GEOGRAPHICAL ANALYSIS

RESEARCH ARTICLE

# Geospatial Perception Towards Conservation of Forest: A Case Study of Dakshin Kannada and Udupi Districts in Karnataka

**Malin Hansepi**[1], **Apurva Dutta**[2]*

**1** *GIS Specialist, GIS Vision India, Assam, India*
**2** *CEO, GIS Vision India, Assam, India*

OPEN ACCESS

**Received:** 15.01.2023
**Accepted:** 12.05.2023
**Published:** 02.06.2023

**Citation:** Hansepi M, Dutta A. (2023). Geospatial Perception Towards Conservation of Forest: A Case Study of Dakshin Kannada and Udupi Districts in Karnataka. Geographical Analysis. 12(1): 30-33. https://doi.org/10.53989/bu.ga.v12i1.23.4

* **Corresponding author**.
info@gisvisionindia.com

**Funding:** None

**Competing Interests:** None



Published By Bangalore University, Bengaluru, Karnataka

**ISSN**
Print: 2319-5371
Electronic: XXXX-XXXX

## Abstract

*Karnataka has witnessed lot of changes in the forest cover due to two primary factors i.e. climate change and exponential increased in use of forest land and resources. However a drastic change is seen in four districts namely Dakshin Kannada, Udupi, Uttar Kannada and Kodagu. Due to the decreasing green cover the government is ceding imperative accords and judgements in conserving the forests. It has been observed that deforestation leaves an underlying impact on human population further disrupting the balance of the ecosystem. However, prevailing complications like climate change, forest fire, deforestation, increase in climatic temperature, loss of soil quality are some of the challenges in maintaining the green sustainability. The paper focuses on two districts: Dakshin Kannada and Udupi in order to study the cause of rapid decrease in forest cover. Use of geospatial technology for the restoration of forest cover is the main objective and to find out plant species that grows fast and survives even on harsh climatic conditions with less water intake. This paper also outlooks the estimated time required for restoration of forest cover.*

**Keywords:** Deforestation; Forest Fragmentation; Climate Change; Forest Biodiversity; Geospatial Technology

## Introduction

Dakshin Kannada is located in the southern and coastal part of Karnataka at an extension of 75°12'1.16" East and 12°45'47.79" North. The district covers a total area of 4,559 sq km with the highest elevation of 1,115 meters. The topography of the district is plain up to 30 km and changes to undulating hilly terrain sharply towards the east in the Western Ghats. The forests in the district are covered with Teak, bamboo and rosewood. The district receives abundant rainfall during the Indian monsoon of about 3912mm annually.

Udupi falls along the western coast and lies between 74°44'31.7112" East and 13°20'27.1716" North. It geographically covers an area of about 3,880 sq km with tropical climate and receives rainfall of about 315.3mm.

## Forest cover

A large chunk of the Western Ghats, which primarily stretches across four districts of Karnataka, lost 20,000 hectares of its area over the last 17 years putting one of the world's biological hotspots at risk. The alarming rate of loss of tree cover over the last 5 years can have long-term repercussions, including drying of rivers. The impacts of decreasing forest cover are now visible. The region is important for the entire Indian subcontinent as it influences the south-west monsoon pattern during late summers.

## Forest degradation

Dakshin Kannada and Udupi lost more than 70% of the total trees coverage areas since 2001. The district is rapidly losing forest to unplanned infrastructure projects and agricultural activities. Some of the causes of forest degradation are-iron ore mining sites in the Dakshin Kannada district, construction of dams, setting up of forest based industries and encroachment for agricultural practices.

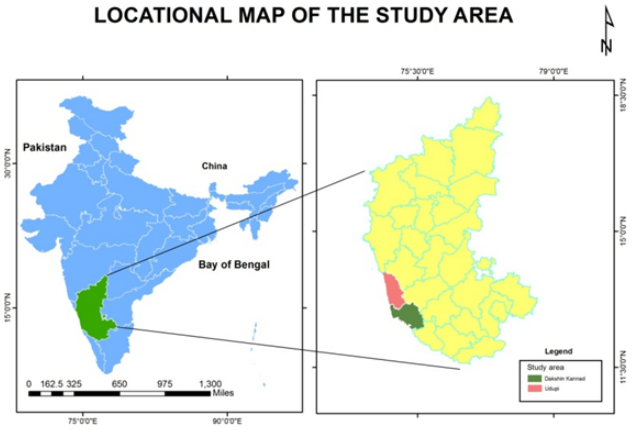


**Fig. 1.** Location map of the study area

Rapid urbanization is another major factor. The encroachment of forest land in conversion to agriculture, horticulture and private plantations are prevalent throughout the districts which have also led to the loss of native vegetation and human-animal conflict. The impact has led to conversion of perennial streams to seasonal streams, flash floods, droughts, change in water quality, soil erosion which has led to an imbalance in the ecosystem.

Out of all the districts in Karnataka, the maximum decline in forest cover was seen in Dakshin Kannada and Udupi districts in the last 3 years. In Dakshin Kannada, the loss was 1109 hectares in 2016; 955 hectares in 2017 and 1072 hectares in 2018. In Udupi, the forest cover decreased to 740 hectares in 2016; 857 hectares in 2017 and 665 hectares in 2018. Declination in forest cover in Dakshin Kannada and Udupi from the year 2001 to 2017 is shown in graphs below.

**Table 1.** Year wise forest cover loss in Dakshin Kannada

| Year | Dakshin Kannada (in Hectares) |
|---|---|
| 2001 | 273 |
| 2002 | 179 |
| 2003 | 163 |
| 2004 | 294 |
| 2005 | 328 |
| 2006 | 214 |
| 2007 | 949 |
| 2008 | 638 |
| 2009 | 568 |
| 2010 | 325 |
| 2011 | 299 |
| 2012 | 809 |
| 2013 | 541 |
| 2014 | 511 |
| 2015 | 338 |
| 2016 | 1011 |
| 2017 | 955 |

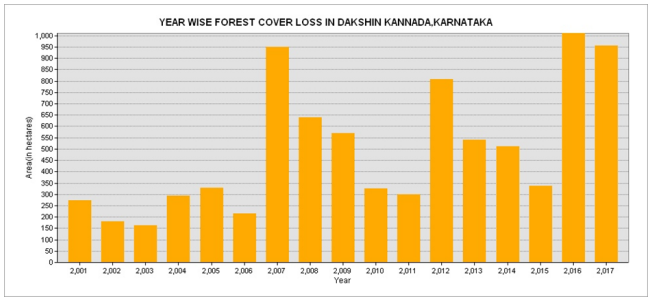


**Fig. 2.** Year wise forest cover loss in Dakshin Kannada

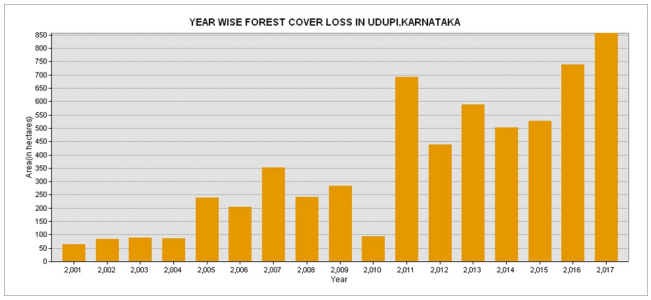


**Fig. 3.** Year wise forest cover loss in Udupi

## Methodology

Methodology is shown in Figure 4

**Table 2.** Year wise forest cover loss in Udupi

| Year | Udupi (in Hectares) |
|---|---|
| 2001 | 65.2 |
| 2002 | 83.1 |
| 2003 | 89.7 |
| 2004 | 85.3 |
| 2005 | 240 |
| 2006 | 205 |
| 2007 | 352 |
| 2008 | 241 |
| 2009 | 283 |
| 2010 | 93.6 |
| 2011 | 692 |
| 2012 | 439 |
| 2013 | 589 |
| 2014 | 503 |
| 2015 | 527 |
| 2016 | 740 |
| 2017 | 857 |

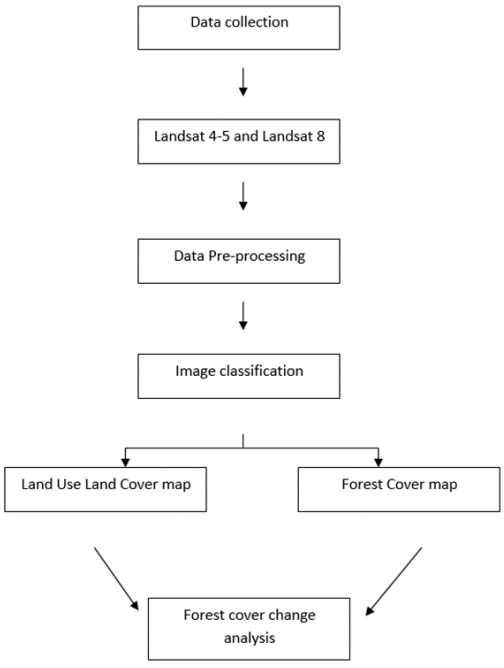


**Fig. 4.** Methodology

## Result and Discussion

The result of this study indicates considerable loss of forest cover in the past 17 years. The Land Use Land Cover map of the year 2002 and 2017 shows a huge conversion and declination in the forest cover. The forest cover has decreased up to 2819.653 sq km in the year 2017 as compared to 2002 which was 3287.124sq km. The map below shows the extracted forest cover of both the years.

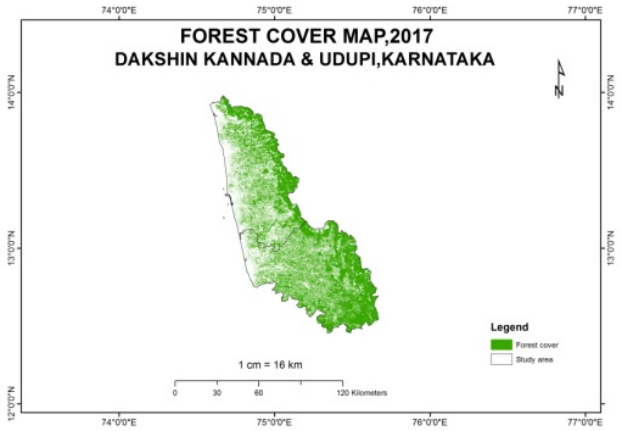


**Fig. 5.** Forest cover map in 2017 for Dakshin Kannada & Udupi

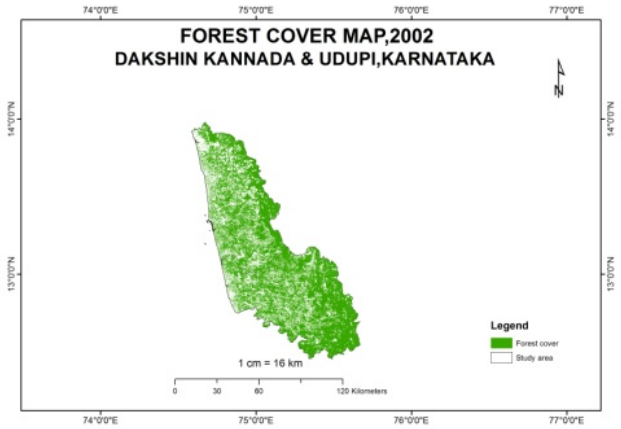


**Fig. 6.** Forest cover map in 2002 for Dakshin Kannada & Udupi

## Conclusion

Dakshin Kannada and Udupi have abundance of natural resources in terms of forest cover and minerals but has been a prey to forest degradation since the past 17 years. It has caused in the loss of several flora and fauna species and also has tremendous impact on the human habitation. Flash flood, drought, forest fires, impact on the air and water quality are

to name a few of the problems.

Knowing the potentiality of the districts and to retain its sustainability, there are few species of trees that would help in restoring back the forest as well as contribute in the growth of economy. 6 species of Eucalyptus can be grown in India. It has a very long lifespan of up to 200 years, takes 8 to 10 years to fully mature, can survive on any soil type and climatic conditions. Eucalyptus can even re-grow from buds on the trunk and lower branches even after bushfire. As the forests in Karnataka are affected by forest fires every year, this species of trees would decline the risk of forest fire and contribute in the quick restoration of forests. Forests and trees species can be monitored using geospatial technology which would keep a track of time in analysing and estimating the time required for restoring back the forest. Geospatial Technology can also be useful in monitoring the affected areas caused due to activities such as mining, forest fire, deforestation and land conversion.

## References

1. Reddy.C.S, et al, 2014, Threat evaluation for biodiversity conservation of forest ecosystems using geospatial techniques:A case study of Odhisa, India.
2. Ajin.R.S, et al, 2016, Forest fire risk zone mapping using RS and GIS techniques: A study in Achankovil Forest Division, Kerala, India.
3. Sedjo.R.A, 2001, The economic contribution of Biotechnology and forest plantations in Global Wood supply and forest conservation.