

## A case study and solution for Urbanization Influence and Land Usage in Coimbatore City

*Case Study*

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### **Abstract:**

Urbanization occurs mainly due to migration of people from rural areas to urban areas. More than half of the world's population lives in urban areas. Recent studies say that the ongoing urbanization and growth of the population in world will add about 2.5 billion in urban areas by 2050. This uncontrolled momentum of urbanization and land usage will raise many issues such as loss of agricultural area, reduction of natural resources, increase in pollution etc. This research aims to analyse the changes that occurred in land usage over a time span of 40 years using modern technologies in Coimbatore. The geographical extend of Coimbatore city is 7433.72 km<sup>2</sup>. It consists of three revenue divisions eleven taluks and 295 revenue villages. The population of Coimbatore is around 16 lakhs as per the 2011 census. For the last two decades the urbanization in the Coimbatore city tremendously increase due to the growth of population and industrialization that leads to increase in buildup area in the city. Thus, build up area increases results in the decrease of natural vegetation, water bodies and agricultural land.

**Keywords:** Urbanization, Geographical, Population, Industrialization.

### **INTRODUCTION**

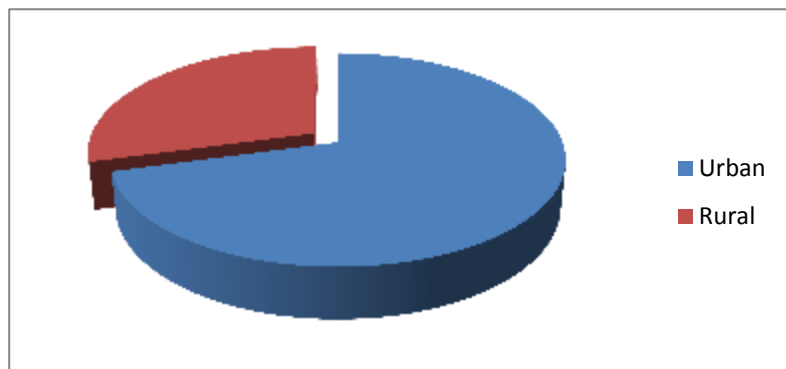
The increasing conversion of rural land use into urban land use is a common phenomenon in most parts of the world because of perceived benefits of urban living as opposed to rural living. Urbanization involves the outward expansion of population centers beyond their original limits to accommodate a growing population. Urbanization results in irrevocable changes to the landscape, a shift in demographic patterns, and economic, social, and environmental impacts on a region. Numerous urban challenges emerged when the agricultural lands in and around cities are engulfed by urban land uses. Urban growth, the density of which is continuing increasingly with the population increase that has taken place in urban areas in the recent

years, leads to the vanishing of an extremely limited number of natural resources and to the occurrence of irregular and unsound urban areas, along with impairing the agricultural lands. Prompt government attention is necessary in order to take the appropriate measures and guide the urban expansion, while protecting the prime agricultural land. The United Nations have projected that the global population living in urban areas will reach 66% by 2050 (UNDESA, 2014). Among these transformations, the spread of the built environment and increase in anthropogenic activities common to urban areas can result in significant pollutant inputs to urban receiving waters, thereby degrading water quality. This in turn can pose risks to human and ecosystem health.

## Study Area

Coimbatore lies at 11°1'6"N 76°58'21"E in south India at 411 meters (1349 ft) above sea level on the banks of the Noyyal River, in southwestern Tamil Nadu. It covers an area of 642.12 km<sup>2</sup> (247.92 sqm). It is surrounded by the Western Ghats mountain range to the West and the North, with reserve forests of the Nilgiri Biosphere Reserve on the northern side. The Noyyal River forms the southern boundary of the city, which

Pie chart – urban and rural ratio



## POPULATION

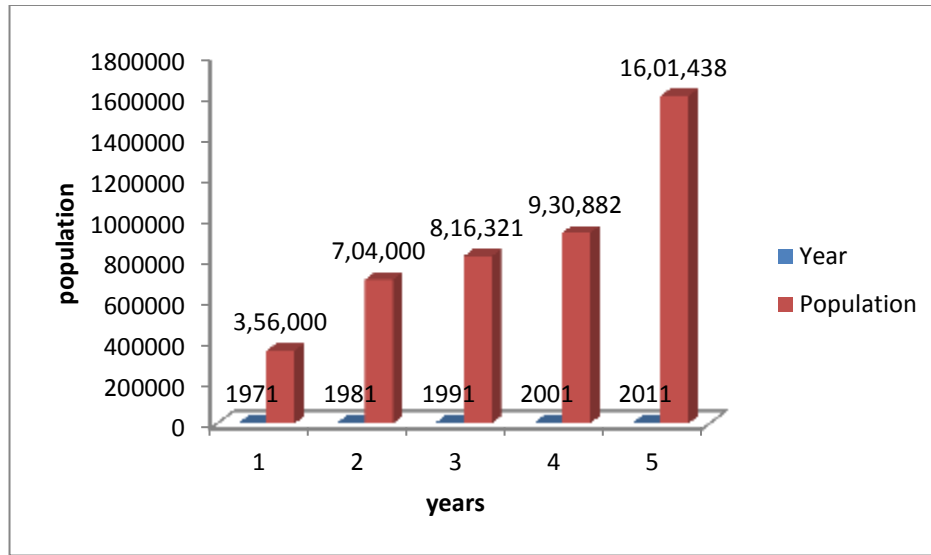
Coimbatore has a population of 1,601,438. As per the 2001 census, Coimbatore had a population of 930,882 within the municipal corporation limits. As per the 2011 census based on pre-expansion city limits, Coimbatore had a population of 1,050,721 with a sex ratio of 997 females for every 1,000 males, much above the national average of 929. It is the second largest city in the state after capital Chennai and the sixteenth largest urban

has an extensive tank system fed by the river and rainwater. The eight major tanks and wetland areas of Coimbatore are namely, Singanallur, Valankulam, Ukkadam, Periyakulam, Selvampathy, Narasampathi, Krishnampathi, Selvachinthamani, and Kumaraswami. Multiple streams drain the waste water from the city. Coimbatore region experienced a textile boom in the 1920s and 1930s.

Coimbatore is the second largest producer of software in the state, next to capital Chennai.

agglomeration in India. The population of the urban agglomeration as per 2011 census is 2,136,916 with males constituting 50.08% of the population and females 49.92%. The population of the urban agglomeration as per 2011 census is 2,136,916 with males constituting 50.08% of the population and females 49.92%. In 2011, the population density in the city was 10,052 per km<sup>2</sup> (26,035 per mi<sup>2</sup>). Around 8% of the city's population lives in slums. The Coimbatore district has 71.37% urban population and 29.63% rural population.[1][2]

Year	Population	Percent change
1971	356,000	+24.5
1981	704,000	+97.8
1991	816,321	+16.0
2001	930,882	+14.0
2011	1,601,438	+72.0

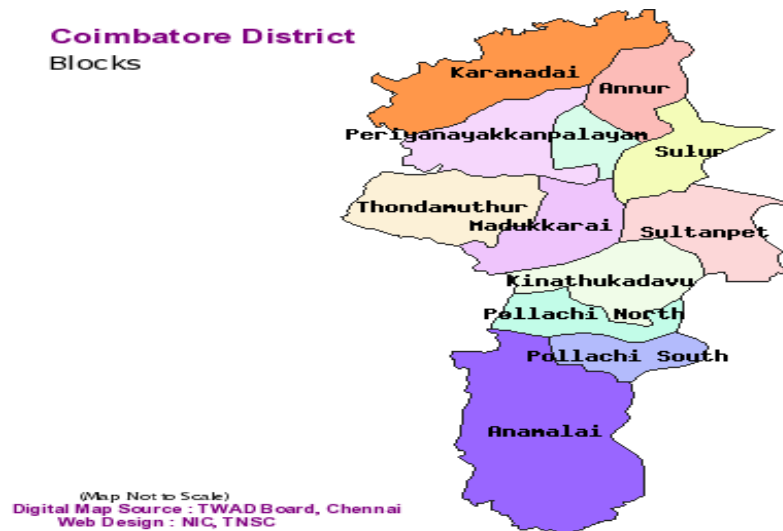


Graph – shows the population increase in Coimbatore

## URBANIZATION

The expansion of urban areas in and around Coimbatore city has been tremendous in the past decades due to increasing diversity of economic activities. In the sphere of economic activities, the city has constantly improved itself by keeping up with globalization and liberalization trends in other parts of the country. Thus, there has been increasing expansion of the urbanized areas across the city. To ensure harmonious development of these expanded areas, the (CCMC) Coimbatore City Municipal

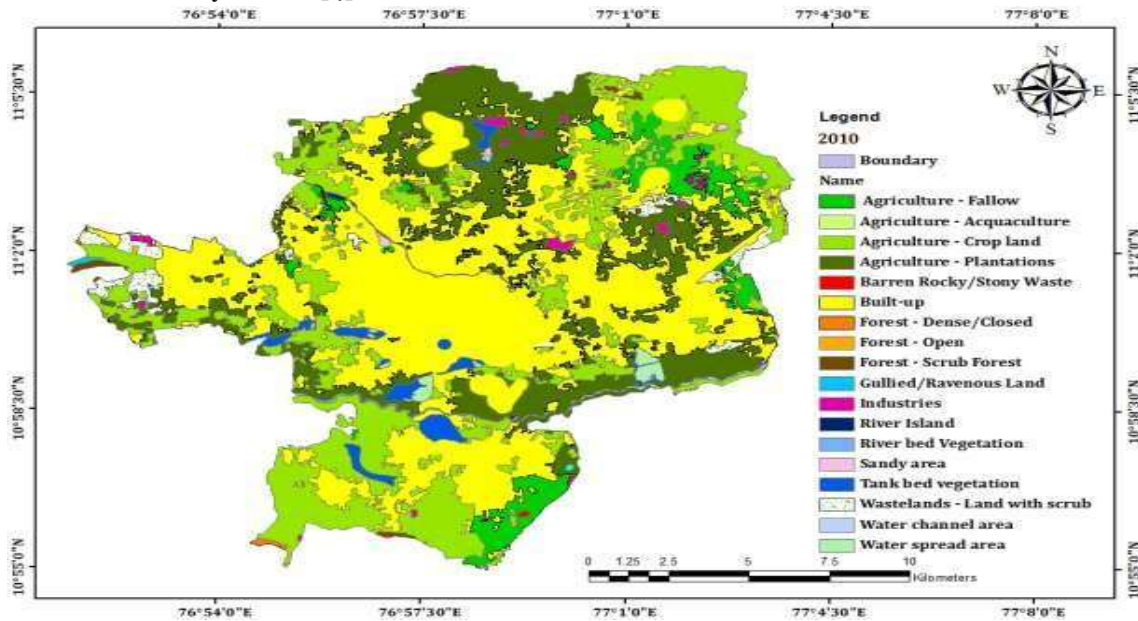
Corporation limit was expanded. The expanded areas include, the pre-expansion area of city limits was 105.6 sq.km. The 2010 expansion order added 12 local bodies and increased the total area to 265.36 sq.km. In 2011, three of the local bodies [Vellalore](#) (16.64 sq.km), [Chinnampalayam](#) (9.27 sq.km) and [Perur](#) (6.40 sq.km) were dropped from the expansion and [Vellakinar](#) (9.20 sq.km) and Chennavedampatti (4.5 sq.km) were added. The area post expansion is 246.75 sq.km.



Source [3]

### Impact of Increase in Built Up Area

Over the past 11 years, urban/built-up areas have increased by 94.5 km<sup>2</sup>, resulting in a significant drop in the area of agricultural land and vegetation cover. It is found that urban areas are increased 200% due to population growth cum rapid economic progress. Vegetation cover decreased 38.76% due to conversion into urban features. Water bodies in area increased to 15.78% due to eradication of encroachment. There is loss of 1.89% of agricultural lands due to demand for construction activities. About 85.24% of barren lands were converted into other uses, particularly 57.33% to urban areas. Urban growth has accelerated towards north-eastern, northern, and eastern parts, where national highways exist. The built-up areas were dropped from 85.32 to 22.28%, within 5-km distance from the city center. [4]



Map – Areas of various land usage-source [4]

## RESULTS AND DISCUSSION

The land use/land cover categories of the study area consist of Built-up land, agriculture land, water bodies and forest land. The change detection results are carefully interpreted using visual interpretation techniques. The results are based on the paper impact of biodiversity-case study of India [5].

### Built-up area

The built-up land is composed of areas of intensive use with much of the land covered by human made physical structures. The study showed that built-up area increased from 61.30 sq.km (12.78%) in 2001 to 140.21 sq.km (29.24%) in 2018. The study observed that there is significant conversion from agriculture land to built-up land category. This is due population growth, economic development, and expansion of Coimbatore corporation boundaries.

### Agriculture Land

Agriculture land is primarily used for forming and production of food, fibre, and other commercial and horticultural crops. This category covers irrigated croplands, unirrigated croplands, plantations, and fallow lands. The change detection analysis showed that agriculture land category is decreased from 260.81 sq.km in 2001 to 190.77 sq.km now. Nearly 70 sq.km of agricultural lands are converted into built-up lands.

### Forest

The western part of the study area covered by forest lands of the Western Ghats shown a decrease of 7 sq.km compare to 2001. The study found out that the expansion of agricultural land took place at the expenses of forest land between 2001 and 2019.

### Water bodies

The study revealed that there is a slight decrease in water bodies. In 2001 the 18.51 sq.km of the area was covered by water bodies and it is slightly

decreased to 16.66 sq.km. The encroachment of water body is mainly for the purpose of built-up, industries and transportations.

#### **Authors' contributions**

AR written the manuscript and collected population data. SG collected the urbanization history. NS supported with necessary geography material. MR consolidated and corrected the manuscript.

#### **Acknowledgement**

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