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Paradeep Port Cartography

Ranjita Sethi[1], Subhashree Bal[2], Akash Kumar Swain[3], Biswa Ranjan Das[4], Chitrabhanu Sahoo[5]
[1, 2, 3, 4]B Tech Student, [5]Assistant Professor, Department of civil Engineering (GIFT), Bhubaneswar

Abstract: ***Paradip Port is a natural, deep-water port on the East coast of India in Paradip, just 53 km from Jagatsinghpur city in Jagatsinghpur district of Odisha, India. It is situated at confluence of the Mahanadi river and the Bay of Bengal. ' The project detects the origin of paradeep port and the land pattern mouza selection in various revenue areas and growth of port from exports/area increment/climate effect/population growth & socio-economic impact due to expansion.' hereby in this project , the intial setup zone of paradeep port is to be plot in revenue map by hand drafting and sketching over mouza map and topo map using the scale factor to denote the initial geographical settlement for the site selection, as the area is marked out then as per yearly growth basis the incremental chart and plans are to be prepared depicting addition of more areas,networks & affect on near by areas to see the bad/good impact on livelihood and development of market areas. The tracing and rubber sheeting of the industrial area is to be done using pins and hand sketching on paper board manually. As on the process initial and final map are plotted hence from study the Hereby in this project , the intial setup zone of paradeep port is to be plot in revenue map by hand drafting and sketching over mouza map and topo map using the scale factor to denote the initial geographical settlement for the site selection, as the area is marked out then as per yearly growth basis the incremental chart and plans are to be prepared depicting addition of more areas,networks & affect on near by areas to see the bad/good impact on livelihood and development of market areas. The tracing and rubber sheeting of the industrial area is to be done using pins and hand sketching on paper board manually. As on the process initial and final map are plotted hence from study the growth chart is to be prepared for growth of industry, climate change, social stability and future growth prediction.***

Keyword: Paradeep port, cadastral sketching, a gis software for conturing and profiling.

I. INTRODUCTION

Paradeep is one of the Major Ports of India and late Sri Biju Pattnaik, the then Chief Minister of Orissa, is the founder father of Paradeep Port. Pt. Jawaharlal Nehru, the then Prime Minister of India, laid the foundation stone of the Port on 3rd January 1962 near the Confluence of river Mahanadi and Bay of Bengal. Government of India took over the management of the Port from the Government of Orissa on 1st June 1965. INS "INVESTIGATOR" had the privilege of maiden berthing in the Port on the 12th March, 1966.The Port was declared open by Mr. Peter Stambolic, Prime Minister of Yugoslavia on the same day. Government of India declared Paradip as the Eighth Major Port of India on 18th April 1966 making it the FIRST MAJOR PORT in the East Coast commissioned after independence. The Port of Paradip, an autonomous body under the Major Port Trusts Act, 1963 functioning under Ministry of Shipping is administered by a Board of Trustees set up by the Government of India headed by the Chairman, PPT. The trustees are nominated by Government of India from various users of the Port such as shippers, ship owners; Government Departments concerned and also port labour. The day - to - day administration is carried out under general supervision and control of the Chairman, assisted by the Deputy Chairman and other departmental heads. Paradeep also spelled Paradeep (originally Paradeep, also spelled Paradwip), is a major seaport city and municipality, 53 km (33 mi) from Jagatsinghpur city in Jagatsinghpur district of Odisha, India. Paradeep Municipality was constituted as an NAC on 27 September 1979 and converted into a Municipality on 12 December 2002.[3] Paradeep (210 15' 55-44" N 806 40' 34-62" E) is the main outlet and inlet of the seaborne trade of the eastern port. It also signalled the economic development of the state, giving impetus to trade and commerce. It has become the gateway of Odisha to the International community.

II. USES OF CARTOGRAPHY

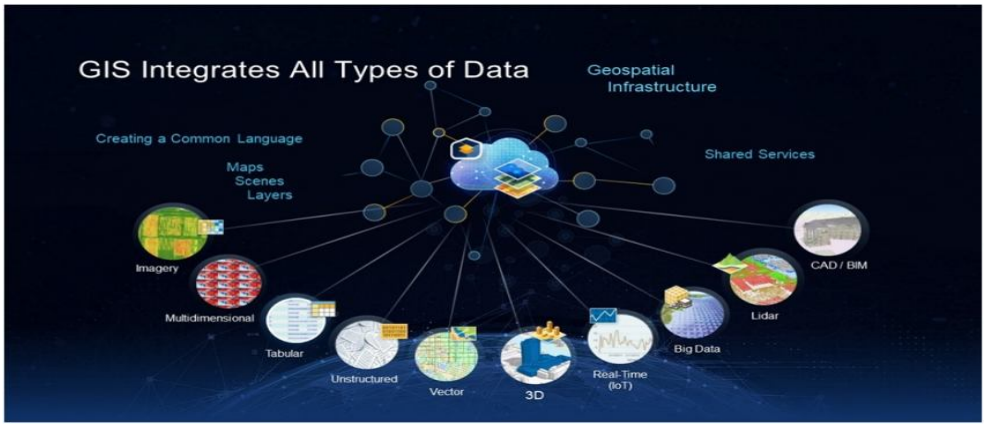
Cartography, the art of creating maps, deals with interpreted data. A cartographer, or map-maker creates a visual hierarchy when he or she decides how features appear on a map to illustrate data. Map making can be both subjective or objective-but its goal is always the visualizing of data with some spatial dimension.GIS is a model of such data in a computer environment. Using GIS, we can simplify, focus or generalize information in maps. It is possible to build layers into the maps until they become "thick" with data. With new map making platforms that can include multimedia and annotation, the map has become a storytelling tool.

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In this module, you, the students, will be in charge of investigations. The materials here will introduce you to some basic cartography, via GIS platforms that can quickly get you started making digital maps

III. HISTORY OF GIS

A Geographic Information System (GIS) is a software package that helping to digitize the world around us. Digital maps and location-based information helps government agencies, businesses and even people like us keep up with the changing pace pf the world around us.A Geographic Information System(GIS) is a system of computer applications that can be used to display, manipulate and analyse spatially varied information from multiple sources all in one place.Most often the data sets used in a GIS are categorized into multiple categories for easier storage and use each data set that a GIS can support is divided into two main parts: graphical(spatial) information and tabular(attribute)information.Raster imagery can lose quality and become blurred when scaled. However, vector data is scalable to any size without losing any integrity. Discrete data is usually vector based and has specific information located at specific points with gaps in between.On the other hand, continuous data is usually raster-based and no gaps are present. Anywhere within the domain of a raster, there will be information.



IV. FUNCTION OF GIS

1) Data collection- It is a technique in which the information on various map attributes, facilities, assets, and organizational data are digitized, organized and captured on a target GIS system in appropriate layers.
2) Data storing, processing & analysis- These are the techniques which is normally performed by a computer. The processing includes retrieving, transforming, or classification of information. The Collection, manipulation, and processing of collected data for the required use is known as data processing. Hence, in GIS one can Store data, Query data and analyse data.
3) Output production - Output is the final product of any processing and analysis. The most common form of output from a GIS is a map. On the other hand, the non-cartographic forms of GIS output are tables and charts containing spatial and non-spatial attribute information.

V. USER

It is the most important part of a GIS. An user define and develop the procedures used by GIS. It can overcome Shortcoming of the other 4 elements (data, software, hardware, procedure)



Figure 2 component of GIS



Figure 3 Ground truth data collection

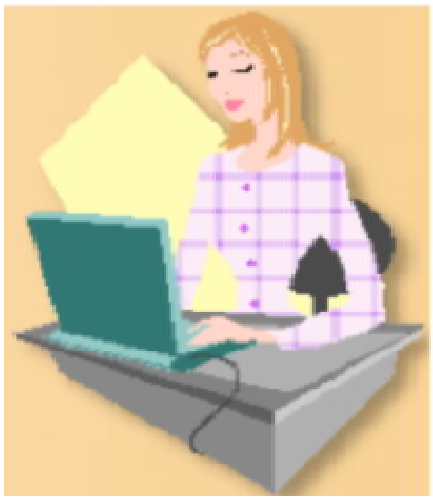


Figure 4 Data storing ,processing, analysis

1) *Data-* Data is the information used within a GIS Since a GIS often incorporates data from multiple sources, its accuracy defines the quality of the GIS. GIS quality determines the types of questions and problems that may be asked of the GIS. Mainly two types of data are used in GIS that are:

a) *Vector Data:* A representation of the world using points, lines, and polygons. Vector models are useful for storing data that has discrete boundaries, such as country borders, land parcels, and streets.

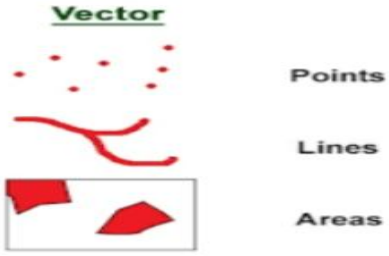


Figure 5 vector data

b) *Raster data:* A representation of the world as a surface divided into a regular grid of cells. Raster models are useful for storing data that varies continuously, as in an aerial photograph, a satellite image, a surface of chemical concentrations, or an elevation surface.

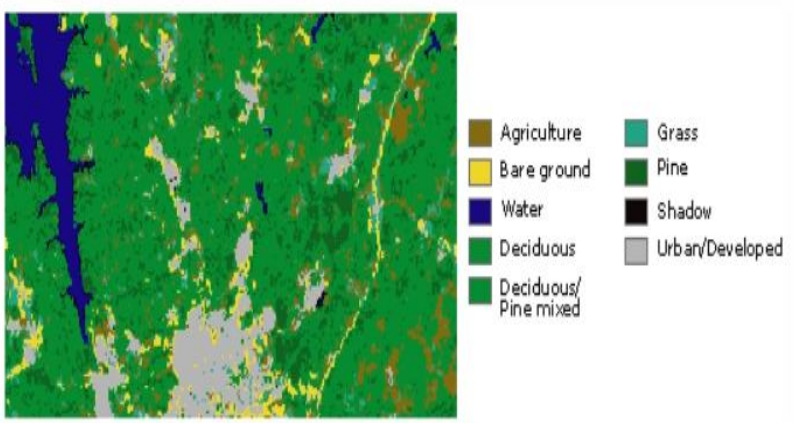


Figure 6 Raster data

A. *Application*

1) Mapping: GIS can be used to provide a visual interpretation of data. Google Maps is an excellent example of a web-based GIS mapping solution that people use for everyday navigation purposes. However, smart mapping technology has significantly advanced and is used in products like Nobel's Geo-Viewer, which gives cities, municipalities and private industry an in-depth look at electric and water district assets in the field.
2) Telecom and Network Services: Organizations can incorporate geographic data into their complex network design, optimization, planning, and maintenance activities. This data enhances telecom processes through better customer-relationship management and location services.
3) Accident Analysis and Hot Spot Analysis: GIS data helps to identify accident locations, and road networks can be optimized using data intelligence. This intelligence helps to improve road safety measures and allows better traffic management.
4) Urban planning: GIS data analyses urban growth and the direction of expansion. When appropriately applied, it can discover new sites for further development, considering various factors that are necessary for successful building.
5) Transportation Planning: GIS data is commonly used for managing transportation issues. With the addition of environmental and topical data in a GIS platform, companies can plan for a new road or rail route.
6) Environmental Impact Analysis: Data gathered via GIS applications is vital for conserving natural resources and protecting the environment. Impact statements assess the magnitude of human impact on the environment, which GIS integration helps indicate.

B. *Process*

1) *Data to be used:* Satellite imagery: Images of the Earth taken from artificial satellites orbiting the planet. Important for GIS and remote sensing. Remote sensing: Studying an object or location without making physical contact with it. They are essentially the eyes in the sky. These images reassure forecasters to the behaviour of the atmosphere as they give a clear, concise, and accurate representation of how events are unfolding.



Figure 7 Satellite image

C. *Authenticated Boundary*

For modernization of land records system in the country, a modified programme, viz., the National Land Records Modernization Programme (NLRMP) a Centrally Sponsored Scheme, was formulated by merging two Centrally-sponsored schemes of Computerization of Land Records (CLR) and Strengthening of Revenue Administration and Updating of Land Records (SRA&ULR) and was approved by the Cabinet.

VI. ANALYSIS

A. *Layer Extraction From Area Of Intrest*

Digitization is the most important technique of data and storage in a GIS but is expensive and time consuming. Map making has been one of the most important achievements for humankind as it was because of this humankind was able to spread throughout the globe. New lands were discovered and inhabited and in all these activities the role of maps cannot be underestimated. Thus, for ages maps have been used to portray the surface of the earth on to a paper. But while viewing the maps, one generally tends to forget that each line or point depicted on the map actually represents a considerable area on the surface of earth. Thus, if lines present on the maps are not presented accurately, it means that a large area of land becomes disputed. Now we have an age of digital revolution.

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Right from digital movies and digital music to digital information, the internet has played a major role in accelerating this digital revolution. Maps have become a part of this digital revolution and internet mapping is the 'in' thing now. The main issue of discussion is the ways and means of depiction of maps in digital form and the probable reasons for the occurrence of such errors in the process.All the digitization was done using PCS (UTM Zone 45N) to extract the features present in study area like road, water body, locations, industrial setups so that we can perform various analysis upon those data for our study.

B. Universal Transverse Mercator (UTM)

1) UTM projection is used to define horizontal, positions world-wide by dividing the surface of the Earth into 6ozones, each mapped by the Transverse Mercator projection with a central meridian in the center of the zone.

2) UTM zone numbers designate 6 degree longitudinal strips extending from 80 degrees South latitude to 84 degrees North latitude.

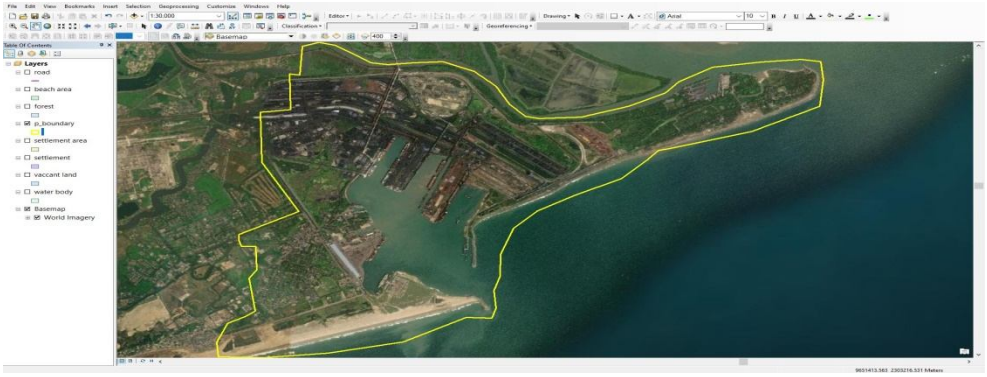


Figure 8Satellite imagery of study area



Figure 9 Road network on Satellite image

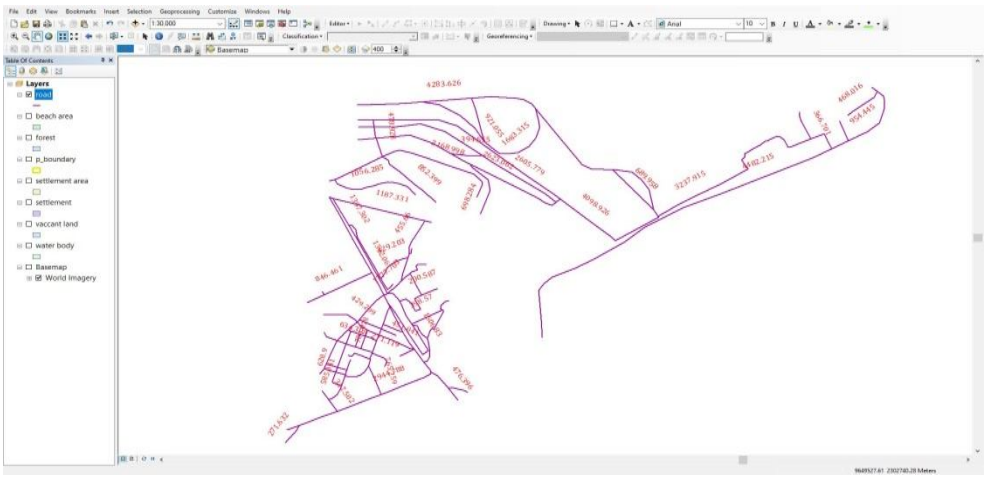


Figure 10 Vector format of Road network

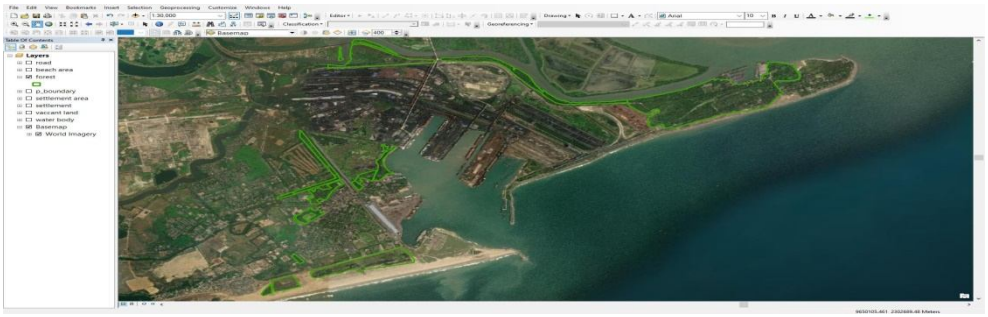


Figure 11 Forest cover on satellite image

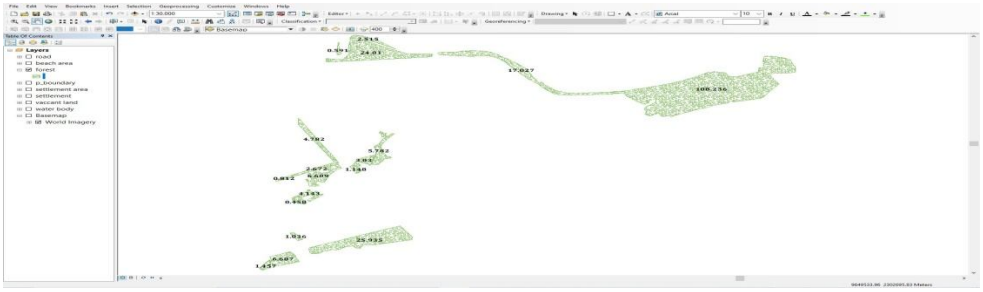


Figure 12 Vector format of forest cover

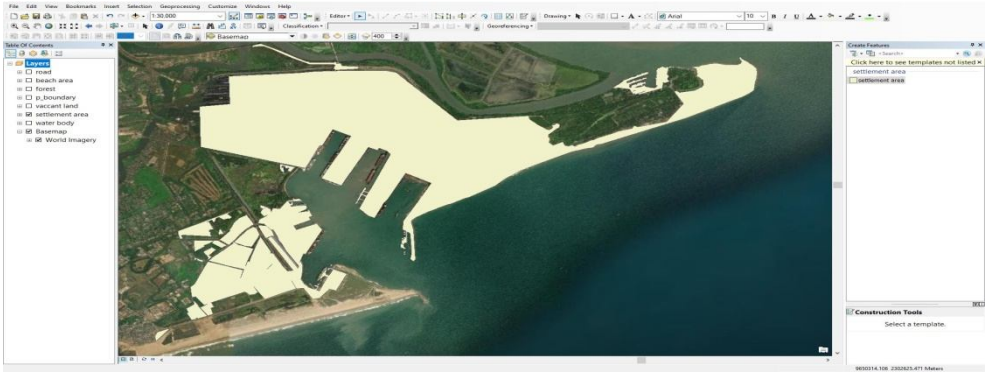


Figure 13 Industrial and residential settlement

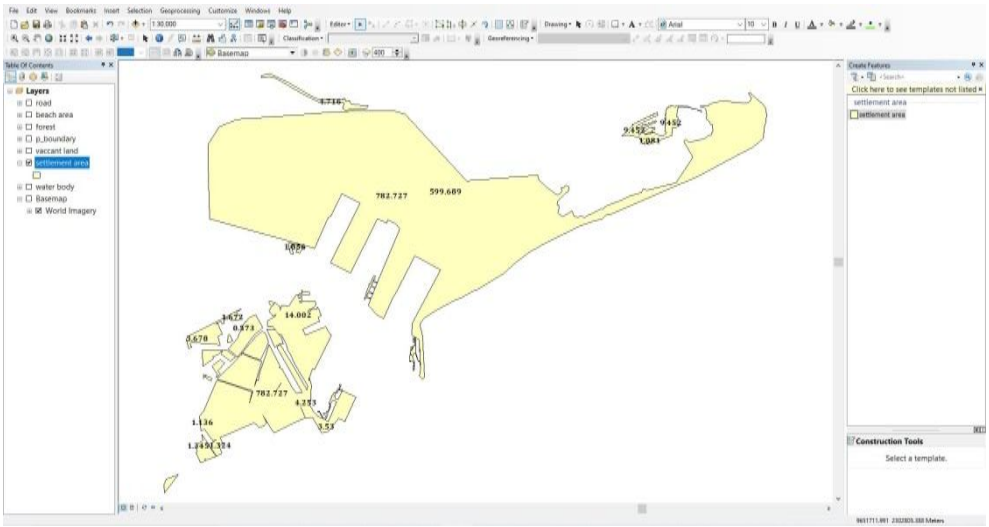


Figure 14 Vector format of Industrial and residential settlement

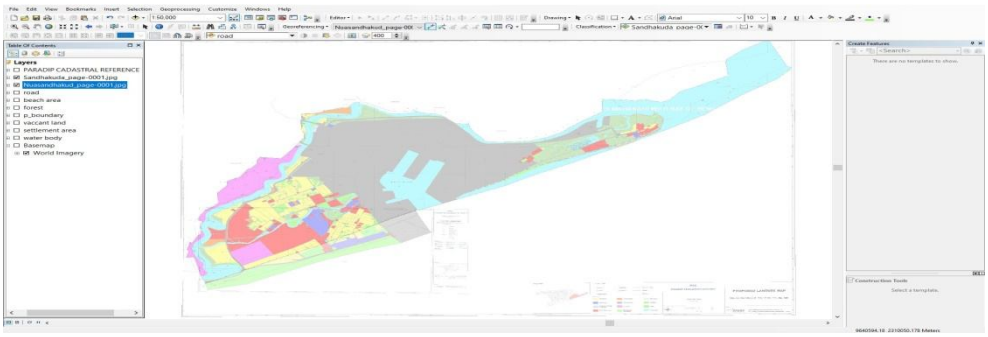


Figure 15 Cadastral map referencing

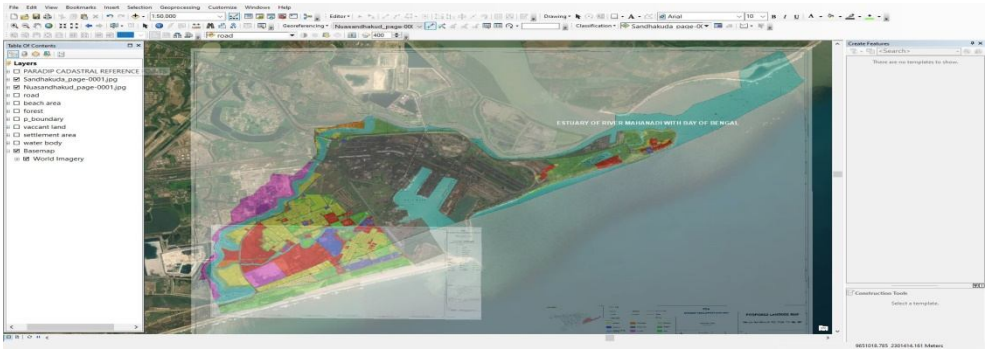


Figure 16 Cadastral map referencing with satellite image

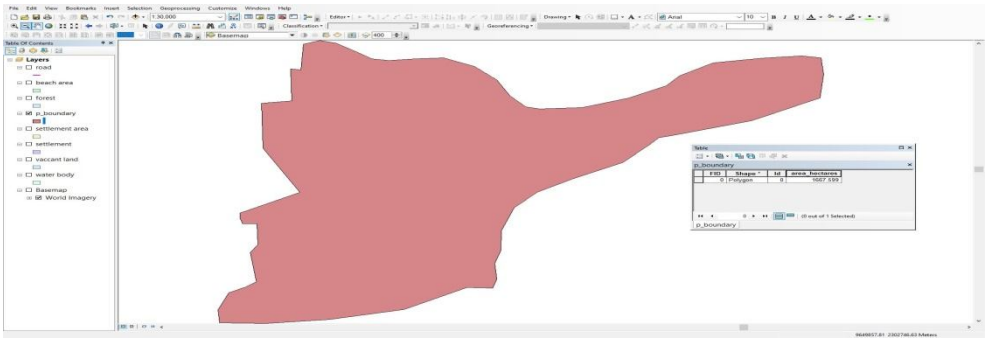


Figure 17 Geometrical calculation of study area

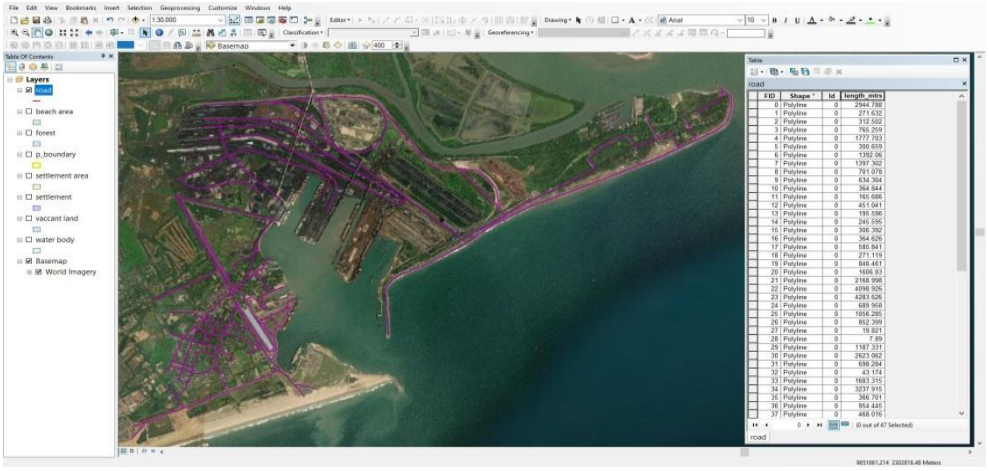


Figure 18 Geometrical calculation of Road network

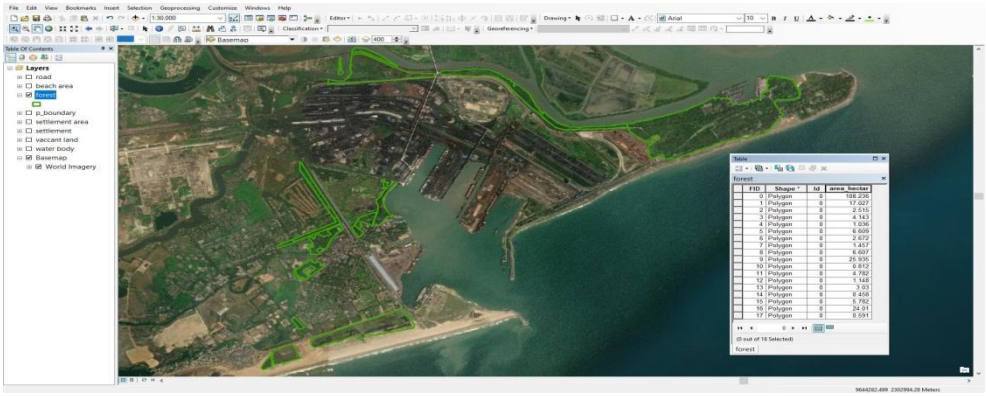


Figure 19 Geometrical calculation of Forest area



Figure 20 Map showing the satellite imagery of study area

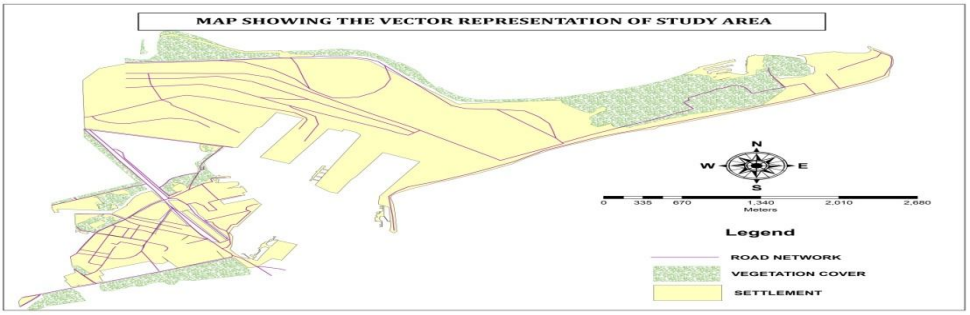


Figure 21 Map showing the Vector presentation of study area

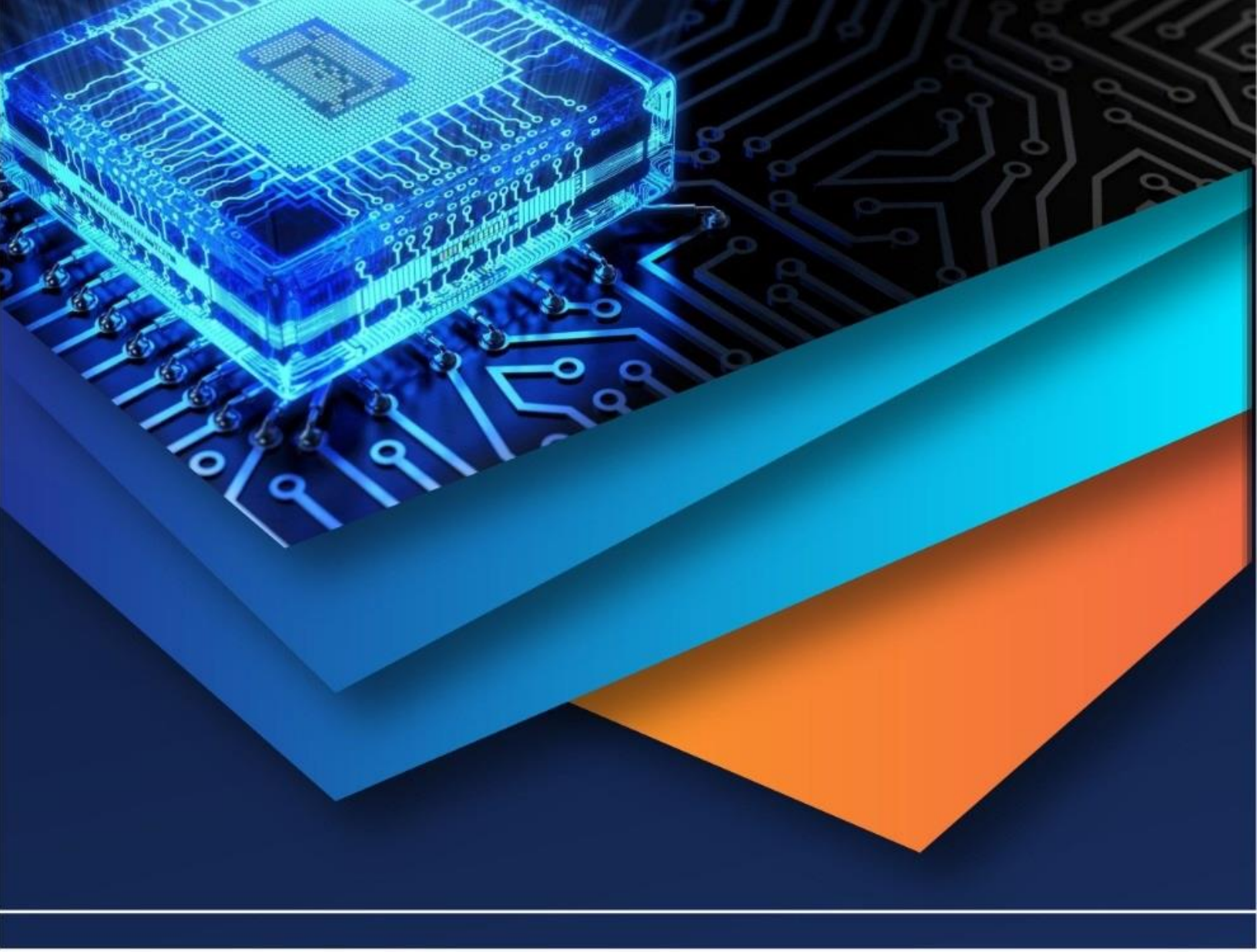
VII. CONCLUSION

Cartographic Mapping is central to many things we do as individuals and as groups. Throughout this study, we've seen the ways in which people have used maps for thousands of years, and indeed, it's likely that they were using maps in times before we had evidence in the form of clay tablets or wall drawings. Today, mapping is a large and growing sector of the economy as well as an important social, cultural, and political phenomenon. Mapping is also important for lifelong learning. Spatial thinking skills are used in many fields, careers, and pastimes. The National Research Council report "Learning to Think Spatially" emphasizes that "with advances in computing technologies and the increasing availability of spatial data, spatial thinking will play a significant role in the information-based economy of the twenty-first century." Mapping and related technologies and societal practices are the foundation of spatial thinking.Maps are useful in part because they allow us to see large areas of the world that we otherwise wouldn't be able to see on our own, whether it be the bus lines on the next block or the entirety of the earth. Maps are helpful because they can present a variety of complex social and environmental information in a way that is easy to interpret. Maps can demonstrate basic spatial relationships and highlight features of interest, but they can also provide information on things that cannot be directly observed even if one were standing in the mapped location. For instance, maps allow us to 'see' invisible phenomena such as mineral deposits below the ground, pollutants in the air, and the day's pollen count. Many of our maps are reference maps, generalist views depicting one world that essentially stores and displays a variety of features for a variety of uses. In contrast, thematic maps high light specific themes, be it the fastest route to work or the best places to eat.

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