

SPATIO TEMPORAL LAND USE DIVERSIFICATION CASE STUDY OF TIRCHIRAPPALLI TALUKS - 2007-08 TO 2014-15

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ABSTRACT

Nowadays in the dynamic situation, accurate, meaningful and current data on land use is essential for sound and feasible planning for natural resources for sustained use. The land diversification is latest and up to date information on land use land cover is essential for future panning. The study area lies between 10°10' and 11°20' of the northern latitudes and 78°10' and 79°0' of eastern latitudes in the centre part of the Tamil Nadu. Total area under study is 4,403.83 sq. kms. and lies in the Trichirappalli District. The base information has been collected from statistical department in Tiruchirappalli District. This information divided the nine major land use categories have been interpreted from the Indian remote sensing agency. The evolution of present land use has been discussed in the light of present scenario; changes in spatio-temporal land use diversification are monitored and suggestions are made for better land use planning in study area.

KEYWORDS: Miscellaneous Tree Crops & Groves, Lalgudi, Rain Fall, Cauvery River

INTRODUCTION

Land use and land cover change (LUCC) is increasingly recognized as an important driver of environmental change on all spatial and temporal scales (turner *et al.*, 1992). Land use and land cover change (LUCC) contributes significantly to earth atmosphere interactions, forest fragmentation, and biodiversity loss. It has become one of the major issues for environmental change monitoring and natural resource management. Lucc and its impacts on terrestrial ecosystems including forestry, agriculture, and biodiversity have been identified as high priority issues in global, national, and regional levels (Fuchs, 1996). The establishment of towns and cities, mining and a range of other factors have all reduced forest cover, however it is land clearing for agriculture that has been the most significant process by far and is a process that continues today (Blair and Dockray, 2004). Victoria's landscapes have changed significantly over the past 150 years. an estimated 66% of victoria's native vegetation has been cleared as a result of the growth and economic development of the state (Woodgate and Black). After industrial revolution, vast portions of the earth's surface have been modified, whole ecosystem destroyed and global biomes altered or vanished. North American and European native forests have largely vanished; the grasslands of interior United States, canada and ukraine, have been converted in to farmland. Marshes and wetlands have been drained. Steppe lands have become deserts and deserts have blossomed under irrigation (Fellmann et al 1985). Land is one of three major factors of production in classical economics (along with labor and capital) and an essential input for housing and food production. Thus, land use is the backbone of agricultural economies and it provides substantial economic and social benefits. Land use change is necessary and essential for economic development and social progress. Land use change, however, does not come without costs. Conversion of farmland and

forests to urban development reduces the amount of lands available for food and timber production. Soil erosion, salinization, desertification, and other soil degradations associated with intensive agriculture and deforestation reduce the quality of land resources and future agricultural productivity (Lubowski et al. 2006).

Rapid urbanization has been the main theme of urban studies in developing countries since the explosion of rates of growth in the 1960's and 1970's in very large cities (Barros, 2004). Like other anthropogenic-environment interactions, urban land cover changes respond to socioeconomic, political, cultural, demographic and environmental conditions, largely characterized by a concentration of humans (Masek et al, 2000). In spite of its small area coverage relative to the earth's surface, dynamic urban growth processes, particularly the expansion of urban population in a larger extent and urbanized area, have a significant impact on natural and human environment at all geographic scales (Herold et al, 2005).

In India, total area under cropland in 1985-87 was 169 million hectares (mha) with the density of population about 2,811 per 1000 ha. Forest and woodland consisted of 121.4 mha whereas land under permanent pasture category was about 11.8 m ha. total area under other uses was about 26.7 m ha (*world resources, 1990-91*). The cultivable area of the country is estimated to be 186 m ha. Cultivated area at the end of 2014-15 was about 159.7 million hectares. indications are that because of pressure on land due to increasing population, it may not be possible to increase the cultivated land.

Land Use Classification

Nine major land use categories have been interpreted from the Indian remote sensing agency like that:

Table 1: Nine Fold Land Use Classification

Land Use Categories	Description
Forest area	As forest under any legal enactment, or administered as forest, whether state-owned or private, and whether wooded or maintained as potential forest land. The area of crops raised in the forest and grazing lands or areas open for grazing within the forests remain included under the "forest area".
Non-agricultural uses	The land occupied by buildings, roads and railways or under water, e.g. Rivers and canals, and other land put to uses other than agriculture.
Barren and un-culturable land	This includes all land covered by mountains, deserts, etc. Land, which cannot be brought under cultivation except at an exorbitant cost is classified as unculturable whether such land is in isolated blocks or within cultivated holdings.
Permanent pasture and other grazing land	This includes all grazing land whether it is permanent pasture/meadows or not. Village common grazing land is included under this category.
Miscellaneous tree crops & groves	This includes all cultivable land, which is not included in net area sown but is put to some agricultural use. Land under casuring trees, thatching grasses, bamboo bushes and other groves for fuel, etc. Which are not included under orchards are classified under this category.
Cultivable waste land	This includes land available for cultivation, whether taken up or not taken up for cultivation once, but not cultivated during the last five years or more in succession including the current year for some reason or the other. Such land may be either fallow or covered with shrubs and jungles, which are not put to any use. They may be accessible or inaccessible and may lie in isolated blocks or within cultivated holdings.
Other fallow land	This includes all land, which was taken up for cultivation but is temporarily out of cultivation for a period of not less than one year and not more than five years.

Table 1: Contd...	
Current fallows land	This represents cropped area, which is kept fallow during the current year.
Net cultivable area	This represents the total area sown with crops and orchards. Area has sown more than once in the same year is counted only once.

Source: ministry of Statistics and programme implementation

Study Area

Tiruchirappalli district is located at the central part of tamilnadu surrounded by perambalur district in the north, pudukottai district in the south, karur and dindigul districts in the west and thanjavur district in the east. It lies between 10°10' and 11°20' of the northern latitudes and 78°10' and 79°0' of eastern latitudes in the centre part of the tamilnadu. The general slope of the district is towards east. It has a number of detached hills, among which pachamalai hill is an important one, which has a peak up to 1015mt height, located at sengattupatti rain forest. The climate is generally high temperature and low humidity. With annual mean temperature of 28.9 C and annual rain fall is 800 to 1000 mm in the study area. Tiruchirappalli district comprised of elavantaluklike that Thuraiyur, Lalgudi, Musiri, Tiruchirappalli East, Tiruchirappalli West, Thiruverumpur, Marungapuri, Thottiyam, Manachanallur, Srirangam and Manapparai. The major rivers flows from study area like that kavery river, Kollidam river, Uyyakkondan river, Upparu river, Ponnaniyarur river and Kudamurutti river but this all rivers non-perennial river or seasonal flowing rivers. The soil is predominantly alluvial soil, which is suitable for paddy cultivation and some river side areas cultivated bananas.

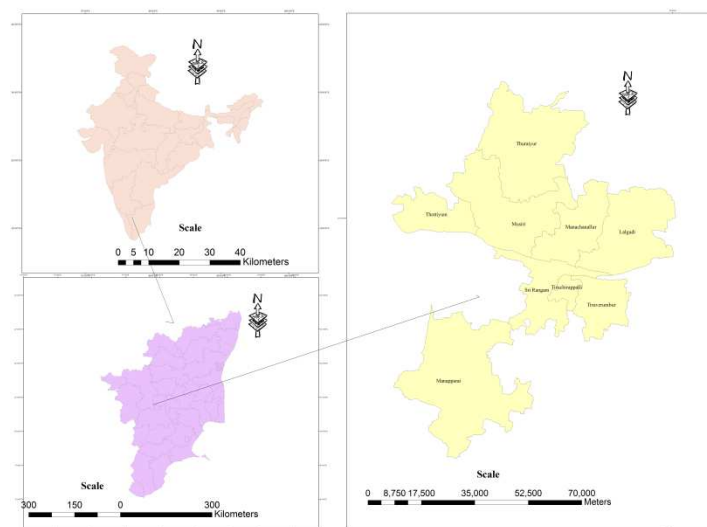


Figure 1: Study Area

Method and Material

The present study analysis is the Spatio Temporal Land Use Diversification Case Study Of Tiruchirappalli Taluks. The following objectives are as to find out the land use diversification from the study area 2007- 08 to 2014 – 15. The sources of data have been collected from the Statistical department and Agricultural Department in Tiruchirappalli district. The present study using the simple statistical method find out the land use diversification in the study area. These data collected from nine fold categories in each taluks in different year. The taluk wise data converted in percentage. These

percentages finally compare the twice years, find out the land use diverted in the study area.

RESULTS AND DISCUSSIONS

Table 2: Land Use Categories Diverted In Percent - 2007 - 08 to 2014 - 15

Taluks	Forest	Un Cultivable Waste	Non Agriculture Uses	Cultivable Waste Land	Permanent Pasture & Grass Land	Misc. Tree Crops Groves	Current Fallow	Other Fallow	Net Cultivated Area
Laugudi	0	-0.105	0.099	1.464	0	-0.565	-1.383	-2.788	3.26
Manapparai	-7.349	0.484	0.913	1.48	-0.153	0.239	5.783	5.949	-7.346
Mannachanallur	0	-0.008	0.033	-0.004	0	0.03	1.946	1.738	-3.735
Marungapuri	0	0	0	0	0	0	0	0	0
Musiri	0	-0.011	0.022	0.052	0	-0.003	-2.175	4.407	-2.292
Srirangam	0.015	-0.103	-2.065	-0.003	0.006	0.224	-10.255	12.53	-0.348
Thiruverumpur	0.184	-0.185	-6.075	3.754	0	0.453	-0.135	-0.939	2.943
Thottiyam	0	0	0.003	-0.086	0	0.034	-0.568	3.723	-3.106
Thuraiyur	0	0.01	0	1.509	0	-0.078	-5.217	4.294	-0.519
Trichy east	-0.873	-0.852	23.689	-5.732	0	-0.373	-0.126	-2.929	-12.803
Trichy west	0	0.831	-8.239	-0.585	0.003	-0.134	0.265	8.822	-0.963

Legend: Land use Diverted

Table 3

	Decreases		Not Diverted		Increased
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Notes: The land use nine fold data was compared from 2007 to 2008 and 2014 to 2015. It is used to find out the divert variation.

The Table No.- 01 represents the Spatio-Temporal Land Use Diversification of Tirchirappalli Taluks - 2007-08 to 2014-15. The Laugudi Taluk Un cultivable waste land, Miscellaneous tree crops & groves, Current fallow land and Other fallow lands few per cent diverted to Net cultivated area, Cultivable waste land and Non agriculture uses. The Forest land

and Permanent pasture & grass land not diverted. The Manapparai Taluk Forest land, Permanent pasture & grass land and Net cultivated area divert from other category. The Manachanallur Taluk not diverted in Forest and Permanent pasture & grass land. These taluk Un cultivable waste, Cultivable waste land and Net cultivable land diverted to Non agriculture land, Miscellaneous tree crops & groves, Current fallow land and Other fallow lands. The Marugapuri Taluk don't diverted any category lands. The Musuri Taluks frequent years not diverted Forest and Permanent pasture & grass land. These Taluk Current fallow land, Net cultivated land, Un cultivated waste land also diverted to Non agriculture waste land, Cultivable waste land and Other fallow land. The Sri Rangam Taluk all the lands diverted from few per cent like that Un cultivable waste land, Non agriculture uses, Cultivable waste land, Current fallow land and Net cultivable land. The Thiruverumbur Taluk not diverted Percentage pasture and grass land. These taluk Un cultivable waste land, Non agriculture land, Current fallow and Other fallow lands few percentage diverted to Forest land, Cultivable waste land, Miscellaneous tree crops & groves and Net cultivable area. The Thotiyam Taluk not diverted forest, un-cultivable waste land and permanent pasture & grass land. These Taluk Net cultivable area, Current fallow land and Cultivable waste land diverted to Other fallow land, Miscellaneous tree crops & groves and Non agriculture land. The Thuraiyur Taluk Forest, Non agriculture land and Permanent pasture & grass land not diverted. Same taluk the Miscellaneous tree crops & groves, Current fallow land and Net cultivable lands diverted to Other fallow land, Cultivable waste land and Un cultivable lands. The Trichy East Taluk Permanent pasture & grass land not diverted another all category land also diverted to non-agriculture use diverted major causes is urbanizations. The Trichy West Taluks the land use categorise diverted to few percentage lands only like that Non agriculture uses, Cultivable waste land, Miscellaneous tree crops & groves and Net cultivated area divert to Other fallow land, Un cultivable waste land, Permanent pasture & grass land and current fallow. These taluk forest lands not diverted. These all taluks lands changed in few percentages only.

CONCLUSIONS

The analysis, compare and find out spatio-temporal land use diversification of Tirchirappallitaluks during periods 2007-08 to 2014-15. Based on the analysis of land use divert on it could be concluded that in Tiruchirappalli district the Uncultivable land and net cultivated area are experiencing a shrink in spatial extent is not a good significant. The no changes in forest and Land permanent pasture & grass land. At the same time non agriculture land, cultivable waste land, miscellaneous tree crops and groves, Current fallow land and other fallow land has shown a significant increase. The most of the lands diverted from non-agriculture land at Trichy East taluk region due to the urbanization. The other taluks land use categories diverted to few percentage only. These changes major cause is may be attributing to failure of monsoon and Cauvery water interstate dispute problem is affected the irrigation system, farmer's capital investment subscribe definite limit low. The credit is not available at the right time to the investment of agriculture practices, cultivable land on either side of the national highway and state highway the real estate residential flat has been change, agricultural labour shortage is due to decline of cultivable lands.

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