# Economic Growth

## of the Mumbai Metropolitan Region

BOMBAY First

Knowledge partner:

Deloitte.

# Economic Growth of the Mumbai Metropolitan Region

# CHAIRMAN's NOTE

In 2004, Bombay First and McKinsey and Company prepared an influential report, Vision Mumbai: Transforming Mumbai into a World-Class City, which laid out a path through which Mumbai could become a city comparable to the best in the world, a city in which every citizen could avail of economic opportunity and a good quality of life.

The report also detailed the very large gaps the city faced, in terms of infrastructure, services and governance, if it aspired to be “world-class”. The city’s infrastructure is inadequate and crumbling, the quality of public education and healthcare poor, and the severe shortage of affordable housing is visible in its teeming slums. New infrastructure like the Sea-Link and the Metro rail is needed to ease traffic congestion, link together various parts of the city and make life easier for the millions of daily commuters. Mumbai needs serious investments in education to upgrade the skills of our population and enable citizens to take advantage of emerging economic opportunities. Its needs more open spaces and clean air, better maintained roads and pavements, and accessible water supply and sanitation for all. Perhaps most importantly, the city need new employment opportunities.

These investments are the building blocks of a vibrant economy and essential to a decent quality of life, but they require substantial resources. In order to meet resource needs, the city must adopt a focused set of strategies to enhance economic growth and spur investment within the region. Healthy economic growth will expand the city’s tax-base and enable it to provide services and amenities to the underserved. Only when wealth is generated within the city, can some of wealth be invested back, leading to more jobs, better infrastructure and services and more investment, thus creating a virtuous cycle.

Leveraging and unleashing the growth potential of key industries will ensure that Mumbai has the resources to meet the needs of all its citizens, including the many who lack basic services and decent living conditions. This report details some key areas within which Mumbai can create value. It focuses on Mumbai’s specific strengths and comparative advantages, based on its long history as India’ commercial and financial capital, and as an industrial hub. The city is known to be a city of entrepreneurs, of talented, hard-working and creative people. It has the potential, with its skilled, well-educated professional workforce, and its concentration of creative arts, entertainment media and research institutions, to move into high-growth, environmentally friendly sectors such as biotechnology and animation. Mumbai is home to the Bollywood film industry, which has great tourism potential. A Bollywood theme park would attract visitors from all over the world, and create a wealth of new jobs.

This report is intended to be a wake-up call. Strategic government action and public-private partnership is required in order to create the conditions under which growth can flourish. These actions include unlocking the city's land resources, upgrading infrastructure, improving the skills base, removing legal and institutional barriers to growth, and providing incentives for investment in leading sectors.

**Economic growth is central to the city's future. It is now time to take concrete measures to rejuvenate Mumbai's economy; otherwise the vision for a World-Class Mumbai will remain a vision.**

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## A Report for the Bombay First Economic Group

### INTRODUCTION

Mumbai is the financial and commercial hub of India. The city contributes 5% to the country's GDP[1] and provides significant tax revenues to both Maharashtra and the Centre. Although the city has evolved into a prominent hub of financial and other commercial activity in India, there are certain sectors that are uniquely positioned to tap into Mumbai and its neighbouring regions strategic advantages and embark on a path of self sustaining growth that would set in place a continuing momentum of income and employment generation within these sectors.

Bombay First, an industry initiative with the aim to improve the economic and social infrastructure of Mumbai city and improve the quality of life for the city's citizens, adopted a conscious mission to research, deliberate and form opinions towards making Mumbai a world class city. The direction of this mission was envisaged in the 2004 McKinsey report "Vision Mumbai". Consequently, in its attempt to continue the dialogue and process moving, Bombay First formed five focus groups in the areas of Governance, Physical Infrastructure, Social Infrastructure, Housing and Economic Growth to provide an opportunity for experts, policy makers, citizens and all other stakeholders to collaborate towards building solutions which will resolve the myriad issues creating obstacles in realizing Mumbai's potential. The Economic Growth committee was established with the aim of developing a sustainable economic growth strategy for the Mumbai Metropolitan Region (MMR). The committee was chaired by Mr. Alok Gupta, Managing Director of Cabot India, with Deloitte as its knowledge partner. The research, observations and recommendations of this committee are provided in this report.

### EXECUTIVE SUMMARY

According to the World Bank report (Doing Business in India 2009) Mumbai currently ranks 10th in the list of 17 Indian cities rated on various attributes pertaining to doing business. As per the report, the major bottlenecks pertaining to investment activities in Mumbai are the difficulty in attaining construction permits, high property costs and inefficient system for enforcement of contracts in terms of judicial and administrative support.

Further, the rising slum population is indicative of the diminishing standard of living of the people in MMR. This situation highlights the possible outward movement of investment activities from MMR to other competing cities in India which top the World Bank's Indian List (from the report Doing Business in India 2009). In the face of this situation, with the aim to reinvigorate economic growth in Mumbai, the committee undertook economic analysis of MMR.

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[1]Source: http://mmrdamumbai.org/projects_muip.htm

Our analysis of MMR's sector wise GDP contributions brought out the following actions required to reinvigorate economic growth in MMR:

- Extend growth beyond Greater Mumbai
- Sustain the Tertiary Sector
- Rejuvenate the Secondary Sector

We then looked to identify specific industries in the tertiary and secondary sector that have the ability to offer sustainable growth in MMR.

The concept of sustainable growth implies that these sectors have the potential to generate sufficient surplus from their operations which could again be ploughed back into the same sector. This would result in further strengthening the growth in the sector and complete the cycle of investment and output in the economy.

In identifying key growth industries and initiatives we emphasized the following requirements in each project:

- It deploys/leverages attributes of MMR that would provide these industries/sectors a comparative advantage such that the long term growth prospects remain secure.
- It has significant employment generation potential.

The core committee held discussions with several eminent scholars and citizens of MMR with significant knowledge and understanding of MMR's economic and social characteristics. In addition, it also studied initiatives and projects that were undertaken by some selected cities across the globe to evaluate the success (and failure) factors of such initiatives. The sectors that were finally shortlisted for MMR was based on the discussions and recommendations that emerged from such discussions. Five sectors were identified which had the potential to grow considerably in the medium to long term These sectors are:

- Biotechnology
- Computer Animation
- Food Processing
- Media and Entertainment
- Medical Tourism

For each of these five sectors, we analysed the key growth drivers and MMR's current potential to absorb and support growth initiatives (in these sectors). We also initiated dialogue with sector experts and government representatives to fine tune our findings and recommendations in the form of action points and projects that could be implemented to jump start the growth process. Our recommendations for each sector have been provided in the table below.

| Industry | Recommendation |
| --- | --- |
| Biotechnology | **Short term**<br>• Establish cold chains.<br>**Long term**<br>• Set up a strategic corridor between Mumbai to Pune.<br>• Collaborate with international institutes. |
| Media and Entertainment | **Short term**<br>• Facilitate development/up gradation of studios and post production facilities.<br>• Introduce specialized technical and creative courses at university level.<br>• Renovate and revamp Tarapore Fish Aquarium.<br>**Long term**<br>• Set-up resort type facilities near film studios.<br>• Promote the creation of a world class entertainment theme park. along the lines of Disney World or Universal Studios. |
| Computer Animation | **Long term**<br>• Develop a specialized computer animation school.<br>• Establish a computer animation research and development lab. |
| Food processing | **Short term**<br>• Formalize existing supply and sales of primary processed food.<br>• Develop efficient distribution systems, cold chains and marketing channels.<br>**Long term**<br>• Develop a Floriculture Centre.<br>• Provide assistance for setting up pisciculture processing units. |
| Medical Tourism | **Short term**<br>• Allow concessions to private players to promote medical tourism.<br>• Undertake international marketing and advertisement initiatives.<br>**Long term**<br>• Earmark a portion of existing municipal/private hospitals infrastructure and upgrade the hospitals for tourism purposes. |

Based on some basic data on the future growth potential for each of these identified sectors and the relative position of MMR in a few years time, the following output and employment potential are possible over the next 4 to 5 years:

**Biotechnology:**

This sector has the potential to generate revenue close to 10,000 crores in MMR region alone by 2015. In addition, the shortlisted projects can also promote widespread employment in secondary sectors catering to the emergence of various activities in this sector.

**Media and Entertainment:**

Bollywood has already made a name for itself and its growth potential is tremendous. The projects that have been identified around this sector attempt to leverage on the dominance of Bollywood in this industry. Specifically, we see the potential for a theme park that will leverage off Mumbai's position as India's entertainment capital to create revenues of approximately Rs. 800 crores for the region and employ 5,000-10,000 of the region's residents.

**Computer Animation:**

This has the potential to attract significant incremental investment into MMR and generate almost 50% of the projected revenue within MMR. Conservative estimates of future revenue growth implies that this has the potential to generate 2000 crores of revenue with additional synergies with the media and entertainment industry.

**Food Processing:**

This has been identified as a sunrise sector by the government as well. Given the increasing extent of migrant workforce in Mumbai and the neighbouring areas, greater emphasis on this sector will have the potential for MMR to realize 70000 crores of revenue and additional employment for a vast number of informal sector labour force and women residing in the slums.

**Medical Tourism:**

With the predicted rise in revenues from medical tourism into India MMR can leverage its existing infrastructure and generate an additional 1000 crores of revenue from this sector alone. The proceeds can be reinvested to improve the overall state of health and medical care within MMR.

The expected cumulative returns from these sectors are estimated to be around 100,000 crores by 2015. Assuming that MMR continues to grow at the current rate, this impetus would cumulatively generate a GDP growth rate of 12%.

Where relevant we have highlighted government intervention and assistance to spark growth in the five sectors. The majority of our recommendations require the improvement of infrastructure and education facilities in the region, with little or no government monetary investment requirement. We emphasise the need for the government to be proactive and responsive in initiating policy that encourages business growth in these five sectors.

## Economic Growth- Significance for MMR

Simply stated, economic growth is the increase in the total output of a region. The more that is produced and sold, higher is the overall growth. The core issue is to identify how one can produce more. Economists have summarized the growth process arising from either more workers (higher employment), or more machines (higher deployment of capital) or technological advances (increased productivity) or some combination of all of these. It is often argued that economic growth is a precursor to improve the standard of living of people, to reduce poverty, to curb state fiscal deficits and sustain a civic society.

The history of economic growth and development reveals that society is constantly growing such that the growth process is rarely stagnant. The fact that net population in most regions is growing implies that society is adding to the pool of workers which is (possibly) adding to the output of that region. At the same time, it is important to measure the rate of growth of various regions so that adequate focus can remain on generating surpluses from the growth process which, in turn, can be ploughed back into production to sustain the future rate of growth. This leads to a process of long term sustainable growth.

Economic growth has catalysed the evolution of MMR from a home of fishing colonies a century ago to the financial hub of the nation. However, over the past few years there has been a slowdown in the growth of the MMR. Along with this slowdown, the environment of doing business in Mumbai has also been declining as is most evident from Mumbai's current rank in the World Bank report on Doing Business in India 2009. According to the World Bank report, Mumbai currently ranks 10th in the list of 17 Indian cities rated on various attributes pertaining to doing business. These attributes are namely ease of starting business, dealing with construction permits, registering property, paying taxes, trading across borders, enforcing contracts and closing business. According to the report Mumbai's economic strength lies in its efficient taxation system, favourable environment for international trade, ease in registering property and closing business. However, the major bottlenecks pertaining to investment activities in Mumbai are the difficulty in attaining construction permits, high property costs and inefficient system for enforcement of contracts in terms of judicial and administrative support.

Further, the rising slum population is indicative of the diminishing standard of living of the people in MMR. This situation highlights the possible outward movement of investment activities from MMR to other competing cities in India like Ludhiana and Hyderabad, which top the World Bank's Indian List (from the report Doing Business in India 2009). This does not augur well for MMR's long term growth prospects. An economic boost by means of improved productivity, efficient taxation, ease in doing business and effective and flexible administration could revitalize the stagnating growth of MMR and ameliorate the living conditions of people.

To model a growth plan for Mumbai we have taken insights from the economic model of growth suggested by Harrod-Domar[2], wherein the economy's rate of growth depends on:

**1. The level of saving - which thereby transform into investment.**

**2. The productivity of investment - which is enhanced by technological growth and human capital.**

Based on the above factors, this report identifies some key growth sectors to reinvigorate the growth path of MMR's economy. The sectors identified and the growth strategy suggested in the report aims at maximizing the investment opportunities in the region by ensuring sufficient surplus (savings) to be reloaded into the system. Secondly, with suggestions of opening various academic and research institutes, the report aims at constant up gradation of productivity of these investments.

# 1. DESCRIPTION OF THE REGION

## 1.1 Location

The Mumbai Metropolitan Region (MMR) encompasses a total area of 4,355 sq. km and consists of the following administrative units:

1. Mumbai city district;
2. Mumbai suburban district;
3. Part of Thane district comprising:
    a) Thane, Kalyan, Bhiwandi and Ulhanagar tehsils; and
    b) Part of Vasai tehsil.
4. Part of Raigad district comprising:
    a) Uran tehsil; and
    b) Part of Panvel, Karjat, Khalapur, Pen and Alibag tehsils.

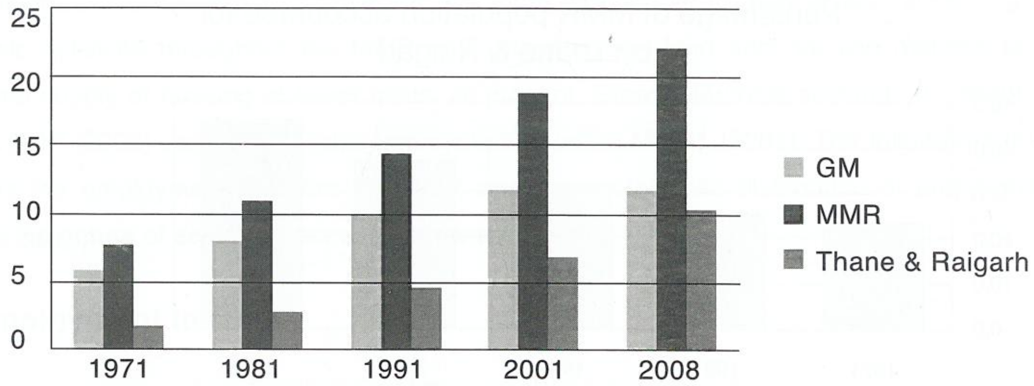
The region consists of seven municipal corporations (Greater Mumbai, Thane, Kalyan-Dombivali, Navi Mumbai, Mira Bhayander, Bhiwandi-Nizampur and Ulhasnagar) and 13 municipal councils (six in Thane district and seven in Raigad district). Out of these, Greater Mumbai constitutes about 10% of the total geographic area, but accounts for 53% of the population of MMR region[3].

## 1.2 Demographic Data

The population of MMR increased from 7.8 million in 1971 to 22.32 million in 2008, recording an average compound annual growth rate (CAGR) of 2.9% over the 37-year period. The population build-up during this period illuminates some interesting facts about the overall development of MMR region (Figure 1.1):

[2]The Harrod–Domar model is used in development economics to explain an economy's growth rate in terms of the level of saving and productivity of capital. The model was developed independently by Sir Roy F. Harrod in 1939 and Evsey Domar in 1946.
[3]Source: Economic Survey of Maharashtra 2008-09

Population Growth (from 1971-2008)




| Year | 1971 | 1981 | 1991 | 2001 | 2008 |
|---|---|---|---|---|---|
| Greater Mumbai | 5.9 | 8.2 | 9.9 | 11.9 | 11.9 |
| Thane & Raigarh | 1.8 | 2.8 | 4.6 | 6.9 | 10.3 |
| MMR | 7.7 | 11.0 | 14.5 | 18.8 | 22.3 |

**Figure 1.1:** Population Growth in Greater Mumbai, MMR and Thane/Raigad
Source: 2008-2009 Economic Survey of Maharashtra, Population and Employment Profile of Mumbai Metropolitan Region, MMRDA

- MMR's population growth slowed down during the nineties (2.7% during 1991-2001) as compared to the seventies (3.6%)
- The overall CAGR of population of MMR (2.9%) was higher than that of Greater Mumbai (1.9%) and also of Maharashtra (2.2%) over the 37-year period (figure 1.1). As a result of which,
  > MMR's share of Maharashtra's population increased from 15% in 1971 to 23% in 2008;
  > The share of Greater Mumbai's population in that of MMR declined from 77% in 1971 to 54% in 2001, which indicates that population has grown at a faster pace in the outer areas of the MMR compared to Greater Mumbai.
- While the CAGR of population of Greater Mumbai declined from 3.3% in 1971-81 to 1.1% in 1991-2008, Thane & Raigad districts registered substantial growth in population (4.2% over 1991-2001 and 5.8% over 1991-2008). These two districts accounted for only 31% of the growth in population of MMR over 1971-81 but for 74% in 1991-2008. This is also a reflection of the direction of spatial growth in the region and the flow of population within MMR.
- As a result of this growth the share of Thane & Raigad in the total population of MMR increased from 23% in 1971 to 46% in 2008 (figure 1.2) and therefore the trend is already in the direction of wider distribution of population throughout MMR.

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[2]The Harrod–Domar model is used in development economics to explain an economy's growth rate in terms of the level of saving and productivity of capital. The model was developed independently by Sir Roy F. Harrod in 1939 and Evsey Domar in 1946.

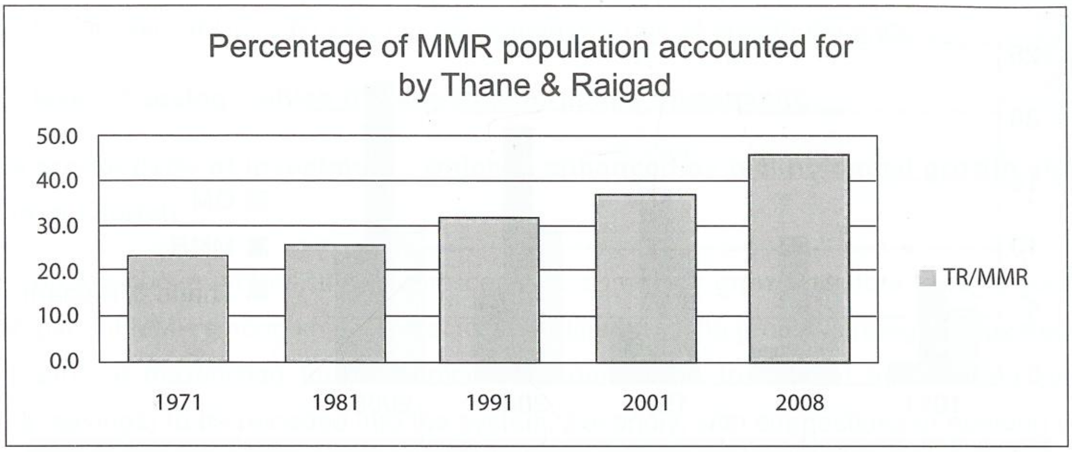



**Figure 1.2:** Percentage of MMR population accounted for by Thane & Raigad
Source: 2008-2009 Economic Survey of Maharashtra, Population and Employment Profile of Mumbai Metropolitan Region, MMRDA

**Table 1.1: Population, Annual Rates of Growth of Greater Mumbai, 1951–01**

| | Population in '000s | Rate of Growth (% p.a.) | Decade Increase ('000s) | Natural Increase ('000s) | Net Migration ('000s) | Share of Migration (%) |
|---|---|---|---|---|---|---|
| 1951 | 2994 | 5.1 | 1193 | 243 | 950 | 79.6 |
| 1961 | 4152 | 3.3 | 1158 | 558 | 600 | 51.8 |
| 1971 | 5971 | 3.6 | 1819 | 934 | 885 | 48.7 |
| 1981 | 8243 | 3.2 | 2272 | 1204 | 1068 | 47.0 |
| 1991 | 9926 | 1.9 | 1683 | 1387 | 296 | 17.6 |
| 2001 | 11914 | 1.8 | 1989 | 1257 | 732 | 36.8 |

## 1.3 What is driving Population Growth in MMR?

The population increase in Greater Mumbai from about 3 million in 1951 to 11.9 million in 2001 is partly a result of natural increase in population and partly due to migration (table 1.1 shows the share of migration in the total increase in population). The share of migration in the total increase in population was 36.8% in 2001-current, lower than in earlier decades, except for 1991-2001, which is being debated as an under-estimate. Such a sharp increase in population definitely puts pressure on the civic infrastructure of the region, especially the housing stock. As a result, unauthorized dwellings get developed in the form of slums due to the region's inability in this period to provide affordable housing to the burgeoning population.

As per the 2001 Census, about 38% of the population of urban MMR lived in slums at an aggregate level. The situation is more alarming in Greater Mumbai where about half of the population lives in slums. The situation is also serious in Thane Municipal Corporation area, where about 28% of the population lives in slums.

Such a large proportion of slum population provides a challenge for any city administration. Controlling the creation of new slums in the region and providing requisite infrastructure facilities to existing slums, is a daunting task. As a premier employment centre of the country, it would be difficult to markedly curtail migration to the region. Answers to the slum problem lie in more evenly spreading out the economic activities throughout the MMR and reforming the land and housing markets to enable increased supply of housing at lower costs. At present, Greater Mumbai accounts for about 59% of MMR's GDP (2008) and 76% of total employment in urban MMR1 (2001). The following sub-section presents the employment statistics for MMR and the sector wise distribution of employment that outlines the nature of economic activities in the region.

## 1.4 Employment in MMR

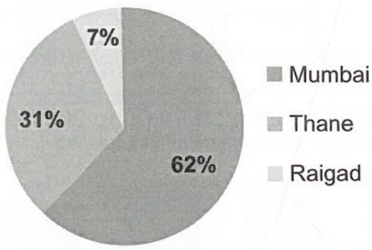



**Figure 1.3:** Regional distribution of Employment in MMR (2004)
Source: Economic Census 2004

As per the 2004 Census, the total employment in MMR was about 3.62 million (fallen from 3.77), out of which the share of Greater Mumbai was about 2.25 million (fallen from 2.63 million in 1998). This shows the prominence of Greater Mumbai as an employment center in MMR. Apart from Greater Mumbai which accounts for 62% of employment in MMR; Thane and Raigad account for 31% and 7% respectively (Figure 1.3).

The biggest employers were the manufacturing sector (24.5%) followed by retail (21.9%) and public administration (16.1%).

## 1.5 GDP composition and growth trends – MMR and Maharashtra

The following sub-sections present the salient characteristics of the economy of MMR and compare them with that of Maharashtra with respect to the following parameters:

- GDP composition and growth trends;
- Contribution of specific sub-sectors within primary, secondary and tertiary sectors;
- Location Quotient (LQ) analysis for identification of sub-sectors that have relatively high concentration in MMR as compared to Maharashtra and India.

The analysis of trends in economic growth shows overall growth in GDP in MMR as well as Maharashtra over FY94 to FY08. The CAGR of GDP was 5.7% for Maharashtra and 7.8% for MMR over the period 1999-2000 to 2007-2008 (figures 1.7 and 1.8). However, there has been an upturn in the (MMR) economy with over 9% growth in each of the last two years (2007, 2008).

**Figure 1.4:**

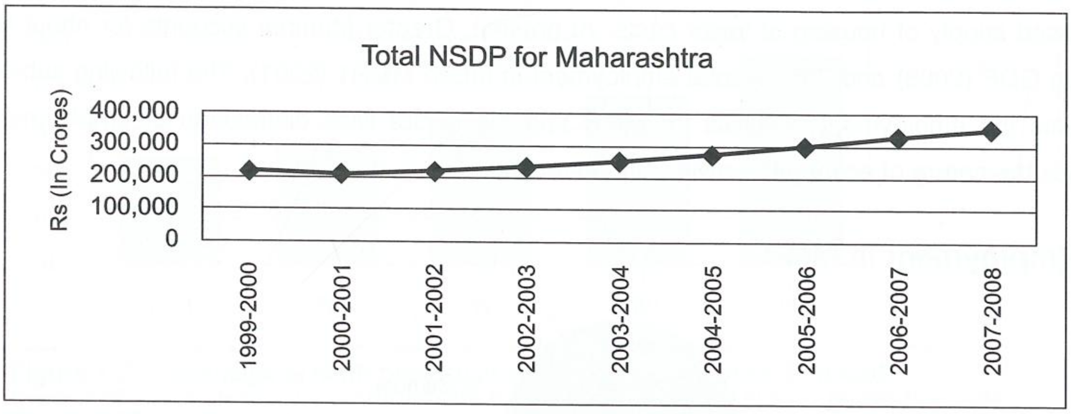



**Figure 1.4:** Trends in NSDP for Maharashtra (1999-00 to 2007-08
Source: Department of Economics and Statistics, Government of Maharashtra

**Figure 1.5:**

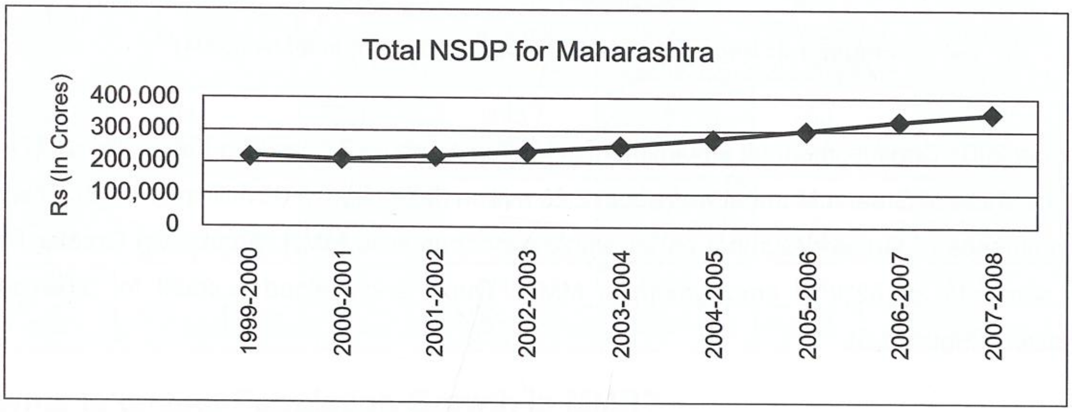
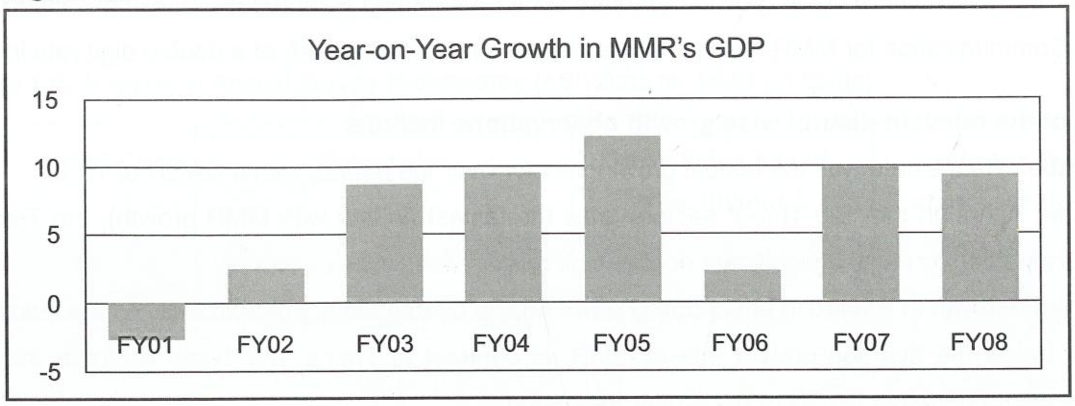



**Figure 1.5:** Trends in NSDP for MMR (1999-00 to 2007-08)
Source: Department of Economics and Statistics, Government of Maharashtra

An interesting feature of the economy of MMR and Maharashtra during the period FY94-FY08 is the volatility in year-on-year growth rates of GDP. MMR's GDP growth rate was negative in FY01 and even the growth rate of Maharashtra's GDP was negative in FY01.

Figure 1.6:



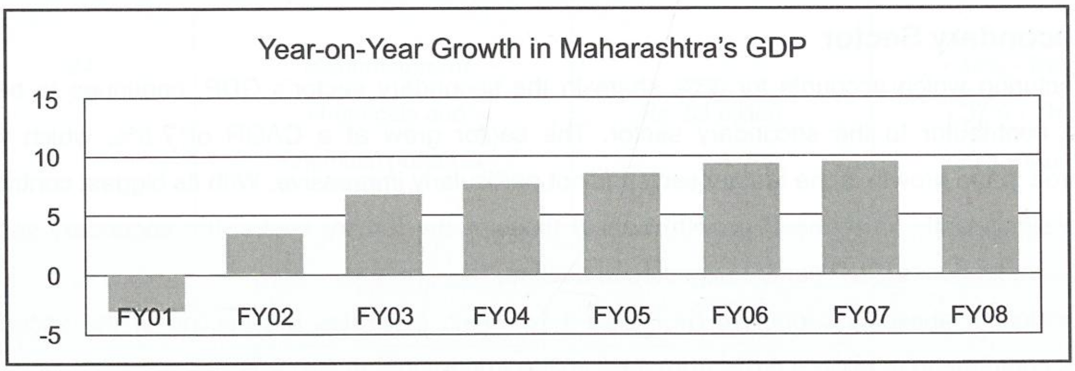




**Figure 1.6:** Year-on-year trends in GDP for MMR & Maharashtra (2000-01 to 2007-08)
Source: Department of Economics and Statistics, Government of Maharashtra

Analysis of the latest available data reveals certain changes in the district wise composition of GDP of MMR. Greater Mumbai in 2007 accounted for 60% of the GDP against its contribution of 67% in 2003-04. Share of Thane district has grown from 31% to 33% over the period. Raigad's contribution fell from 8.6% to 7% in the same period. The above trends indicate differential growth rates of various regions comprising MMR. A look into the sector wise growth provides an insight into certain aspects pertaining to this growth scenario.

## 1.6 Tertiary sector- 'The mainstay of MMR's economy'

The share of tertiary sector in the GDP of MMR has risen from 63.5% in 2003-04 to 67.6% in 2007-08. The following table shows the CAGR (from 2001-2008)) of various industries in the tertiary sector.

**Table 1.2: District wise and sector wise breakdown of CAGR, 2001-2007**

**Table 1.2:**

| | Real Estate | Banking & Insurance | Commu-nication | Railway | Transport, Storage & Warehousing | Trade, Hotel & Restaurant | Public Adm. | TERTIARY SECTOR |
|---|---|---|---|---|---|---|---|---|
| Mumbai | 16.4 | 14.4 | 13.0 | 8.4 | 7.5 | 6.5 | 4.9 | 10.8 |
| Thane | 14.1 | 14.4 | 13.6 | 8.4 | 6.8 | 10.1 | 4.9 | 11.0 |
| Raigad | 6.9 | 14.4 | 10.8 | 8.4 | 6.9 | -5.4 | 4.9 | 3.1 |
| MMR | 15.3 | 14.4 | 13.0 | 8.4 | 7.3 | 6.6 | 4.9 | 10.4 |

• The main contributors to the growth of tertiary sector have been Real Estate, Banking & Insurance, and Communication for MMR. Each of these sectors grew notably fast- at a double digit rate in MMR.

**Some of the relevant district wise growth observations include:**

**Mumbai:** Real estate was the fastest growing sector over the period, with a CAGR of 16%.

**Thane:** Although the "Big Three" sectors grew the fastest (in line with MMR growth), the Trade & Hotels industry grew at a significant double digit rate as well.

**Raigad:** Growth in Raigad in effect pulled down MMRs overall tertiary growth rate. All the industries grew below the average growth rate of MMR. In contrast to Thane, the Trade & Hotels industry witnessed a negative CAGR of 5.4% over the period.

## 1.7 Secondary Sector

Manufacturing which accounts for 33% share in the secondary sector's GDP, continues to be the biggest contributor to the secondary sector. The sector grew at a CAGR of 7.5%, which when compared to the growth in the tertiary sector, is not particularly impressive. With its biggest contributor lagging significantly (in terms of growth) behind those in the tertiary sector, the secondary sector's overall contribution to GDP can be expected to decline.

Our conclusion above is supported by Figure 1.1., which illustrates the decline in the secondary sector's contribution to MMR's GDP, from 34% in 2003-04 to 30% in 2007-08.

**Table 1.3:**

| District | Manufacturing (Registered) | Manufacturing (Unregistered) | Construction | Electricity, Gas & Water Supply. | SECONDARY SECTOR |
|---|---|---|---|---|---|
| Mumbai | 10.3 | 8.3 | 5.7 | 2.0 | 8.0 |
| Thane | 7.8 | 7.3 | 5.7 | 11.1 | 7.7 |
| Raigad | 5.4 | 8.1 | 5.7 | 0.5 | 5.2 |
| MMR | 8.7 | 7.8 | 5.7 | 3.7 | 7.5 |

**Some of the relevant district wise growth observations include:**

**Mumbai:** Registered manufacturing grew the fastest at a CAGR of 10%. However this growth rate was much lesser than major industries in the tertiary sector.

**Thane:** The growth in Electricity, gas and water supply stands out (at a rate of 11%) when compared to the growth in this sector in the other two districts (which was 3%).

**Raigarh:** Unregistered manufacturing grew the fastest vis-à-vis other sectors.

As per ASI data, sub-sectors such as, manufacture of coke, refined petroleum products and nuclear fuel; manufacture of chemicals and chemical products, manufacture of basic metals and fabricated metal products, manufacture of machinery & equipment including electrical machinery are important constituents of MMR's secondary sector (refer Table 1.3)

**Table 1.4:** Analysis of Annual Survey of Industries (ASI) Data for MMR (2003-04)

| NIC Code | Sub-sector | Gross Value Added (Rs. Billion) | Highest district shares within MMR |
|---|---|---|---|
| 23 | Manufacture of coke, refined petroleum products and nuclear fuel | Rs. 102 billion | • 79% - Raigad<br>• 20% - Mumbai |
| 24 | Manufacture of chemicals and chemical products | Rs. 56 billion | • 43% - Raigad<br>• 37% - Thane<br>• 20% - Mumbai |
| 27 & 28 | Manufacture of basic metals and fabricated metal products | Rs. 26 billion | • 64% - Raigad<br>• 27% - Thane |
| 29 | Manufacture of machinery and equipment including electrical machinery | Rs. 21 billion | • 65% - Mumbai<br>• 24% - Thane |
| 36 | Manufacture of furniture | Rs. 13.4 billion | • 98% - Mumbai |
| 17 & 18 | Manufacture of Textiles and apparels | Rs. 11.3 billion | • 50% - Thane<br>• 44% - Mumbai |

Source: Directorate of Economics & Statistics, Govt. of Maharashtra

## 1.8 Primary Sector

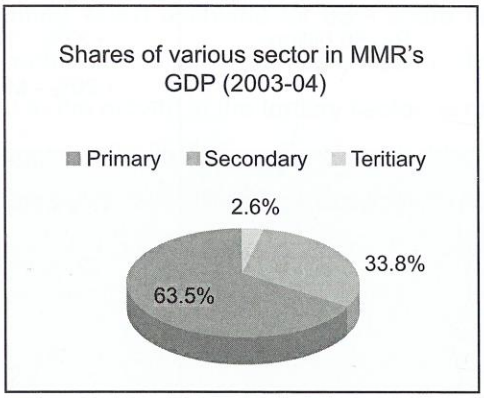
Activities related to agriculture, forestry, logging, mining, quarrying and fisheries comprise the primary sector of MMR. The primary sector witnessed a CAGR of 1.8% over the 2001-2008 period. The following are the district wise key growth industries for the primary sector of MMR.

**Mumbai:** Fisheries grew at a CAGR of 6.7%, all the other primary sector activities witnessed negative CAGR in the Mumbai region.

**Thane:** Agriculture and related activities grew fastest at a CAGR of 5.6%. The logging and mining industry was an exception, which witnessed a negative CAGR of 2-3%.

**Raigad:** Mining grew spectacularly in Raigad over the period, at a CAGR of 54%. However the growth in the other primary sectors was negligible.

**Figure1.7**



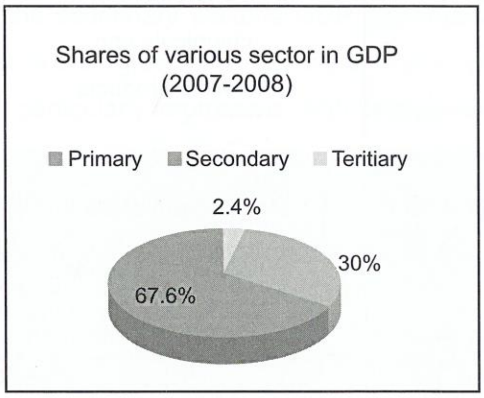




**Figure1.7:** Sector wise contribution to GDP
Source: Department of Economics and Statistics, Government of Maharashtra

## 1.9 Analyzing the factors contributing to GDP growth of MMR

The average GDP growth of MMR for the period 2000-08 was 8%. The prime sectors driving the economic growth are banking, communication and transport sectors. These sectors improved the scale of operations of economic activities by strengthening the infrastructure and enhancing connectivity in the region. The growth in these sectors can also be attributed to global economic boom prior to recent economic slowdown, increased FDI inflows to India and improvement in the labor productivity of Maharashtra.

## 1.10 Conclusions

From the above sections, the following conclusions may be drawn:

1. Thane has grown faster (in both per capita and in gross terms), as compared to the Greater Mumbai region, over the 2001-2007 period. A possible explanation for this trend could be the shifting of economic activities out of the Greater Mumbai region to Thane: this could be due to the high costs, lack of land availability and congestion problems in Greater Mumbai. Although there has been some population shift towards the outer regions of MMR in the recent times, Greater Mumbai still claims the largest share in terms of population and economic activity.

2. The MMR's share in the state's GDP in 2006-07 was as high as 40%. Within MMR, Greater Mumbai alone contributes to 54% of the population of MMR, 60% of GDP (2007-08) and 76% of employment (1998). This shows the importance of Greater Mumbai in the context of MMR and the state.

**Within MMR's economy:**

- The mainstay has been the tertiary sector, which is now typical of major metropolitan economies, both nationally and globally.
- The share of the secondary sector, although declining in the last 10 years, is still substantial and cannot be neglected in the overall economic context of MMR. MMR still contributes to 50% of Maharashtra's manufacturing GSDP and over 8% of India's manufacturing GDP. Greater Mumbai accounts for about 60% of MMR's manufacturing GDP.
- There are clearly some sub-sectors that hold greater promise in terms of higher growth or greater employment generation potential and therefore these sectors should be focused on. These are covered in greater detail in section 3 on sector analysis.
- The contribution of the primary sector will continue to be insignificant to MMR's GDP (hence, primary sector is not analyzed further in this report).
- However further analysis of both districts will be required before a conclusive answer can be provided. An understanding of Thane's growth accelerator would assist in establishing a better development strategy for the MMR.

**In order to further catalyze economic growth, there are a few critical areas that need immediate attention of state government and policy makers:**

- Extending growth beyond Greater Mumbai: There is a necessity to catalyze economic growth and spread it more evenly throughout MMR, so as to enable outer areas to develop and also reduce pressure on Greater Mumbai. There is a need to streamline and spread the development process uniformly in areas neighbouring Greater Mumbai, such as Raigad, so as to reduce migration and slums in Greater Mumbai.
- Sustaining the Tertiary Sector: The tertiary sector has emerged as the largest contributor to MMR's economy, with a 64% share in GDP which is in the range typical in developed countries (60-75%). It is important that the government provides relevant support to this sector so that it can continue to sustain growth and its contribution to MMR's GDP.
- Rejuvenate the Secondary Sector: The secondary sector (and especially manufacturing) is not keeping up (in terms of growth) with the tertiary sector. This calls for proactive steps from the state government to rejuvenate the secondary sector and specifically the manufacturing sector.

The following chapters look to address the issues identified above by highlighting initiatives and opportunities in specific industries in the tertiary and secondary sector that offer the promise of sustainable economic growth in the MMR region (beyond Greater Mumbai).

## 2. OBJECTIVE OF THE REPORT

The 2007 USAID Report Economic Growth of the Mumbai Metropolitan Region laid down the vision for MMR as:

1. To enable economic growth of 12-15% per annum while ensuring more even growth throughout the MMR;
2. Supplement this economic growth by facilitating superior quality of 'life' factors to the citizens of MMR; and
3. To ensure the equitable participation in economic growth by all segments of society.

In enabling economic growth of 12-15% per annum, we have proposed policies that will lead to the sustainable economic rejuvenation of MMR. Our emphasis on sustainable economic growth is consistent with MMRDA's Regional Plan (excerpt below).

### Excerpt from the MMRDA Regional Plan (1996-2011)

The strategic goal of such regional development management would be to promote and sustain growth with social justice in a resource efficient manner and in consonance with the goals of national development planning. The basic goal can be translated into following specific objectives:

1. To facilitate and promote economic growth of the region taking into account its role in the process of national development,
2. To improve quality of life particularly of the poor and the deprived,
3. To minimize the impact of negative externalities-particularly the adverse environment impacts- that may occur in the process of economic growth,
4. To achieve these objectives improve the efficiency of the existing methods of resource mobilisation, adopt innovative methods of resource mobilization and facilitate, attract and guide private investment in the desired direction, and
5. To achieve these objectives, promote effective citizen participation in the process of development through decentralization of institutions.

Policies, programmes, procedures and projects will have to be evaluated with reference to these basic objectives on a continuing basis. This will require a drastic change in metropolitan planning- moving away from the land use planning to truly comprehensive development planning

MMRDA Regional Plan for Mumbai Metropolitan Region 1996 – 2011

## 2.1 Framework for achieving the USAID vision

We have short listed specific industries where MMR holds a competitive advantage over other Indian and International cities. In order that these industries to attain the requisite "critical mass", we have concentrated on highlighting opportunities to initiate policies and projects that could generate "surplus" funds, which can be ploughed back in the respective industry and/or MMR as a whole.

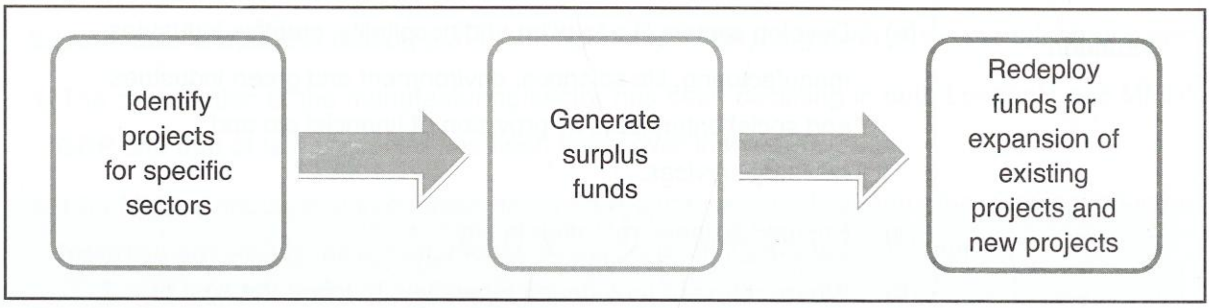



**Figure 2.1** Creating sustainable growth opportunities

The objective of this sustainable economic growth strategy is to increase the growth rate of per capita GDP and income in the region, under conditions that lead to improving the quality of life of the population, alleviating poverty, and preserving or improving the natural resource base.

The focus of this report, from this point forward is to outline specific policies and projects in high-growth industries that could generate sustainable growth in the MMR.

## 3. STRATEGIZING THE ECONOMIC DEVELOPMENT OF CITIES: INTERNATIONAL

The core committee analyzing the issue of promoting sustainable economic growth within MMR held a number of meetings and discussions with scholars and eminent personalities of Mumbai who have a deep understanding and knowledge of the economic and social characteristics of MMR. Based on their input, some sectors were identified for further analysis. The prospects of employment and output growth, leveraging on the attributes of the MMR was based more on subjective input from the experts and less on formal data gathering and modeling. The committee presented these preliminary findings to a larger Bombay First board to get confirmation on the choice of these sectors as priority sectors. In addition, the core committee also spoke to experts from each of these sectors to identify additional micro-projects and initiatives that could be implemented within each sector to generate employment and output growth.

Moreover, the group also selected from cities from across the globe and undertook research to document the various initiatives that were adopted by these cities as they continued to grow. While some of the international experiences would have less relevance or significance for MMR, it is nonetheless interesting to evaluate the proposals for MMR in the back drop of these initiatives.

Hence, we are also summarizing the city specific initiatives to provide a broad based overview of projects that led to sustainable growth in some of the well known cities of the world today.

| | |
|---|---|
| London | (a) Regenerate various sites to promote economic development as a part of neighborhood renewal.<br>(b) Develop sectors like tourism and hospitality, creative industries, manufacturing, life sciences, environment and green industries and social enterprises by provision of financial aid and advisory services. |
| New York | (a) Ensure business retention in city.<br>(b) Where relevant provide tax incentives to lower the cost of leasing spaces<br>(c) Renovate and reconstruct sub urban areas. |
| Toronto | (a) Invest in education to expand the knowledge base.<br>(b) Adopt a 'Cluster based economic development' strategy.<br>(c) Provide services designed to assist existing businesses, potential investors and business associations. |
| Sydney | (a) Actively foster the tradition of diversity and tolerance<br>(b) Protection of environment.<br>(c) Contribute to the festivals celebrated in the city and make it a leading event centre. |
| Johannesburg | (a) Improve corporate profitability through enhanced spatial planning, utilities, transport and telecommunications. |

**Table 3.1:** Key findings from Metropolitan City analysis

## Detailed Analysis

### LONDON

Studying the development of London can provide some interesting insights for MMR. London as a city is specifically relevant to us, due to the common factors that both London and MMR share-

1. Both cities have a large concentration of financial and commercial services.
2. Both have a legacy of trading ports forming the basis for the growth of the manufacturing sector.
3. The contribution of the manufacturing sector has been declining in both London's and MMR's GDP and that of tertiary sector has been rising over the years.
4. Like MMR, London is also a major centre for e-commerce and several other thriving industries including arts and fashion, film, media, design, tourism, law and computing.

### Development Strategy

The London Development Agency (LDA) which was created in 2000 has undertaken several measures to promote the growth of the city. Specific Areas of intervention include:

1. Areas of intervention - regeneration initiatives in sites and locations in London boroughs to promote economic development as a part of neighbourhood renewal.
2. Sector strategies – working with businesses in developing sectors like tourism and hospitality, creative industries, manufacturing and public sector as well as in emerging sectors like life sciences, environment and green industries, social enterprises. Some of the initiatives taken by LDA in these areas include-

**(a) Life sciences**

- Establish a space for life sciences by creating incubators, science parks and other specialist facilities.
- Build a life sciences cluster by creating support systems, promoting the cluster's image, promoting inward investment and working with the NHS[4].
- Encourage company growth by supporting and unlocking management resources.
- Bridge the finance gap by enabling access to early stage funding.

**(b) Production industry**

- Establishment of a manufacturing advisory board to provide consultancy services to the industry.
- Setting up the 1.5 million pound Manufacturing Sub Sector Support Programme.

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[4]NHS London is the Strategic Health Authority for the whole of the Greater London area.

**(c) Creative industry**

- Setting up of "Own it"- the intellectual property advice service for creative enterprises.

3. Regional priorities - strengthening economic development in London through capacity building for community economic development, enterprise and basic skills.

## NEW YORK CITY (NYC)

NYC is an important city to study because like Mumbai, its economy has developed around a harbour. Over the years, rising land values have contributed to the decline of the manufacturing sector in NYC. Like Mumbai, NYC is a metropolitan city with large population concentrations, growth of which is strongly driven by economic factors.

### Development Strategy

NYC is an established hub for international trade and much of its current economic strategy is focused on business retention by a variety of means, including retention deals, tax SOPs, and renovation and reconstruction of down town, all of which yielded positive results.

The renovation of the Times Square entertainment district, a joint venture project of Economic Development Corporation (EDC) and Empire State Development Corporation (ESDC) underway since the mid-1980s, was a considerable stride in the 1990s, with several major office and entertainment investments made. In an effort to jump-start new interest in Lower Manhattan's financial district, the city and the state approved a package of tax incentives in 1995 through EDC and ESDC, designed to lower the costs of leasing spaces and to encourage the conversion of older commercial office buildings to residential uses. By the end of the 1990s the strength of demand for commercial space in both downtown and midtown Manhattan markets resulted in an increase in rents that led companies to shift to Jersey City across the Hudson River and even to Lower Manhattan. **A similar development strategy can well be adopted for MMR wherein a blend of tax incentives, improved land utilization and renovation of old commercial spaces is considered.**

## TORONTO

Toronto is an interesting case study as it is Canada's largest city, with almost 2 million people within the city, and a further 2 million outside in the wider metropolitan area. The city is considered the most multi-racial city in North America, which gives it a key competitive element in the global economy.

### Development Strategy

Toronto has a long history of being a centre for trade, manufacturing, finance, research and development. The city has a long standing legacy/policy of large investments in education, research, technology and culture; precisely the elements necessary for success in a knowledge economy. This policy has borne fruit, with more than 50 per cent of the city's labour force holding a university degree or community college diploma. Toronto's diversity and strong concentration of highly skilled workers gives the city a tremendous competitive advantage and is a driving force behind the city's economic success.

Toronto's Economic Development Office undertakes the development planning of Toronto. The Office supports and assists existing businesses, potential investors and business associations by addressing the following -

> It responds to investment inquiries with data and advice, and works with site selectors to promote new investment in Toronto.

> Provides key information on key industry clusters, provides statistical data and undertakes economic research to help businesses stay competitive. For example- if a business is in the start up stage, entrepreneurs can contact one of the 'Enterprise Toronto' offices for information and assistance.

> Manages capital improvements and works to establish and assist Business Improvement Areas.

> The Toronto Film Office promotes and supports Toronto's status as an international film production centre

**The Toronto example could provide some insight into choosing an approach for MMR's growth plan.**

As the financial hub of India, MMR offers immense employment and growth opportunities, which has resulted in a vast cultural diversity in the region's population. Taking Toronto as an example; investment in education, research, and technology would provide a basis for translation of varied ideas emanating from diversity into innovative products and services creating sustainable economic value for the region.

Secondly Toronto's 'cluster - based economic development strategy' wherein focussed development plans have been prepared and implemented for certain key industries of the economy, such as biotechnology and IT. For example, by establishing strong linkages between leading–edge knowledge, and research capabilities, Toronto has become the largest Biomedical and Biotechnology cluster of any metropolitan area in North America. Further the IT, Food and Beverages industries were given significant impetus in terms of enhancing innovation and strengthening skill base.

## SYDNEY

Sydney has established itself as the leading Australian city in 'world city' terms. It is the major international air hub, the most important financial centre and has become a location for many transnational corporations providing services to south-east Asia.

## Development Strategy

The strategic planning of the Sydney metropolitan region is undertaken by the State of New South Wales (NSW).

One of Sydney's important development projects has been the 'Cities for the 21st Century' initiative, for the promotion of Central Sydney nationally and internationally as a corporate headquarter, financial and tourism centre. Under this initiative, buildings with heritage value were retained for office purposes and Darling Harbour was developed as a major recreation and convention centre with a linked mono-rail. Retention of heritage buildings for office purposes is a feature adopted by MMR as well.

In 1997, with an aim to foster a competitive and adaptable economy, the State produced a review of strategic planning called 'A Framework for Growth'. This plan pointed out that the State would continue to use its powers to make decisions over major projects as this helps to attract major inward investment and 'encourage major companies to locate regional headquarters and facilities in the Region'. The plan has an emphasis on environmental quality and the city bid for the Olympic Games under the slogan of the 'Green Games'. This campaign heightened the profile of environmental issues in the city. A similar "green" development approach should be considered for the MMR, as the growing pollution problem in the city due to inadequate waste disposal facilities, illegal construction, underdeveloped sewages and sanitation system pulls down several other strengths of the region. In 1997 a new body was established called The Committee for Sydney which aimed at acting as a catalyst for building a better future for the city on issues related to the environment, education, business investment and the arts. Some of the main objectives of the committee are mentioned below -

- To make Sydney an important international commercial centre.
- Actively foster our tradition of diversity and tolerance.
- Prevent Sydney from being outsmarted by other cities by driving policy to enhance the global competitiveness of Sydney.
- Preserve and enhance Sydney's urban character.
- Make our city even safer to live in and visit.
- Create employment opportunities.
- Encourage corporations to increase support for the arts.
- Contribute to the festivals which celebrate our city and make Sydney Australia's event centre.

**All the above objectives can be adopted when framing MMR's development plan. Doing so would not only strengthen the existing potential of the region in form of its diversity, urban character, and public safety but also ensure a sustainable and competitive environment preventing loss of business to other upcoming cities in the country.**

## JOHANNESBURG

Johannesburg has been considered for analysis due to its unique and well structured development plan "Joburg 2030" under its Integrated Development Plan (IDP).

### Development Strategy

The Joburg 2030 strategy has sought to overcome the problems of the city by focusing on economic growth as the crucial driver to building a better city. Economic growth would encourage long-term economic activity, investment and jobs to ensure a better life for all those who live and work in the city. Johannesburg is a city with a unique setting – it has a legacy of the apartheid and inequality. Poverty and scattered population makes it extremely expensive to provide services. Joburg 2030 aims at striking a balance between addressing these backlogs in the most efficient manner.

The Joburg 2030 strategy has identified three strategic areas through which the City will actively promote the necessary economic growth. They are as follows:

> Creating an environment conducive to Economic Growth with adequate skill base and public safety.

> Engine of Growth (Increase the Efficiency of Investment): Within this focus area the factors that contribute to corporate profitability will be addressed through enhanced spatial planning, utilities, telecommunications and transport. Further strategies have been developed to support this strategic focus area, such as an Integrated Transport Plan and the demarcation of the urban boundary.

> Accelerating Growth: The interventions in this focus complements the market growth resulting from the above two focus areas. It is aimed at being catalytic and in accelerating the benefits that arise from the implementation of the strategy. These interventions include information systems, sector development and catalytic projects.

An important aspect of the Joburg 2030 plan is the restructuring of the city governance structure, which incorporated both efficiency and equity aspects into the design. **This clear strategy addresses the major bottlenecks in development; with specific plans for developing the skill base, infrastructure and governance providing direction to channelize the development plans for MMR.**

Taking the academic approach emanating from the theory of Development Economics, the key drivers of any economy are savings (which eventually turn to investments), human resources and technology. It is evident from the above analysis that the development plans of the major cities have concentrated on addressing these key drivers. The development strategy for MMR also needs to target the above three areas to ensure sustainable growth.

**Savings and Investment:** MMR has seen rising per capita income, with rising consumption expenditure due to high rentals, insufficient infrastructure and congestion in the city. The mismatch between the high demand and insufficient supply has marred the growth of the economy. In the case of New York and London special efforts have been made by the development authorities to reduce the cost of doing business by improving land utilization, tax incentives, etc. MMR's growth plan needs to incorporate this understanding into its strategy to achieve the targeted growth.

**Human resources:** The low labour force productivity in various sectors due to lack of capital, technology and unhealthy lifestyles have further dampened the growth prospects of the MMR. Learning from Toronto's and Johannesburg's experience, MMR could also expect high returns by investment in research and education initiatives.

**Technology:** As evident from the development strategy of all the cities discussed above, investment in technology and infrastructure has played a direct role in the growth of the respective economies. We need to address inefficiencies in both technology and infrastructure when developing a sustainable economic development plan.

## 4. SECTOR ANALYSIS

In order to reinvigorate growth in the MMR the group has identified sectors which can offer sustainable growth to the region. Based on the evaluation of the key attributes of MMR, the report suggests sector specific projects that could derive a comparative advantage from being housed in MMR. The primary objective is to earmark certain "potential high growth" sectors that would generate surpluses from their operations that could be ploughed back into the sector for further expansion. Moreover, we also identified and analyzed the experience gained in other international cities with regard to projects/initiatives that led to growth within those cities. The following sub-sections lays out the results of our study.

### 4.1 Identifying key industries and growth initiatives

In identifying key growth industries and initiatives we emphasized the following requirements in each project:

1. It uses attributes of MMR that would lead to a comparative advantage of such projects.
2. It has significant employment generation potential.

Moreover, as the summary of the economic overview of MMR revealed, the proposals would need to also factor in the emergence of Thane as an important area with a large labour force while at the same time promoting or recommending projects in the tertiary and secondary sectors so that these would lead to a more balanced growth within the MMR.

In order to identify emerging industries, the group studied projects and initiatives that were undertaken in other cities across the globe and deliberated on whether similar initiatives could be implemented in MMR. International metropolitan cities were analyzed and findings from these cities were tested for relevance to MMR. Relevant strategies and initiatives introduced by the metropolitan city are included in Table 3.1. These strategies formed the basis for identifying potential opportunities. We then consulted with sector experts to clarify and confirm our understanding of the relevant opportunities in emerging sectors.

The group made a conscious effort to explore new emerging opportunities and not include industries that were previously comprehensively covered in other reports and studies (for example, the USAID report). In this regard, the group decided to not dwell any further in analyzing opportunities in the Financial Services, Information Technology and Retail Trade sectors since the potential for these sectors had been discussed in other reports and/or some of these sectors were already in a fairly matured stage well recognized as "hubs" from other regions.

The sub-committee discussed the structure and characteristics of the MMR and were able to identify the following local industries as containing potential to deliver sustainable growth opportunities to MMR:

- Biotechnology
- Computer Animation
- Food Processing
- Media and Entertainment
- Medical Tourism

The following sections discuss each of the above industries and delivers recommendations for the sustainable development of each sector in MMR.

## 4.2 Biotechnology

**Overview**

The Indian Biotech industry contributes approximately 2% to the global biotechnology industry and clocked revenues of US $2.5 billion in 2007-08 registering a growth rate of 30.98% over the previous year. The sector employs about 20,000 scientists and the Indian market is expected to grow to US$ 5 billion by the year 2010 and US$ 25 billion by 201. India ranks third in this industry in the Asia Pacific region after Japan and Korea. Currently, Andhra Pradesh and Karnataka have taken the first steps in establishing biotechnology hubs in the country. These two states have taken several proactive measures like lowering sales tax and providing land concessions to boost their Biotech sector.

However, Biotechnology can be a key potential growth sector in the MMR because –

1. **Corporate headquarters for a number of leading Bioscience Companies:** MMR has corporate headquarters of major biotech companies in India like Biocon, Serum Institute of India, Piramal Healthcare, Wockhardt Limited.

2. **Presence of Leading Research Institutions and academic infrastructure such as,** IIT, UDCT, VJIT, and Bombay University provides a pool of scientists, researchers and skilled workforce to the industry. Other competing cities such as Bangalore and Hyderabad lack the same quality of academic infrastructure.

3. **Biodiversity:** The Sahyadri ranges running along the western perimeter of Maharashtra (covering Matheran, Lonavala-Khandala, Mahabaleshwar near MMR) can provide rich flora and fauna to the Biotech industry[7] . Also, the natural availability of coastline in the MMR provides a valuable opportunity for marine Biotechnology ventures in MMR.

4. **Cheap Clinical trials:** A large patient population reduces the cost of clinical trials for Pharma/Biotech companies. MMR has 72 Government/Municipal hospitals more than 100 private hospitals, high quality hospital infrastructure and English speaking medical staff. Due to these advantages a large pool of clinical trials for Pharmaceutical companies is outsourced to Mumbai[8]. The cost advantages for clinical trials can be accessed by the Biotechnology industry as well.

**Table 4.1:**

| Biotech Park | Established by |
|---|---|
| 1. ICICI Knowledge Park | Govt. Of Andhra Pradesh & ICICI Bank |
| 2. Shapoorji Pallonji Biotech Park | Govt. Of Andhra Pradesh & Shapoonji Pallonji Co. Pvt. Ltd. |
| 3. Women's Biotechnology Park | Govt. Of Tamil Nadu & M.S Swaminathan Research Foundation |
| 4. Punjab Biotech Park | PSCST & Beckons Industries |
| 5. TICEL Biopark Ltd | TIDCO |

Table 4.1 Biotech Parks in India
Source: USAID Report 2007

[5]Source: http://www.scribd.com/doc/14957974/Indian-Biotech-Industry-Presentation-010709

[6]Source: Status and Development of Biotechnology in India: An Analytical Overview by Sachin Chaturvedi

[7]The area is one of the world's ten Hottest biodiversity hotspots and has over 5000 species of flowering plants, 139 mammal species, 508 bird species and 179 amphibian species. Source: Wikipedia

[8]Source: Clinical trials in India: Pangs of globalization by Arun Bhatt

5. **Availability of low cost workforce** to employ in various allied activities like medical transcription, distribution channels, cold chains, etc.

6. **Superior technology** - The presence of large number of high-tech hospitals could promote research and development in the biotech industry. The *States of Andhra Pradesh and Karnataka do not enjoy this advantage*[9].

7. **Financial Capital** - Mumbai is the hub of India's financial services sector. The Reserve Bank of India and the State Bank of India, NABARD, SEBI, etc., are all headquartered in Mumbai. Also, the presence large venture capital companies here, allows for the easy access to technology financing to the Biotech companies.

Based on these factors, the sub-committee identified this sector as one that can form a leading engine of growth for the MMR satisfying the three-fold objective of leveraging MMR's comparative advantage, employment generating potential and working within the parameters of the current legal framework.

## Recommendations

### Short term

1. **Cold chains[10]:** Establishing cold chains near the airport and biotech parks to transport microbes and other biological matter nationally and internationally. The cold chain infrastructure and management could be created using Public Private Partnerships with the following setup

**Role of Government:**

1. Leasing of land to private entities near airports and biotech parks at concessional rates.
2. Fiscal Benefits in the form of exemptions from import duty on raw material/ machinery, and tax holidays for services providers and operators.
3. Uninterrupted power supply at lower rates.
4. Pricing regulation with provision of a price band within which the prices are allowed to be market determined.
5. Development of best practices for temperature/humidity control with international assistance.

   **Example:** Thailand developed the above cold chain features with assistance from United States Department of Agriculture (USDA)

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[10] Source: CII Cold Chain Summit, 2007.

**Role of Private Sector:**

1. The private sector would undertake all functions and bear all risk associated with building, functioning, financing and operating of cold chains.

2. Collaborating with international institutes: MMR holds natural advantage in research and development for the Biotech industry due to the presence of premier research institutes such as IIT, UDCT, etc, together with world class hospitals. Collaborating with international universities and research organizations would place MMR on the global Biotech network.

   **Example:** The Tamil Nadu Industrial Development Corporation (TIDCO) has linked a technical service agreement with Cornell University, USA for setting up a biotechnology park in Chennai, christened TICEL (Tidco Centre for Life Sciences). This initiative will put Chennai in the global network of Cornell University, which has technical collaborations in 36 countries[11].

**Long term**

1. Set up a strategic corridor between Mumbai to Pune for the development of the biotech industry: This could be built like the San Diego biotech cluster. All stakeholders involved in this sector would be located within the same campus such that the mutual demand and supply created by one another can be fulfilled within minimum effort. This could form the basis for fast and sustainable growth momentum.

   The amalgamation of academic, social, administrative and financial infrastructure provided by the government in San Diego has led to massive growth of the industry. (Refer Box Below).

   However, Dr Swati Piramal, took a contradictory view on this idea. She believes factors like distance from the airport, hospitals in Mumbai, research institutes, etc, shall completely outweigh the benefits of this corridor. Thus, the benefits of this recommendation are debatable.

**Government Support**

1. Concessions from the government: in terms of single window clearance, land provisions, speedy customs clearance are required to fasten the investment inflows into the region vis-à-vis the states of Andhra Pradesh and Karnataka[12].

2. Extend permissible FSI: Owing to scarcity of land in MMR increasing the permissible FSI limit to 1.5, (i.e. similar to the IT industry) will encourage the construction of Biotech industry/offices in the region and will provide a check on outward movement of Biotech companies to other cities[13].

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[11]Source: Status and Development of Biotechnology in India: An Analytical Overview by Sachin Chaturvedi

[12]Source: Status and Development of Biotechnology in India: An Analytical Overview by Sachin Chaturvedi

[13]Mumbai FSI conundrum: The perfect storm: the four factors restricting the construction of new floor space in Mumbai By Alain Bertaud

**Case Study: San Diego Biotech Cluster**

Ernst &Young has identified San Diego (SD) as the fastest-growing biotech region in USA. San Diego has around 400 Biotech Companies with a market capitalization of $24.7 billion. Over the period 1975-1999 San Diego issued 1,865 patents. The value of Venture investments in San Diego from 1995-2001 is worth $1.506 billion.

Source: Building a Successful Biotechnology Cluster – San Diego and BIOCOM

The process started with a government initiative in 1960 which established two Biotech institutes namely the new Salk Institute and UCSD. In 1965, the government zoned Torrey Pines Mesa for research/industrial use. The late nineties saw a number of policy implementations like the creation of the Cal(IT)2 Program with a bioengineering center in SD and passing of the Multiuse Biotechnology Center act. Following section discusses the key drivers for Biotech Excellence of SD.

**Research Drivers:** Presence of world-class research institutions like University of California San Diego, Scripps Institute for Oceanography, Salk Institute, Burnham Institute, Sidney Kimmel Cancer Center, Neuroscience Research Institute and La Jolla Institute of Allergy and Immunology. These institutes together spend $1+ billion per year on biomedical research.

**Academic Drivers:** University organizations in SD promote interaction between academia and companies. The universities provide workforce training and research for Biotech firms. For example-

- University of California, San Diego - Research and IP;
- San Diego State University - Research; Laboratory Training, Regulatory Affairs Training.
- CSU San Marcos - Research; Laboratory and Business Training
- University of San Diego - Business, Legal, Research, Lab Training
- San Diego Community Colleges - Technical Training

**Financial Drivers:** SD provides a favorable environment for global investments like speedy license clearing systems, land concessions, scholarships for research aspirants, etc. Due to these reasons companies such as Novartis moved a $100 million venture capital fund to San Diego and Jafco, a Japanese $3 billion venture fund chose San Diego as its U.S. base of operations. Apart from these Real estate developers, lawyers and accountants specializing in biotech have emerged to support start-ups and global corporations.

**Key success factors of SD Biotech clusters**

1. **Network effect:** SD has developed efficient social networks linking managers, scientists, and financiers. This integrated network permits quick transmission of knowledge in the system.

2. **Heterogeneity:** SD has attracted individuals and organization with a diverse range of skills and experiences. The heterogeneity of a network is important as it provides access to different types of individuals, organizations, etc. The Companies must have access to a deep labor pool consisting of both scientists and managers with industry experience. The Non-market actors, e.g. universities, hospitals, and research institutes, actively participate in local technology marketplaces.
3. **Marketplace orientation:** Labor market in SD is very dynamic with extensive entry and exit of individuals. SD has become a hub of Biotech activity, with fairly rapid entry and exit of organizations and individuals. Companies frequently bring in resources from outside the region.

Source: Research paper for "The Shape of Things to Come" conference, Stanford University, Jan 17-18, 2008, By Steven Casper, Associate Professor, Keck Graduate Institute, Claremont, CA

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In 2007, the performance of the Indian media and entertainment (M&E) industry surpassed most other domestic industries. The industry achieved a 17% growth, higher than the projected 15% growth, according to a recent report published for this industry[14] .The Indian M&E industry is one of the fastest growing industries in the country. Its various segments - film, television, advertising, prints media and music among others - have witnessed tremendous growth in the last few years. The media and entertainment industry in India is likely to grow 12.5 % per annum over the next five years and touch US$ 20.09 billion by 2013.

**Television:** According to a study by FICCI and KPMG, the television industry, which is currently valued at about US$ 4.63 billion, will expand by 14.5 per cent between 2009 and 2013. Digital distribution platforms such as direct-to-home (DTH) and Mobile TV are transforming the industry. Mobile TV, where content will stream in on mobile phones, is currently at a nascent stage and is poised to grow with the advent of 3G.

**Music:** Industry experts estimate that the current size of the music industry is about US$ 149 million. According to the industry study, the music industry is likely to grow by 2 per cent over the next five years and will be a US$ 164.56 million industry by 2012.

**Radio:** According to a PwC study, revenues from radio are likely to grow at a CAGR of 24 per cent over the next five years and the industry will grow from US$ 150.52 million in 2007 to US$ 370.22 million in 2012.

**Advertising:** According to an IBEF article on the matter, advertising trends have showed healthy growth in the last five years as marketers sought to woo customers for a wide range of products. Print and TV account for the majority of the ad spend. Going forward, digital media advertising (internet, mobile and digital signage) is expected to emerge as the medium of choice for advertisers.

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[14]Source: FICCI – PricewaterhouseCoopers' Indian Entertainment and Media Industry - Sustaining Growth, 2008.

**Cinema:** The FICCI-KPMG study values the Indian film industry at US$ 2.11 billion and projects its growth at 9.1 per cent till 2013. The opening of the film industry to foreign investment coupled with the granting of industry status to this segment has had a favorable impact, leading to many global production units entering the country.

## Key Success Factors for MMR

1. As Mumbai leads India in all parts of the entertainment supply chain- talent sourcing, content development, production, and distribution, MMR is strategically best placed to leverage of the expected growth in the sector.

2. Multi-cultural, Multi-racial population mix provides a large customer base for all languages and regional entertainment networks.

## Recommendations

### Short term

1. Facilitate development/up gradation of studios and post production facilities in line with world-class facilities and standards.

2. Introduce specialized technical and creative courses at university level to ensure talent generation for the industry.

3. Renovate and revamp Tarapore Fish Aquarium on the lines of Singapore Aquarium. This would increase its educational and entertainment value, attracting more visitors and therefore increasing revenues which could be ploughed back promote the pisciculture industry in MMR.

### Long term

1. Set-up resort type facilities near film studios along with customized support services (theme based shops, eateries, exhibition halls, etc). Offer guests a complete package including watching a shoot, lunch/dinner with a celebrity, etc, thus creating a BOLLYWOOD experience.

2. The government can consider promoting the creation of a world class entertainment theme park along the lines of Disney World or Universal Studios. There are large tracts of vacant land around Thane which can be devoted for this purpose. These parks should have lower ticket pricing on weekdays and higher on weekends to attract population from various segments of society and spread the crowd over the entire week. Special transportation can be provided to and from these theme parks and there should be a

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[14]Source: FICCI – PricewaterhouseCoopers' Indian Entertainment and Media Industry - Sustaining Growth, 2008.

conscious effort to provide employment to a large number of deserving people from MMR. Synergies can be created by building a food haat (food processing initiative) within the theme park.

**Government support:**

1. Availability of land- government could assist by way of rezoning land or increasing FSI for these initiatives.

2. Promotion- the private sector could work in tandem with the Department of Tourism, to promote film tourism in India and overseas.

3. To kick-start new initiatives such as a theme park or resorts, the Government provide appropriate funding to begin with (this can be in the form of PPP) and laying down strict guidelines and protocols for maintenance and delivery of the services so that it is not entirely driven by a profit motive.

## 4.4 Computer Animation Industry

Although this industry could be clubbed with Media & Entertainment industry, we think it has the potential to grow independently and it requires specific autonomous support and as such we have looked at the Computer Animation industry separately in the report.

**Overview**

Computer animation in India is a relatively new business opportunity, with the first few computer animation operations only starting up fifteen years ago. However, a recent study by NASSCOM on the animation industry states that the global animation production market is set for major growth. The study forecasts that the global animation market will generate revenues worth US$ 100-150 billion by 2010. The Indian animation industry is estimated to grow at a CAGR of 22% to reach USD$ 1 billion by 2012.

**Table 4.2:**

| Figures in USD million | 2008 | 2012 |
|---|---|---|
| Animation Entertainment | 107 | 207 |
| Custom Content Development Multimedia / Web Deign | 256 | 542 |
| VFX | 65 | 174 |
| Animation Education | 67 | 173 |
| TOTAL | 495 | 1,096 |

Table 4.2 Revenues from Animation in India
Source: NASSCOM Animation and Gaming Report 2007-2008.

As per a NASSCOM Report, the significant changes which shaped the industry in the last few years were:

- The shift from a pure off shoring services industry to the growth of a domestic consumer market. In gaming, the mobile and console segments contributed to domestic consumption and the animation entertainment segment took early steps towards domestic box office success.
- The services market, on the back of successful project deliveries, moved up the value chain especially in animation with end to end animation movies being produced in India.
- Growth of sub sectors like custom content development where animation is used for education, training and simulation purposes and also the console gaming market with the entry of global majors like Sony and Microsoft.

Currently there are few computer animation companies in India that actually deliver start- to-finish animation products. Most large IT companies that have computer animation service lines are specifically in the outsourcing space- where American studios outsource the actual development of animations to India, to take advantage of India's low labour costs. Outsourcing units generate significant revenue from these services in the short term, although it is unlikely revenues are sustainable as the cost arbitrage is not sustainable in the long term.

We have identified this industry as one of the key growth sectors for the MMR economy on the basis of the following advantages Mumbai enjoys vis-à-vis other cities:

1. **Location advantage:** Mumbai is the correct place to develop computer animation into a standalone industry, given its position as India's entertainment capital. As Bollywood develops to cater to a worldwide audience, so too should computer animation.
2. **A vast base of English speaking manpower:** Animation requires familiarity with the English language. Mumbai has a large pool of English speaking manpower.
3. **Presence of animation studios:** Mumbai has a number of hi-tech animation studios (equipped with state-of-the-art hardware and software) which are successfully completing projects for overseas companies.
4. **Low cost of animation services:** NASSCOM's study shows that while the rates for production of half hour TV animation program would be around US$ 250,000-400,000, in the US and Canada, it is in the region of US$ 60,000 in India. India's edge in terms of pricing is stated to be unmatched by the UK, USA, Korea or Philippines.
5. **This sector can also contribute to the "special effects" requirement** in films produced in Mumbai and elsewhere. This would ensure a natural demand for their services and would provide greater stability to the growth process.

Some of the key challenges identified in the computer animation sector include:

1. **Lack of "Global sensitivity":** It is a challenge to deliver animated stories that have the potential to be successful in the international market and provide lucrative returns to the producer. Currently, Indian animators are unable to deliver storylines that cater to worldwide audiences.
2. **High barriers to entry-Costs:** Computer animation is a capital intensive operation, requiring the use of the latest computers, software and visual technology. In order to compete with American computer animation companies, Indian firms must continually invest in the latest technology available. The large investment required in this venture, may or may not provide high returns, and therefore acts as deterrent to many corporate houses looking at opportunities in this area.
3. **High barriers to entry-Skill set:** To be successful in computer animation requires a whole host of different skills including those required by the actual animators, the storey line producers and merchandisers. At the moment, India (and Mumbai) does not have sufficient people with these skills, or that have an understanding of the development process and deliverability of computer animation products.

## Recommendations

### Long term

1. Develop a specific computer animation school - to educate students on the whole range of services required by the computer animation industry. The school should be able to deliver on a yearly basis, a group of students who understand the development and delivery of computer animation products from start to finish-and not just one facet of the industry, for example software programming or product marketing. Although DSK's education centre in Pune offers a computer animation course, more such world class initiatives in and around MMR are required before the region can develop into the centre for computer animation in India. This recommendation could be entered into as either a public, private or a public-private partnership.

2. Establish a computer animation lab - similar to pharmaceutical and IT company's Research and Development labs, this lab will act as an incubator for ideas in the computer animation space. Creative minds need space and security, so that they can spend time exploring script ideas and character development that will appeal to a global audience. This hub could look to employ international experts, who could assist Indian story writers in understanding and developing global sensitivities. This recommendation could be entered into as either private or public-private partnerships.

**Government Support**

1. Government could support the development of a computer animation lab with seed capital, which could be returned to the government once the lab begins generating and selling animated products.
2. Government could offer public-private partnership (PPP) opportunities for the development of a computer animation education centre. The government could provide appropriate funding or land incentives to begin with (this can be and lay down strict guidelines and protocols for maintenance and delivery of the services so that it is not entirely driven by a profit motive.

## 4.5 Food Processing Industry

**Overview**

With an industry size of US$70 billion, the food processing industry in India ranks fifth in terms of production, consumption, export and expected growth. The industry contributed 8% to India's GDP in 2007 and had a share of 7% in total industrial production. It employs 1.6 million workers directly and accounts for 13% of the country's exports and 6% of total industrial investment. The overall food processing industry has achieved a growth rate of 8% in 2007 with estimated revenues of Rs 3,584 billion. However, as a percentage of global processed food trade, India's share is a minuscule 1.5%. This is because a majority of India's food units are engaged in primary processing (which does not increase the shelf life of natural produce). Value addition to foods by processing is a mere 8% of total production currently and is expected to increase to 35% by the end of 2025[16].

Increased urbanization, improved standards of living and the convenience needs of dual income families points to major market potential in the food processing and marketing sectors. This is also evident from the presence of several global foods giants and leading Indian industrial enterprises in the country's food processing sector, such as: Nestle India Ltd, Cadbury's India Ltd, Kelloggs India, Hindustan Lever Ltd, ITC-Agro, Godrej Foods and MTR Foods Ltd.

On August 26, 2009, the Minister for Food Processing Industries- Subodh Kant Sahai stated that the Indian Government will provide food processing training to 500,000 women in collaboration with industrial training institutes (ITI) as part of its efforts to create 10 million jobs by 2015. He said that the Government is also facilitating setting up of 350 food processing units across India, in line with the Government identifying the Food Processing Sector as a Sunrise Sector.

Source: India e-news

[16]Source: Ministry of Food Processing Industries

## Key Success Factors for MMR

1. Cost advantages in manpower and a large pool of women in the MMR workforce makes the development of the food processing industry ideal for MMR.
2. Favorable demographic profile of MMR with rising middle class and increasing number of working wives, changing lifestyles of the resident population, growth in organized food retail and increasing urbanization in provide huge opportunities for growth of the food processing industry.
3. MMR is surrounded by several agriculture dependent districts. This will assure relatively easy availability of raw material to the industry.
4. Presence of leading Indian industrial enterprises such as: Nestle India Ltd, Cadbury's India Ltd, Kellogg's India, Hindustan Lever Ltd, ITC-Agro, and Godrej Foods.

## Recommendations

### Short term

1. Develop efficient distribution systems, cold chains and marketing channels for processed food, flowers and fish. This would provide a check on wastage of the unsold stock. Establishing cold chains near airports would protect the quality of flowers and food exported, and would promote international trade.

### Long term

1. Formalize existing supply and sales of primary processed food: in a sanitized (with quality control standards) and regulated environment. Sales could be made through a "haat", with a portion of the haat profits ring fenced for developing this sector, for e.g. so as to offer group based lending to sellers or expanding similar concept to other locations. Develop a Floriculture Centre: Leverage off Mumbai's geographical location, and potential to be the gateway to East Asia by developing a Floriculture Centre similar to the "Dubai Flower Centre". This centre will operate as a "Free Zone", where international traders, logistic companies and service providers can establish operations in an off-shore environment. Such an initiative could allow Mumbai to establish itself as the floriculture trade hub of South Asia.
2. Provide assistance for setting up pisciculture processing units: specifically around the Jawaharlal Nehru Port and Navi Mumbai.

### Government Support

1. The government could promote new initiatives such as "food haats", to give credibility to them.
2. Make land available to logistic infrastructure developers, at competitive rates, in an effort to kick start development.

## 4.6 Medical Tourism

### Overview

India's medical tourism sector is expected to experience an annual growth rate of 30%, making it a Rs. 9,500-crore industry by 2015[17].

Foreign medical patients looking to have treatment in Mumbai would receive the following benefits-

- reduced costs,
- the availability of latest medical technologies
- compliance on international quality standards

**Some of the key challenges identified by medical tourism industry in MMR include:**

1. Lack of accreditation: Accreditations (like the Joint Commission International accreditation, etc) signal a consistent high quality and standard of the treatment and other related services such as cleanliness and hygiene, quality of food, skills of doctors, staff, and the technical soundness of the hospital. Foreign patients often consider these accreditations when choosing a city/hospital for treatment. As of now, very few hospitals in Mumbai hold such accreditations.
2. Difference in cultural aspects: Medical tourism requires hospitality to be rendered not only to the patient but the family as well. Differences in language, food habits and cultures require proper infrastructure and training programmes for medical staff.
3. Comprehensive approach: This involves complete care of the patients, right from the day they enter the country for treatment till complete recovery. Reduced legal complexities pertaining to visa availability, travel from air port to hospital, follow up after treatment etc. all are a part of medical tourism package.

## Key success factors for MMR

1. Low costs of medical treatment as compared to UK, USA make MMR an attractive medical services outsourcing location.
2. Availability of high quality medical care with latest equipment, technology and trained staff make MMR a suitable place for medical tourism.
3. Short waiting-time for critical treatments as Mumbai has a number of excellent hospitals and specialty centers like Bombay Hospital and Medical Research Center, Asian Heart Institute, Wockhardt Hospital, P D Hinduja Hospital and Medical Research Center, Breach Candy Hospital and Tata Memorial Centre. The waiting time is less than a week in MMR vis-à-vis USA where it could extend to 7-8 months.

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[17]Source: "Just what the hospital ordered: Global Accreditation" by Zeenat Nazir, Indian Express, Sept 18, 2006, retrieved September 29, 2006

4. A number of these hospitals have collaborations with reputed medical schools in the US and UK, and access to international expertise and technology.
5. Specialist expertise in MMR includes Cardiology, Cardiothoracic Surgery, Gastroenterology, Neurosurgery, Plastic Surgery, Obesity Surgery and Oncology.
6. Availability of large pool of fluent English speaking staff to serve the medical tourists.
7. Mumbai's geographic location makes it a very accessible hub for people coming from overseas.

**Table 4.3:**

| | Name | Location |
|---|---|---|
| 1. | Breach Candy Hospital | Breach Candy |
| 2. | Lilavati Hospital, | Bandra(W) |
| 3. | Nanavati Hospital, | Juhu |
| 4. | Hinduja Hospital | Mahim |
| 5. | Wockhardt Hospital | Mulund |
| 6. | Raheja Hospital | Mahim |
| 7. | Bombay Hopital | Marine Lines |
| 8. | Hiranandani Hospital | Powai |

**Table 4.3:** List of Private Hospitals identified with potential for Medical Tourism in MMR
Source: Mr. Micah Joseph, Nanavati Hospital

## Recommendations

### Short term

1. Allow concessions to private players to promote medical tourism but at the same time correlate the incentives to an "adoption" of another facility with poor infrastructure.
2. Undertake international marketing and advertisement initiatives with the Government of India to showcase MMR as a medical tourism hub.

### Long term

1. Earmark a portion of existing municipal (public) hospitals infrastructure and upgrade the hospitals for tourism purposes. A portion of profits from can be ploughed back to ensure up gradation of other facilities.

The idle land available to Cooper Hospital could be leased to a nearby private hospital like Nanavati to independently manage and control the medical tourism wing. In turn, Cooper Hospital would receive leasehold income and also potential a share of the revenues earned by the private operator.

**Government Support**

1. The government should intervene to ensure quick availability of Indian visas to foreign patients.
2. The Government could provide of a block of land which is the equivalent of a medical tourism "SEZ". If this large block of land would be provided (particularly around the international airport) at a subsidized/competitive rate, there could be the potential for various hospitals to develop "specialized" medical tourism hospitals. Also other infrastructure, such as lodgings for patient's family and rehab centres could be set up at a relatively low cost and consistent with foreign patients needs.

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