



CHANGING LAND USE: A CASE STUDY OF THALIPPARAMBA TALUK, KANNUR, KERALA

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Abstract

Land is a basic natural resource which encompassed all attributes of the biosphere. It is the most important resource which determines the regional development. The transformation of land use, from one to another may be due to climate, social economic change, ecology and hydrologic chain. Non-availability of water and migration of population, may change the land use over a period of time. The present study relates to Thalipparamba taluk. The main objective of the present study is to examine the land use and the change (LULC) that has taken over a period of time (1971-2011). The land use data for 1971 is from the Survey of India (SOI) topographical sheet and 2011 Landsat-8 Operational Land Imager (OLI) satellite data downloaded from USGS Earth Explorer are used for the analysis. National Remote Sensing Centre (NRSC) standard classification method is slightly modified and adopted for LULC classification and executed in GIS platform. This study shows, rubber, pepper and built up land has increased significantly whereas part of forest and paddy covering area has been tremendously converted to other land use purposes. This indicate that people are interested to cultivate plantation crops like pepper and rubber instead of labour intensive less profit paddy cultivation.

Key Words: *Land Use / Land Cover, Toposheet, Landsat-8 data, NRSC method, Thalipparamba*

Introduction

Study area

The present study is conducted in Thalipparamba taluk which is located in the Kannur District of Kerala which comprising three blocks namely Payyannur, Thalipparamba and Irikkur. Thalipparamba is the second largest taluk in kerala state. The taluk extends towards north latitudes of $11^{\circ} 55'07''$ to $12^{\circ}17'59''$ and East longitudes of $75^{\circ}10'05''$ and $75^{\circ} 43'08''$ (Fig.1). The total area of Thalipparamba taluk is 1557 km^2 , in this 1232.95 km^2 in rural and 97.71 km^2 in urban sector.

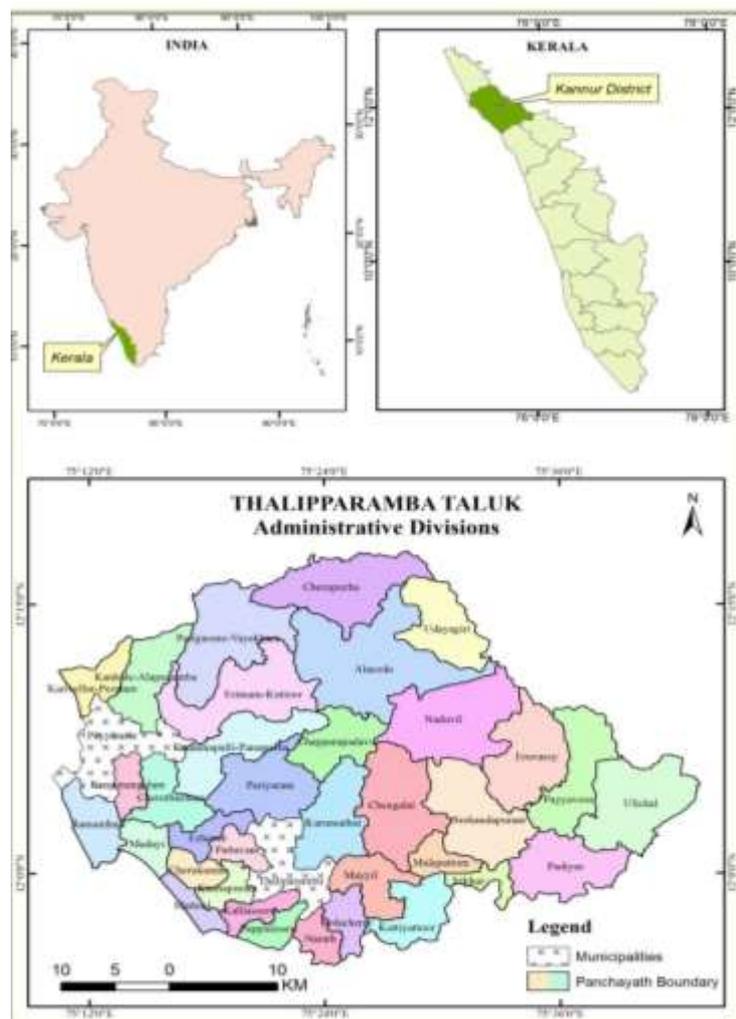


Fig.1 Study area Location Map

Objectives of the Study

The objective of the present study is to analyse the spatio temporal land use/land cover changes for the period 1971 and 2011 in Thalipparamba Taluk.

Data base and Methodology

This study investigated that land use / land cover (LULC) for the period 1971 used 1:50,000 SOI toposheet and 2011 landsat-8 OLI data. NRSC standard classification method is slightly modified and adopted for LULC classification and executed in GIS platform. Manual digitizing method is employed to derive 1971 LULC spatial data. On the other hand, Supervised classification-

Maximum likelihood method is adopted to generate 2011 LULC spatial information. For each land use Area of Interest (AOI), were captured using Megallan GPS. The same has been used to supervised classification as a signature file. The changing LULC patterns for the last four decades are being investigated. Beyond this, primary data has been collected the field through field interview, 50 questionnaires was used and the collected data has been correlated with LULC and to find the impact of migration over LULC for the last four decades. In order to understand the genetic characteristics of land, various physical characteristics of the land such as slope relief, etc. have also been investigated.

Results and Discussion

Land use and land cover change is a human modification of earth's surface. Thalipparamba taluk, has a population of 9,00,960 of which most of people are engaged in agricultural activities. Over a period of four decades the major parts of study area has been transformed. The land use / land cover map of 1971 (Fig.2) is shows that the maximum area is under mixed crops. The major crops found are coconut, arecanut, mango, jack, cashew etc. is about 53.80 % (837.73 km²), land under paddy covers 20.14 % (313.53 km²). Paddy cultivates mainly in the lowland areas of the Thalipparamba. Highland paddy also cultivated in the areas of Udayagiri, Alakode and Naduvil panchayaths. The land under forest category covers 11.92% (185.54 km²) in the eastern part of Western Ghats mainly along the bordering areas of Madikkeri and Virajpetta districts of Karnataka. The land under rubber plantation is about 5.57%, as the migrant population from Travancore who are well known in the cultivation of rubber, come from the rubber tracts of Kottayam and Idukki, so they started rubber cultivation. Pepper occupies about 2.23% of the land area. 1.27% of area covered by coconut and only 0.28% of area occupies cashew. Around 0.84% of the total area of taluk is under Built-up category. About 0.74% land is under barren land category. The river and waterbodies covers 3.22% (50.9 km²) of study area.

The land use / land cover map of 2011 (Fig.2) has been prepared with the help of landsat-8 Operational Land Imager (OLI) satellite images. The land use / land cover area wise statistics details for the year 2011 (Table.1) shows that forest land in Thalipparamba taluk has declined from 11.92% in 1971 to 5.11% in 2011 due to plantation and deforestation especially in the highland areas of Alakode, Udayagiri, Naduvil, Padiyur, Ulikkal and Payyavur panchayaths. About 61% (944.08 km²) area comes under agriculture mainly paddy and mixed crops which occupies the lowland areas of Chapparappadavu (71%), Cheruthazham (75%), Chengalayi (49%), Cherukunnu (74%), Eramam Kuttoor (76%) and its adjoining areas. The barren land covers 4.60% area covers a small tract in Payyavur and its adjacent panchayaths. About 10% land is under rubber which occupied mainly in highland panchayaths of Udayagiri, Alakode, Naduvil, Cherupuzha, Eruvessy and Payyavur. Current fallow land occupies 0.85% (The term fallow land is applied to any land which is left fallow for one or less than one agricultural year). Only a small tracts area covers coconut (0.84%) and cashew (0.67%) in the mid lands of lateritic terrains. The water body covers an area of about 3.22% (50.09 km²).

Table:1

Land Use Change 1971 -2011 (Thalipparamba Thaluk)

LAND USE	1971	%	2011	%	Change
Forest	185.54	11.92	79.60	5.11	-6.80
Built Upland	13.09	0.84	71.56	4.60	3.76
Barren Land	11.46	0.74	10.12	0.65	-0.09
Current Fallow	0.00	0.00	13.21	0.85	0.85
Coconut	19.75	1.27	13.07	0.84	-0.43
Banana	0.00	0.00	0.17	0.01	0.01
Cashew	4.38	0.28	10.39	0.67	0.39
Rubber	86.70	5.57	155.76	10.00	4.44
Pepper	34.67	2.23	75.12	4.82	2.60
Paddy	313.53	20.14	133.68	8.59	-11.55
Mixed crops with settlements	837.73	53.80	944.08	60.63	6.83
Water body	0.06	0.00	0.15	0.01	0.01
River	50.09	3.22	50.09	3.22	0.00
Total	1557.00	100.00	1557.00	100.00	

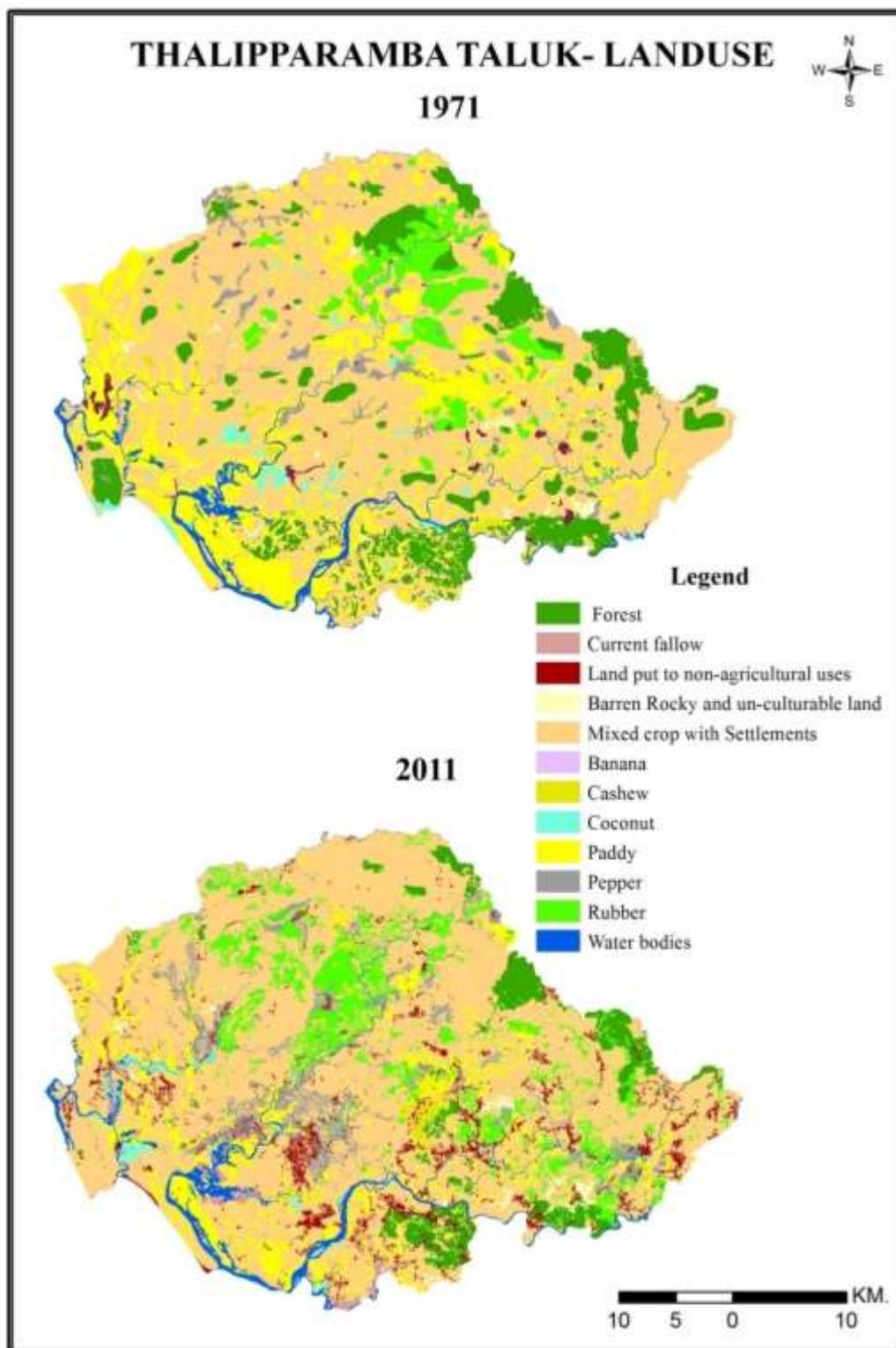


Fig. 2 Land Use / Land Cover Map

Land Use / Land Cover Change (1971-2011)

In the land use changes, mixed crops have increased by 6.83% followed by rubber 4.44%, built up land 3.76% and Pepper 2.60%. Paddy is the major loser crop (-11.55%) and the paddy cropped area is replaced by plantation, cashew, pepper, coconut and built-up in terms of land use and land cover. As the people are not interested in labour intensive crop like paddy as its economical value

is comparatively low, when compared to other commercial crops. Between 1971 and 2011, the percentage of forest land has decreased by -6.80%. In terms of areal extent, it has decreased from 185.54 Km² in 1971 to 79.60 Km² in 2011. The gram panchayath level study reveals that, an increase in forest land has taken place in three gram panchayath viz. Eruvessy, Ezhome and Madayi and decrease of forest area is registered in 32 gram panchayaths.

Conclusion:

Land use and land cover change is a human modification of earth's surface. The study area Thalipparamba taluk is having agriculture base and major portion of the land is under agricultural use. After the invasion of migrant people from the southern parts of Kerala especially in Kottayam district and Trivandrum people who settled down and cleared the forest for plantations and their settlement. In this time the land gets first conversion . Over a period of four decades the existing land use / land cover of study area tremendously converted to other commercial crops. The temporal data i.e. SOI toposheet for the year 1971 and Landsat-8 OLI images for the year 2011 shows that the land use category such as forest (-6.80%), barren land (-0.09%), coconut (-0.43%) and Paddy (-11.55%) have been decreased. At the same time built-up land (3.76%), current fallow (0.85%), banana (0.01%), cashew (0.39%), rubber (4.44%), pepper (2.60%) and mixed crops with settlement (6.83%) are showing increasing trend. From the result, paddy and forest are decreasing at an alarming rate. So suitable solutions need to be find out and implement for sustainable development in the study area.

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