



A Study of Landuse Pattern Around Brima Sagar Maharashtra Distilleries Ltd., Shreepur

KEYWORDS

Land, Landuse Pattern, Image Classification, Change Analysis

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ABSTRACT *The land resources used for human purpose termed as 'land use' which varies with the purposes it serves. Landuse is the way in which, and the purposes for which, human beings employ the land and its resources e.g. farming, mining, settlement, transportation, etc. Shreepur town of Solapur district is having one sugar factory and one distillery which contributed in the development of this region by several ways. These factories are key component for transformations in socio-economic and landuse aspects. In this paper an attempt is made to understand the landuse pattern around Brima Sagar Maharashtra Distilleries Ltd., Shreepur. Temporal satellite dataset is used for analysis on which image classification is carried out and derived results are interpreted systematically. The study shows that there are many positive transformations occurred. The agricultural and built-up area is increased at considerable amount.*

INTRODUCTION

Land is the most useful resource after water on which all human activities are being conducted. Man is utilizing it by various means. The land resources used for human purpose termed as 'land use' which varies with the purposes it serves. Landuse and landcover are distinct though they are closely linked characteristics of the earth's surface and there is no standard universally accepted set of categories for classifying land either by use or cover. Landuse is the way in which, and the purposes for which, human beings employ the land and its resources e.g. farming, mining, lumbering, settlement, transportation, etc. [1]. This study focuses on the study of landuse condition within 10km radius from the factory site. The study covers about 31400 ha. land which possesses diverse landuse. Using temporal dataset an attempt is made to understand the changes occurred in landuse, in due course of time.

OBJECTIVES

The main aim of this study is to comprehend the landuse pattern within 10 km radius from factory site. The related objectives are:

- To understand landuse using temporal satellite dataset
- To study the change in the state of landuse pattern over period of 35 years

STUDY AREA

Brima Sagar Maharashtra Distilleries Ltd., is located at Shreepur, Taluka Malashiras, Dist Solapur. The villages around 10 km radius from sugar industry are considered as a study area. There are total 24 villages in the circumference out of that 16 are considered in this study. This area is come under drought prone area of Maharashtra state. The general climate of the region is dry. The soil is from medium deep soil to very deep soil. River Bhima is the main river flowing through this area which is tributary of River Krishna.

DATA

In this study both primary and secondary source of data is utilized. The Suvey of India toposheet and satellite images are used for mapping. Especially the Land use within 10

km radius of the study area is studied with the help of satellite imagery. First dataset is of MSS sensor of 1976 and second is from IRS LISS-IV of year 2012.

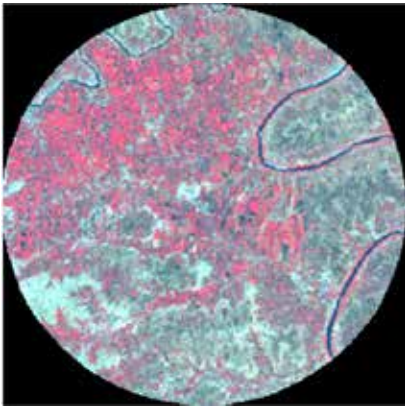
METHODOLOGY

The land use and land cover contains broad range where each region has its own characteristics and specific landuse, therefore, number of classification systems are developed. The study of land use / land cover change will be characterized by integrated, interdisciplinary approaches. In this study the region is broadly classified into built-up, water body, agricultural land, barren land, etc. The satellite images of study area are utilized for spatio-temporal mapping. The image processing software is applied for image preprocessing and classification of the satellite data. The generated maps are validated with other authentic data and GPS readings. The interpretation of generated maps is made to derive results and further analysis. In second phase quantification is carried out to understand the change occurred in landuse. The landuse condition of these years are mapped and tried to understand the actual change in various classes of landuse. In last phase secondary data published by census of India is used for graphical analysis. The final landuse map is prepared after field verification and used as final map.

RESULTS AND DISCUSSION

In most of the activities information about land use and land cover is very much important. In Environment Impact Assessment (EIA), planning and development studies Landuse condition is one of the prime aspects [2]. Rapid urban expansion necessitates proper planning to avoid negative environmental and socio-economic impacts. Remote sensing and GIS technology provides effective tools to understand the phenomenon as well as for planning and decision making process (Ramotra and Saymote, 2012). The use of satellite dataset is improving the accuracy of results in more scientific manner. Hence use of remote sensing and GIS is been applied more effectively.

1976



2012

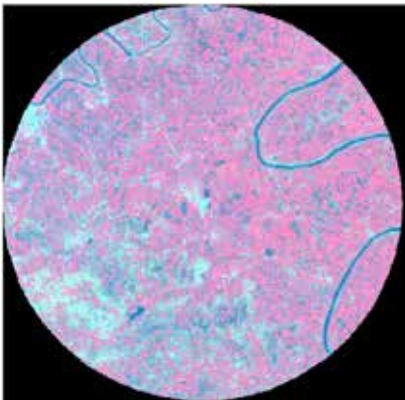


Figure 1: False Colour Satellite Images of Study Area

The above figure represents the different satellite image of study area. These datasets shows that most of the area near river is under agricultural use whereas some patches are of fallow land. The study area is located on the bank of Bhima River as a result most of the land is having plane topography. The road network is well developed which is a positive sign of development. The visual image interpretation of FCC image shows that there is significant increase in irrigated agricultural land.

LANDUSE MAPPING

The image classification for landuse study within a distance of 10 kilometers from the factory site is carried out. Each landuse class has occupied some land hence the areas coming under the respective classifications is tabulated.

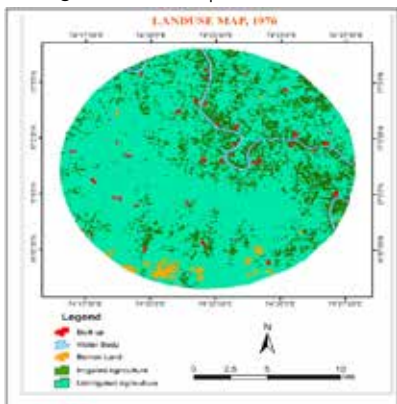


Figure 2: Landuse Map (1976)

The classification shows that most of the land is under non-irrigated agriculture. There are some patches of irrigated agriculture and barren land. Also some spots of settlement patches are representing settlements in the study area.

An important aspect of change detection is to determine, which is actually changing to what extent, in other words to check, which landuse class is changing. The outcome results will reveal both the desirable and undesirable changes along with relatively stable categories overtime. This information works as a vital tool in management decisions [3].

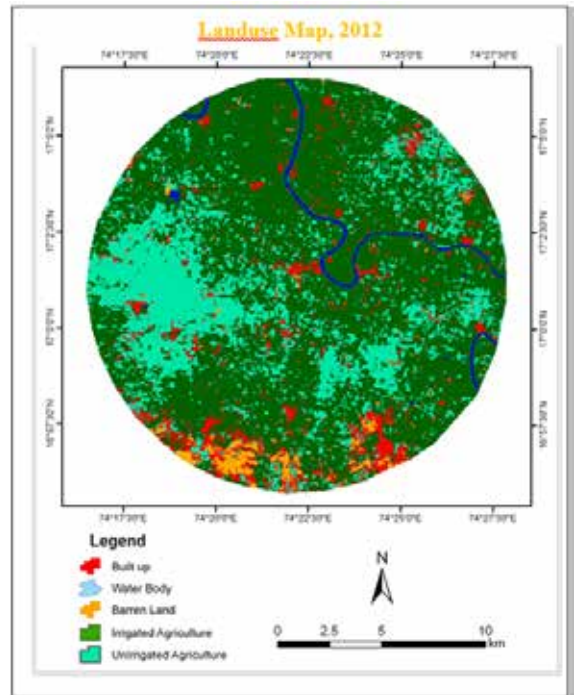


Figure 3: Landuse Map (2012)

LANDUSE CHANGE ANALYSIS (1976 to 2012)

An important aspect of change detection is to understand, which landuse class is actually changing to what extent (Ramotra and Saymote, 2014). The quantification of the landuse condition of two different time periods. During first time period (1976) most of the land was depend on rainfall as a result land was un-irrigated and dry. In due course of time many irrigation schemes were started in this region as a result un-irrigated and some barren land was brought under irrigation. In 1976 only 24.29% (7628.27 ha.) land was irrigated on the contrary 65.85% land (20678.14 ha.) was un-irrigated. In the year 2012 the scenario was drastically changed. The irrigated land becomes 65.72% to total land (20637.27 ha.) which is increased by 13009 ha. At the same time the proportion of un-irrigated area is decreased very fast by 24.27%. The area under settlement is also increased.

Land use, reflects the human activities, which indicates the agricultural landuse and manmade structures covering the land surfaces i.e. the modification of landscape. There are several transformations can be seen in the landuse category within 10 km radius from the sugar factory. The major transformations are occurred in the agricultural class where

proportion of agriculture land is increased and most of the land is brought under utilization. In this transformation Pandurang sugar complex have played a great role. Overall in the landuse is greatly associated with the irrigation facilities and other transformation.

CONCLUSION

Shreepur town of Solapur district is experiencing several transformations for which the sugar factory and distillery is main cause. Both are located in proximity as a result surrounding open land has brought under several uses. It contributes towards the development of Shreepur and around area. About 20678.14 ha. land was un-irrigated which brought under irrigation. Due to new irrigation schemes dry land has brought under irrigation and at present 65% land is under irrigation. There is remarkable increase (3.06%) in built-up area. The share of barren land was 1522 ha. (4.85%) which was reduced drastically to 570 ha. because each inch of land has got importance and been utilized for particular use. The industrial development has lot of potential to feed its working employee and same time it support to other developmental activities. This situation is perfectly observed at Shreepur and in coming days it will be increasing at considerable rate.

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