

Industrial Area Mapping using High Resolution Satellite data: MIDC area of Latur city (Maharashtra) India

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Abstract - This paper describe the industrial Area development in MIDC area of Latur city (Maharashtra).The satellite data used in the present study includes a Quick Bird II image, was also used for large scale mapping of industrial Area mapping with using GPS and GIS.This paper will try to explain GIS-GPS integrated systems and give applications to industrial area mapping in MIDC block in Latur city. For industrial area mapping, visual interpretation technique was used to mapping total industrial area as a polygon layer. The integration methodology with hand held GPS receiver is used to collection the location of industries in the study area. More than 50 waypoints were collected in the Industrial area of MIDC block. In this study the waypoints which were collected from the industrial area were overlapped on the Satellite image and industrial area maps are prepared by visual mapping method. Road and settlement layers were also digitized using high resolution data and by integration of all the layers a base map was prepared for MIDC block. This study shows that the maps which are obtained by using handheld GPS and GIS softwares can be used effectively for getting information, querying and analyzing the industrial area in MIDC block.

Keywords: GIS, GPS & Industry, RS.

I. INTRODUCTION

This Industries play a very important role in the development of any country. Due to industrial development and increasing process of urbanization, there is an urgent need to provide accurate and timely geospatial information that will assist the planners and decision makers in understanding, planning and managing the changing urban Therefore, for the proper planning and management, of the industrial areas and the process or environment. Industrialization has a great impact on several aspects of a given nation. It usually provides jobs for citizens and therefore boosts the economy, but with the new technology of today's world industrialization also means new technology which replaces the human that used to be responsible for a given job.

Industrialization is on the increase, which of course is necessary for the progress of human civilization but so is the environmental pollution due to emissions and waste generated from these industries. The industrial pollution due to its nature has the potential to cause irreversible reactions in the environment and hence is posing major threat to our very existence. Since the carrying capacity of the environment is not unlimited and some areas or ecosystems are more susceptible to adverse environmental impacts than others, unplanned and haphazard industrialization has substantially increased the risk to the environment. So there is an urgent need to provide accurate and timely geospatial information that will assist the planners and decision makers in understanding, planning and managing the industrial area development.

II. OBJECTIVES

In the present study we have taken the industrial area of MIDC block in Latur city of the Maharashtra state. The major objectives of this study are:

- i. Identification of Industrial area using GPS in MIDC Block.
- ii. To generate Industrial Area map of MIDC block.

III. STUDY AREA

Latur is situated 636 metres above mean sea level, on the Balaghat plateau, near the Maharashtra–Karnataka state boundary. It receives its drinking water from the nearby Manjira River, which suffered from environmental degradation and silting in the late 20th and early 21st centuries. As a result of this and lack of implementation of a water management strategy, during the drought of the 2010s the city ran out of water. Latur lies between 18.40 latitudes and 76.56° longitudes

Temperature : Annual temperatures in Latur range from 13 to 41 °C (55 to 106 °F), with the most comfortable time to visit in the winter, which is October to February. The highest temperature ever recorded was 45.6 °C (114.1 °F). The lowest recorded temperature was 2.2 °C (36.0 °F). In the cold season the district is sometimes affected by cold waves in association with the eastward passage of western disturbances across north India, when the minimum temperature may drop down to about 2 to 4 °C (36 to 39 °F).

Rainfall : Most of the rainfall occurs in the monsoon season from June to September. Rainfall varies from 9.0 to 693 mm/month. Average annual rainfall is 725 mm.



Map1:Location map of Latur block

IV. DATABASE REQUIREMENT

The satellite data used in the present study includes the QuickBird II image with 0.61 meter panchromatic and 2.4 meter multispectral resolution in Blue, Green, Red, NIR and PAN bands. The ground-truth data required for visual interpretation and accuracy assessment of QuickBird II images was collected from the field in July, 2011.

V. SOFTWARE USED

GPS: GPS was used to collect the ground truth control points of different industries in Latur block.

Arc GIS 9.3: Arc GIS 9.3 software was used for Industries area mapping and for composition and generation maps.

Microsoft Office: for database preparation.

Erdas Imagine 9.3 In this study ERDAS was applied in subsetting and mosaicking image.

VI. METHODOLOGY

For industrial area mapping, visual interpretation technique was used to mapping total industrial area as a polygon layer in Latur block. Road and settlement layers were also digitized using high resolution data and by integration of all the layers a base map was prepared for Latur block. Integration of GIS and GPS for the preparation of quick maps and plans have described in this study. The integration methodology with hand held GPS receiver is used to collection the location of industries in the study area. More than 50 waypoints were collected in the Industrial area of Latur block. Type of factories and common utility buildings are the attributes of these feature classes. The waypoints which were collected from the industrial area were overlapped on the satellite image.

VII. RESULTS AND DISCUSSION

The industrial area maps of Latur block are shown in Map 2, 3, 4 & 5. The information about the industries is shown in Table 1. In this study the waypoints which were collected from the industrial area were overlapped on the Satellite image and industrial area maps are prepare by visual mapping method. The maps which are obtained by using handheld GPS and GIS softwares can be used effectively for getting information, querying and analyzing the industrial area in Latur block. This study shows that good progress and suitable condition of different industries are found in Latur block.

At the end of these studies it is seen that, the collected waypoints by using hand held GPS receiver can be used for rapid data collection. These data have the ability to transfer rapidly from the GPS environment to the GIS environment. The maps and plans which are obtained by using handheld GPS and GIS software's can be used effectively for getting information, querying and analyzing the feature classes. This study shows that the maps which are obtained by using handheld GPS and GIS software's can be used effectively for getting information, querying and analyzing the industrial area in Latur block. A good match is observed between background registered image and collected GPS points. The non-graphic data which are the attributes of the industrial area and its location were prepared in a simple tabular form. This study provides quantitative basis and support for ecosystem and also provides accurate and timely geospatial information in understanding, the industrial location and progress in Latur block.

Sr. No.	Industry Name	Latitude	Longitude
1	MIDC Subdivision Office	N18°24.706'	E076°32.808'
2	Messer's Kalantri Dal mill	N18°25.015'	E076°32.781'
3	Maruti Furto Claim Ltd.	N18°25.139'	E076°32.501'
4	Kirti Oil Mill	N18°25.171'	E076°32.317'
5	Maha Transco 132 KV Substation	N18°25.288'	E076°32.308'
6	Bai Kakaji Polymers Pvt. Ltd	N18°25.318'	E076°32.255'
7	Mundada Food Products	N18°25.286'	E076°32.199'
8	Vijay Gas Agencies	N18°25.353'	E076°31.997'
9	ADM oils and Chemicals	N18°25.336'	E076°31.934'
10	Mahanand Dairy Milk	N18°25.059'	E076°31.899'
11	Indira sarkari Sut Girani	N18°24.782'	E076°31.890'
12	Nana Gas	N18°25.344'	E076°32.059'
13	Aroma Hotel	N18°24.860'	E076°32.933'
14	Jilha Udyog Kendra	N18°24.665'	E076°32.830'
15	Police Station	N18°24.521'	E076°32.594'
16	Collector residence	N18°24.487'	E076°32.260'

17	Sangam Nursery	N18°24.480'	E076°32.233'
18	Grand Hotel	N18°24.458'	E076°32.059'
19	Polytechnic College	N18°24.430'	E076°31.818'
20	VDF College	N18°23.263'	E076°28.575'
21	Mahila BCA College	N18°24.877'	E076°32.437'

Table 1: Information of the Industrial Area of the Latur.



Map 2 : Industrial Area Mapping of Block on Satellite image



Map 3: Zoom View of the Industrial Area Mapping of Industrial Area



Map 4: Industrial Area Mapping of Latur Block



Map 5: Industrial Area Mapping of Latur Block by Google Earth Pro

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