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RESEARCH ARTICLE

Land Use/Land Cover Change Detection Studies in Dhari Taluka of Gujarat, Using Remote Sensing and GIS Technique

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ABSTRACT

land is an important finite natural resource. It is only source to sustenance of living being. The pressure of rapidly growing population is increasing the variety of demands which make a burden on land resource. Thus, the best possible use of land is necessary whether for development, conservation, or mixed uses. Assessment of spatial and temporal changes in land use pattern through the satellite data is an effective tool for the evaluation of changes occurring in land use and extent of environmental degradation. In this paper an attempt has been made to interpret the land use and land cover features using remote sensing digital technique to generate land use and cover maps for Dhari taluka. Apart from this, changes in the land use and land cover pattern between the year of 2000 & 2005 have been accessed through change detection studies and findings are helpful to the planners make a strategy for development of the area.

Introduction: land is the sole source of the sustenance of mankind supporting the plants and animal on it providing the food, fiber and shelter. The growing pressure of population coupled with and increasing variety of demands being made on land resource have brought extra pressure on the available resources all over the country. Hence it is a necessary pre-request to know the present or existing use of land in order to plan for its optimal use. The natural resources are responsive to human interaction and these together with terrain features determine the selection of proper land use pattern, which also in some way reflects the cultural, social and economic conditions. The land system is highly dynamic which undergoes significant changes according to changes in socio-economic and natural environment. The changes in any forms of land use are largely related with the external forces and pressure built-up within system. Assessment of spatial and temporal changes in land use pattern is an effective tool for the evaluation of changes occurring in land use and extent of environmental degradation. The great merits of recording land use/land cover on maps are that each parcel of land

can be precisely located and the aerial relationship of different use analyzed in a way that is not possible with a variety of statistical data, often collected for quite different purposes. Remote sensing can be a powerful method for monitoring changes in land cover and use.

Objectives – The study has been carried out with the following objectives:

1. Land use / land cover classification for the study area using the satellite remote sensing data.
2. Assess the change in land use/ land cover in study area between 2000 and 2005 years through change detection studies.

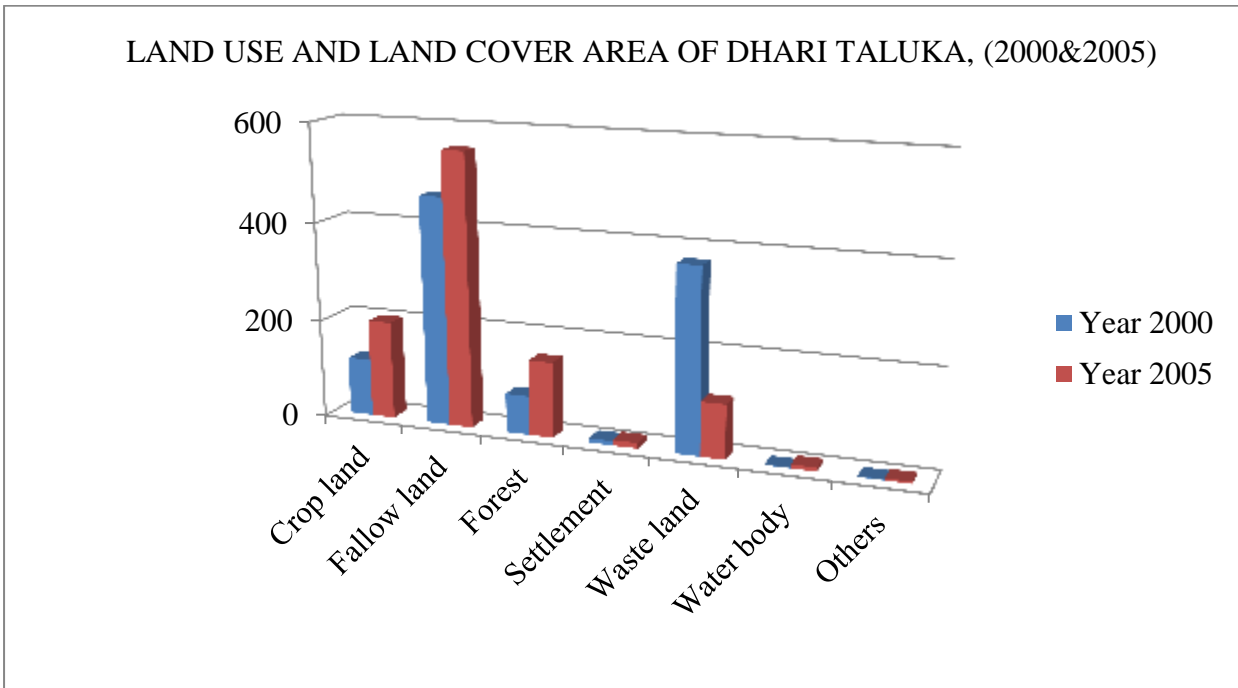
Study Area- The study area selected for the present project work is Dhari taluka in Amreli district, Gujarat state. District falls in survey of India degree sheet no. 41o & 41k. The taluka lies between 78°48'14.37" and 71°16'4.77" E Longitude, 21°7'13.20" and 21°28'21.01" N Latitude. It covers about 1041 sq. km area and is bounded by Una taluka in the south, Khambha taluka in the southeast, Savarkundla taluka in the northeast, Amreli taluka in the north, Bagasara in the northwest and visavadar taluka in the west.

Methodology – land use/ land cover mapping and change detection studies based on the digital processing of remotely sensed data need careful planning of various activities. Satellite data pertaining to two periods i.e. IRS-1C/1D LISS-III & IRS-P6 LISS-III date of November 2000 and October 2005 are used for land use land cover mapping. The satellite data LISS-III IRS-P6 are geo referenced to bring into the real world co-ordinates. The imagery has to be interpreted and checked for correction. After checking of collateral data the map have been finalized.

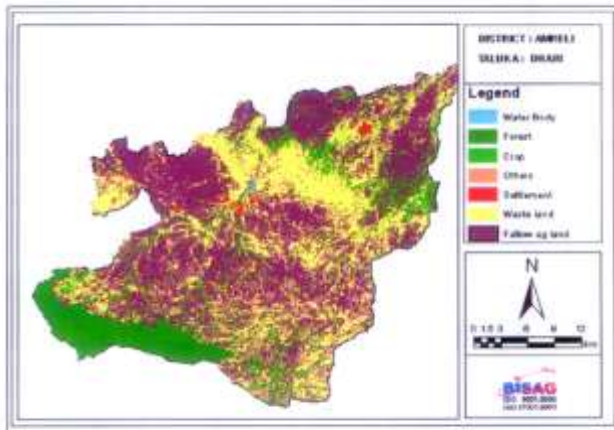
Land use/land cover Statistics: land use/land cover classes for Dhari taluka after digital classification is shown in following table for the year 2000 & 2005.

Table: Land use/land cover Area of Dhari Taluka, (2000 & 2005)

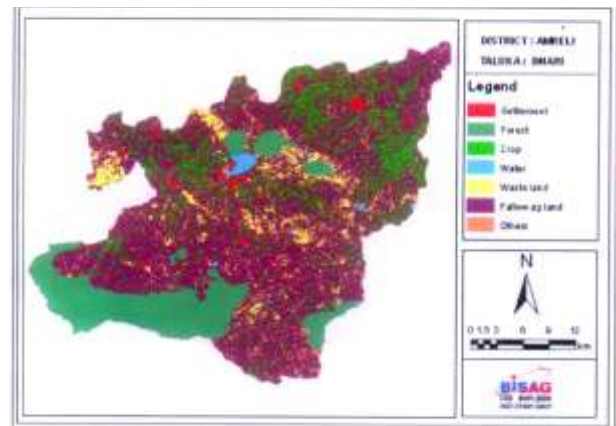
S.No.	Classes	Area (Sq.km.)		
		2000	2005	Variation
1	Crop land	116.95	199.38	82.43
2	Fallow land	463.10	555.03	91.93
3	Forest	79.27	152.95	73.68
4	Settlement	8.67	11.33	2.66
5	Waste land	370.84	109.44	261.44
6	Water body	0.80	7.87	7.07
7	Others	1.30	4.12	2.84



Land Use/ Land Cover Map of Dhari Taluka, 2000



Land Use/Land Cover Map of Dhari Taluka, 2005



Conclusion:- The objectives of this study were to interpret the land use and land cover feature using remote sensing digital technique to generate land use and cover maps for Dhari taluka. Apart from this change in the land use and land cover pattern between 2000 & 2005 has been accessed through change detection studies. Total agriculture land in 2000 was 579.44 sq. km and 754.41 sq. km in 2005. It was increased because few wastelands were converted in the agriculture land due to the fact that 2000 was a drought year and there was good rain in 2005. In 2000 wasteland was 370.84 sq. km but due to good rain in 2005 it was only 109.44 sq. km. The change detection study shows there is urban expansion by 2.66 sq. km. forest area has increased in large amount by 73.68sq. km. it's due to

good rain between 2000 & 2005 and human activity in favour of plantation. Since 2000 was a drought year, large area of forest was in the form of wasteland as evident in the image of 2000, which was converted into forest till 2005. Water body area has increased by 7.07 sq. km, because 2000 was a drought year. So some water body region in 2005 was in the category of wasteland in 2000 as classified by supervised classification.

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