

URBAN GROWTH ANALYSIS OF PUNE CITY USING GIS AND REMOTE SENSING

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Abstract:- India had been going one of the most noticeably awful periods of the monetary emergency in its 72 years of history. India's best three rating offices like Fitch, Moody's and S&P have just diminished India's development GDP to the least stamps much before Corona. Presently, this Corona plague would have an enduring and startling impact on the Indian Economy which may push India very nearly 70 years back like the bit period. The investigation looks at the condition and effect of Coronavirus in India's various areas. One of the critical targets of the examination is to comprehend and investigate different variables that cause Indian economy down. The examination can be utilized for making some compelling approaches, identified with their effect and recommendation to fill hole among Corona and Economy of country.

Keywords– Indian Economy, BPL, Pandemic, Quarantine, Covid-19

I INTRODUCTION

It is fact that urban growth is affecting on Environment. Because of urbanization we face number of problems in future also. So we should give more attention on environment awareness. The urban areas in the developing world are under constant pressure of a growing population. Indian cities are experiencing an accelerated pace of growth since independence. Cities are now emerging as centers of domestic & international investments in an era of economic reforms, liberalization and globalization. Because of push from villages and capital investment made in urban area large number of people migrate from villages to cities. Cities find it difficult to accommodate all the economic activities and population. The core of cities became more important. Due to population pressure, concentration of commercial activities, traffic congestion, pollution, crime etc. it is important to plan core of the city with advanced techniques like remote sensing and GIS.

Pune (Maharashtra) is one of the many cities in India, growing at a very fast rate. In the patronage of kings and rulers, it has acquired a complex urban structure over the years. The city has gone through

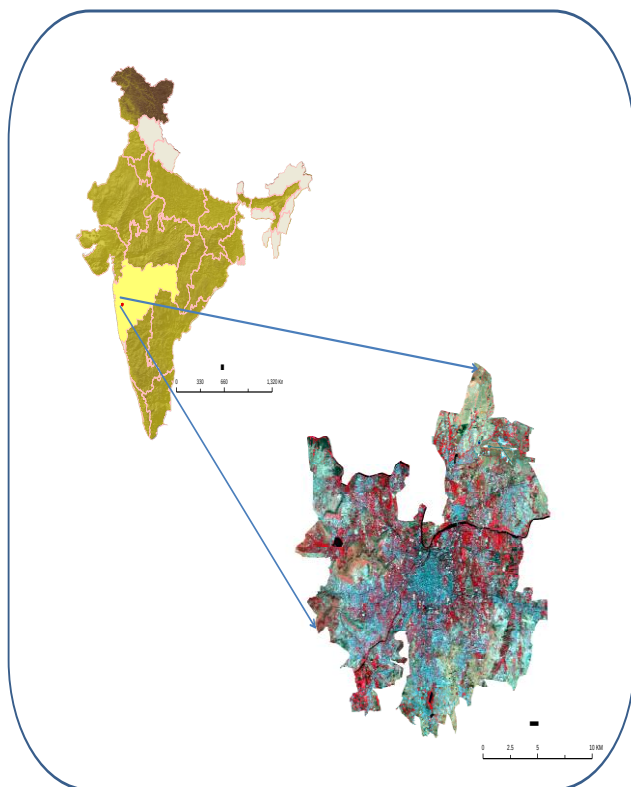
unusual changes from last 40 years in terms of economic, social and physical transformations.

An attempt is made to prepare a Development Plan in duration of three years on a Geographic Information System (GIS) platform ensuring the connectivity and integration of core area with the rest of the city using spatial information obtained through remotely sensed data, city maps and Survey of India (SOI) topographical sheets.

II STUDY AREA

Pune city situated on the 18° 31' North latitude and 73° 51' East longitude and cover an area of 243.96 sq.km. It has a strategic position in the valleys of Mula and Mutha, which join each other in the Pune city. In Pune city total 177 census wards are there where, more than 600000 households and more than 3.2 million people (according to Pune Municipal Corporation 2006). Pune is one of fast developing urban agglomerations in Asia and ranks eight at national level (Census 2001).

It has grown quite haphazardly. The present growth is due to various factors such as industrialization, location of various Central and state Government establishments.



III NEED OF STUDY

Usually researchers use technique and satellite data to see the changes of the growth of a city. In present work I am conducted the research with searching ground truth with the help of extensive fieldwork. To see the change occurred in economical activities of Pune city in last 30 years and how Pune city transform from small hamlet with only 15 huts in 613 A.D. to 1.3 million in 1981 and in 2001 the population has reached 3.5 million. City dwellers economically transform from fisherman to IT professionals. How spatial change occurred in different phases of Pune city and surrounding area with the help if people participation in the research.

IV DATABASE

1. Collateral data: temporal population data from the government agencies, cadastral data from land records

department and topographical sheets from Survey of India on 1:25000 scale 47 F/14.

2. IRS – 1C/ID, LISS- III - For 1997 and recent one. Remote sensing data from National Remote Sensing Agency, Hyderabad.
3. Data related to Population of city, workers participation in different activities, Housing will be used from Census of India.
4. Random Sample Survey

V METHODOLOGY

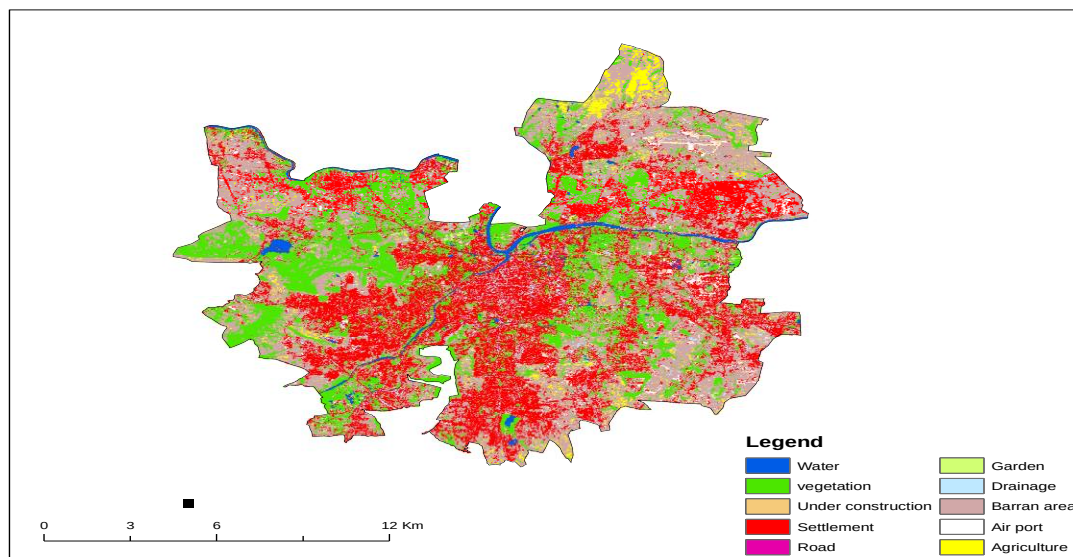
The digital remote sensing data was processed and geo-referenced in Erdas software. Initially the toposheets were scanned and geo-referenced and used as base for image registration. The geo-referenced FCC image was further enhanced by using necessary enhancement techniques. After that visual interpretation of image was done to identify the major land use classes. The enhanced image was classified on the basis of sample collected from different classes. Maximum likelihood classifier of supervised classification in Erdas was used to classify the image into major classes and again they remerged into two main classes as built-up and Non built-up area.

Hence, considering the built-up area as a potential and fairly accurate parameter of urban growth gives better knowledge for understanding the behavior of such growths. Therefore the classified image and the merged toposheets were brought into Arc View 3.2 environment and the toposheets and the area under built-up was calculated for further analysis.

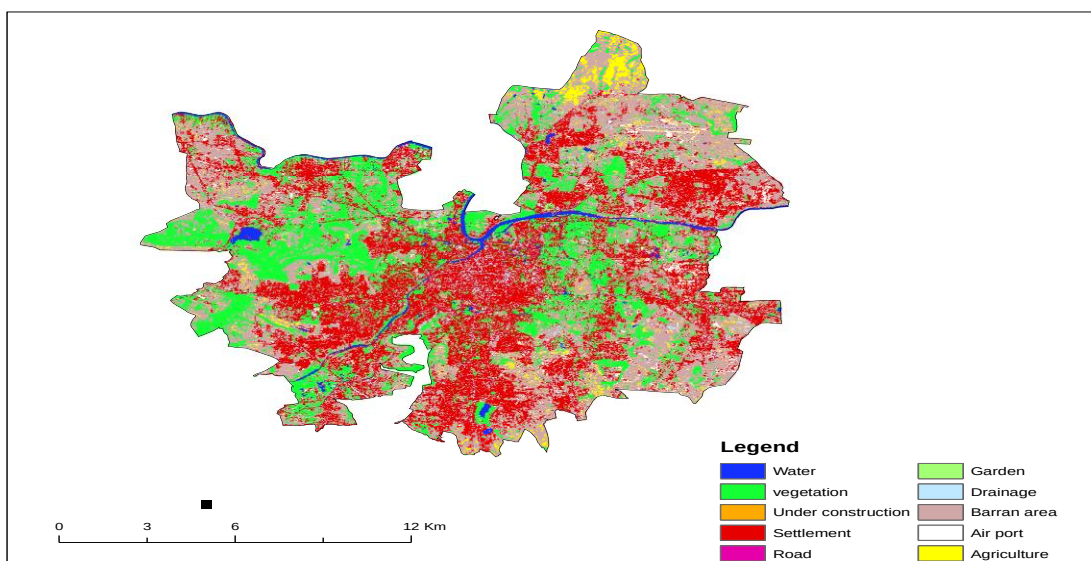
VI URBAN GROWTH ANALYSIS

Urban growth over the period of 1970 to 2001, almost a period of three decades was determined by computing the area of all the settlements from the digitized toposheets and comparing it with the area obtained from the classified IRS ID image.

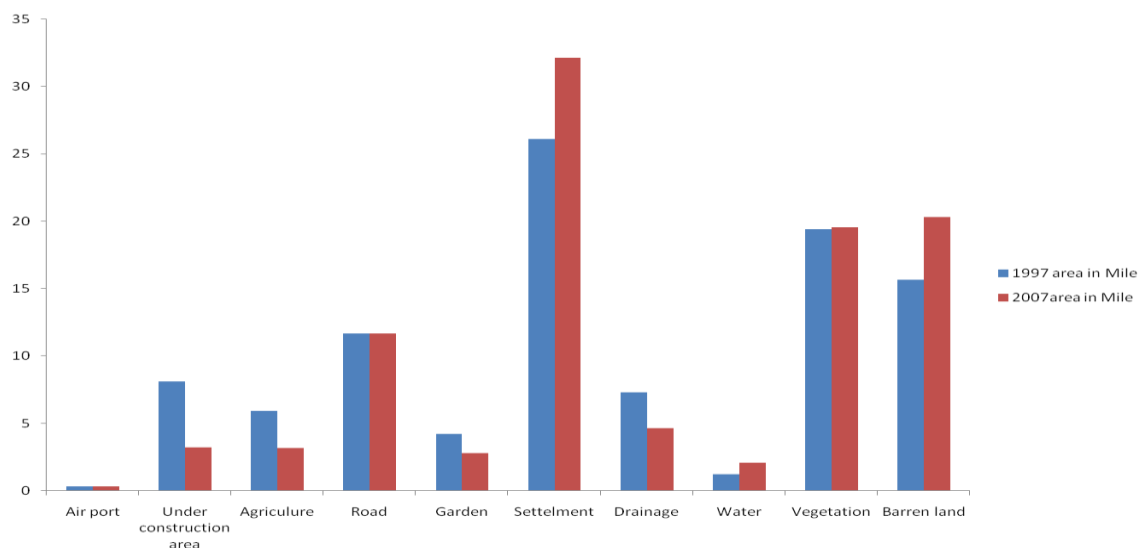
Classified Image of Pune City (1997)



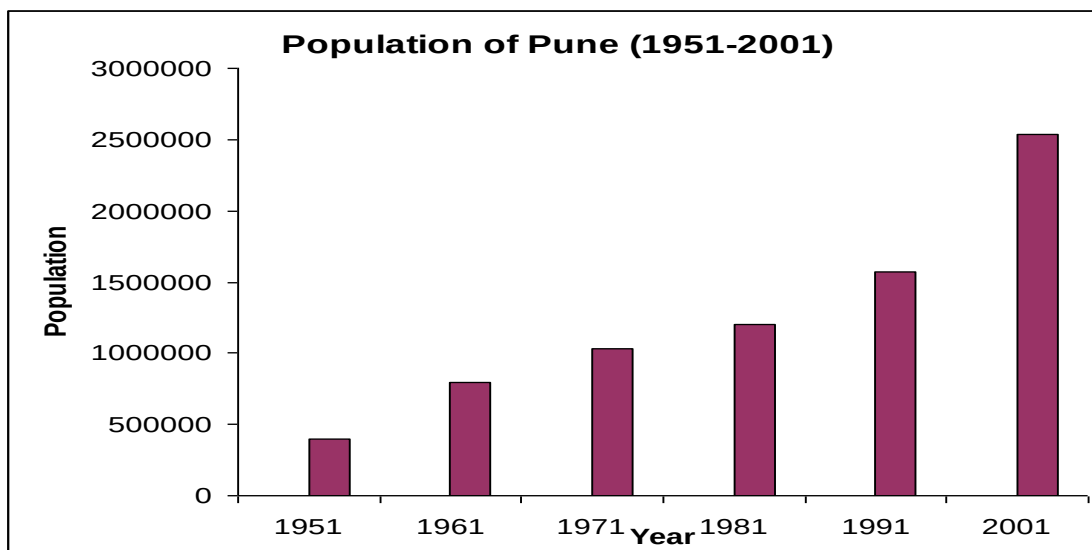
Classified Image of Pune City (2007)



Change Detection



POPULATION OF PUNE



Between 1976 and 1981, the population of Pune city grew by 16.7%, and from 1981 to 1991 it grew by 30.2%. Between 1991 and 2001, the growth has doubled to 62.17%. In comparison, Pune district has a growth rate of 30.58%, while the state is experiencing the growth rate of 22.5%. These trends are likely to

persist in future. This shows that the larger urban agglomerations are getting over crowded and fast growing in a haphazard and unplanned manner. Therefore, it is necessary to assess the past and present growth trends of these rapidly growing cities, for

effective urban management and sustainable development.

VII RESULTS AND CONCLUSION

- Remote sensing and GIS are time and again proving that they are highly capable in urban studies particularly in urban management and planning. With these modern tools it is quite possible to analyze the spatial pattern of urban growth over different time periods and it can be systematically mapped, monitored and accurately assessed from remotely sensed data along with conventional ground data.
- Pune, is experiencing high rate of population growth. Between 1976 and 1981, the population of Pune city grew by 16.7% and from 1981 to 1991 it grew by 30.2%. Between 1991 and 2001, the growth was more than two times i.e., 62.17%, where as Pune district has the growth rate of 30.58% and the state experienced the growth rate of 22.5%.
- This shows that the increasing population of Pune city exercise lot of pressure on available land in the city and city's limit had been pushed towards the adjacent villages.
- This will show how much pressure has been given to the available land. Recently, 23 villages had been added to the old municipal limit and the total area of Pune city has increased from 145.92 sq.km. to 243.96 sq.km.
- The municipal corporation has also prepared the development plan for these villages. Our present study does not have any aim to analyse the development plan of fringe village. But to help the planners to identify the villages which have to be given more priority and where exactly the growth takes place and to understand the degree and intensity of such growth of better management.
- As the urban phenomena (residential, industrial, commercial, public and semi public uses... etc) has uniform reflectance throughout electromagnetic spectrum, it is not possible to identify delineate urban land use classes using digital analysis techniques as

these techniques employ spectral characteristics of the objects for the classification.

- This study shows that the city of Pune is experiencing a leapfrog pattern of urban growth due to the hills, and ribbon growth along the highways.
- With the integration of remote sensing and GIS, it is easy to implement in the study of Pune city and quite sure that the results will be definitely useful for implementing and managing the development plan of Pune.

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