



USAGE OF GEOSPATIAL TECHNOLOGY A CASE STUDY OF GMDC

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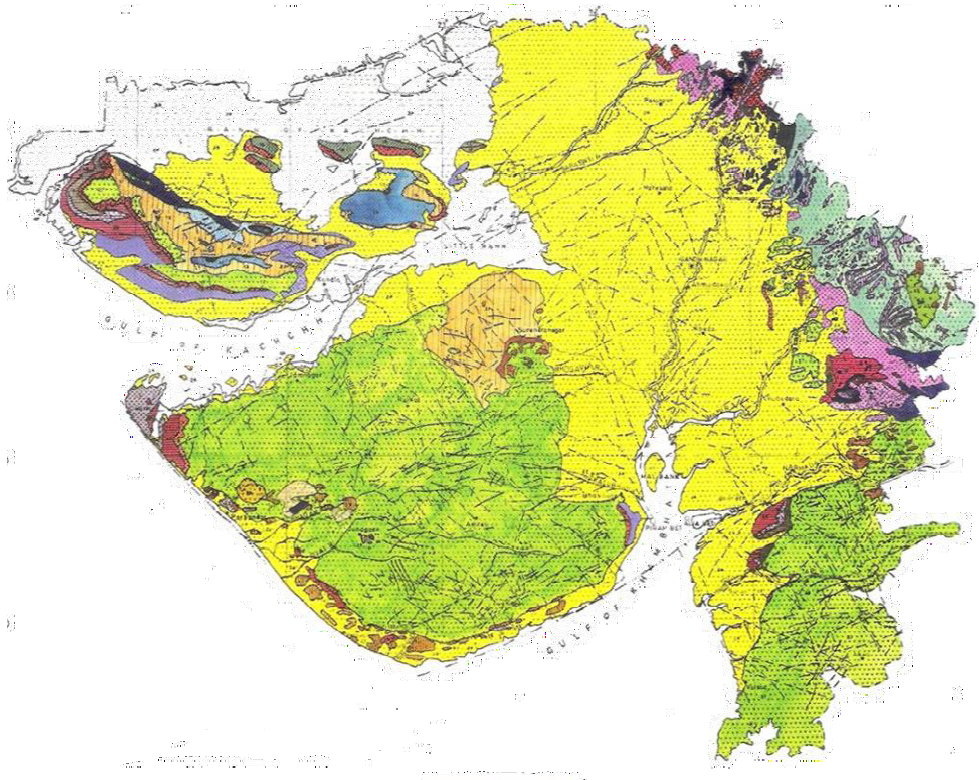
क्षणशः कणशश्चैव विद्यां अर्थं च साधयेत्
क्षणे नष्टे कुतो विद्या कणे नष्टे कुतो धनम्

- (One should learn from every moment and one should earn from every bit. If you waste a second (Kshana) you cannot get knowledge (Vidya) and similarly if you waste a bit (Kana) you cannot get money (Artham).
- This is the real sense of use of technology which our ancestors have directed us to implement for the betterment of our mankind.

Gujarat

Longitudes E 68°04'00" to E 74°80' 00"

Latitudes N 20°02'00" to N 24°42' 00"



Located in western India

- Geographical area: 1,96,024 sq. kms
- Cost Line: 1600 kms. long
- Geologically, mineral-bearing rocks ranging in age from Pre-Cambrian, Jurassic, Cretaceous, Tertiary and Quaternary Formations.

Gujarat endowed with :

- Major minerals : Petroleum & Natural Gas, Lignite, Bauxite, Limestone, Fire-clay, China-clay, Fluorspar, Gypsum, Agate, Chalk.
- Minor Minerals: Bentonite, Marble, Granite And Decorative & Dimension, Stones, Black Trap & Ordinary Sand.



Exploration



Mining



Beneficiation



Solar Energy



250 MW Power Plant



150 MW Wind Energy



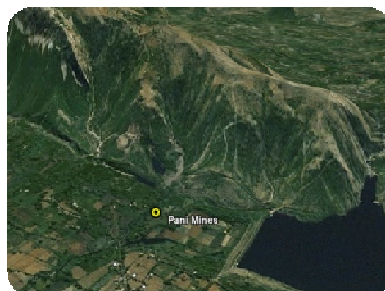
GMDC – CARING FOR EXPLORATION DISCOVERY TO DELIVERY

- The growing global energy need, rapid infrastructure development and environmental concerns have renewed the focus on better utilization and responsible exploration of natural resources.
- GMDC is in line of better utilizing the resources of Gujarat through innovative technology, exploration and establishing reserves for mining and value addition of mineral resources to the industry. This has led to an increase adoption of advanced tool and technologies



Exploration

Indian Geospatial Forum 2015



Evaluation



Mining

19 February 2015

CASE STUDY

Gujarat Mineral Development Corporation has awarded work of Topographic survey, Geological Mapping and Rapid Reserve Assessment with help of satellite image, exploration data and GIS techniques in Kalyanpur Taluka of Jamnagar district, Gujarat to Geology Department of M. G. Science Institute. As the demand for Bauxite is increasing GMDC has applied for new lease areas in Kalyanpur Taluka of Jamnagar District. GMDC has applied for total 31 lease areas covering 7024.47 Hectors

AIMS AND OBJECTIVES

The main Objectives of the present study are as follows:

- Topography generation of the area using various Satellite Data and DGPS Surveying.
- Geological mapping of the outcrops occurring in the area through Remote Sensing and geological field study.
- Landuse and Landcover plans of core and buffer zones of each lease.

SCOPE OF WORK

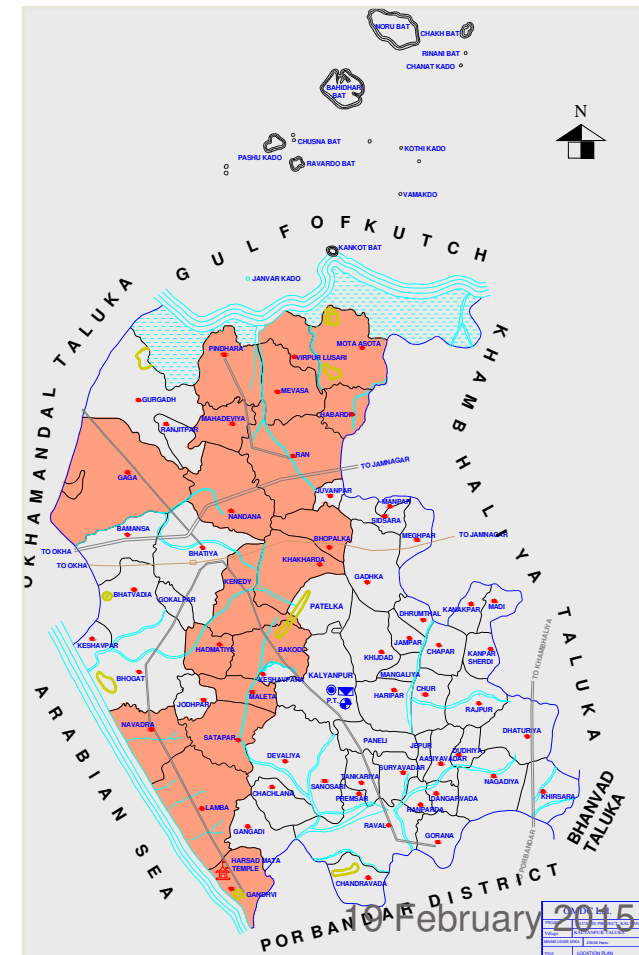
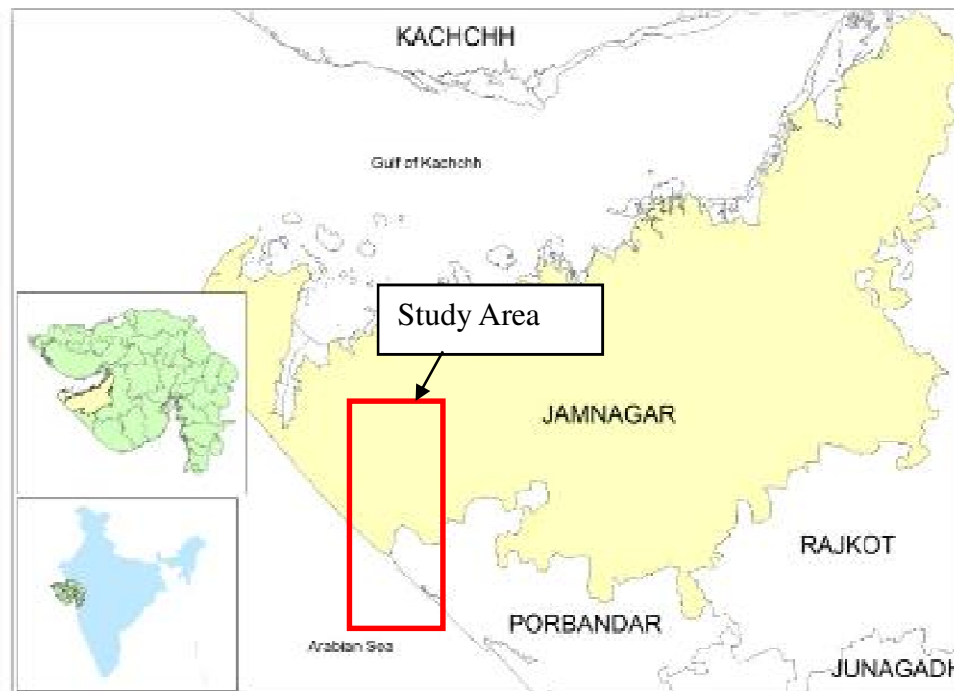
- The scope of work includes Topographical and Geological mapping of 31 Mining Leases and Prospecting Leases of GMDC in Kalyanpur Taluka of Jamnagar District. The work also includes Rapid Reserve Assessment of Bauxite and Limestone occurring in these areas.
- Topographical Survey is to be carried out using Remote Sensing Data and GIS Technique. Topographical maps are to be prepared using 10 to 20 DGPS Survey Points for maximum accuracy.
- Geological Mapping is to be done using ASTER and High Resolution satellite images with GIS based demarcation of Geological boundaries and Geological Structures. Geological field work to be performed in the area and field geological data are to be compared with satellite image interpretation. Samples to be collected and identified.
- Economic minerals Laterite/Bauxite and Limestone occurring in the area have to be demarcated on the Geological maps.

19 February 2015

• From the Exploration data, resource estimation of Bauxite in ML's and PL's of GMDC

STUDY AREA

Gulf of Kutch is present in the North direction of the study area while Arabian Sea touches the South tip of the area. The area is covered between 69°13'59" E to 69°25'21" E Longitude and 21°50'48" N to 22°15'50" N Latitude.



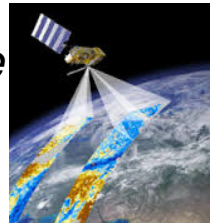
Common Examples of Geospatial Technologies

Geospatial Technology refers to equipment used in visualisation, measurement and analysis of earth's features involving such system as

- **Global Positioning Systems (GPS):** A satellite-based geolocation system that functions via GPS units and is accessible to the public via GPS units



- **Remote Sensing:** The acquisition of images and information from afar



- **Geographic Information Systems (GIS):** information systems enabling the creation, organization, and presentation of data in a spatially referenced form as well as the production of maps and charts

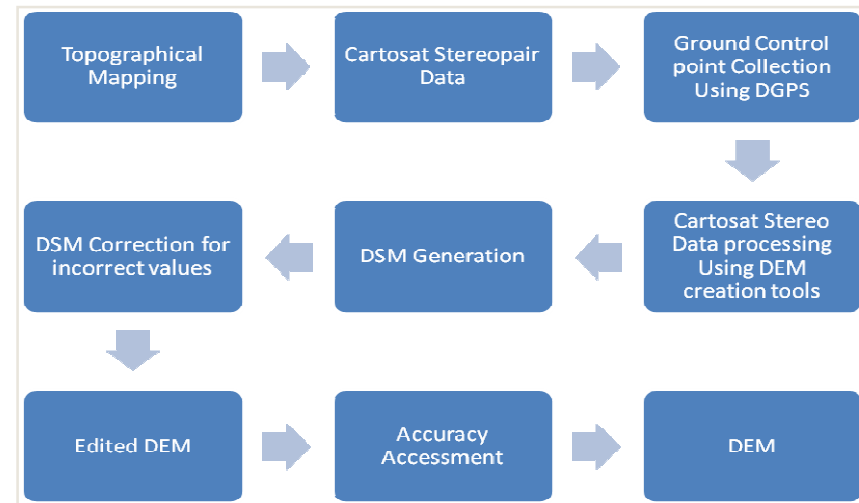


Cartosat 1

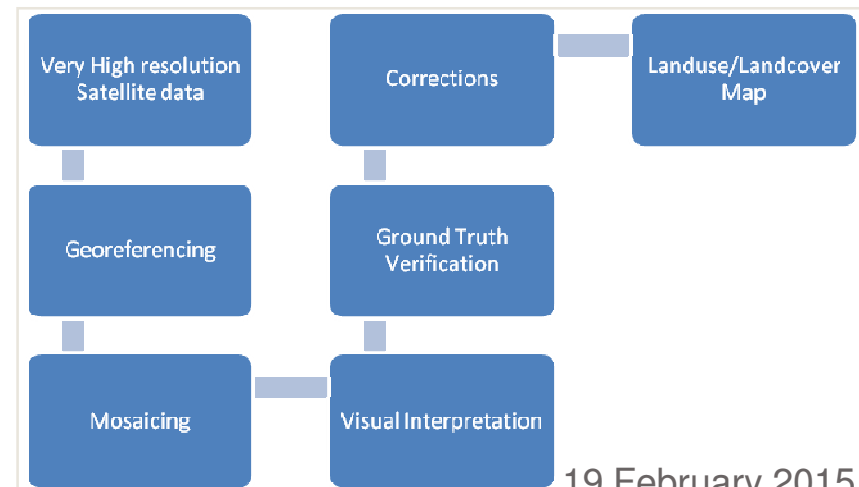
ASTER image

METHODOLOGY

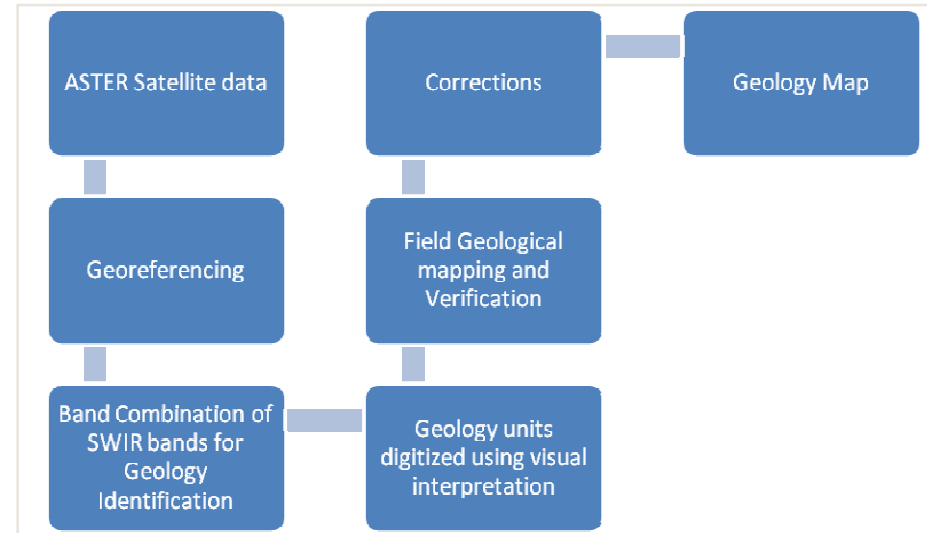
- **Topographical Mapping**



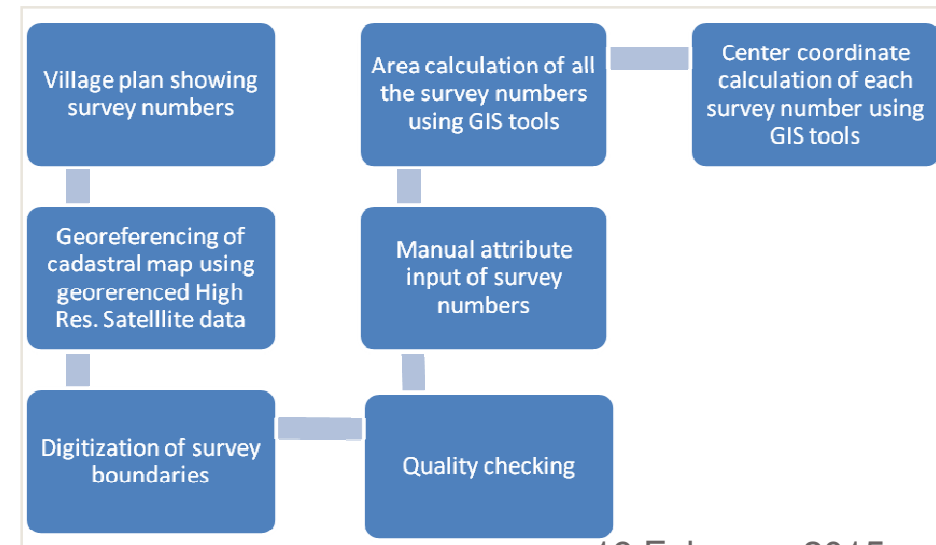
- **Landuse / Landcover Mapping**



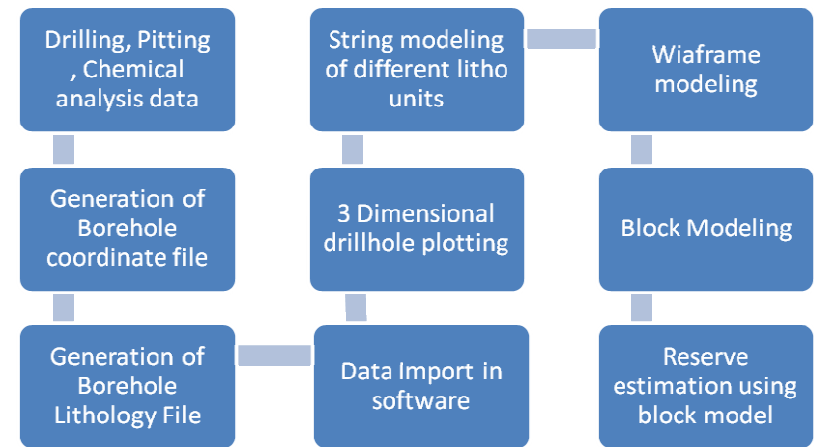
- **Geological Mapping**



- **Cadastral Maps Digitization**



- **3D Modeling and Reserve Estimation**



- **Geographic Information System**



Satellite Image Map

Base Map (Road, Rail, Village location)

Cadastral Map

Elevation Map (DEM and contour map)

Drainage Map

Landuse/Landcover Map

Geology Map

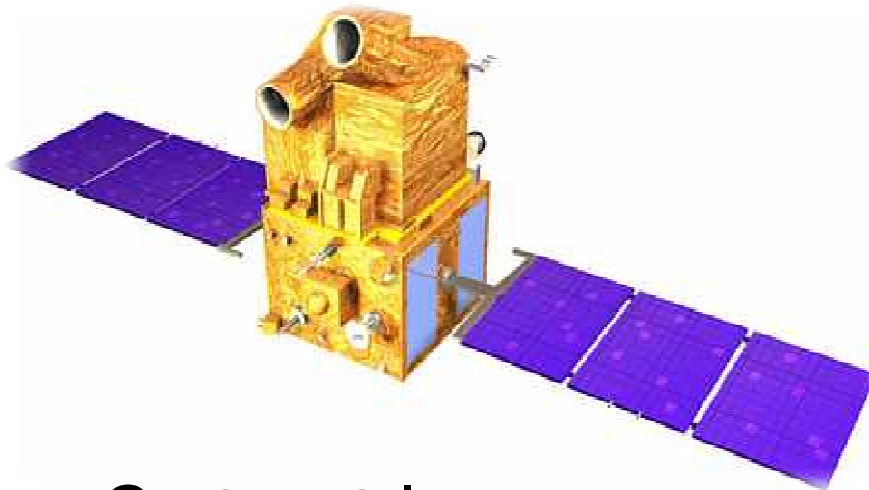
Borehole location and Reserve Calculation



ASTER For Geological mapping



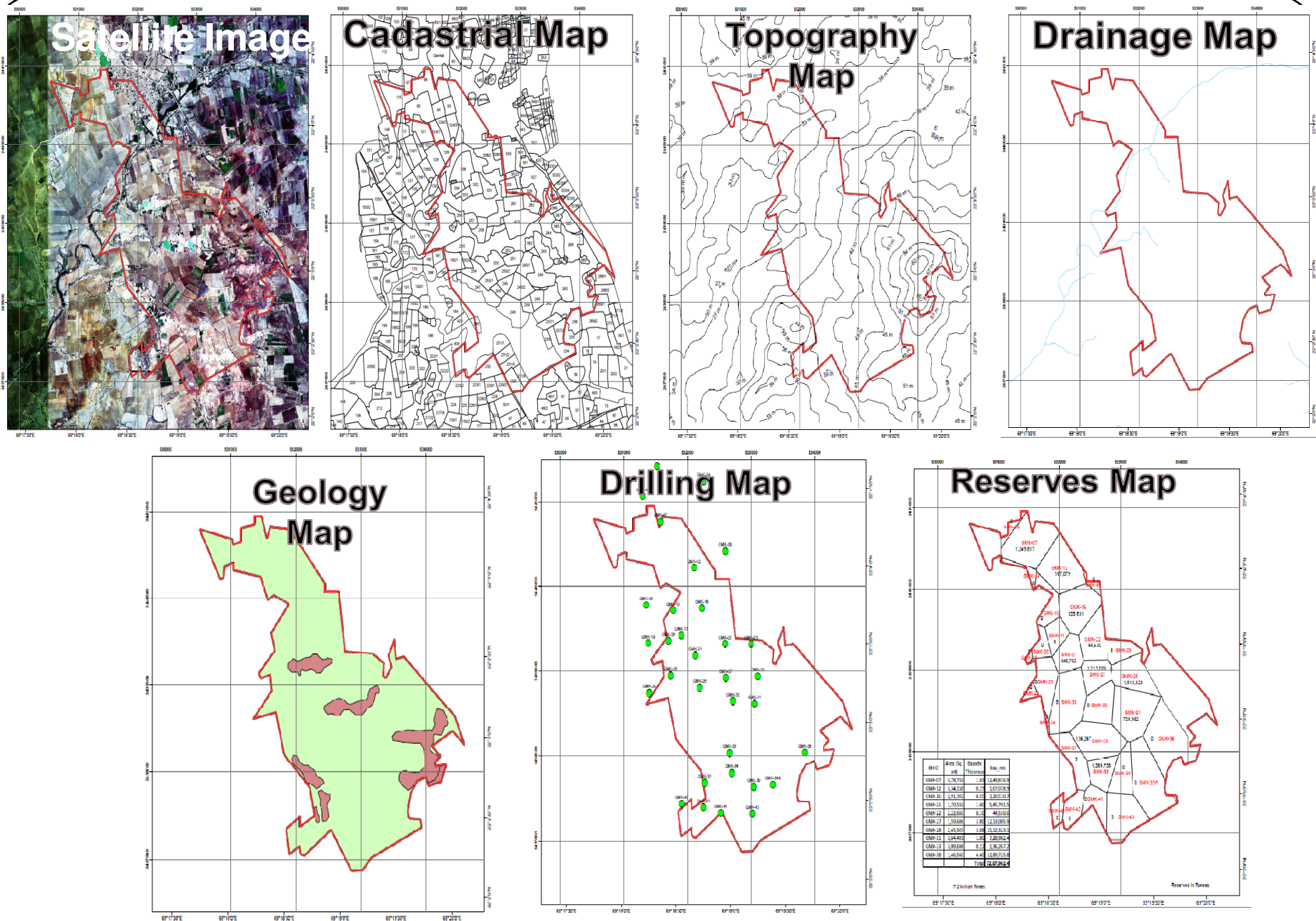
Landsat-7 For Landuse mapping



Cartosat-1 For Topographical mapping

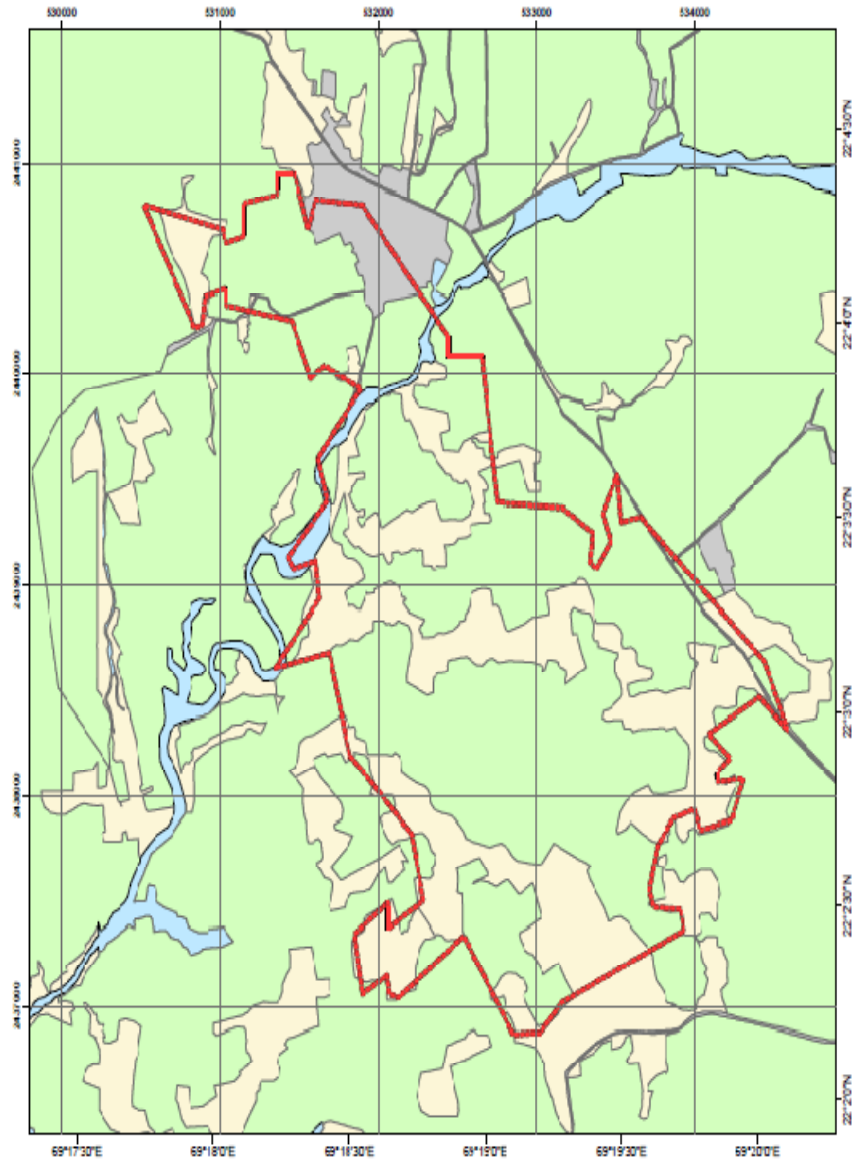


QuickBird For Environment mapping

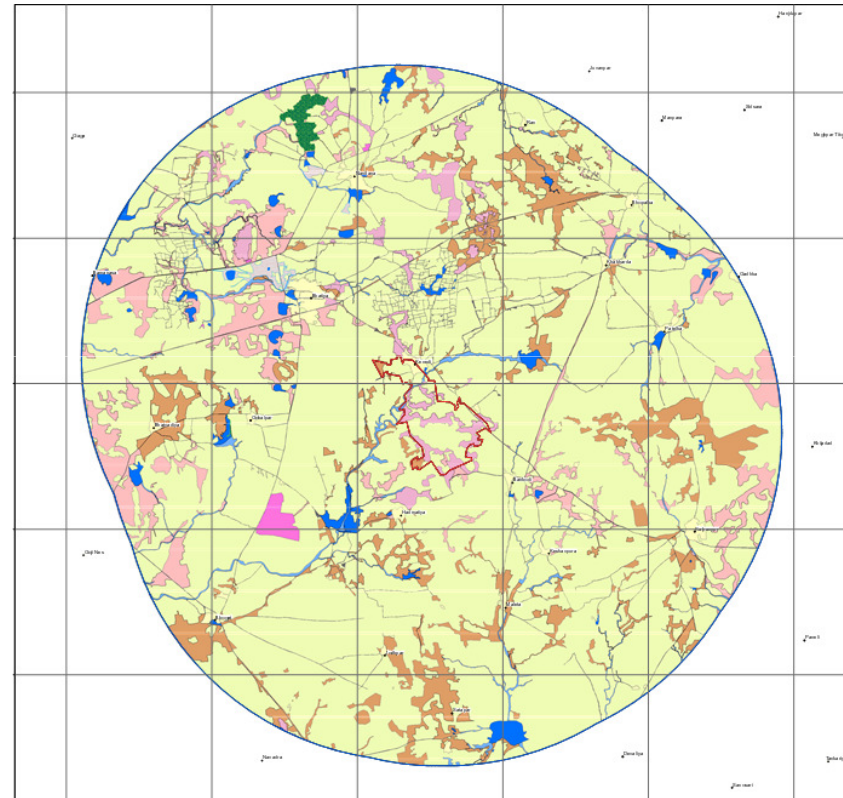


A Case study of Kenedy ML Taluka: Kalyanpur Dist: Dwarka

LANDUSE /LAND COVER PLAN – KENEDY ML

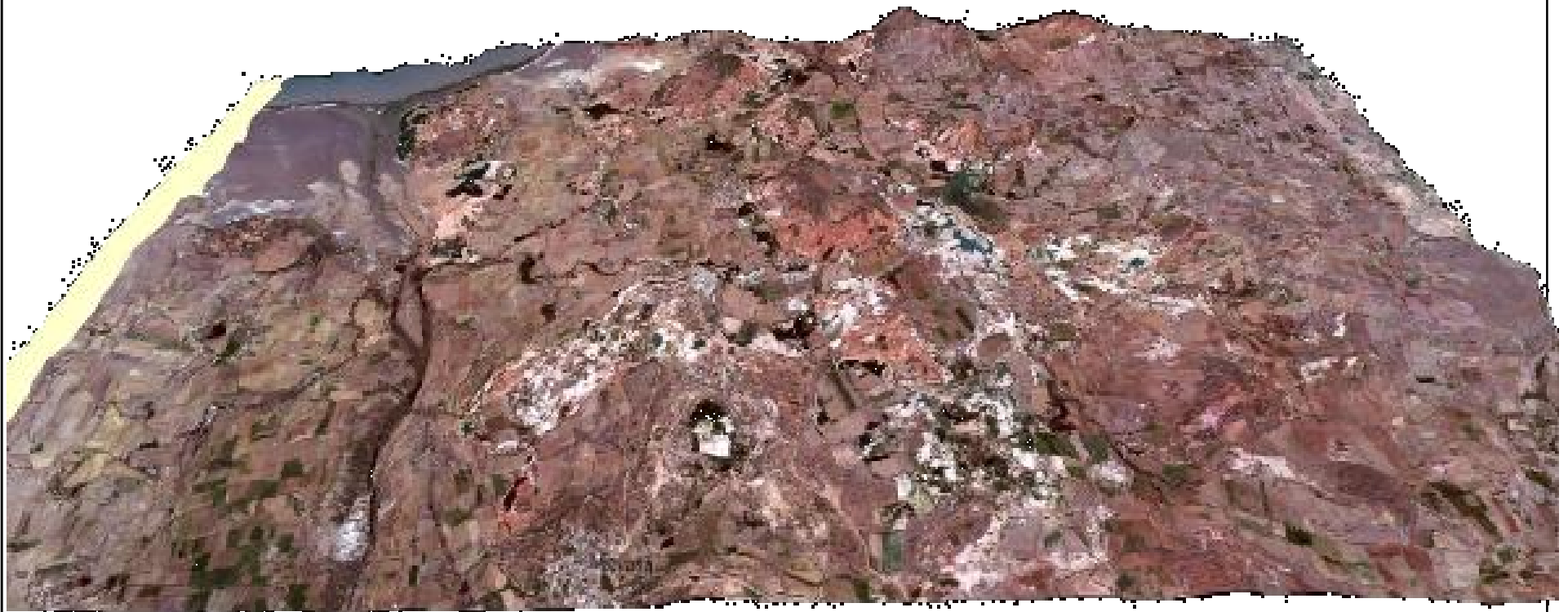


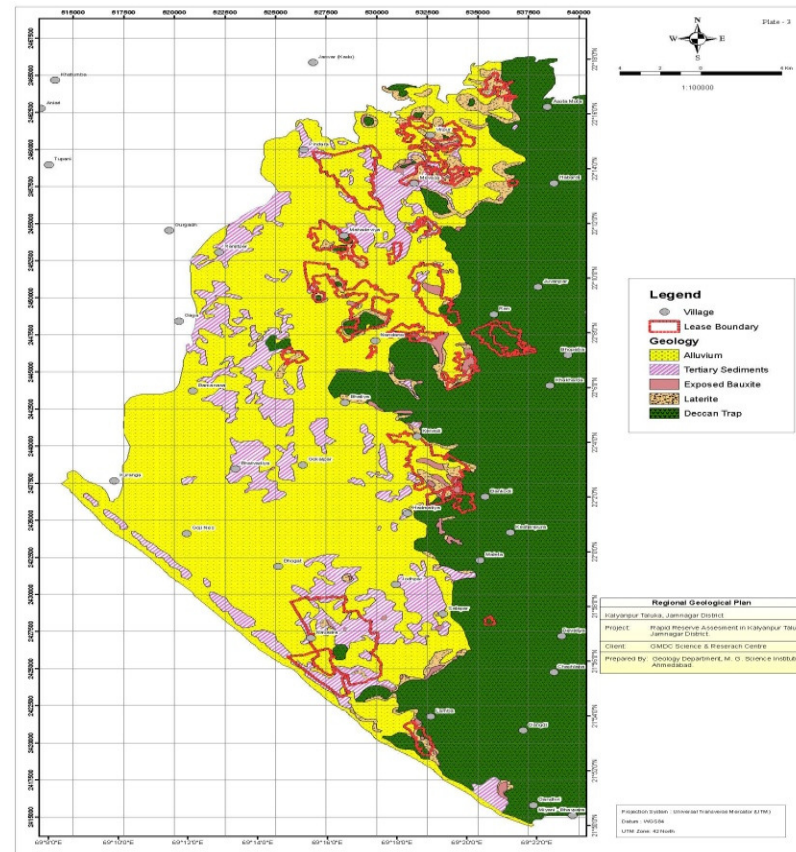
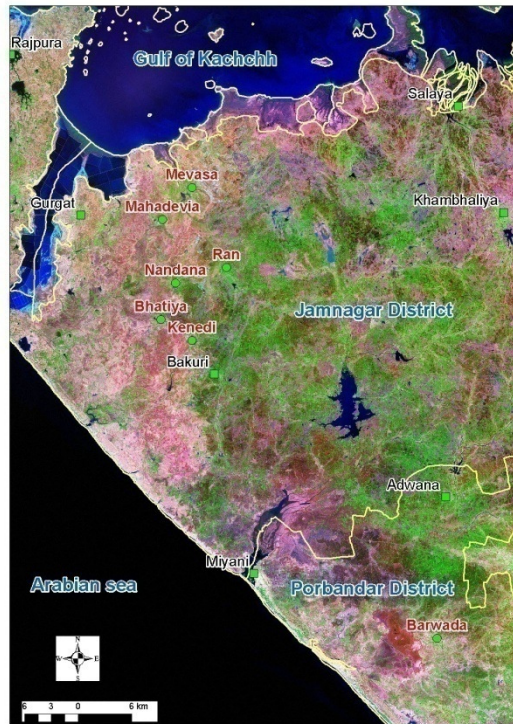
Landuse/Lancover Map



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3D DIGITAL TERRAIN MODEL OF THE AREA





- Objective : Topography survey Geological mapping, land use-land cover analysis & rapid assessment of Bauxite deposit within 70 Sq KM applied mining leases of Dev Bhumi Dwarka district in Gujarat .
- Achievement : Completed geological mapping & Land use/Land Cover analysis of 70 Sq Km belt (Including identification of lithological units , dip & Strike and modification of existing Geological map and preparation Digital Elevation Model) and established about 21 Sq Km potential Bauxite bearing areas
- Proved about 280 lacs metric Tonnes of bauxite resources in this area.

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Conclusion

- Case study is to demonstrate how geospatial technology can bring about a real difference and revolution in the way the mineral resource estimation and saving time and money of mining companies for SUSTAINABLE DEVELOPMENT
Thus nation can work and grow , bringing together the diverse stakeholders at all levels which is in the support of **Make in India** in true sense.



Thanks