airports. This will add convenience for executives and company representatives who travel frequently.

Recently Mr. N. Cheluvarayaswamy, Transport Minister, Karnataka State said that Bangalore Development Authority would implement a circular Bus Rapid Transit of 72 km in two phases on the outer ring road.[24]

In summary, we can conclude from this case that Bangalore was developed because of:

- Ability to capitalize on global software boom;
- International investment;
- Proximity of world class educational institutes;
- Climate;
- Early availability of inputs like electricity, cheap labor for industrialization;
- State governments support

Chandigarh – "The Dream City"[25]

Chandigarh, the first planned city of India, is the capital of the States of Haryana and Punjab. It is located on the foothills of Shivalik Ranges of Himalayas. Chandigarh has a unique distinction of being a Union Territory and capital of States of Haryana and Punjab. The city was planned as "Open to give, open to receive".

Chandigarh exists on a flat and gently sloping plain of agricultural land which is highly fertile. Towards the north east are the foothills of the Himalayas, the Shivalik ranges which give the city a natural backdrop. The city is also surrounded by two seasonal streams namely Patiali ki Rao on west side and Sukhna Choe on east side. After the partition of India this area was conceived to serve as the capital of East Punjab as well as a city to resettle thousands of refugees.

In March 1948, the Government of Punjab approved this plain area at foothills of Himalayas as the capital of Punjab in consultation with the Government of India. The

---

[24] "72-km rapid transit system to be in place soon" – The Hindu,
http://www.hindu.com/2007/02/06/stories/2007020619730300.htm
[25] So called by Pandit Jawaharlal Nehru, First Prime Minister of India

foundation stone for the city was laid in 1952. The Governments selected Albert Mayer, an American national, as the town planner and Swiss born French architect Charles – Edouard Jeanneret, popularly known as Le Corbusier as the architect for the city.

Le Corbusier conceived the master plan analogous to human body as described below:
1. Heart: The City Centre (Sector 17)
2. Lungs: Leisure valley, open spaces and green sectors
3. Intellect: Cultural and educational institutions
4. Circulatory System: Network of roads i.e. 7 V's
5. Viscera: Industrial area

These parts of the city were based on four major functions:
1. **Living** i.e. the residential zone
2. **Working** i.e.
    a. Administrative and Educational zone
    b. Industrial zone
    c. Commercial zone
3. **Circulation** i.e. 7 V's
4. **Care of body and spirit** i.e.
    a. Open space
    b. Landscape
    c. Roadside plantation
    d. City gardens
    e. Sukhna Lake

The entire network of roads in the city was planned according to their purpose. They were known as 7 V's – a rule established at the demand of UNESCO to constitute a proposition of urbanism for general world application, which are described as follows. In order to encourage the cyclist the planners later added a 8th V for cyclist.
    a. V1 – Arterial Roads,
    b. V2 – Major Boulevards
    c. V3 – Sector Definers
    d. V4 – Shopping Streets
    e. V5 – Neighborhood Streets
    f. V6 – Access lanes
    g. V7 – Pedestrian path
    h. V8 – Cycle track

V1 is the road which goes through traversing cities and villages. V2 and V3 are meant for fast vehicular traffic and have no building opening on them. V4 divides a sector in four parts. V5 ensures internal traffic distribution and V6 gives access to the door of dwelling.

As Le Corbusier defines use of Chandigarh as:
- Chandigarh is a city offering all amenities of life to the poorest of poor of its citizens to lead a dignified life.

- Chandigarh is a Government city with a precise goal and consequently a precise quality of inhabitants.[26]

Chandigarh was subdivided in small sectors measuring about 800m x 1200m i.e. covering an area of about 250 acres. There are a total of 63 such sectors which were built for a population of 500,000. These sectors were developed in three phases. Phase 1 comprised of construction of Sectors 1 to 30 covering area of 36 km^2. Consequently land for Phase 2 was acquired. Phase 2 included construction of high rise i.e. 3/4 storey apartments in sector 31 – 47. Phase 2 was to cater a population of 350,000. Phase 3 for the city is still on the drawing board.

The city was planned for a population of 500,000 but by the year 2001 the population of the city was about 900,000. It is estimated that the population of the city by 2021 would be 1.95 million almost four times that it was built for. The population growth in 1971 census as compared to the 1961 census was 144.59%, one of the highest for the cities in India. It further grew by 75.55% in 1981 census followed by 42.16% in 1991 census and 40.33% in 2001 census as compared to previous censuses. The city could attract all the classes in population may it be middle and upper class or skilled and unskilled labor, etc due to,
- High quality of life
- Fast growth

To maintain the countryside outlook for Chandigarh the Periphery Control Act was passed in 1952 which regulated all development within 16 kilometers of city limit, prohibited the establishment of any town or village and forbade commercial or industrial development. [27] Chandigarh was a city of employment for skilled/unskilled labor and petty tradesmen. They had tiny incomes which led them to create their own housing on vacant lands or erecting makeshift shacks of mud and thatch. This was detrimental for the planned character of the city and the beauty of the planned city was hampered from within. Since 1975, the administration has taken various schemes and is resettling these peoples. The recent approach is to mark out the plinth area and allow people to create their own houses. Prof. Gopal Krishnan projects the squatter population rising from 13% in 2000 to 17.25% in 2010 and 21.55% in 2020.

To summarize Chandigarh could attract masses due to the high standard of living, fast growth, source of employment and its "Open to give, open to receive" nature. At the same time it also faces the threat of squatter settlement which has the potential to harm its planned character.

Aamby Valley City – "One of the top 5 destinations of the World"

Sahara India Parivar's [28] Aamby Valley City is one of the first large-scale urban developments planned in India. Aamby Valley City[29] (AVC) is located in Sahayadri

---

[26] Statute of the Land – City of Chandigarh
[27] Punjab Urban Planning and Development Authority website
[28] Sahara India Parivar is one of the largest business conglomerate with an asset base of Rs. 500 B (USD 10.7 billion) and businesses in Infrastructure housing, Finance, Media & Entertainment, etc. www.sahara.in

Mountains close to Mumbai. The vision of AVC is to develop a city by providing world class environment friendly residential units, hospitality services and tourism solutions by focusing on people, customers, technology and quality. Hence passionately driving AVC as a city which is not only the best in India but also ranks as "One of the Top 5 Destinations of the World".[30]

The main features of AVC are
1. Ambience – Natural ambience due to presence of Sahayadri Mountains and Koyarigarh Fort in the backdrop. The developers plan to create artificial lakes, water bodies, flower beds, gardens and other softscape and hardscape elements.
2. Secured Environment for physical being, neighborhood, investment, mind and health.
3. Area for leisure, recreation and amusement
4. Easy connectivity to two major cities of India - Mumbai and Pune, the upcoming IT hub[31]
    a. 120 km from International Airport, Mumbai
    b. 95 km from International Airport, Pune

The city was planned by Victor Gruen and Associates of Los Angeles which was further refined by Burchill Partners, Goldcoast Australia. The city is being developed in phased manner with four to five phases. The city will have amenities like an airport, 128 km of wide roads, business centers, hospital, medical research and wellness centre, Knowledge Village – comprising of International School, Colleges and other educational institutions. As well as to cater the requirements of the power in the AVC a 110/ 220 MW natural gas based plant is proposed.[32] These facilities are planned and provided to ensure a resident at AVC doesn't need to step out in "real" India again.[33] AVC will form a City Management Company to build, operate and maintain these facilities for 15-20 years.

AVC has already finished first phase which included construction of infrastructure and services and few residential units. They plan to construct the residential facilities on larger scale in later phases once the infrastructure is in place. They are also acquiring land for the remaining phases directly from the land owner at the prevailing market rates. The residents for some of the residential units sold earlier have already moved in. AVC plans to develop the infrastructure and services before they open the residential areas.

Sahara Group intend to spend around Rs. 150 billion by 2014 to complete the project after a Rs. 45 billion spent to build on basic amenities. The first funding of Rs. 45 billion was managed by the internal corporate borrowing from the Sahara group.[34] The group is also looking at FDI as financing option, as well as few other outside resources.

---

[29] Aamby Valley City is being developed as per the Hill Station Development act 1996 of the Government of Maharashtra
[30] Response from SAVC official
[31] Aamby Valley City website - www.aambyvalley.com
[32] Sahara Infrastructure and Housing Company www.saharahousing.com
[33] Valley of dreams for India's new super-rich by Peter Foster, Telegraph -
http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/03/31/wamby31.xml
[34] Information from Sahara Aamby Valley

The biggest challenge that AVC faces now is that they don't have any similar historical development or parallel from which they can draw inspiration and hence need to be careful in building practices as they are setting standards for township constructions. The other challenges for them are finance and organizing the manpower.

AVC can face problems because of the costs of property and their regular maintenance cost of the world class amenities. The company targets customers of high net-worth, non-resident Indians, and corporate executives to consider AVC as their first home which will be at a distance of about 90 km from two business cities Mumbai and Pune. Even if an economic zone is one of the developments proposed, but there is vague of the industry to cater. The other major barrier AVC faces is the cheaper option for homes available in new townships which are being developed close to AVC. Homes sold at newly emerging townships Magarpatta City and Lavasa at a distance of around 90 minutes are about a million rupees less. The Magarpatta City (60 km) and Lavasa Township (60 km) with similar amenities and much lower costs are the possible threats to AVC.[35]

The success parameters for AVC can be:
- Close vicinity to two business towns Mumbai and Pune
- Superior recreational and infrastructure facilities given to the people like road linking to Mumbai-Pune expressway and existing airports, communication and IT back up
- Climate
- Uninterrupted power supply and other infrastructure facilities
- There have been many big townships projects but the lifestyle the Sahara Parivar proposes has not been offered yet, own rules and regulation to run the city

Infrastructure and other amenities are critical for establishing a valley of dreams or it might turn to ghost town.[36]

Nanocity – "Silicon Valley Clone in India"

Nanocity is a high-technology city being planned in Panchakula district of Haryana, 25 km from Chandigarh.[37] It is a public-private partnership initiative by the Haryana State Industrial and Infrastructure Development Corporation and Nano Works Developers Private Limited. They don't intend only for a real estate development but a township to form the "intellectual-property capital" of the world on the similar lines of the knowledge hub Silicon Valley in the USA. The vision is to develop a sustainable city with world class infrastructure facilities along with an ecosystem encouraging innovation hence leading to economy, ecology and social cohesion. Nanocity aims to provide a place for finest education and affordable eco-friendly city for residents.

Nanocity will feature residential and commercial buildings. It is a city mainly planned to have the finest education, business hub for nanotechnology, biochemical and

[35] Interview of Mr. Subroto Roy with Nandini Lakshman, Rediff news-
http://www.rediff.com/money/2005/may/09spec.htm
[36] Valley of dreams for India's new super-rich by Peter Foster, Telegraph -
http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/03/31/wamby31.xml
[37] Nanocity's website – www.nanocity.in

pharmaceutical companies. The development for the city will be phased out in two phases of 5000 acres and 6000 acres. City comprises of 50% space for parks and public places to create a social environment. The city will have its own private infrastructure facilities like transportation, power supply, and water and sewage system which will be outsourced to companies for development and operation. The city will also have a world renowned university campus to provide good education and research facility for R&D. They envision Nanocity as a centre for innovation with the help of international universities and educational facilities provided.

"Mixed Use Districts" is a distinct feature at Nanocity for administrative control. The city is divided in four districts viz IT, University, Airport and Biotech. The districts house various facilities and services as follows:
- IT district – IT companies, golf course and market square
- University district – University campus, cricket stadium
- Airport district – Convention centers, hotels, warehouse
- Biotech district – Bio technologies, medical center, horse race track, resort[37]

Another feature of Nanocity is the high density node; the city is also planned in such a manner so that the density in the area doesn't affect the surrounding environment and people. There are four high density nodes identified which are technology and ecology region, research and development region, knowledge and innovation region and international communication and exchange region. Nanocity will have a flexible and efficient transportation system which consists of Bus Rapid Transport system looping the entire city. The transportation system aims to have each residence within quarter mile walking distance from the bus stop. Nano Developers intend to build sustainable and eco friendly city, so they plan to have clean and reusable sources of energy. The company wants to lease the land for longer duration in the city instead of selling the land. A separate company will be formed which look after the operation and maintenance of the infrastructure facilities for a longer run.

The project is a Public Private Partnership (PPP) between the State Government of Haryana and Nano Works Developers Private Limited. The state government holds 10%[46] stake in the project as well as are going to acquire 50% of the land for the developer. The cost of the first 5000 acre development is estimated to be around Rs 110 billion. The initial investment of Rs. 13.5 billion is raised by the Nano City Developers which will be used for land acquisition. In the fifteen year project they have plans to have an IPO at-least after five years[46] of its launch for generating funds.

The major challenges for the project at this stage are land acquisition, getting right partners, identifying right technology for various infrastructure facilities and having an airport close to the city. The government will help the private firm in land acquisition after they acquire the first 50% of the land.

Nanocity's success highly depends on the university campus and the technology companies that set up operations there as these are the seeds for the development of Nanocity.

Navi Mumbai SEZ – "Best positioned SEZ in India"

Navi Mumbai SEZ (NMSEZ) is India's 21st century megapolis proposed near Mumbai (Bombay) – the financial hub of India. The SEZ will function as a duty free zone with hassle free administration and special concessions from Government of India. NMSEZ is inspired by Shenzhen and Jebel Ali, to provide world class business environment in third world country targeted to transnational corporations. NMSEZ is a Public Private Partnership (PPP) between Reliance Industries Limited (74%) – India's largest private sector company and City and Industrial Development Corporation (26%) - a government body responsible for planning and construction of Navi Mumbai.

The NMSEZ is spread over four areas namely, Dronagari, Jawaharlal Nehru Port Trust (JNPT) area, Kalamboli and Ulwe. The construction will be carried out in phases as follows:
1. Phase 1: 2500 acre in Dronagiri
2. Phase 2: Remainder of land in Dronagiri and 1000 acre in Ulwe
3. Phase 3: JNPT area and 875 acre in Kalamboli

NMSEZ targets industries like Manufacturing, Logistics and Warehouses, IT, Bio-Tech, Engineering, Pharmaceuticals, Power, R&D, Apparels, Services, Institutional, Commercial and other support industries. In the master plan 25% of the area will be reserved for industrial activities. It will provide amenities of international stature like public transport, helipads, sport facilities, hospitals, parks and recreational spaces, commercial areas. Navi Mumbai is presently ready with existing physical infrastructure like roads and rail linking the area to rest of India. International standard educational institutes are already present in Navi Mumbai offering various medical, engineering and management courses, these can attract the IT, Bio-Tech, Engineering, Pharmaceuticals, Power, R&D, Apparels, Services, Institutional, Commercial and other support industries. A 900MW gas turbine power plant within site is planned along with an existing 960 MW power generation capacity whose capacity will be increased to 1500 MW by 2010.[38]

NMSEZ is the only SEZ in India where the land (except the land in Regional Park Zone) is in the possession of the project sponsor and hence reducing the possibility of the regulatory delays. NMSEZ has a good access to all the modes of transportation as:
- It is about 25 km from Mumbai's International and National airport and a new international airport is sanctioned for the city of Navi Mumbai.
- It is in close proximity to JNPT – India's largest and most modern sea port and Mumbai sea port
- It is well connected by National Highways (Nos 3, 4, 8, 9 and 17)
- The company has also sanctioned to create a sea-link to connect to central Mumbai

Tata Economic Consultancy Services carried out the economic feasibility study for the NMSEZ and Ernst & Young are the business plan and joint venture partner selection consultants. The master plan for NMSEZ was developed by McClier (an AECOM company), USA. The first users are expected to move in by March 2010.

---

[38] Navi Mumbai website – www.navimumbai.com

The company estimates a total investment of about Rs. 50 billion in a period of 5 to 8 years to complete the project. The company expects to raise the 30% money by equity and 70% in debt.[47] Company is considering various sources of financing like International banking institutions, IPO and bonds.

Current challenges for NMSEZ are:
- Investment in SEZ by FDI
- Attracting transnational companies with the competition from other SEZ's being developed in South Asia
- Integrated development approach
- Connectivity at regional and national level

In spite of these challenges the city has a huge advantage compared to other developments in India with regards to land acquisition. The land required for the development is already owned by City and Industrial Development Corporation (CIDCO).[39] It will be exempt from all taxes, levies, charges and customs and excise duties on the import of capital goods, raw materials, spares and a corporate tax holiday till 2010. The strategic location of the SEZ is very much favorable for the promotion of export and attracting FDI as planned. NMSEZ is adjoining to JNPT, JNPT and Mumbai port accounts for 17% of India's port traffic. NMSEZ is close to other industrial cities - Thane (3 km), Greater Mumbai (29 km), and Pune (160 km) which account for 60% of Maharashtra's factory employment. It has an easy access to huge urban markets, cheap and skilled manpower, social infrastructure and trading centers. NMSEZ has the potential to emerge as an economic dynamo for India.

Lavasa – "Private Hill Station"

Lavasa is a mega self-sufficient hill town to be built in the Western Ghats to undertake a large-scale lifestyle development promoted by Lavasa Corporation. Located 65 km from Pune in the Mose Valley and the backwaters of the calm Warasgaon dam area. The township is master planned with the objective of striking a balance between cosmopolitan award winning architecture and environmentally friendly surroundings to have a unique way of life, where people can live, work, learn and play in harmony with nature.

The development of Lavasa is planned across three town centers – Dasve, Damanhole and third unnamed. Dasve will have elegant housing, lakeside apartments and multiple arrays of villas. Dasve would also include Country Club, day school, hospital, hotels, resorts, spas and a center for excellence in education and research. Dasve town center is estimated to be developed by 2009-10. The city will also have Business Park for commercial, institutional, IT and non polluting processing firms. Modes of commuting will include personal cars, ferry transport, ropeway (skyway or ski lift-type) traffic and electric public buses. The city will have captive mini-dams, helipads, ropeways and luxury hotels too. There have been brand corporate groups with whom the Lavasa Corporation is involving to enhance the lifestyles. Like the Accor Hotels and Resorts to come up with resorts and hotels at Lavasa, the Symbiosis to set up institutional campus

---

[39] Feasibility Report of Navi Mumbai SEZ – by Tata Economic Consultancy Services

with both to start in Phase I of the project. A unique feature of Lavasa will be the implementation of IT and GIS system which will support city governance system with state of the art enterprise of GIS. RMSI and ESRI will work to develop the IT-GIS system for city governance making it a truly digital city.

Master plan of Lavasa is developed on the principles of New Urbanism by HOK design consultants, USA. Lavasa's design is based on the transect model where the development begins from town centers that are densely populated to uphill locations which are sparsely populated. This master plan won both the Award for Excellence 2005, given by the Congress for New Urbanism (USA) and the American Society of Landscape Architects Award—2005. The other consultants include Deloitte (Strategy and Partnerships), Accenture (Business plan and market research) and Hafeez Contractor (Architectural design). Lavasa city is expected to be developed by 2021.

Lavasa is a creation of Lavasa Corporation which includes: Hindustan Construction Company (60%), L.M. Thapar Group of companies (15%), Venkateshwara Hatcheries (12%) [40], Aniruddha Deshpande and Vithal Maniar. They also include Nationalist Congress Party president Sharad Pawar's daughter Supriya Sule and her husband Sadanand Sule.[41] The project is being built in phases with first phase to be completed by 2008, with residential villas, a dam to satisfy the water needs as well as a tourist attraction and with a hotel, school and hospital. The group bets on three revenue streams—lease rentals, the sale of apartments and single family homes and fee. An investment of Rs. 9 billion will be mobilized through a mix of debt (Rs. 5 billion), equity of Rs. 2 billion and Rs. 2 billion from pre-sale money.[40]

The main economic drivers for Lavasa are seventy per cent of the available untouched land bank, condominiums beginning at Rs 2.7 million on the lake front. Lavasa will absorb people from the 30 km away IT park of Pune (Hinjewadi), primary residents of Lavasa's planned independent economy as well as self-employed professionals like architects and consultants preferring to live in ex-urban environments serving the catchments of Mumbai and Pune. Other amenities like 18-hole golf course, a club house, shopping centers, a tourist destination around Lavasa and sparse development near hills for residential area will also contribute to its success.

The main drivers for the success of Lavasa city will be the exotic location, cheaper housing options compared to other townships, vicinity to Pune and the modern infrastructure facilities.

---

[40] A pvt hill station – by Baiju Kalesh, Dec 2006 -
http://timesofindia.indiatimes.com/articleshow/726411.cms
[41] State accords top priority to Lavasa City project – by Abhay Vaidya, Jan 2006
http://timesofindia.indiatimes.com/articleshow/1371859.cms

Conclusion

Summary of lessons learned

a.   *Land Acquisition:*
Land Acquisition plays an important role in construction of any project as it decides the size and scale of the project. It also accounts for a considerable percent of initial investment in the project.

The major problem while acquiring land for a large-scale township is to handle the number of owners of different land and to handle the statutory bindings (litigations) on the land (if any) within the location of works. A lot of time is spent in communicating with the landlords as well as the time involved in completing the legal paper works for the development rights on the land. There can be a series of actions taken by the developer before acquiring the land. Non-agricultural land will require less legal formalities and paperwork as compared to converting agricultural land for construction.

The developer must come with proper relocation or compensation policy to the affected people in the catchments of development as in case of Reliance SEZ project in Mumbai (see Appendix C). In the two cases NMSEZ and Nanocity the partnership with the government has been an added advantage. NMSEZ has had no hassles acquiring land as CIDCO already owns the land whereas, for Nanocity, the government will help in acquiring the second half of the land if necessary only after the private developer acquires the first half. Such partnerships should be encouraged by the government to attract more developers and international investment for developing such projects which can prove the boon for urbanization in India.

b.   *Infrastructure:*
Infrastructure plays an important role in any development, as it gives the basic connectivity between different sectors of the city and with the rest of country. Today, major cities have attracted companies and people because of infrastructure facilities. Due to the tremendous growth of cities in India, government cannot single-handedly build and maintain infrastructure.

Private sector along with the public sector can build infrastructure facilities and further operate and maintain them. This can be done by proper planning of the infrastructure by the government, and then procuring it through long term contracts with companies who build, operate and maintain these facilities.

c.   *Investments:*
The scale of any large-scale urban development requires a huge investment which and either a developer or investor with deep pockets. Projects have a development period ranging from 8 to 15 years and require high initial investment for land acquisition, statutory clearances, and provision of basic infrastructure which do not fetch any returns initially. Raising funds for these initial investments can be a challenge for developers. The developer needs to find out suitable and reliable

funding source in advance. There are many sources of funding apart from traditional borrowing from banking institutions. Developers can look for resources like project financing, IPO and others. As stated earlier and even proven successful in countries like China and other Asian countries, PPP can be a solution to reduce some financial burden, where the government can step in and through invoking the Land Acquisition Act reduce the costs of land acquisition, as in the two cases discussed Navi Mumbai and Nanocity. The government has also opened up the possibility of FDI up to 100% which is present in nearly all cases analyzed in this research.

d. *Selecting right partners:*

The development period for such developments is 8 to 15 years and goes on even longer for maintenance of the infrastructure facilities. Developers need to select the right partners because once they have 15-30 year concession agreements, it is not easy to bid them farewell.

As Bangalore and Chandigarh were state owned cities the maintenance schedule was often neglected. This resulted in an infrastructural crisis which has probably slowed down their growth. In all the cases analyzed we find that they are planning to have a maintenance company in the city and to consider a lifecycle perspective in the planning of the city to optimize the combination of up-front costs and maintenance costs. The maintenance company will ensure the maintenance and further developments of infrastructure needed. The developers need to have partners who will ensure proper maintenance of the city infrastructure and need to incentive these partners through the appropriate use of incentive and penalty clauses in their contracts. These partners will help the developer keeping the initial vision of the city intact.

Way ahead

This research provides an overview of urbanization in India as well as comparative analysis of upcoming projects. This research involved both a desk study component with analysis of all available online materials and interviews with executives from project developers. Further research would be beneficial in the following areas:

- Factors affecting land acquisition,
- Investment strategies for large scale developments, and
- Models for organizing the maintenance company to ensure maintenance of infrastructure facilities.

Acknowledgement

We would like to thank following people for their help in the research study.

APPENDIX A
Important Historical Dates of Bangalore[42]

- **850 AD** 'Bengalooru' appears on Mauryan empire milestone
- **1015** Chola Empire takes over City
- **1120** Veera Ballala II calls it 'Benda Kalooru' or 'Town of Boiled Beans' (after a poor woman feeds him beans in the forest)
- **1537** Kempe Gowda I designs City as it exists today. (KG II builds the 4 towers)
- **1638** Shahaji Bhonsle (Shivaji's father) captures City for Adil Shah and gifts it to him
- **1687** Aurangzeb's army captures City
- **1690** Sells it to the Wodeyars for Rs. 3 lakhs.
- **1759** Wodeyar gifts it to Hyder Ali who builds Lal Bagh
- **1791** Cornwallis defeats Tipu Sultan but returns City to him
- **1799** Tipu Sultan dies. City returned to Wodeyar
- **1831** British take-over administration
- **1842** First English Medium School in Bangalore
- **1864** First Railway line in State
- **1887** Built up area of city was 10 km^2 out of total area of 45 km^2
- **1900** First electrified city in India with a power plant producing 4.3 MW of electricity
- **1905** India's 1st electric bulb lit in Bangalore City Market, Handloom industry for silk, gold thread and carpets began to grow
- **1909** Indian Institute of Science built
- **1920 – 1940** America's entry in India by Hindustan Aircraft Pvt. Ltd. held by Walchand Hirachand, Government of India and Mysore, 1st flight Bangalore/Bombay
- **1941 – 1961** High migration in Bangalore being one of the big and developed cities after independence, establishment of large scale public sector undertakings like Bharat Electronics Limited (BEL) and Hindustan Aeronautics Limited (HAL)
- **1961 – 1971** Manufacturing Industries started investing, establishment of Indian Space Research Organization (ISRO) and Bharat Heavy Electronics Limited (BHEL)
- **1971 – 1981** Real Estate boom, Texas Instruments
- **1981 – 1991** IT boom, establishment of Wipro Ltd., Infosys and international companies like Hewlett-Packard's HP India Software Operations Pvt. Ltd., entry of international brands as ANZ Bank, Citibank, Pizza Hut, KFC, etc
- **1996** Miss World beauty pageant was organized; which was viewed by 2 billion viewers

---

[42] Network City – Heitzman, www.citybengaluru.com

Geographical and Demographic Profile of Cities

Bangalore:[43]

1.	Area	2190 km^2
2.	Altitude	920 m above sea level
3.	Rainfall	1060 mm (2004)
4.	Climate	Summer - March to May
		Winter - December to January
		Rainy - June to September (Southwest monsoon) and November to December (Northeast monsoon)
5.	Temperature	Min: 14 ^{0}C (57^{0}F) to Max: 33 ^{0}C (91^{0}F)
6.	Total Population	6.1 million
7.	Density of population/km^2	2980
8.	Literacy	83.91 %

Chandigarh:[44]

1.	Area	114 km^2
2.	Altitude	304 – 365 m above sea level
3.	Rainfall	1110.7 mm
4.	Climate	Summer – April to July
		Winter – November to January
		Rainy – July to September
5.	Temperature	Min: 3^{0}C (37^{0}F) to Max: 44^{0}C (111^{0}F)
6.	Total Population	0.9 million
7.	Density of population/km^2	7900
8.	Literacy	81.90 %

AVC and Lonavala (Nearest city):[45]

1.	Area	10,000 acres
2.	Altitude	766 m above sea level
3.	Rainfall	450 mm
4.	Climate	Summer – April to July
		Winter – November to January
		Rainy – July to September
5.	Temperature	Min: 12^{0}C (54^{0}F) to Max: 36^{0}C (97^{0}F)
6.	Total Population	*Not available*
7.	Density of population/km^2	*Not available*
8.	Literacy	*Not available*

Nanocity and Chandigarh:

1.	Area	11,000 acres

---

[43] Bangalore IT – the official website of the department of IT and Biotechnology, Gvt. of Bangalore
[44] Official website of Chandigarh Administration - http://chandigarh.nic.in/
[45] Data from SAVC and Official website of Maharashtra Tourism Development Corporation - www.maharashtratourism.gov.in

2.	Altitude	321 m above sea level
3.	Rainfall	617 mm
4.	Climate	Summer – April to July
		Winter – November to January
		Rainy – July to September
5.	Temperature	Min: 0^0C (32^0F) to Max: 36^0C (97^0F)
6.	Total Population	500,000[46]
7.	Density of population/km^2	11200
8.	Literacy	*Not available*

Navi Mumbai SEZ and Mumbai (Nearest city):

1.	Area[47]	5288 acres
2.	Altitude	10 m above sea level
3.	Rainfall	2500- 3500 mm
4.	Climate	Summer – March to May
		Winter – December to February
		Rainy – June to September
		Post Monsoon – October and November
5.	Temperature	Min: 15^0C (59^0F) to Max: 39^0C (102^0F)
6.	Total Population	100,000 approx.
7.	Density of population/km^2	4670
8.	Literacy	*Not available*

Lavasa and Pune (Nearest city):

1.	Area	10,000 acres
2.	Altitude	600-900 m above sea level
3.	Rainfall	~700 mm
4.	Climate	Summer – March to May
		Winter – October to February
		Rainy – June to September
5.	Temperature	Min: 12^0C (54^0F) to Max: 38^0C (100^0F)
6.	Total Population	100,000 primary and 10,000 floating[48]
7.	Density of population/km^2	2470
8.	Literacy	*Not available*

---

[46] Sabeer Bhatia's interview on February 27th – Mountain View, California
[47] Response from Arun Mhaisalkar, President Planning at NMSEZ
[48] Rediff news - What's happening in Lavasa? http://www.rediff.com///money/2007/jan/13spec.htm

APPENDIX C
Rehab package for Reliance SEZ

"Reliance rehab package for SEZ-hit" – The Telegraph[49]

"Reliance Industries held out three options to compensate project-affected persons with money or land under a comprehensive relief and rehabilitation package it unveiled today.

The Mumbai SEZ (MSEZ) seeks to provide compensation as well as employment. The package comprises three compensation options. Under the first option, the company will allocate 12.5 per cent developed land in the proportion of the original land holding to the legal landholder at a price to be determined by the Maharashtra government.

The second option is a one-time down payment of Rs 5 lakh (Rs. 500,000) per acre of land originally sold. The third option is a lifetime payment at the rate of Rs 5,000 per month. The package will also offer employment to one nominated family member of the landowner and even here there are two options.

The first option seeks to provide training, employment and sustenance allowance. Reliance will provide technical training to the nominated person plus sustenance allowance at the rate of minimum agricultural wages during the training period, that is, Rs 60 per day per family. On successfully completing training, the nominated person is assured of a job with a monthly salary of Rs 4,000 to 5,000 a month. If the training and employment option is not chosen, the family will get a one time payment of Rs 300,000.

A spokesperson for MSEZ told The Telegraph that there will be certain conditions attached to the option under which Reliance will provide 12.5 per cent of the developed land to persons affected by the project, which will be carried out according to the regulations of the state. "The persons will be provided with a fully developed plot of land that is well connected with essential facilities such as water, drainage and road access. They can use the land for permissible purposes", the spokesperson added."

---

[49] http://www.telegraphindia.com/1070220/asp/business/story_7415620.asp