SPATIAL PLANNING AND ENVIRONMENT: A REFERENCE TO SURAT CITY (INDIA)

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ABSTRACT

Six to seven million people are added annually to urban India. At the beginning of this millennium, 285 million Indians lived in its nearly 4400 towns and cities. It is estimated to rise to 550 million by the year 2021 and 800 million by 2041 when it will surpass China. At that point urban India will be larger than the total population of Europe.

Economic growth is both a driving cause as well as the chief outcome of any urbanization process. Cities act as engines of economic growth, contributing to 60 per cent of the national income. Per capita urban energy consumption has been increasing in the recent years. These developments pose a serious threat to fast depleting natural resources that act both as factors of production, as well as dumping grounds for wastes generated.

Urbanization in India is characterized by unplanned and uncontrolled growth leading to urban sprawl. Land use planning and the pattern of development, relationship between residential areas and industrial, commercial and office complexes have a considerable impact on the environment. Most of all, appropriate infrastructure provision has not kept pace with economic growth. Consequently, the environment of urban areas, particularly of larger cities, has been deteriorating rapidly. ULBs in India are faced with a plethora of issues that directly impact their capacity to manage municipal service delivery while simultaneously addressing environmental concerns.

Spatial planning somehow has failed to address these issues in real context. The land use composition in a development plan of a city greatly determines the urban environment of that city to a large extent. Even the logical location of land use and its proportion are of critical importance. Sound planning with reference to waste land, agriculture, industrial and habitable areas are few among many parameters required to be considered while planning.

Somehow it is felt that proper attention or seriousness towards spatial planning is lacking particularly when it is compared to the fast pace of urbanization in Indian context. Still the old and traditional practice of land use and zoning is going on in

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most of the cities by locating residential, industrial, commercial, institutional and other uses of the land. It is this uses that going to decide the future direction of Urban sprawl and its circulation network. The urban transport has a direct bearing to the land use of the city and ultimately the air pollution through vehicular emission other than industrial pollution as well. Land use planning and design forms the base platform for the design of urban infrastructure investment planning and design.

Key Words : Planning and design, Economic growth, Vehicular emission, Spatial planning.

INTRODUCTION

 Approximately seven million people are added annually to Urban India. At the beginning of the millennium 285 million Indians lived in its nearly 4400 towns and cities\(^1\). It is estimated to rise to 550 million by the year 2021 and 800 million by 2041 when it will surpass China. At that point urban India will be larger than the total population of Europe\(^2\).

Economic growth is both a driving cause as well as the chief outcome of any urbanization process. India is among the ten most industrialized nations of the world. At 8.5 per cent (2003–4) India stands next only to China in terms of per annum GDP growth. In the last decade India’s average growth rate was 6.3 per cent (1994–2004) and it aspires to achieve 8 per cent plus growth rate in the coming decade. Much of this boom has been experienced in the larger urban areas, where majority of the industrial production is concentrated. Cities act as engines of economic growth, contributing to 60 per cent of the national income. After India embarked upon economic reforms in 1991, the percentage of poverty fell from 36 per cent in 1993 to 26 per cent in 2000. This new found prosperity has not only led to a greater collective demand for a variety of goods, but also that traditional lifestyles have been altered in pursuit of an increasingly ‘modern’ way of living. Per capita urban energy consumption has been increasing in the recent years. Demand for packaged consumer goods has increased several folds even in rural areas. These developments pose a serious threat to fast depleting natural resources that act both as factors of production, as well as dumping grounds for wastes generated. Urbanization in India is characterized by unplanned and uncontrolled growth leading to urban sprawl. Land use planning and the pattern of development, relationship between residential areas and industrial, commercial and office complexes have a considerable impact on the environment. Most of all, appropriate infrastructure provision has not kept pace with economic growth. Consequently, the environment of urban areas, particularly of larger cities, has been deteriorating rapidly. ULBs in India are faced with a plethora of issues that directly impact their capacity to manage municipal service delivery while simultaneously addressing environmental concerns\(^3,4\).

Surat an emerging megalopolis on western India is an example of better urban planning and management techniques for a conducive environment and provision of better quality of life. The city is selected only to highlight some of the best practices adopted by the civic authorities and the city managers as well\(^5,6\).
Surat Evolution

The city is one of the oldest (300 B.C) historical trade center of India. It has a most vibrant present and an equally varied heritage of the past. It is the city where the British first landed in India. The Dutch and the Portuguese also established their business centers in Surat (18th century), the remnants of which are still preserved in the modern day Surat. In past this was a glorious port with ships of more than 84 countries anchored in its harbor at any time.

Today’s Physical growth of Surat city is an outcome of the expansion of the city’s limits at various intervals geared to accommodate the additional population and the increasing economic activities. Physical growth of the city at different time period is as shown below in Table 1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Area (Sq. Km.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1664 (Inner wall Area)</td>
<td>1.8</td>
</tr>
<tr>
<td>1707 (Outer wall Area)</td>
<td>7.4</td>
</tr>
<tr>
<td>1961</td>
<td>8.18</td>
</tr>
<tr>
<td>1963</td>
<td>21.95</td>
</tr>
<tr>
<td>1971</td>
<td>33.9</td>
</tr>
<tr>
<td>1975</td>
<td>55.7</td>
</tr>
<tr>
<td>1981</td>
<td>55.7</td>
</tr>
<tr>
<td>1986</td>
<td>110.0</td>
</tr>
<tr>
<td>1991</td>
<td>111.15</td>
</tr>
<tr>
<td>1994</td>
<td>112.28</td>
</tr>
<tr>
<td>2001</td>
<td>112.28</td>
</tr>
<tr>
<td>2006</td>
<td>326.515</td>
</tr>
</tbody>
</table>

Source : City Development Plan, Surat, 2006-2012

It is clear from the above table that like any other city Surat has grown spatially. The city of ancient times has assumed the economic importance due to industrialization. Surat is experiencing rapid growth of population, because of the increasing industrialization in the peripheral area of Surat. Due to industrialization migrant population has also increased rapidly. The study in the field of migrants in Surat reveals that almost every second family of Surat has come from out side.

Urban Planning and Development

The Surat Urban Development Authority (SUDA) is the key agency entrusted to formulate the development plan. This development plan formulates the direction of growth for any city (Surat in present case). The development plan proposes the land use,
reservation of land for public purpose, transportation network and a broad based financial layout. The land use proposals guide the direction of growth. Residential land will primarily allow residential development only with some amount of commercial activity to satisfy the neighborhood requirements. Similarly the proposal for general industrial and obnoxious industrial uses are also proposed in the development which means that such land will be utilized for the designated use only. SUDA had proposed the first development plan in 1980, which was sanctioned in 1986. The first plan was prepared for the plan period up to 2001 AD. The process of urbanization is a continuous phenomenon. The first plan envisaged was based on the existing situation predominant that time. However the process of planning depends upon a number of variables such as population growth, economic activities, development of counter magnates, and the nature of development. To cope-up these problems it requires to review the development process at moderate time intervals SUDA revised development plan to streamline the development to achieve the long term goals. This revised development plan also requires to be reviewed at an interval of 10 years with a view to accommodate and to review the program of implementation and also to assess requirement and needs created by new technology and new development.

The first step in preparation of development plan is the identification of the land use characteristic and existing city structure. Detailed survey of existing situation has been made. While formulating the proposals of revised development plan, the broad principles followed are to minimize the spread of urbanization in agriculturally rich fertile irrigated area, moreover to utilize maximum waste-land for future urbanization. Urban growth pattern is always studied in order to define the growth. It is partly for the planners and partly the forces of urbanization that decide the structure of the city. Delhi is a concentric ring concept while Mumbai is a linear city model. Both forms have its advantages and disadvantages. That is why perhaps urban planners have a job to make a balance of all the scenarios. Study and analysis of infrastructure existing and the proposals are key factors for a better environmental living condition.

**METHODOLOGY**

Most of work rendered with this research paper has been carried out by secondary data. Although some of the work were also performed through primary data.

**Objectives of Development Planning**

The main objectives of the development plan would be to achieve efficient functioning by restructuring the city, by means of conservation, redevelopment or new development and to serve as a policy frame work with long term perspective to guide future developments. One of the important considerations while formulating the revised development plan proposals has been the need to protect the best of existing character of a city to redefine its structure and suggest appropriate measures the growth of city. Any urban planning effort is to achieve the social objective i.e. “Improved quality of life”

The Main objectives of the revised development plan in case of Surat are :
- To guide spatial form
- To design transportation network for an optimal use of energy and moving people from on place to another
- To develop residential (hub) nodes with self sufficient infrastructures for achieving sustainability
• To aim for evolving poly-nucleated structure for the area as against the present mono centre structure.
• To identify and suggest possible water resources and to indicate possible drainage disposal system for over all urban area for a clean and green environment.
• To develop environmental balanced planning with provision of open spaces, recreational areas, amusement parks catering the regional needs as a whole.
• To identify the industrial activity in the vicinity of the city. e.g. Heavy industrial growth area, Ports, Oil giants like O.N G.C., Shell, etc. fertilizer complexes, etc.
• To identify and suggest preservation of historical monuments and architectural heritage buildings.
• To regulate and control the development in the planned manner through various control mechanisms.

RESULTS AND DISSCUSSION

Existing Land use Analysis

The city managers are responsible for deciding the land use structure of the city. The land use designation has an important bearing on the entire environment of the city. The provision of the industrial use with the classification of the type of the industries will have an important aspect for the environmental improvement and the general ecological balance of the area. One must be very careful while designating a portion of the city space for industrial use. Before designating any use of the land we have to understand the wind direction and the general climate of the city. Furthermore we must take into account the type of the soil of that area. If it is a fertile land than designating any developmental use will spoil that area of its fertility. There arises no question of designating industrial use in that area. We may suggest conservatory uses such as forest land, green belt, botanical garden and similar such use.

Planner has the liberty to define the circulation network. He has the liberty to frame a policy about the transport mode to be adopted in the city. Maximum use of public transport like bus, light rail will help in reducing air pollution due to vehicular emission. The unplanned and haphazard growth of the city leads to more individual two and for wheeler ownership which is detrimental for the extreme level of air pollution. Unfortunately this has been the picture of almost all the cities of India and Surat is no exception. Perhaps the city of Surat may fall at the extreme range of improper transportation network and planning leading to a very high ownership of individual vehicle ownership in the city. Take a detailed look at the existing land use analysis of the Surat city.

The Land use structure of the city is governed by the Development plan prepared by SUDA. The preparation of the Development Plan of the city is governed by the Gujarat Town planning and Urban Development Act, 1976 under the provisions of which the Surat Urban Development Authority prepares the development plan for the entire area of SUDA including the area under the Surat Municipal Corporation (SMC). SMC prepares the Town Planning Schemes for the area which is a planning technique for the spatial improvement of the city. The schemes so prepared are a effort for provision of basic infrastructure to the people of the city and thus improving the quality of life.

The preparation of first Development plan by SUDA began in 1978 after its establishment. This plan was sanctioned in 1986. The revised development plan for the SUDA area was submitted to the Government in 1998, which was sanctioned on 2004. The land use details as per the Development plans (SUDA) is shown in the Table 2.
The Total Urbanized area in SUDA is 17043.14 hectares and out of that 11228 hectares already belonged to SMC. The Previous existing SMC Land use and the Changed Scenario can be seen from the Table 2.

<table>
<thead>
<tr>
<th>Type of Zone</th>
<th>Area in 1978</th>
<th>%</th>
<th>Area in 1995</th>
<th>%</th>
<th>Area in 2004</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>2695.60</td>
<td>36.96</td>
<td>6189.00</td>
<td>46.77</td>
<td>9806.18</td>
<td>57.54</td>
</tr>
<tr>
<td>Commercial</td>
<td>141.30</td>
<td>2.09</td>
<td>256.00</td>
<td>1.93</td>
<td>415.72</td>
<td>2.44</td>
</tr>
<tr>
<td>Industrial</td>
<td>1006.40</td>
<td>14.92</td>
<td>2784.00</td>
<td>21.04</td>
<td>3023.40</td>
<td>17.74</td>
</tr>
<tr>
<td>Educational / Public / Purpose</td>
<td>540.00</td>
<td>8.00</td>
<td>735.00</td>
<td>5.55</td>
<td>579.82</td>
<td>3.40</td>
</tr>
<tr>
<td>Recreation / Garden and open space</td>
<td>22.21</td>
<td>0.33</td>
<td>58.00</td>
<td>0.44</td>
<td>106.61</td>
<td>0.63</td>
</tr>
<tr>
<td>Transport and Communication</td>
<td>790.92</td>
<td>11.72</td>
<td>1661.00</td>
<td>12.55</td>
<td>1561.41</td>
<td>9.16</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1550.00</td>
<td>22.98</td>
<td>1550.00</td>
<td>11.71</td>
<td>1550.00</td>
<td>9.09</td>
</tr>
<tr>
<td><strong>Urbanised Area</strong></td>
<td><strong>6746.43</strong></td>
<td><strong>100</strong></td>
<td><strong>13233.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>17043.14</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>Non Urbanised Area</td>
<td><strong>65453.57</strong></td>
<td></td>
<td><strong>58967.00</strong></td>
<td></td>
<td><strong>55156.86</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72200.00</strong></td>
<td></td>
<td><strong>72200.00</strong></td>
<td></td>
<td><strong>72200.00</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Revised Development Plan and CDP 2006 – 2012

The land use table is given for the simple reason to show how different uses are designated. The important feature of the table is the urbanization pressure. One can easily make out that with the advent of time the provision for the residential use is increased.
More the residential use more is the pressure on the city governments for the provision of the basic infrastructure. The city economy can thrive on the industrial and commercial output. They need to be taken care in deciding the land use. Surat has followed the pattern of mixed land use which has substantially proved to be effective in the satisfaction of the city dwellers.

Surat like other cities has experienced the recent extension of the city limits. All the adjacent residential area has been included. The area having zoning other than agricultural is the urbanized area. The features of the land use are to explain to the readers that they are detrimental in deciding the city local environment. One can never ignore the same aspect. Unfortunately we in India don’t take the matter seriously by passing the functional buck to different persons and agencies citing some legal explanation.

Fig. 2 : Revised Developmen Plan 1994
Map Extension of the city

The picture map above shows the land use of the Surat city which can be extended to any city for academic purpose of understanding. The land defines the residential, commercial, industrial, institutional, open spaces, green spaces, gardens, etc. A city is a living organism which has a birth and it grows and grows and then decays. The environmental activists and experts has to tackle the developmental tools to control and guide environment. Improved environment leads to the development and achievement of social objective, particularly for the countries like India. We need to promote good environment and thereby allow a conducive environment to the people of the city for the promotion of social objective.

Suggestive Remarks

One needs to understand the importance of the city planning, spatial planning and the
important linkage to the environmental planning of the area. Traditional approaches of an environmental engineer need to be redirected towards the achievement of a cleaner environment for our future generation. The academicians have already given enough thought towards this important aspect, however the general practice of the administration at all levels need to recognize this important aspect. Cities contribute approx 60% of the national GDP and by all means they are the engines of economic growth. These economic drivers are needed to be sustainable if we want to be the leaders of social upliftment. The social objectives can be fulfilled through a sustainable environmental scenario. We need to promote good health, quality education, green and efficient infrastructure. All this concentrate on our cities and these are the hubs that promote our culture. Our environmental concerns are valued towards potential and pro active work in this field.

CONCLUSION

Urban planners, city managers, policy makers, administrators and academicians need to understand the spatial planning importance towards environmental improvement. Land use design, road network planning and formulation of policy guidelines for developments are the key parameters for tomorrow’s urbanization.

Urbanization though accelerating at an alarming rate, has to be accepted. Half of the population of India will live in cities in next decade or two. We are supposed to frame our policies to provide next generation clean and green cities. These can be achieved through thoughtful and rational planning. These can be achieved by providing good basic infrastructure like water for drinking, drainage and disposal of solid waste. These parameters can never be studied in isolation. Spatial planning is an umbrella for all these indicators.

REFERENCES

2. NIUA (2000)

SAVE THE ENVIRONMENT

Good Environment is good health
Air Pollution causes health hazards
Recycle every drop of Water