Industrial area mapping with the help of GPS: A Case Study of Rudrapur Block of Uttarakhand

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Abstract- All kind of data is the important component of a GIS studies. The data which will be used for GIS works is mostly provided from a digitized maps, existing paper maps, and aerial photos or satellites images. Nowadays the data from GPS can be used to make plans and maps of the studied area and the GPS data can be converted into the GIS environment more easily. GIS and GPS integration systems have some useful applications for the rapid preparation of plans and maps of small areas. This paper will try to explain GIS-GPS integrated systems and give applications during the preparation of Industrial Area plans and Touristic Area plans.
Keywords: — Remote Sensing, GIS & GPS.

INTRODUCTION

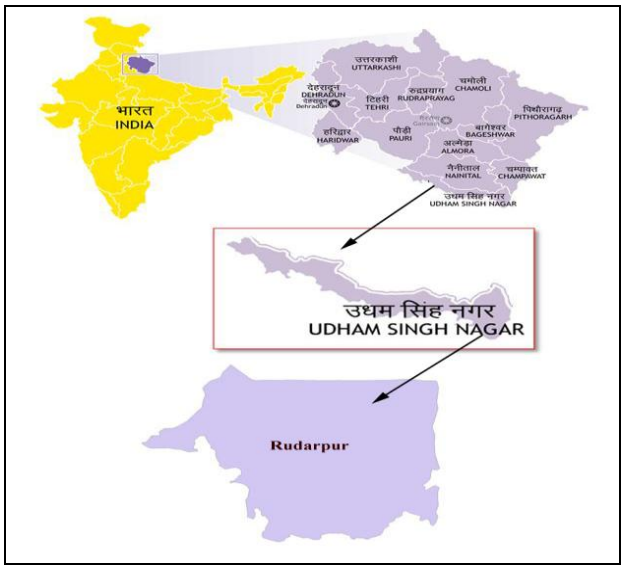
Industries play a very important role in the development of any country. Due to industrial development and increasing process of urbanization, there is an urgent need to provide accurate and timely geospatial information that will assist the planners and decision makers in understanding, planning and
managing the changing urban. Therefore, for the proper planning and management, of the industrial areas and the environment, GPS data is very useful. 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

1. Identification of Industrial area using GPS in Rudrapur Block.
2. To generate Industrial Area map of Rudrapur block.

III. STUDY AREA

Rudrapur is located in the state of Uttarakhand sharing borders with Uttar Pradesh. Rudrapur is a city and a municipal board in Udham Singh Nagar district in Uttarakhand falls under 28°59′N 79°24′E having an elevation of 284 meters (932 ft.). The GIS and GPS integration method was applied for these areas. Rudrapur area belong to industrial area.



Map 1: Location map of Rudrapur block

IV. MATERIALS & METHODOLOGY

The satellite data used in the present study includes the Quick Bird 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 Quick-Bird II images was collected from the field in July, 2011.

4.1 Software Used:

ERDAS IMAGINE 9.3: In this study ERDAS was applied in importing, image rectification and Geo-referencing.

Arc GIS 9.3: for digitization, preparation of land use/land covers layer and for composition and generation of maps.
GPS: was used to collect the ground truth control points of different industries in Rudrapur block**.**
Microsoft Office: for database preparation.

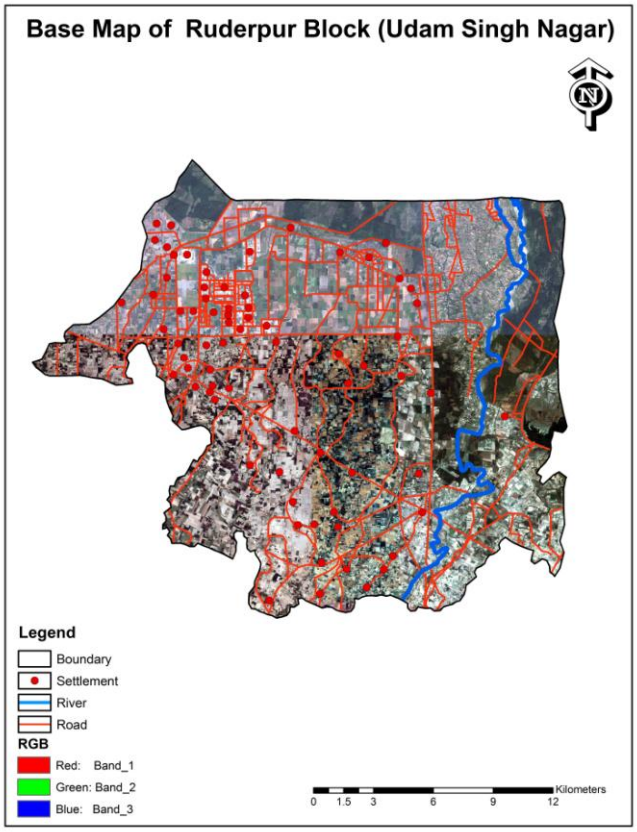
Definition of GPS:
In recent years the availability of global positioning system technology has permitted convenient, inexpensive, and accurate measurement of absolute location. GPS, another increasing useful form of GIS technology, was initially developed by the U.S. military but now widely used for both military and civilian applications around the world, often in conjunction with GIS. GPSs have the capability to integrate image data with field data.

4.2 METHODOLOGY

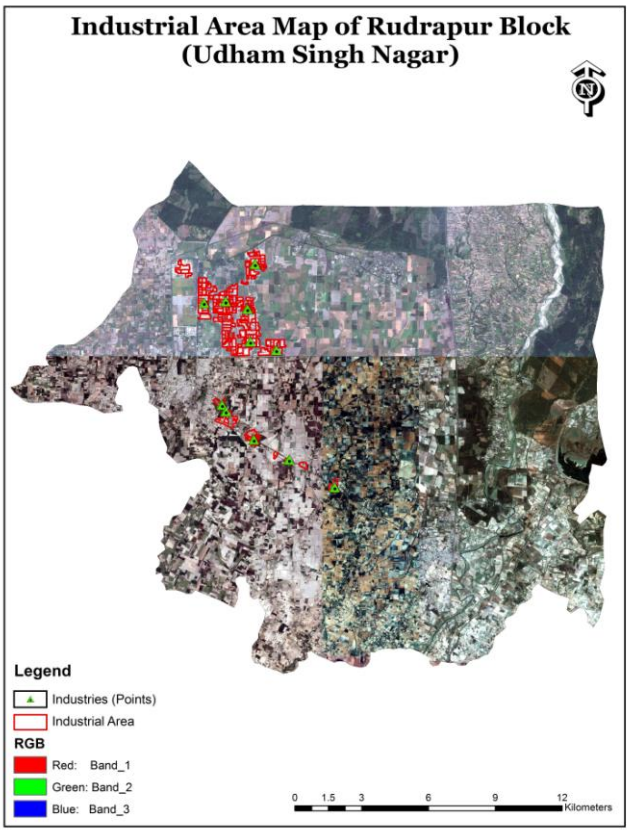
Integration of GIS and GPS for the preparation of quick maps and plans have described in this study. The integration methodology with hand held GPS receiver is used to check whether it is good enough for collecting GIS feature's attributes.

V. RESULTS & DISCUSSIONS

For industrial area mapping, visual interpretation technique was used to map total industrial area as a polygon layer. Road and settlement layers were also digitized using high resolution data and by integration of all the layers a base map was prepared for Rudrapur block. Map 2 representing the base layer of the study area. The industrial area of Rudrapur block is shown in Map 3 & 4. Map 3 representing collected waypoints of the study area. Map 4 representing the industrial area of Rudrapur block using visual interpretation technique.



Map: 2 Base map of Rudrapur Block.



Map 3: Industrial Area Mapping of Rudrapur Block on Satellite image

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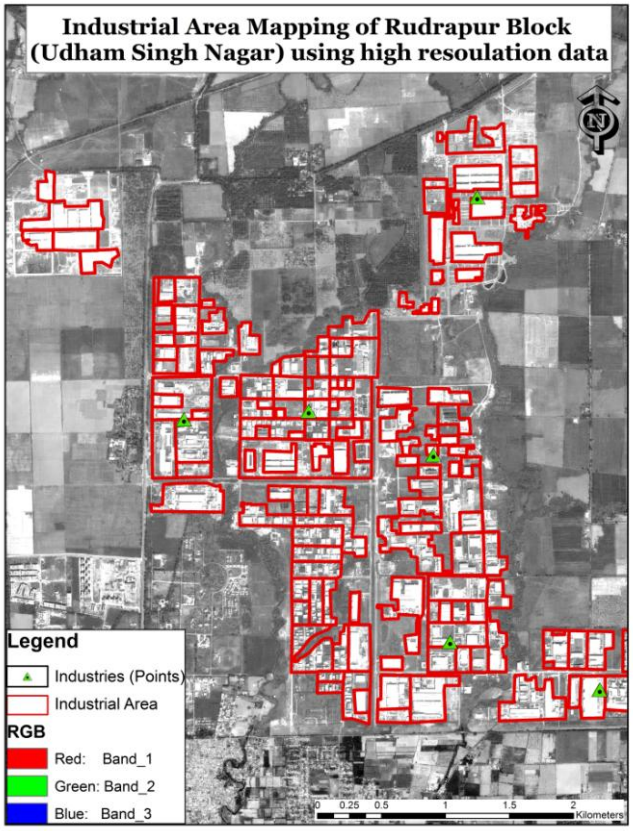

Map 4: Zoom View of The Industrial Area Mapping of Rudrapur Block on Satellite image.

V.I Conclusions

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 Rudrapur 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 Rudrapur block.

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