

## **“Application of Geospatial Technology in Socio-Economic Transformation of Rural Satara District Maharashtra State India”**

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### **ABSTRACT:**

Knowledge of the status of development at micro level will help in identifying where a given area stands in relation to others. The spatial distribution of variables and rural development is not uniform in Satara district. The present study deals with the evaluation of socio-economic transformation using geospatial technology for the period of 1991 to 2011. This transformation depends on various indicators like Physical, demographic, social and economic. A composite index of development has been formulated based on various variables. All the selected variables are converted in to a common base indexing and finally they are converted in to a single index of overall development. The lowest composite score indicates less development and highest composite score indicates high development. District villages shows low (Score 28-35) to very low (score 21-28) status of development because rugged topography, lack of transportation facility, health, education, communication, banking facility. The north, east and central plain region lies in Krishna and Nira Basins have better physical conditions. The villages having closeness to NH4, are favoured to growth of infrastructural facilities. This part shows high (score 42-49) to very high (score 49-59) level of development. Socio-economic transformation in Satara district shows most of the villages from 1971 to 1991 are in the low and very low level of development. In 2001 many villages shifts to moderate (418) level of development and in 2011 most villages shifts to high (409) to very high (225) level of development. If the socio-economic development of these villages modelled along human development framework, it can provide better understanding of development and its impact on quality of life of people.

**Keywords: Geospatial Technology, Level of development, Socio-Economic, Transformation, Composite Index**

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### **I. INTRODUCTION**

Economic planning has been used in the country as an instrument for bringing about uniform regional development because main objectives of the developmental programmes has been a progressive reduction in regional disparities in the pace of development. The very important developmental issues in India today include development of human resource, distributive justice and regional disparities in development. The development of different sectors of economy should be in proper direction because it improves the economy of the area and also enhances the level of living of people.

Ohlan (2013) Presents the Pattern of regional disparities in socio-economic development in India - District level analysis. Bhatia B. K. & Rai S. C. (2004) has studied the Evaluation of socio-economic development in small areas. Naresh Kumar (2017) has studied "Measurement of social development: evidence from India". Houshyar H. & Valizadeh H. (2013) Study the spatial distribution of the quality of life in rural areas, case study of central part of the city Shahindezh in Iran. Higgins P., Campanera J. & Nobajas A. (2014) presents Quality of life and spatial inequality in London. Wang Y. (2016) has studied the spatio-temporal patterns of urban-rural development transformation in China since 1990. Bollen, Glanville & Stecklov (2001) has studied the socioeconomic status and class in studies of fertility and health in developing countries. Kurien C. T. (1980) studies the dynamics of rural transformation: A case study of Tamil Nadu. Bakshi, Chawla & Shah (2015) studied the regional disparities in India

Rostow (1960) presents a political theory as well as descriptive economic study of the pattern of growth and development of Nations. An extensive study has been made by Rao (1983), having used thirty years of data from 1950-1980 to observe the change in the Indian economy. The Indian Society of Agricultural

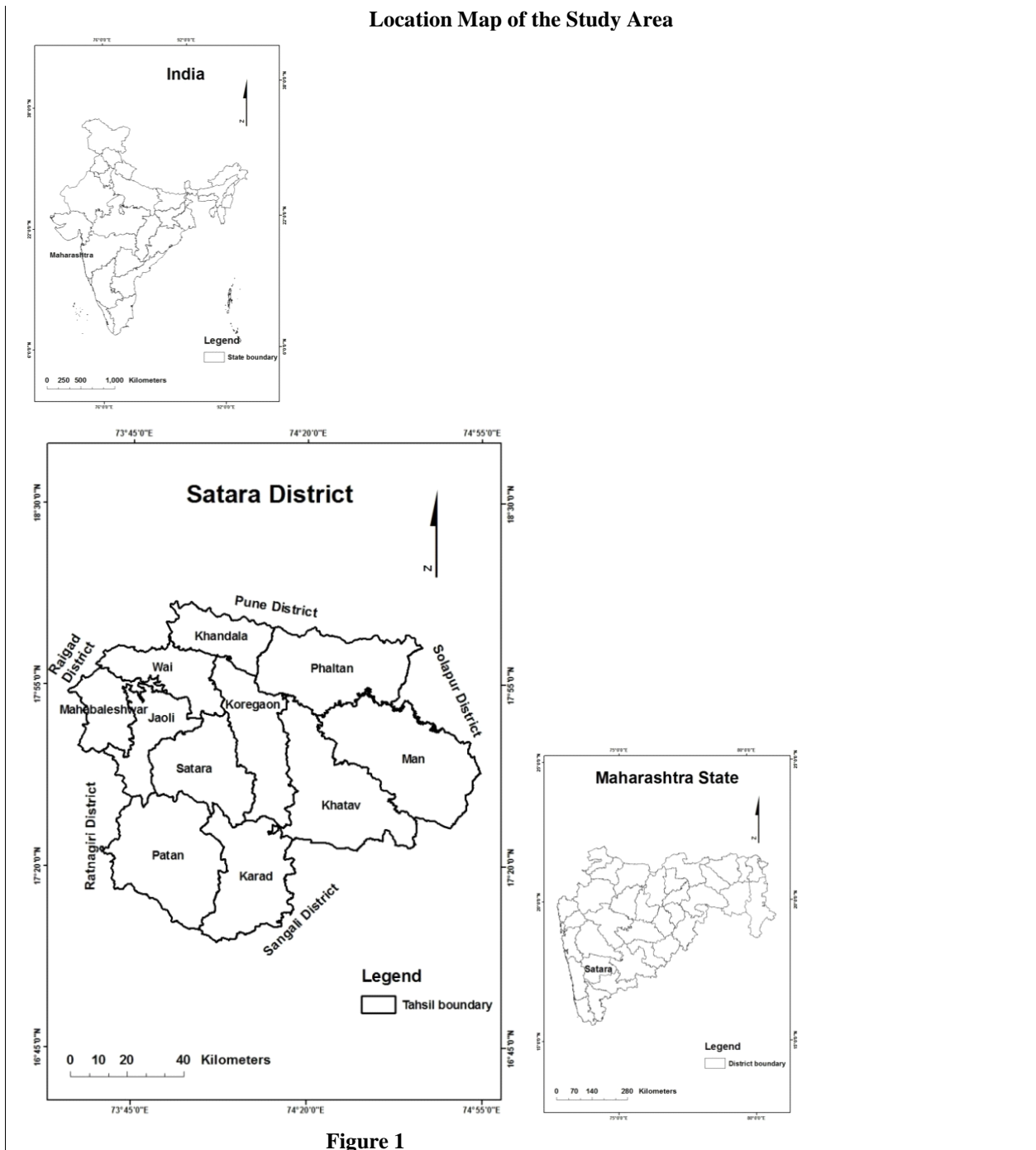
Statistics conducted a series of research studies in the direction of level of development at state level for the year 1971-72 and 1981-82. Thereafter a deeper analysis using the district level data on socio-economic indicators was made for the States like Maharashtra Narain (1996), Orissa Narain (1992-93). The research studies of Das, (2002); Dholakia, (2003); have been reviewed. Wishlade and Douglas Y. (1997) have described and explained the types of disparities i.e. physical disparities, economic disparities and social disparities. Suryawanshi and Sawant (2011) has studied the regional disparities of Thane District and in 2013 micro level detailing of Talasari and Dahanu tehsils of Thane district. He also studied level of development in Jawahar, Mokhada, Vikramgad and Vada tahsil of rural Thane district Suryawanshi (2014)

The Satara district is a rugged country stretching about 100 kms from North to South with a considerable regularity in height and presents a panoramic view all around with truncated hill ranges separated by the deep valleys descending to the plains. The district has three natural sub-divisions based on the topographic situations - Hilly area in the west, plains of the Krishna river in the central part, and the plateau area in the east.

## **II. STUDY AREA**

Satara is a district in the Indian state of Maharashtra. Satara District is located in the south western part of Maharashtra. Satara district lies between 17<sup>05</sup>' to 18<sup>011</sup>' north latitudes and 73<sup>033</sup>' to 74<sup>054</sup>' East longitudes. It is bounded by Pune District to the north, Solapur District to the east, Sangli District to the South and Ratnagiri District to the west. Raigad district lies to its north-west. The entire area of the district falls in parts of Survey of India degree sheet No's 47-G, 47-K, 47-J and 47-F. It is situated in the river basin of Bhima and Krishna Rivers. Satara district covers an area of 10484 sq. kms with an east west expanse of 135 km and a north south expanse of 112 km. which constitutes about 3.41% of the total area of Maharashtra. In 2011, district had 11 talukas. These talukas consist of 1719 villages including 26 uninhabited villages besides 22 towns. The district is divided into four Sub Division as per 2011 cences but in 2014 The district is divided into Seven Sub Division and eleven administrative sub units (tahsils) - Satara, Wai, Khandala, Koregaon, Karad, Man, Phaltan, Khatav, Patan, Jawali and Mahabaleshwar. (Fig. no.1)

**Location Map of the Study Area**



**Figure 1**

**III. OBJECTIVE**

To evaluate the micro level socio-economic transformation from 1991 to 2011 using geospatial technology.

**IV. DATABASE AND METHODOLOGY**

The entire research work is based on the secondary data. Census data (Village directory) has been used for preparing village or talshil boundary of the study area. Besides these, many reports and government publications viz. Gazetteer, Socio-economic Abstracts, periodicals have been also extensively used. Topographical maps 47F/12, 47F/16, 47J/4, 47J/8, 47J/12, 47G/9, 47G/10, 47G/11, 47G/13, 47G/14, 47G/15, 47G/16, 47K/1 to 47K/14 at the scale 1:50000 have been used to evaluate the village locations. These village locations have been digitised using GIS software and subsequent GIS platform used. The village polygons for 1719 villages were used as the areal units. The vector based GIS technique like Arc GIS, Global Mapper, has been used for analysis of information and presentation of maps, for this the village boundary map of the talshil

has been digitized (Census-2011) The elevation data available in raster format from ASTER GDEM DATA (data with 30 m ground resolution) for visual representations of selected areas.

The composite Index has been prepared as per 2011 census for all the physical, demographic, social and economic variables by denoting score of 1-5. Based on the variable supporting socio-economic development of the population, the lowest score indicates less development and highest score indicates high development. This has enabled to analyze the regional disparity lucidly (Suryawanshi and Sawant, 2013). **Indicators of Level of Development:** The following indicators have been chosen: **Physical factors:** (a) Relative relief (b) Slope (c) Forest Cover. **Demographic factors:** (a) Population Density (b) Sex Ratio (c) Literacy **Social factors:** (a) Education (no. of total unites) (b) Health (no. of total unites) (c) Communication & Transportation (no. of total unites) **Economic factors:** (a) Income (b) Non Agriculture workers (c) Banks, ATM , ACS, SHG, PDS, Mandis & Weekly Haat (no. of total unites) (d) Facilities in villages

### V. LEVEL OF DEVELOPMENT:

• **Very low level of development-**

The composite score of very low level of development is between 21 to 28. In 1991, 750 villages (48.48%) has very low level of development. During 1991-2001, these villages has decreased from 750 to 494(28.79) in 2001 and finally to 132(7.68) in 2011. Very low level of development shows in western part of satara district.

• **Low level of development-**

The composite score of low level of development is between 28 to 35 In 1991, 669 villages (43.25%) has low level of development. During 1991-2001, these villages has increased from 669 to 721(42.02) in 2001 because of the newly created villages in the district. During the year 2001 to 2011 villages decreased by 721 to 467(27.17) in 2011. Low level of development shows between the hilly and plain area in the district.

c) **Moderate level of development-**

The composite score of moderate level of development is between 35 to 42 In 1991, only 121 villages (7.82%) has moderate level of development. During 1991-2001, these villages has increased from 121 to 418(24.36%) in 2001 because of the newly created villages in the district. During the year 2001 to 2011 villages increased by 418 to 486(28.27%) in 2011. Moderate level of development shows in middle and eastern part of satara district. In South-east part of Patan Koyna river basin and in north Phaltan Nira river basin shows this development.

d) **High level of development-**

The composite score of high level of development is between 42 to 49 In 1991, only 7 villages (0.45%) has high level of development. During 1991-2001, these villages has increased from 7 to 83(4.84%) in 2001 because of the newly created villages in the district. During the year 2001 to 2011 villages increased by 83 to 409(23.79%) in 2011. High level of development shows in Krishna and Nira river basin of satara district and also shows in Wai, North Jaoli which is the part of Krishna river.

e) **Very High level of development-**

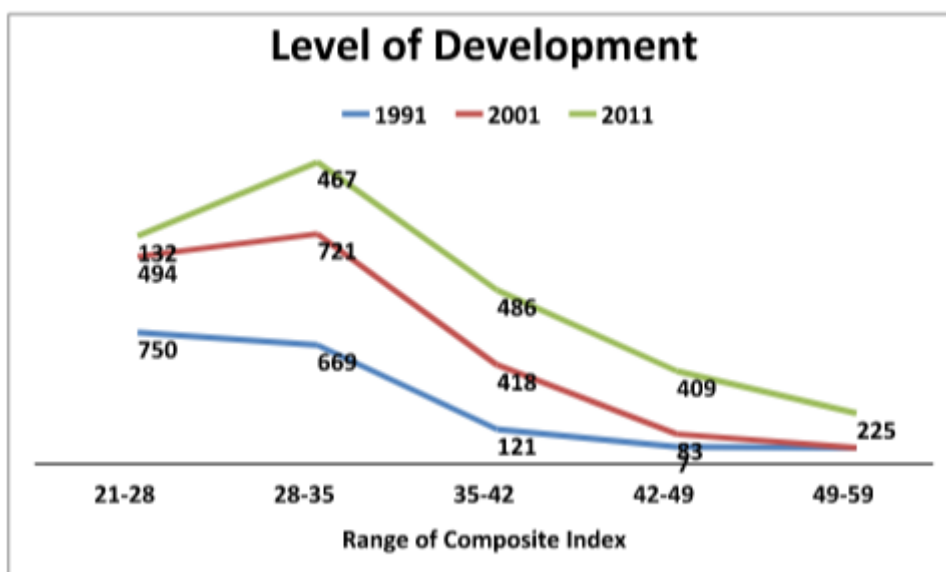
The composite score of very high level of development is between 49 to 59 In 1991 and 2001 no village has found in very high level of development. In 2011, 225 villages found in very high level of development. Very high level of development shows in middle part of Satara and Karad tahsil and north part of Phaltan tahsil. High development occurs in most of the villages in middle and eastern part of Satara district. A very large uninterrupted compact block of high development occurs in the Krishna and Nira Plain sprawling in Karad, Satara, and Phaltan.

#### Overall Transformation

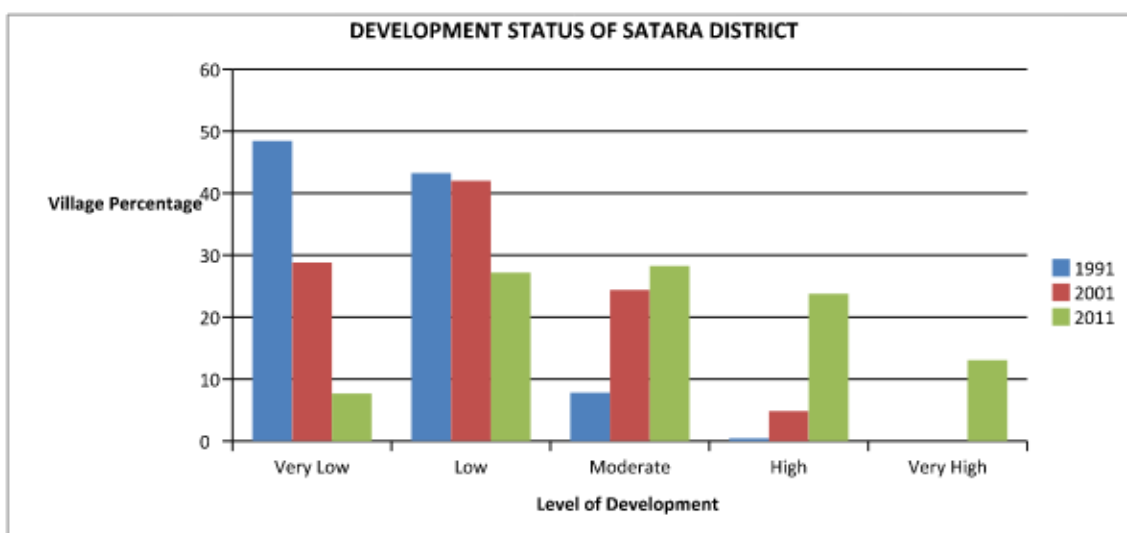
| Range        | 1991            |       | 2001            |       | 2011            |       | Development Level |
|--------------|-----------------|-------|-----------------|-------|-----------------|-------|-------------------|
|              | No. of Villages | %     | No. of Villages | %     | No. of Villages | %     |                   |
| <b>21-28</b> | 750             | 48.48 | 494             | 28.79 | 132             | 7.68  | <b>Very Low</b>   |
| <b>28-35</b> | 669             | 43.25 | 721             | 42.02 | 467             | 27.17 | <b>Low</b>        |
| <b>35-42</b> | 121             | 7.82  | 418             | 24.36 | 486             | 28.27 | <b>Moderate</b>   |

|       |      |      |      |      |      |       |           |
|-------|------|------|------|------|------|-------|-----------|
| 42-49 | 7    | 0.45 | 83   | 4.84 | 409  | 23.79 | High      |
| 49-59 | 0    | 0    | 0    | 0    | 225  | 13.09 | Very High |
|       | 1547 | 100  | 1716 | 100  | 1719 | 100   |           |

Table No. 1 (Source: Computed by the author)



Graph no.1



Graph no.2

## VI. CONCLUSION

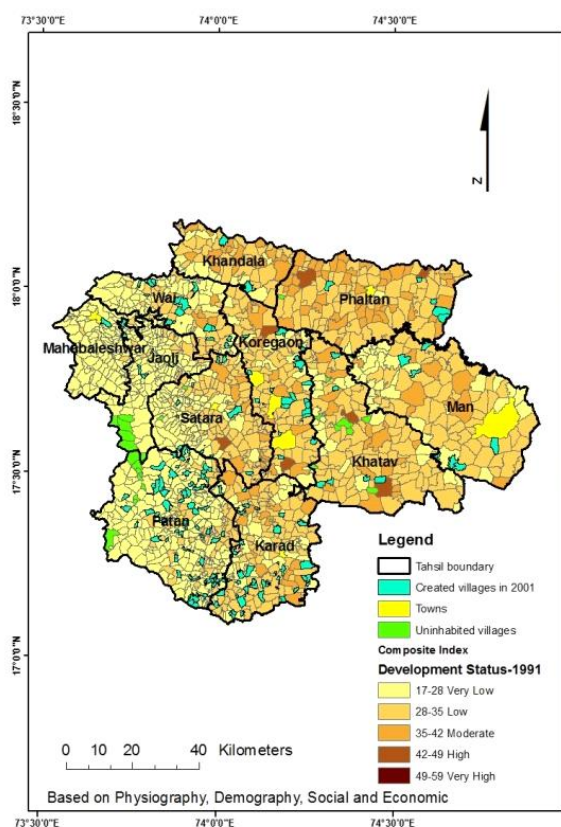
This overall transformation shows the transformation from 1991 to 2011. The district's developmental level of very high level (49-59), high level (42-49) and moderate level (35-42) has increased from 1991 to 2011. Very low (21-28) and low level (21-28) has decreased from 1991 to 2011. (Graph no.2) It is clear that the socio-economic differences between the physiographic micro divisions of district are closely linked up with physical character of a region. The better physical conditions has favoured the growth of infrastructural facilities, but the inverse physical character like western hilly region has reduced the development activities.

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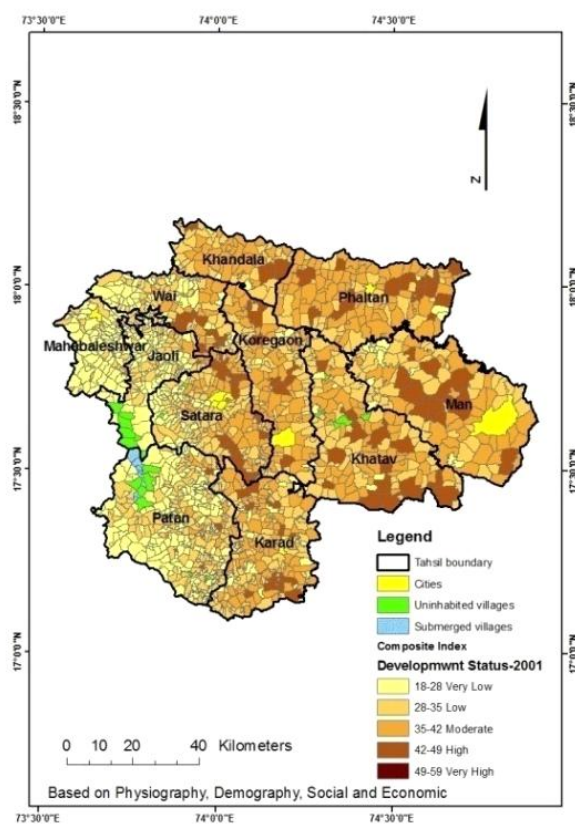
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**Composite index for development-1991**

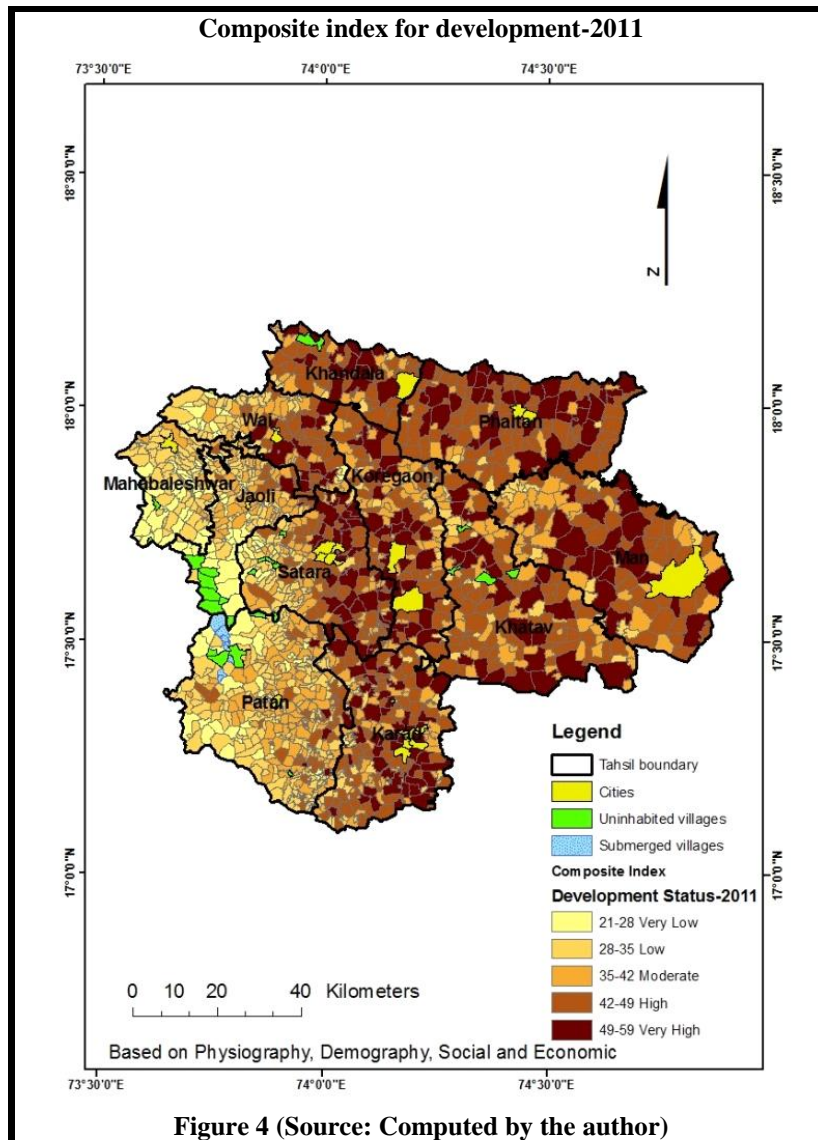


**Figure 2 (Source: Computed by the author)**

**Composite index for development-2001**



**Figure 3 (Source: Computed by the author)**



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