

Analyzing Role of FSI in City Sprawl- Case Study: Pune City

Prof. Digvijay Dilip Pawar*

*Assistant Professor, Trinity College of Architecture, Pune, Maharashtra, India, 411048

Email: Ar.digvijaypawar@gmail.com

Abstract

Pune is the second-largest city in the state of Maharashtra after Mumbai, and is an important city in terms of its economic and industrial growth. Over the years Pune Municipal Corporation area has grown in concentric rings. Future growth of PMC will be mainly governed by existing transport corridors, existing and future industrial developments in and around PMC and the expansion of central business district (CBD). The aim of the research is to analyze role of FSI in city sprawl supported with a case study of Pune City. The objectives of the research are- to assess existing and proposed policies/projects undertaken in Pune City for last two decades, to understand population growth trend and its distribution within and around the city, to analyze factors contributing to intensification and spatial distribution of population density, to examine the effects of increased population density on the existing infrastructure facilities in the urban settlements and lastly to propose strategies or proposals for the selected study area. The methodology adopted for the study initiates with assessing the data collected from secondary sources. The increase in population and built-up area attributed to various factors are studied using satellite images and GIS techniques. Population and built-up density can be linked up together to understand how the former growth affects the latter. The distribution and pattern of population density helps to provide useful information in provision of necessary service infrastructure. Finally, different approaches of accommodating the future population are studied and proposed in the study.

Keywords

Urban sprawl; Density; Spatial Distribution; Accessibility; Urban Growth

1. Introduction

FSI is a common variable in cities and results in varying pattern of development of the urbanform and space. FSI is also a tool for planners to control the extent of built-up area on a given plot and also an instrument in the real estate market (Bertaud and Brueckner, 2004). In every city there are development controls, earlier it was informal, now formalized. Post world war- II, the concept of FSI came into light from America, also known as FSI in India (Patel B. Shirish 2012). In some large cities classified by the URDPFI draft guidelines 2014 like Delhi, Bangalore, and Kolkata it is known as FAR and in some cities like Mumbai and Chennai it is known as FSI.

Cities are constantly evolving and at any point of time exhibit their unique character through their urban structure, which can be mapped and measured. Cities have a hidden structure which is to be understood only through analyzing the data, more particularly the land use and population distribution. It becomes evident in today's context to monitor and manage the spatial expansion of cities which is more complex now.

2. Methodology

The entire research has been carried out in 3 stages- Preliminary study, Data collection, Analysis. The First stage consists of the Preliminary study conducted through critical analysis of various research papers, reports, frameworks/guidelines of various organizations, concepts, theories, principles, relevant case-studies, etc. and formulating the aim, objectives, scope, limitations and outcome of the research. The Second stage consisting of the Data collection through primary and secondary surveys considering the existing condition of the selected study area in Pune. The primary data collection has been carried out through reconnaissance survey and physical documentations in terms of photographs, notes based on characteristics, etc. Primary surveys were also carried out through public responses to structured questionnaire by online or face-to-face communication. The secondary survey has been done through various news articles and reports of the selected study area. The Third stage consists of the Analysis of the collected data in order to list the conclusions and findings based on the previous stages and understanding the research gap, and giving further recommendations.

3. Literature review

Literature study of various reports and papers based on FSI and its implications on urban sprawl. Study of aspects related to FSI in various codes and guidelines was carried out. Case-studies of various cities with respect to FSI-Delhi, Bangalore, Mumbai, Chennai, Vijayawada, Kolkata. Review of various news articles with reference to FSI and urban sprawl was done in order to achieve information about current and old development updates. Study of past planning efforts in Pune city and their details for analyzing the various implemented policies and strategies at city-level.

4. Study area

The study area, is Pune city within Pune district boundaries in Maharashtra. Pune city lies between latitudes 18°25'N and 18°37'N and longitudes between 73°44'E and 73° 57'E. Parameters for selection of study area are composition of Slum area, TOD-influenced area, hierarchy of roads for analyzing the changes in FSI, river-side development, old and new developments, placement of various land uses within the area. The total study area is around

243.84 sq. kms. The total population within study area is approximately 31,15,431 persons. The population density within study area is around 12,777 persons per sq.km. (which is approx. 127pph)

Pune Municipal Corporation (PMC) was established in 1950 under Bombay Provisional Municipal Corporation Act (BMPC) Act, 1949. The total area under Pune Municipal Corporation jurisdiction in 1951 was 125 Sq. km

with a population of around 4.8 lakhs while in 2011, it covers a total area of 243.84 Sq. km with a population size of 3.11 million. Pune city is divided into 4 main zones and further sub-divided into 14 administrative wards. Pune city administration of 14 wards is further divided into 76 'Prabhags'.

5. Survey

5.1 Representation of the road-wise FSI within the delineated Study area:

The Central Business District (CBD) of Pune is the high density zone with major land use under residential and commercial activities. The old city is congested with its narrow roads and lack of open spaces. Majority of the middle and high income groups are inhabited on the peripheral areas i.e. on the first belt area. Industrial developments are mostly found in pockets and belts along the radial roads entering the city. The fringe area i.e. the peripheral second belt was recently merged with PMC, which have been developed as an unorganized urban sprawl with residential, industrial and local commercial users.

Though statistics for the ground situation for changed land use is not available, from field surveys and discussion with PMC officials, it is observed that a lot of land use changes have taken place from the defined zones, especially for commercial areas. Old city wards are overcrowded with commercial establishments and the same is the case with areas along transport corridors. A number of IT offices in residential areas have also come up since IT industry is permitted in residential zones. It is seen that wards of Ghole road, Kothrud-Karve Road, Dhole Patil road, Nagar road and Kasba Vishrambaugwada have maximum area under the influence of Transit-Oriented Development due to the proposed metro corridor. Though statistics for the ground situation for changed land use is not available, from field surveys and discussion with PMC officials, it is observed that a lot of land use changes have taken place from the defined zones, especially for commercial areas. Old city wards are overcrowded with commercial establishments and the same is the case with areas along transport corridors. A number of IT offices in residential areas have also come up since IT industry is permitted in residential zones.

6. Observations through survey

The study area consists of various ranges of FSI due to varying road widths and the character of that area. Comparatively large area currently covered with slums along the river side, is observed to have not consumed the FSI as per regulation. Due to presence of metro stations within the selected study area, influential area gets the benefit of the transit-oriented development (TOD zone) as per new regulations. Area under influence of TOD gets FSI of 4, depending on their plot sizes. Due to less wide internal roads, the FSI for most of the development is between 1.00-1.40. The land-use under the future TOD influence is seen to be mostly residential and mixed use. Also, not all commercial plots are placed along major roads, hence have less allowable FSI as per regulations.

7. Discussions and recommendations based on FSI

Additional FSI can be provided to the wards with lower built density in order to reduce the built concentration in the core area. It is not only to reduce crowding but also help in decentralization of the resources within the Pune city limits. As per the map generated based on built density, the wards with less than 60% built index, can be provided with additional FSI for further development of redevelopment of residential projects and other infrastructural facilities. With a view to encourage low cost housing schemes in MHADA owned vacant lands, FSI of 2.5 shall be allowed. An incentive FSI towards rehabilitation of existing occupants shall be admissible as 50 per cent (congested areas) and 60 per cent (elsewhere) for plots up to 4000 square metres and 60 per cent (congested areas) and 75 per cent (elsewhere) for plots larger than 4000 square metres. Premium FSI up to 0.4 can be bought in all areas of the city by paying a premium of 1 times the ready reckoner rates for open plot of that area. Also, premium FSI cannot be used in congested areas (except in metroinfluence zones). Premium FSI cannot be used for slum dwellers' housing schemes and in areas where permissible FSI is less than 1. Educational institutions can use a maximum of 1.5 FSI while hospitals can use a maximum of 4 FSI.

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