

A Study of Landuse Pattern Around Padmabhushan Krantiveer Dr. Nagnath Anna Nayakawadi Hutatma Kisan Ahir Sahakari Sakhar Karkhana Ltd., Walwe - Maharashtra



Geography Science

KEYWORDS : Land, Landuse, Sugar Factory, Image Classification.

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ABSTRACT

The study of land use / land cover change is characterized by integrated and interdisciplinary approach. The land use and land cover contains broad range hence region specific its classes are changing. The sugar factories in western Maharashtra are nodal point which brought positive transformations in socio-economic status of residents as well as physical state of the region. Dr. Nagnath Anna Nayakawadi was the freedom fighter and having very good vision. This sugar factory is established for the development of farmers and society. Due to establishment of this factory there are several transformations in landuse of surrounding area which is studied in this paper. This work is based on primary and secondary source of dataset. The satellite image classification technique is adopted to obtain the results. The study reveals that several irrigation facilities are started due to which huge un-irrigated land has brought under irrigation particularly under sugarcane crop.

INTRODUCTION

Land is the most useful resource and man is utilizing it by various means. Land is the stage on which all human activities are being conducted and the source of the materials needed for this conduct. Human use of land resources gives rise to 'land use' which varies with the purposes it serves. *Land use* is the way in which, and the purposes for which, human beings employ the land and its resources e.g. farming, mining, lumbering, settlement and transportation, etc. [1]. Comprehensive information of land use and land cover is the basic pre-requisite for land resource evaluation, management, planning and Environmental Impact Assessment [2].

The sugar factories in western Maharashtra are nodal point which brought positive transformations in socio-economic status of residents as well as physical state of the region. Padmabhushan Krantiveer Dr. Nagnath Anna Nayakawadi Hutatma Kisan Ahir Sahakari Sakhar Karkhana Ltd., Walwe which is commonly called as Hutatma sugar factory is one of well reputed sugar factory in Maharashtra. Dr. Nagnath Anna Nayakawadi was the freedom fighter and having very good vision. This sugar factory is established for the development of farmers and society. The factory is giving highest cane rate not only district but also in entire Maharashtra. The study of landuse within 10km radius from the factory site is carried out. 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.

OBJECTIVE

The main objective of this paper is to comprehend the landuse and landcover around Padmabhushan Krantiveer Dr. Nagnath Anna Nayakawadi Hutatma Kisan Ahir Sahakari Sakhar Karkhana Ltd., Walwe – Maharashtra. The associated objectives are as below:

To study the landuse / landcover condition of study area for the year 1976 and 2014

To understand the village wise general landuse of study area

STUDY AREA

Hutatma sugar factory is located in Walwa tahsil of Sangli district on the bank of Krishna River. The nearest railway station is Bhilawadi (16 km) and nearest town is Islampur 912 km). The plant is established the coordinate of 17° 2' N & 74° 27' E. The total area of factory site is 43.55 Ha. and its built up area is 0.9328 Ha

DATA

To conduct the landuse study both primary and secondary source of data is used. For mapping purpose Survey of India toposheet and satellite images are used. Land use within 10 km radius of the study area has been determined with the help of satellite imagery. The tem-

poral dataset of landsat is used for study of landuse. First dataset is of MSS sensor of 1976 and another is from IRS LISS-IV of year 2014.

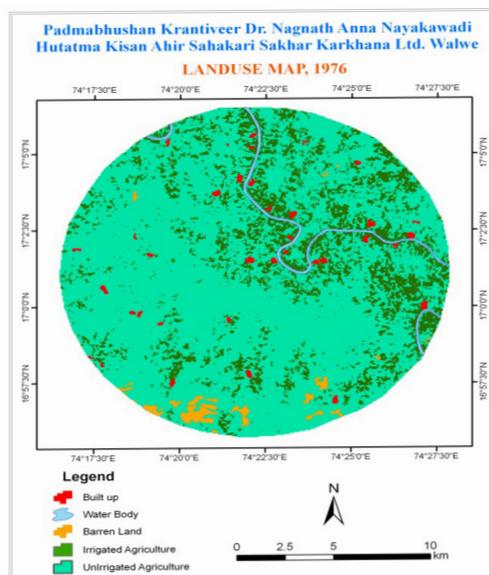
METHODOLOGY

The land use has been presented in the form of a map prepared by satellite data. During initial phase Survey of India toposheet is used to demarcate 10 km radius from the project site. Once study area is defined often field visits are made to understand the real condition of the study area. Satellite data is used for mapping landuse pattern. The image processing software is applied for image preprocessing. The study area is broadly classified into built-up, water body, agricultural land, barren land, etc. The quantification is carried out to understand the change occurred in landuse. The secondary data published by census of India is also utilized. Village wise landuse data available in census is collected and graphical analysis is carried out to comprehend village level landuse. Most of the changes are found in the agricultural land.

LANDUSE PATTERN

Land use, reflects the human activities, which indicates the agricultural landuse and manmade structures covering the land surfaces i.e. the modification of landscape [3]. Identification and periodic observation of land uses and vegetation covers, in the surrounding area of any developmental activity is one of the most important components for an environmental impact assessment.

Figure 1: Landuse Map (1976)



CHANGE IN LANDUSE (1976 to 2014)

The land use classification of satellite image within a distance of 10 kilometers from the project location is performed (Figure-1 and 2). The statistics of change in landuse categories are understood. The highest positive change is recorded in Irrigated Agriculture category, settlement and water body whereas negative change is noticed in barren land and un-irrigated land.

The irrigated agriculture is increased by 41.43% (i.e. in year 1976 about 24.29% land under this class which become 65.72% in year 2014). The share of un irrigated agriculture was 65.85% in year 1976 which is reduced by 41.58% and become 24.27% in year 2014. In short before starting the factory most of the agricultural land was un-irrigated and depend on rainfall. In due course of time many irrigation schemes were launched in this region as a result un-irrigated and some barren land was brought under irrigation.

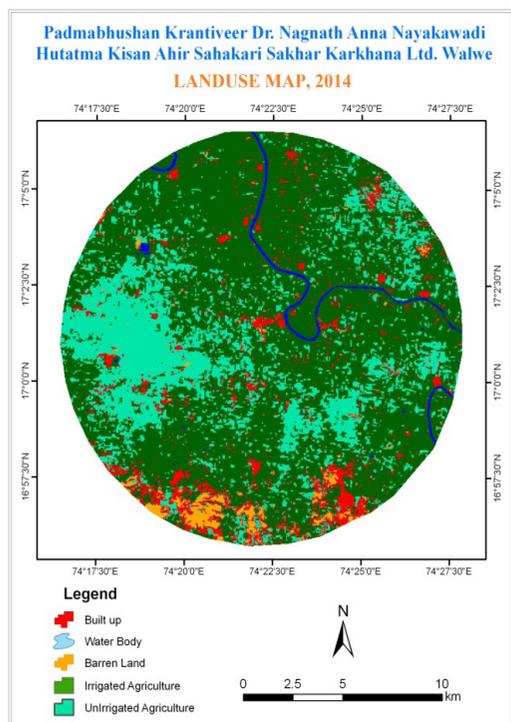


Figure 2: Landuse Map (2014)

VILLAGE WISE LANDUSE

The above discussion is about comprehensive representation of landuse of the study area. While studying the entire study area it is also necessary to check the root level conditions. Hence, in this section an attempt is made to study micro level i.e. village wise landuse condition of study area. Table No 3 represents village wise general landuse of study area of year 2001. This table show that some villages are very small and some are quite big as a result the landuse is also varies from village to village.

**TABLE – 1
GENERAL LANDUSE OF STUDY AREA**

Village Name	Area	Land Under Forest	Total Irrigated	Un-irrigated land	Culturable waste	Area not available for cultivation
Ahirwadi	235	0	1186	0	0	116
Amanapur	1363	0	772	518	0	73

Ankalkhop	2099	0	1778	0	2	122
Bavchi	1689	130	1071	227	54	208
Borgaon	2390	0	266	1921	16	187
Burli	1489	0	751	593	29	115
Dudhondi	823	0	692	49	7	74
Gatadwadi	563	0	478	0	0	47
Gothkhandi	2070	243	1254	336	0	83
June Khed	657	0	970	0	0	55
Mardawadi	497	0	259	203	0	36
Masuchiwad	597	0	172	381	0	44
Nagrale	649	0	400	203	0	45
Nagthane	1328	0	1232	0	0	96
Nave Khed	360	0	970	0	0	55
Padavalwadi	314	0	0	0	0	0
PundiT. Walava	609	0	525	19	0	65
Pundiwadi	102	0	51	43	0	8
Radewadi	273	0	159	0	0	19
Shirgaon	324	0	327	0	0	0
Tujarpur	523	0	459	0	0	64
Vithalwadi	51	0	10	37	0	4
Walwa	3681	0	2130	815	320	417
YedeNipani	1661	142	1229	30	30	231
	24347	514	17142	5376	458	2163

Source: Sangli District Census Handbook, Census of India.

The area under forest is 2% (514.20 ha.) which is found in only three villages and other villages are lacking in terms of area under forest. The area under irrigated land is 67% (17142.02 ha.) where as un-irrigated area is 21% (5376.24 ha.). The proportion of cultivable waste i.e. temporary fallow land is 2% (458.40 ha.) and are not available for cultivation i.e. permanent fallow or barren land is 8% (2162.59 ha.).

IRRIGATION AND LANDUSE

The water is one of the prime concerns for agricultural activities and the agriculture activities in India are mostly depend on rainfall during monsoon season. To overcome this uncertainty of rain, the irrigation facilities have been developed in the region. This will help to develop economic stability of farmers and ultimately beneficial to society. The irrigation plays central role for the changes in landuse status and consequently on the socio-economic conditions of an area[4]. If the utilization of irrigation is done systematically it brings positive results whereas an opposite, its mismanagement leads to negative impacts. In this section the focus is made on village wise irrigated land and the source of irrigation. The required data for this study is available in district census handbook. The village wise data is compiled and analysis is carried out.

WATER SUPPLY SCHEMES STARTED BY THE SUGAR FACTORY

The sugar factory has started several water supply schemes in study area. The irrigation is the most essential component in the production of sugarcane. The irrigation schemes provide timely water to the sugarcane and in return produced cane is been supplied to the factory. These schemes are helpful to factory as well as individual farmers. There are more than 20 irrigation schemes are started by the sugar factory. The benefited area is varies from 50 acre to 2000 acres depend on the farmers involved in it. Vasant Water Supply Co-Operative Society Ltd. Gothkhandi is having 2000 acre service area, The important schemes in the study area are Ahirwadi, Gatadwadi Lift Irrigation Scheme (1350 acre), Kissan No-3 Water Supply Co-Operative Society Ltd. Walwa (802), Vishnu Bhairav Co-Operative Irrigation Society Ltd. Nagrale (650), Kissan No-4 Water Irrigation Scheme, Walwa (600), etc.

CONCLUSIONS

Land use and land cover 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; whereas it depends on a number of

multi-linked factors. In this study knowledge based image classification criteria is adopted. The derived results are very interesting and highlight the contribution and efforts of Hutatma sugar factory.

There are several transformations can be seen in the landuse category within 10 km radius from the sugar factory. In only 7628.27 ha. land was irrigated which become 20678.14 ha. year 2014. The barren land is decreased down and brings under proper use. The village wise analysis also showing diversity in landuse. 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 Hutatma sugar complex have played a great role. Various irrigation schemes are started by the factory due to that agriculture landuse seems changing. Overall in the landuse is greatly associated with the irrigation facilities and other transformation.

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