



SPATIAL GEOTECH PVT. LIMITED

www.spatialgeotech.com



“Future is not something we stumble upon. Future is something we create.”

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From the Director's desk

It gives me immense pleasure to see my company steadily marching towards its aim. In 2009, I started the company out with an idea and savings of just under \$1000. With that money, I paid the EMD for my first client and won the bid. Spatial Geotech's first employee was an ex-colleague from RMSI, Mr. Yadvinder Bhuttar, who joined the company as a head honcho and is now our GM. Over the last 5 years, we have grown from strength to strength in terms of projects' list, servicing leading Government organizations in the country. Our key emphasis is on Geospatial Systems with the spotlight on Research and Development, resulting in improved technologies. Advanced capacities and skills in providing geospatial solutions in time, will act as the change agent for socio-economic development for the betterment of the society. We believe that continuous investments in R&D and capacity building of its staff, partners and community shall result in development of several new products and solutions.

At SGPL, we have genuine regard for the interests of our employees, customers and members of the communities in which we operate. Consequently, our values are designed keeping this in mind. Our approach to business involves providing world-class service to our customers at competitive rates. At SGPL, we are very proud to have a corporate image built around quality and integrity. Management pays close attention to the community, employees and customers on a regular basis, because they are the pillars of our existence. After all, it is only with the community and customer's support, a cooperative and productive workforce, a satisfied customer base and a strong corporate brand that a company can be successful.

With a mission at hand, SGPL has ventured out towards a better future and facilitating it is one of our biggest objectives. As a part of our core objectives, we have grown YOY to a total of 40+ office staff in 2013, which includes GIS engineers, assistants and experts in mapping. Externally, we also have a network of who's who in the field of Watershed Management, Land Information Management, Irrigation systems, Mining, Geology and an affluent advisory board with combined expertise of over 200 years. The team also saw its new CFO, Annu Gupta in 2012 (who is also my significant half in personal life) and a Business Development Lead, Richa Arora in Q3, 2013. Our technical expertise, together with the guidance from the who's who in the industry and our dedication to make it happen helps us to be the instrument of change towards the common good. I am grateful to everyone in the team who is working towards this common goal.



1.0 Profile

Following its foundation in 2009, Spatial Geotech Pvt. Ltd. (SGPL) today is assisted by a dedicated team of experts drawn from various fields such as GIS and Remote Sensing, Dairy Production, Processing and Management and a multitude of industries such as Agriculture & Forestry, Irrigation, Mining, Power, Infrastructure and Watershed management. The organization is proud to have very eminent persons from diverse fields on its panel, who provide their consulting services as well as priceless business advice to us.

1.1 Aim

SGPL aims to focus on research and development and deliver the most cost-effective, and high quality geospatial technology, services and solutions to the industries and governments worldwide. It aims to work for the welfare of the community by providing efficient, accurate and implementable solutions and innovations for a better world.

1.2 Objectives

- To provide high end geospatial solutions, aimed at addressing the socio-economic issues. To consistently deliver solutions that meet the requirements of the society while maintaining high standards of quality, efficiency and effectiveness
- Provide best in the industry environments for growth and research and development for our valuable staff.
- Provide technologically advanced solutions for problems faced by the community and partners.
- To adapt to and incorporate change. To continually motivate our staff and Directors to keep up with the change through industry events, conferences and seminars.
- To achieve a leadership and dominant role worldwide in the areas of its operation. To encourage joint ventures in countries in high need of cost-effective geospatial services.
- To foster an environment of continual growth – in revenue, size of projects and in team size.
- To engage in healthy competition.
- To be an instrument of change for greater common good.



1.3 Our Advantage

SGPL banks on its extensive skills, vast resource, and considerable know-how to manage large, complex projects for clients with many different business challenges, operating in a wide range of industry sectors.

The SGPL Advantage	How Our Clients Benefit
Unique ability to provide complete data, engineering, and software solutions under one roof	One stop shop solution provider to manage client business efficiently
Innovative automated processes	Cost optimization and efficiency gains resulting from extensive process automation
Deep domain expertise in a variety of vertical markets	Higher quality solutions due to superior domain understanding
Unmatched geo-processing capacities	Quick execution and rapid project delivery thanks to our large human resource base and automated workflow systems

The company's advisory board is comprised of technical experts from various streams like GIS & Remote Sensing, Civil Engineering, Hydrology and Computer Science. A quick snapshot of their details is mentioned below:

Name	Qualification	Experience
Mr. Sanjay Kr. Gupta (CMD)	M. Tech(Hydrology)	8 Years
Dr M.D. Nautiyal (Director)	Ph.D (Hydrology)	41 Years
Mr. B.K. Gairola Director Tech)	M.Sc (Surveying)	35 Years
Dr. P. K. Garg Advisor)	Ph.D (Civil)	27 Years
Dr. Mahesh Jat (Advisor)	Ph.D (Civil)	10 Years
Mr. Yadvinder Singh Buttar (GM)	B.Tech(Computer Sci)	15 Years
Dr. Rama Rao (Sr. Consultant)	Ph.D (RS & GIS)	5 Years
Dr. K. Venkates Warlu (Sr. Consultant)	Ph.D. (RS & GIS)	10 Years
Dr. Vivekananda Acharya (Sr. Consultant)	Ph.D. (Earth Science)	7 Years
Dr Ranveer Singh (Sr. Consultant)	Ph.D. Water Resources	40 Years
Shamsher Singh (Consultant)	Ministry of Agriculture Rtd.	45 Years



1.4 Service Offerings

- **Specialist consultancy:** Geographical User Needs Assessment -> Identification of optimum procedures for data capture and collation -> Geospatial workflow analysis and design. Custom approach towards geo-technical applications for a variety of industries such as Water management, Watershed Management, Construction & Infrastructure, Defense, Agriculture and Natural resources
- **Software solutions:** End-to-end, scalable web-based enterprise geospatial applications, web mapping applications, customized desktop applications, Workflow Management Systems (WMS), application maintenance and enhancement support. Evaluation of existing hardware & software.
- **Spatial Modeling & Analysis**
- **Image Processing:** Geo-referencing, Ortho-rectification, Mosaicing, and Color balancing & cutting to specified output format.
- Database update & upgrade.
- **Property taxation services:** Consulting, Database creation, Business Process outsourcing, Application development, Content conversion and Data analytics.
- **Land Information Management (LIM) solutions:** Expert consultancy and interoperable, scalable and flexible LIM solutions.

1.5 Company Capabilities

1.5.1 *GIS Consulting*

SGPL strives to provide optimum, business driven solutions and undertakes a consulting assignment with a prospective client before proposing a comprehensive solution.

SGPL assists clients with assessment of geographical data needs (User Needs Assessment), which helps our clients identify and define the requirements for spatial data and relevant solutions within the organization. The results of these studies address requirements for geospatial related data, applications, database design, implementation methods, and training. An implementation strategy is finally formulated to ensure effective integration of geospatial solutions within an organization.

One of our consulting strengths is our ability to quickly identify ways in which workflow can be optimized or automated to provide immediate productivity gains. We work with the client to implement any proposed optimization and automation solution.



1.5.2 Geospatial Software Application

We significant experience in providing geospatial data and application software solutions to its clients. The capability to offer a combination of geospatial data and software services as a comprehensive solution to clients is our prime USP.

Our geospatial platform and vendor independent approach allows us to use the best-of-breed technologies from ESRI, MapInfo, Autodesk and Intergraph to develop successful client solutions.

Our remit extends to (and is not limited to):

- End-to-end, scalable web-based enterprise geospatial solutions
- Web mapping applications
- Customized desktop applications
- Workflow Management Systems (WMS)
- Application maintenance and enhancement support

1.5.3 Remote Sensing

SGPL has extensive expertise in satellite image interpretation and processing, having worked with most of the commercially available satellite data products, including IKONOS, QuickBird, SPOT, ASTER, IRS, Landsat, Radarsat, MODIS, and NOAA.

Our RS services include:

- Aerial Photography
- Ground Control and Mapping
- Detailed Topography
- Land use/land cover morphology data (used in wireless network planning)
- Vector updates
- Land use land cover mapping for environmental applications
- Agronomic & Meteorological/hydrological investigations & Hydrography
- Agricultural crop acreage estimation and NDVI based crop yield estimation
- High-resolution urban mapping
- Forest density mapping and species level forest mapping
- Agro-economic surveys Snow and glacier mapping





We procure and examine latest satellite images to derive valuable and accurate information for a wide range of applications such as:

- Telecom
- Natural resource mapping
- Watershed management
- Livelihood development
- Land use Land Cover
- Utility planning

1.5.4 Spatial Modeling and analysis

SGPL has considerable expertise in spatial modeling and analysis, and in building databases to model natural catastrophes such as earthquakes, hurricanes, and floods.

Our service offerings include:

- Generating soil and liquefaction maps from digital geological maps
- Generating geotechnical databases, which comprise the aggregated hazard value for a given variable, such as soil, based on the distribution of land use /land cover conditions across a particular geocoding region, such as a postcode
- Landslide susceptibility mapping using raster modeling
- Hydrological analysis involving analyzing historical data and generating probabilistic flood events, catchment derivations, catchment property studies, and run off. This analysis also includes generating flood depths and flood extent maps for different scenarios that comprise modules such as, rainfall, runoff, and flood depth. This kind of river flood model helps agencies involved in risk and disaster management understand risk levels
- Identifying zones that have a potential risk from hurricanes, based on the distance to coast, roughness data (building roughness), and topography data
- Strike and dip calculations along the geological strata from the high resolution DEM, which can be used in sync with lithological and structural information to understand the cross sectional strata over the area
- Environmental impact assessment to identify the potential impact of storage facilities for hazardous materials in populated areas





- Mitigation and monitoring of hazardous materials and toxic waste areas that overlap with soils, water tables, and other surface and subsurface data
- Digital terrain modeling (DTM), to analyze environmental phenomena or engineering projects that are influenced by elevation or slope aspects
- Spatial display of erosion, sediment deposition, and dredge material sinks. Tracking the dispersion of pollutants in an aquifer
- Developing the 3D visualizations of urban risk from both natural and man-made catastrophes
- Geospatial analysis in carrying out seismic microzonation studies over urban areas

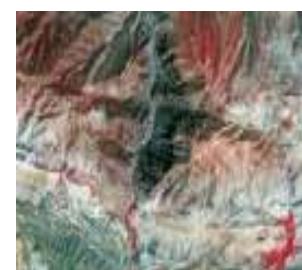


1.5.5 *Image Processing*

SGPL is an expert in processing high-resolution imagery into quality raster data products. This involves removing distortions in the images (georectification, orthorectification) and ensuring that the output is of high quality in terms of clarity, resolution, and color. The processing consists of georeferencing images, orthorectification, mosaicing, color balancing, and cutting to specified output formats. SGPL is able to produce a seamless raster data product from multiple image tiles.



SGPL is adept at handling large volumes of images, automating many of the data management processes in this activity, and is able to pass on the gains in productivity to the client in terms of fast turn around times and competitively priced solutions.



1.5.6 *Agriculture and Natural Resources services offerings*

Agriculture

- Crop mapping, acreage and yield estimation
- Crop suitability assessment and health monitoring
- Climate change induced impact assessments
- Developing crop models for agriculture insurance
- Water resource assessment for agricultural crops
- Damage and land degradation assessment studies





Forestry

- Carbon foot print mapping, crediting and management
- Forest management and sustainable livelihood development
- Species level classification and biodiversity mapping
- Change detection studies
- Environment impact assessment studies



1.5.7 Geo Spatial Application Development, Integration & Maintenance:

- Development and maintenance of integrated desktop, and Intranet and Internet solutions, such as:
- Property information portals
- Information search and data exchange applications
- Workflow applications
- Decision-making tools and analytical applications
- Land Information Management System
- Property Tax Information System
- Urban Information & decision Support System
- Utilities sectors
- Geospatial application integration with legacy application to deliver the enterprise solutions

1.5.8 Land Information Management

SGPL provides interoperable, scalable, and flexible Land Information Management (LIM) solutions and services to the federal and state governments, title and credit services industry, insurance industry, and multi-lateral funding agencies. LIM professionals and governments use SGPL's services for land use planning, land records management and administration, property conveyance and transactions, and implementation of land policy & reforms.

SGPL's specialized and integrated land information management service offerings include:

- Creation of large, complex geospatial databases for land registration, cadastre and land-use planning
- Development and maintenance of land information systems and solutions for agriculture farm mapping subsidies



- Mapping of habitats, environment, waste disposal, and historic land information essential for environment analysis
- Manual flood determination and flood mapping for identification of flood indentation zones

Our experts comprise of architects, planners and urban designers who bring in local market specific knowledge besides their core area of expertise. In the UK, SGPL works closely with its strategic partner, Landmark Information Group (LIG), a leading supplier of quality land and property search information, to deliver customized spatial solutions and services to local authorities, government departments, and other public sector organizations.

1.6 Key Projects

The growth in the use of Geographic Information Systems (GIS) technology over the past few years has been phenomenal. Organizations in the public and private sectors have been adopting the technology in droves. Spatial Geotech Private Ltd has accumulated years of experience extensively in the domain of Land-use mapping and database development through the successful execution of a number of projects for various eminent clients, such as

- WAPCOS LTD
- Tahal Consulting and Engineering Ltd
- REC Power Distribution Company Limited (Subsidiary of REC Limited)
- Uttarakhand Urban Sector Development (ADB Funding Project)
- Bajaj Hindustan Limited

These projects are discussed in quick snapshots in pages to come.

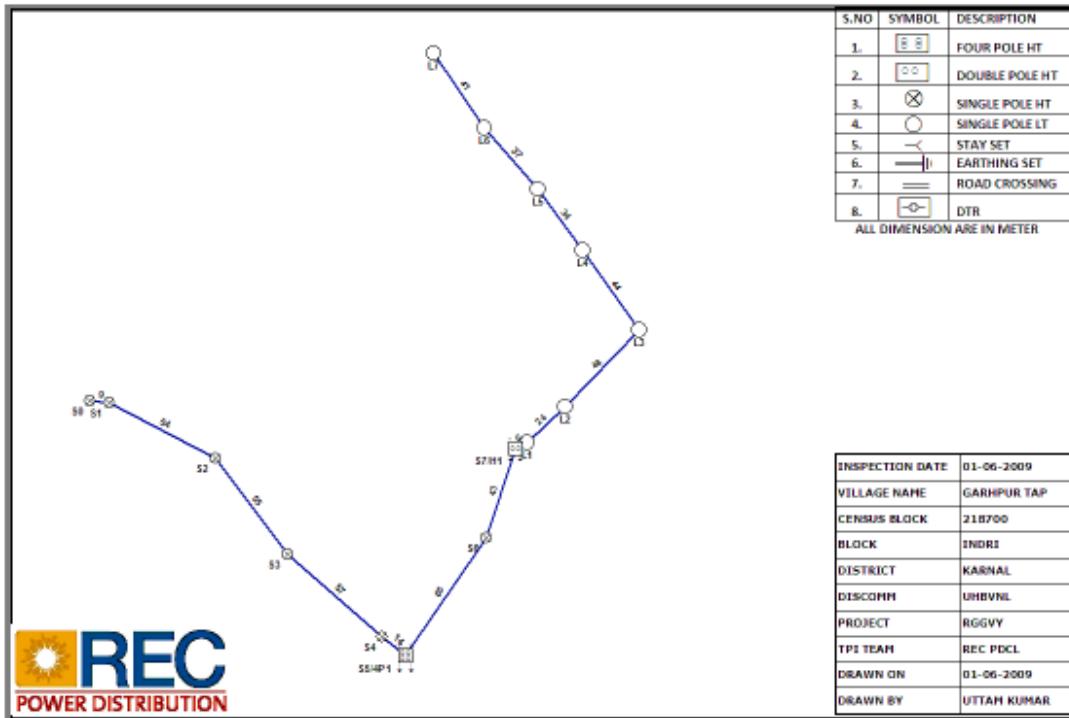


1.6.1 Preparation of Single Line Diagrams using GPS Data

Scope of work: Generation of Monitoring report of Electrification works executed under RAJIV GANDHI GRAMEEN VIDHYUTIKARAN YOJNA (RGGVY).

As a 3rd party provider, we use GPS point and other relevant information, to generate the monitoring report of particular area. This includes all the intricate information regarding the power line of transmission system along with the line diagram depicting flow of power supply, no. of poles, kind of poles and other related information.

Assignment Name: Preparation of Single Line Diagrams of Power System networks using GPS Data	Country: India
Location within Country: Rajasthan (6 District of Rajasthan State)	Key professional staff: Project Manager, Senior GIS Team Leader, RS/GIS Engineers
Area Of Interest: 700 Feeders	
Customer Name: REC Power Distribution Company Limited	
Status: On Going	





1.6.2 Urban Land Use Zonal Planning of LAO PDR

Scope of work: Zonal Planning for all the provenances across the entire nation and final plan submission with proposals of feasible developments.

We undertook the following route towards our scope of work:

1. Geo-referencing of images using control points available.
2. Creation of Land Use & Land Cover at scale of 1:10,000 using high resolution geo-referenced images and Generation of DEM.
3. Zonal Planning with the help of created Base Map.

Assignment Name: Urban Land Use Zonal Planning of LAO PDR	Country: LAO PDR
Location within Country: All Provinces of LAO PDR	Key professional staff : Project Manager, Senior GIS analyst, RS/GIS executives, Survey Team Leader
Area Of Interest: 2,32,000 sq. km	
Customer Name: National Land Management Authority, LAO PDR	
Status : Complete	

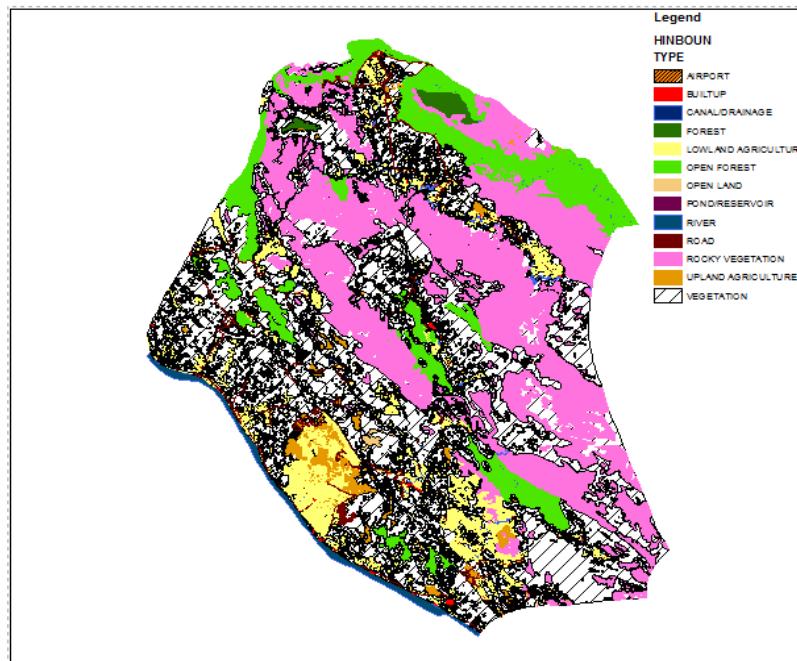


Fig: Urban Land use map of Hinboun (Khammouan Province, Lao PDR)



1.6.3 GIS Based Property Tax Mapping of Hathibarkala ward, Dehradun

Dehradun Property Tax Mapping System (DPTMS) involves Property tax assessment using GIS database along with the development of property related feature layers with basic query functionality.

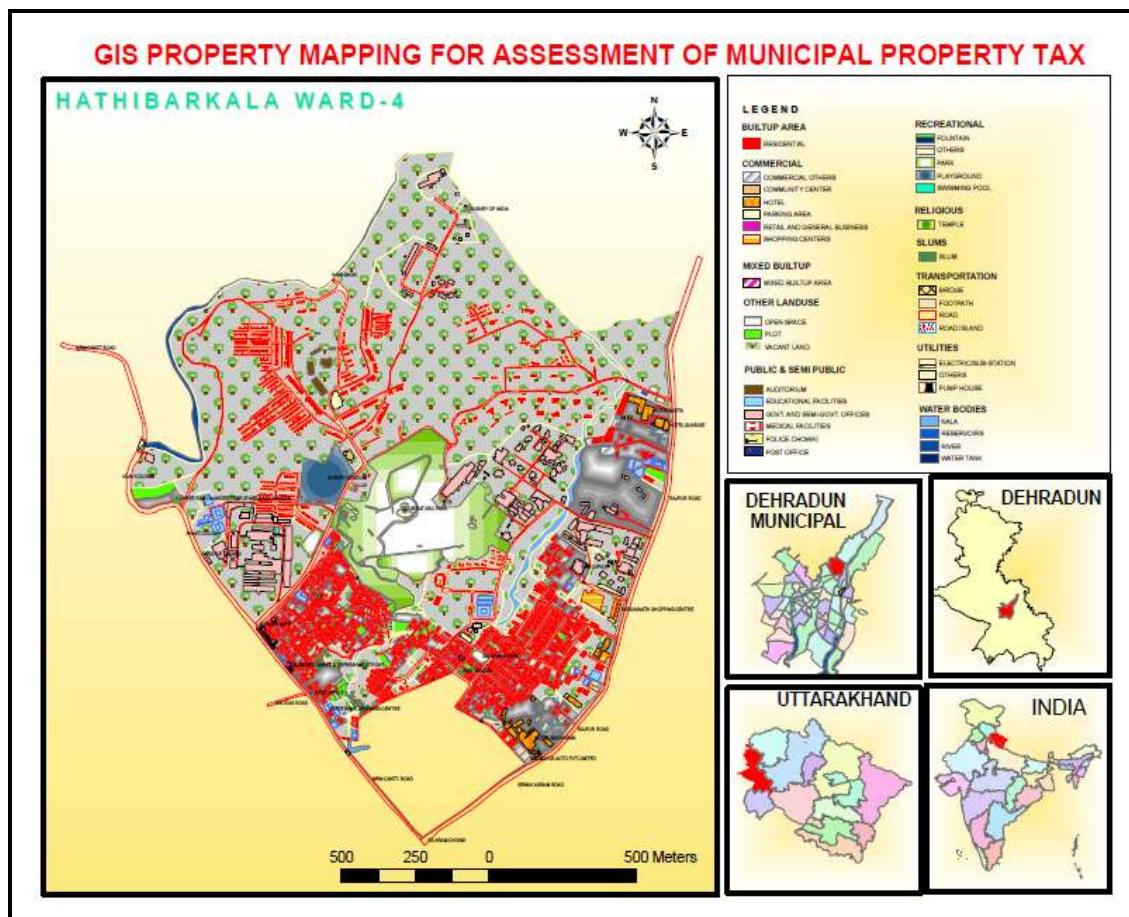
Assignment Name: GIS Based Property Tax Mapping, Dehradun	Country: India
Location within Country: Dehradun District of Uttarakhand State	Key professional staff: Project Manager, Senior GIS analyst, RS/GIS executives, Survey Team Leader
Area Of Interest: Hathibarkala ward of Dehradun	
Customer Name: Wilber Smith/ Uttarakhand Urban Sector Development	
Status : Complete	

Major Activities involved in DPTMS

- Image Procurement and Image Geo-referencing
- Procurement of Secondary Data
- Mapping and Finalization of Attributes
- Software Application Overview

Deliverables

- Mosaiced and seamless, true color, high resolution image, providing complete coverage across the entire area of AOI.
- The data/information will be supplied on soft copy.
- Base maps showing the high-resolution imagery with landmarks and location names, organized so as to provide a legible map without obscuring the satellite image. These maps will be composed as: One set of map sheets at 1:1000 scales, covering all built-up areas within the project area.





1.6.4 Preparation of LULC Map of Sitapur Village of Sitapur District

SGPL was involved in generating maps for Land Use/ Land Cover in Sitapur Village, Sitapur District U.P. Maps were created from remote sensing using Visual image interpretation. Land use refers to man's activities and various uses, which are carried on land. Land cover refers to natural vegetation, water bodies, rock/soil, artificial cover and others resulting due to land transformation.

Assignment Name: Preparation LULC Map of Sitapur Village.	Country: India
Location within Country: Sitapur District of UP State	Key professional staff: Project Manager, Senior GIS analyst, RS/GIS executives, Survey Team Leader
Area Of Interest:	
Customer Name: Bajaj Hindustan Ltd.	
Status : Complete	

Preliminary work:

- To examine the limitation of satellite data.
- To lay down the criteria for land use classification to be adopted.
- To fix the size of mapping units depending upon the scale.
- Interpretation of different land use/land cover classes.
- Demarcation of doubtful areas.
- Preparation of field land use/land cover map.

Field work:

- Type of ground data to be collected.
- Selection of sample area for final classification.
- Checking doubtful areas.
- Change in land use/ land cover due to wrong identification, fresh development, nomenclature.
- General verification.

Post field work:

- Reinterpretation or analysis or correction of doubtful areas.
- Transfer of details on base map.
- Marginal information and final preparation of land use/land cover map.



1.6.5 Integrated Watershed Management IWMP 2010-2011:

Assignment Name: Preparation of Various thematic layer for Watershed Project	Country: India
Location within Country: Rajasthan (10 District of Rajasthan State)	Key professional staff): Project Manager, Senior GIS analyst, RS/GIS executives, Survey Team Leader
Area Of Interest: 47 watershed constituting the area of 2, 63,926 Hact.	
Description of Actual Services Provided by Your Staff: All above described activities are the part of Project scope.	
Customer Name WAPCOS Ltd.	
Status :- Complete	

Recorded output

Base Map

Macro/micro watershed boundary, village boundary, gram panchayat boundary, transport network, canals and settlements.

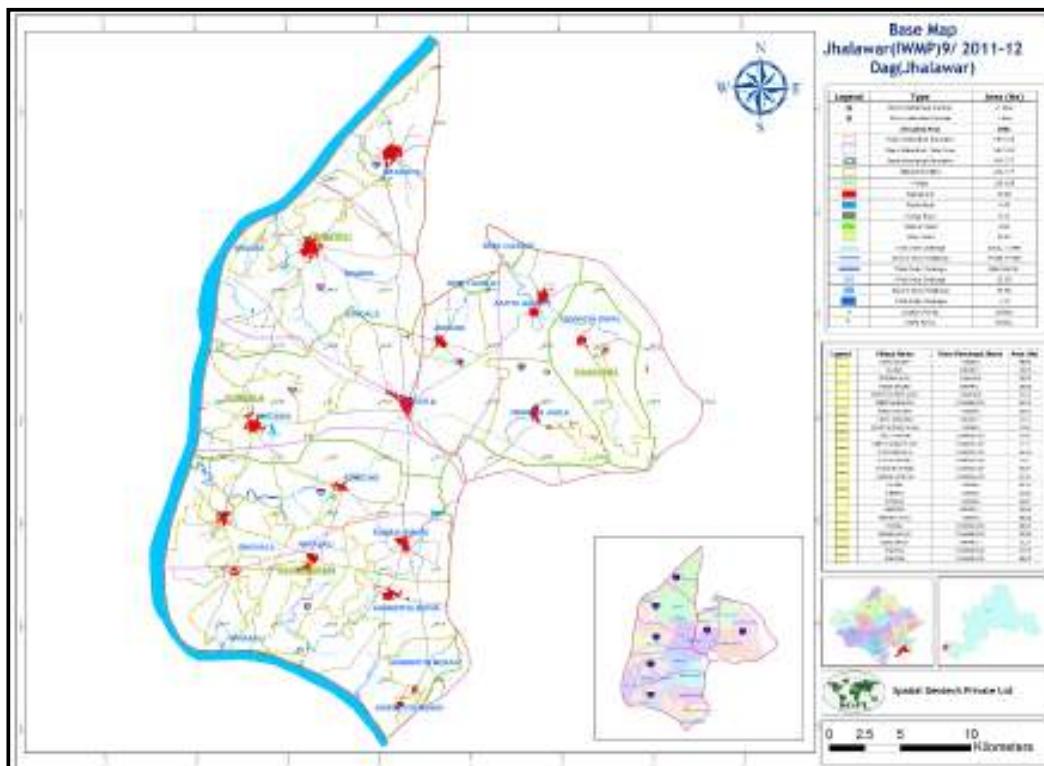


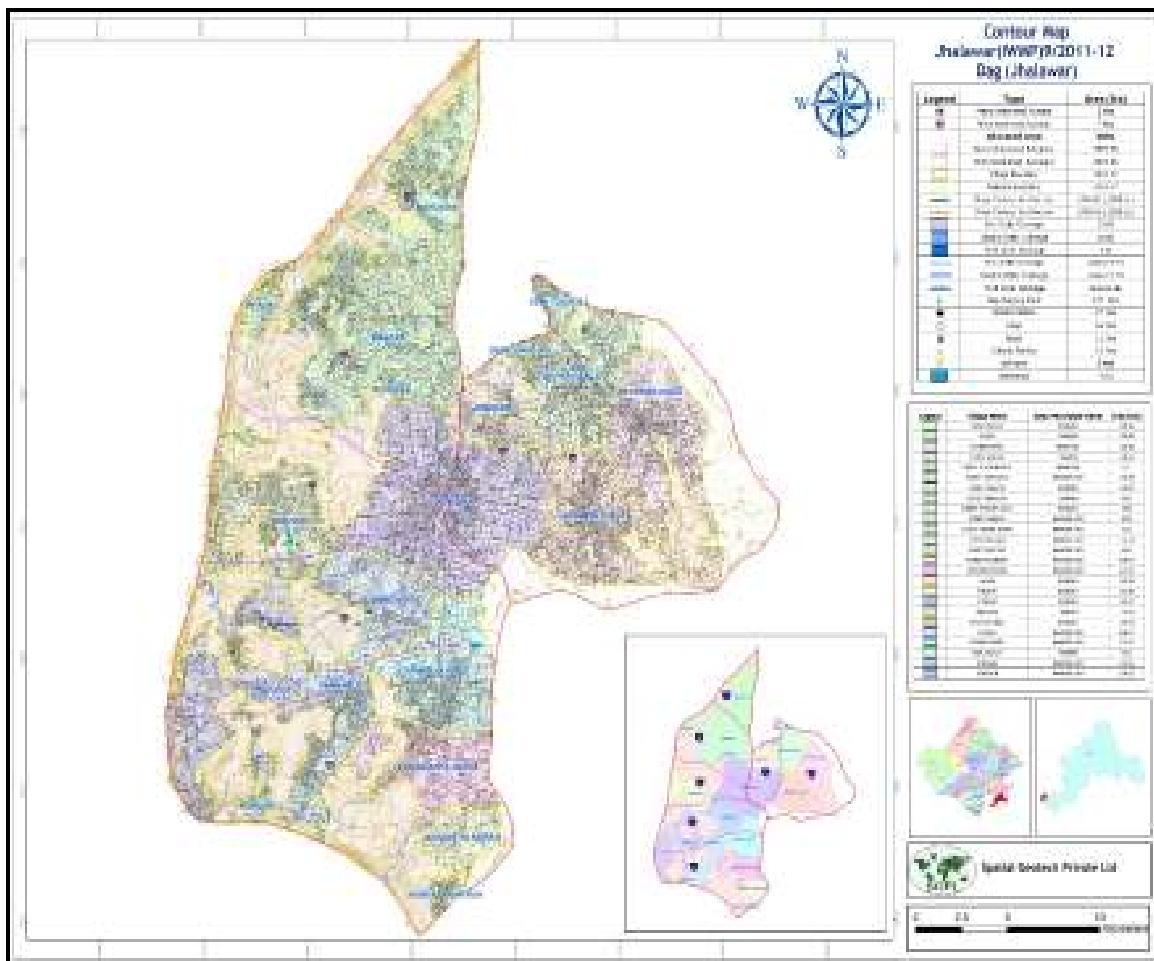
Fig: Typical base map



Contour Maps

Contour map at 1 m interval superimposed over revenue record & administrative boundaries.

Fig 7: Typical Contour map superimposed over Khasra layer

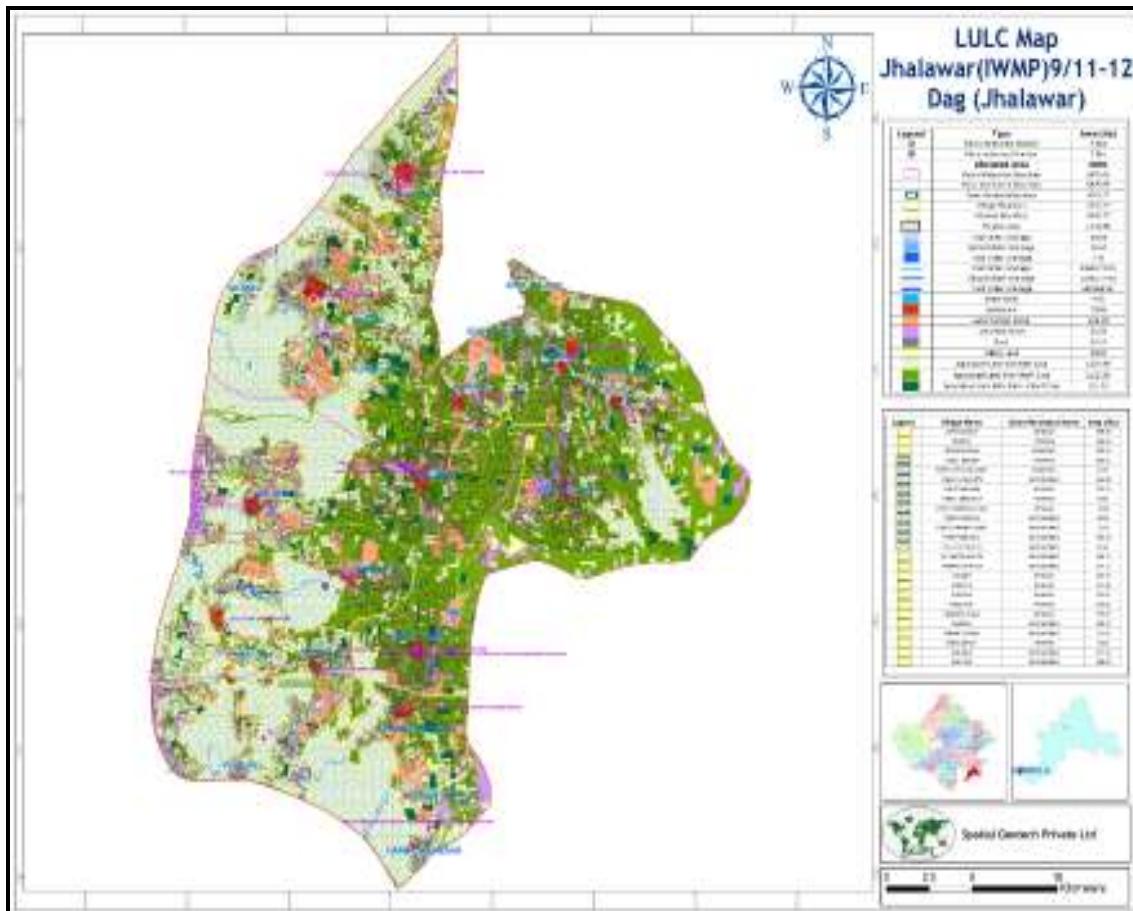




LULC Map

Latest land use and land cover map for two seasons; pre monsoon and post monsoon superimposed over revenue record

Fig: Land use /land cover map

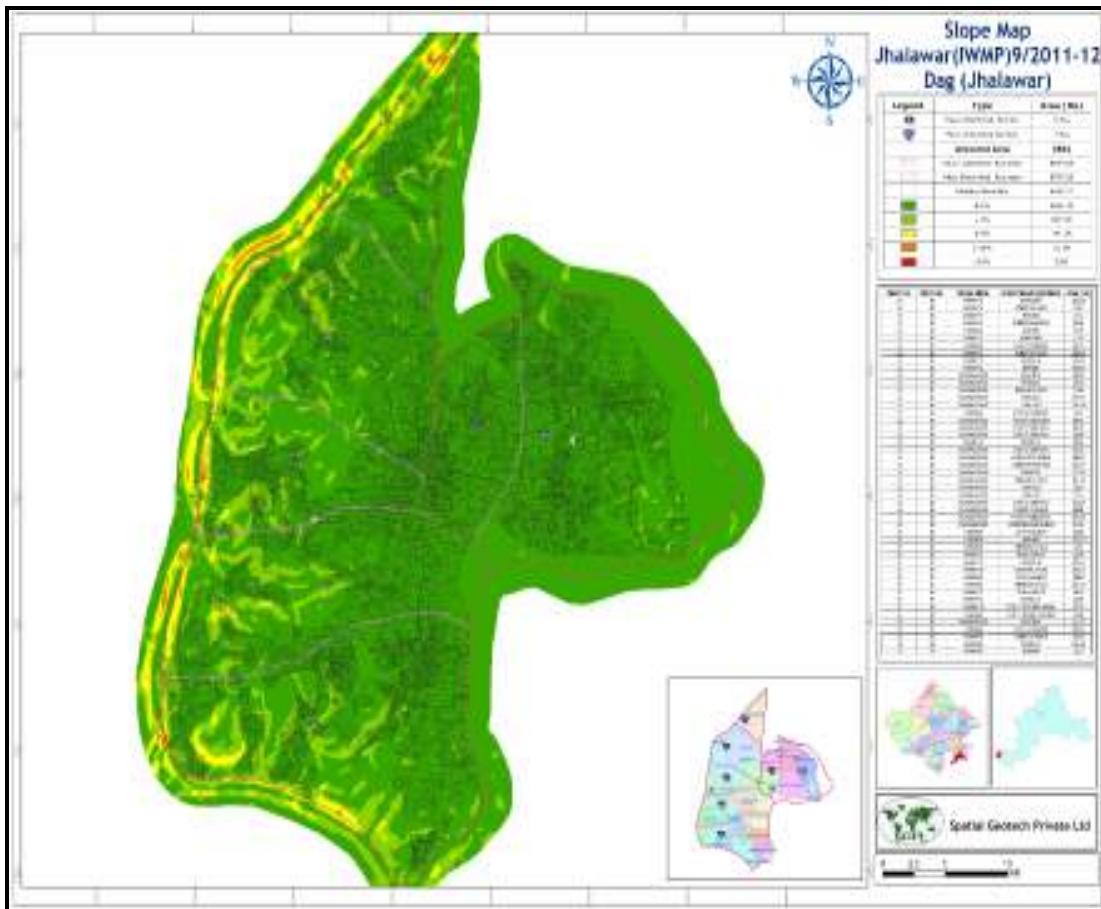




Slope Map

Slope maps superimposed over revenue record. For flat lands slope will be classified in following categories (a) 0-1%, (b) 1-3 %, (c) 3-5 %, (d)5-10 % and (e) 10 %

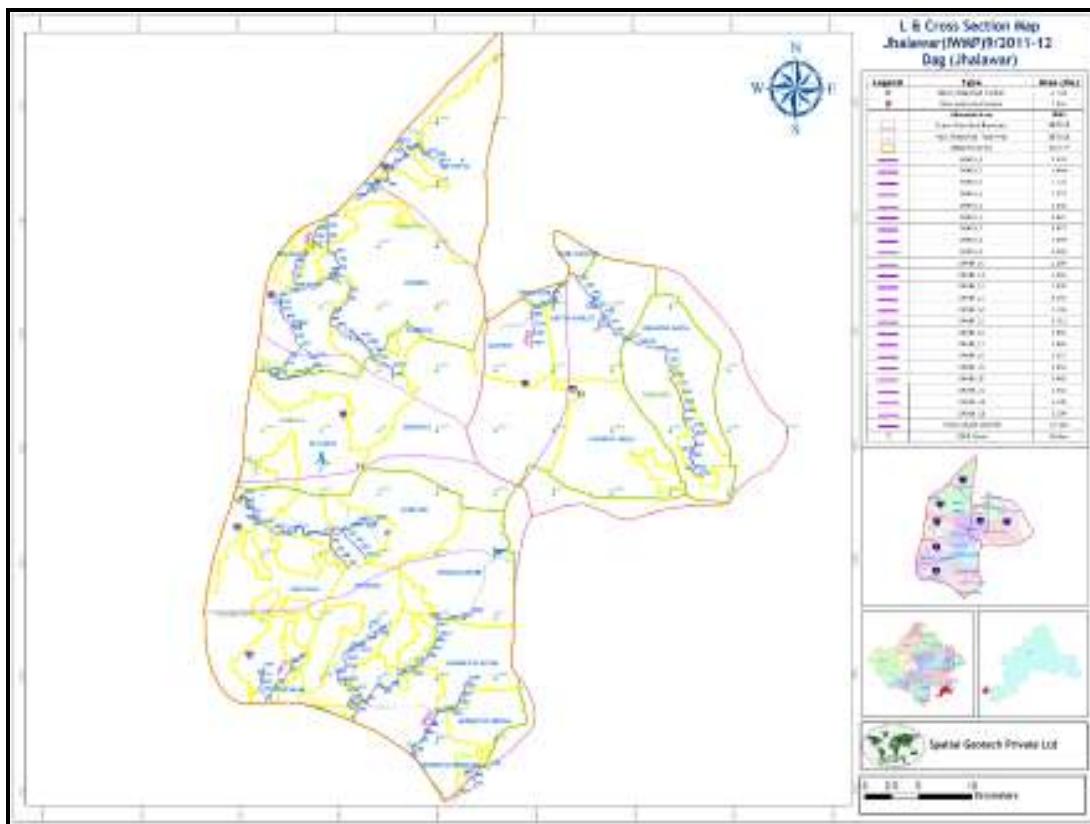
Fig: Slope map generated from DEM surface

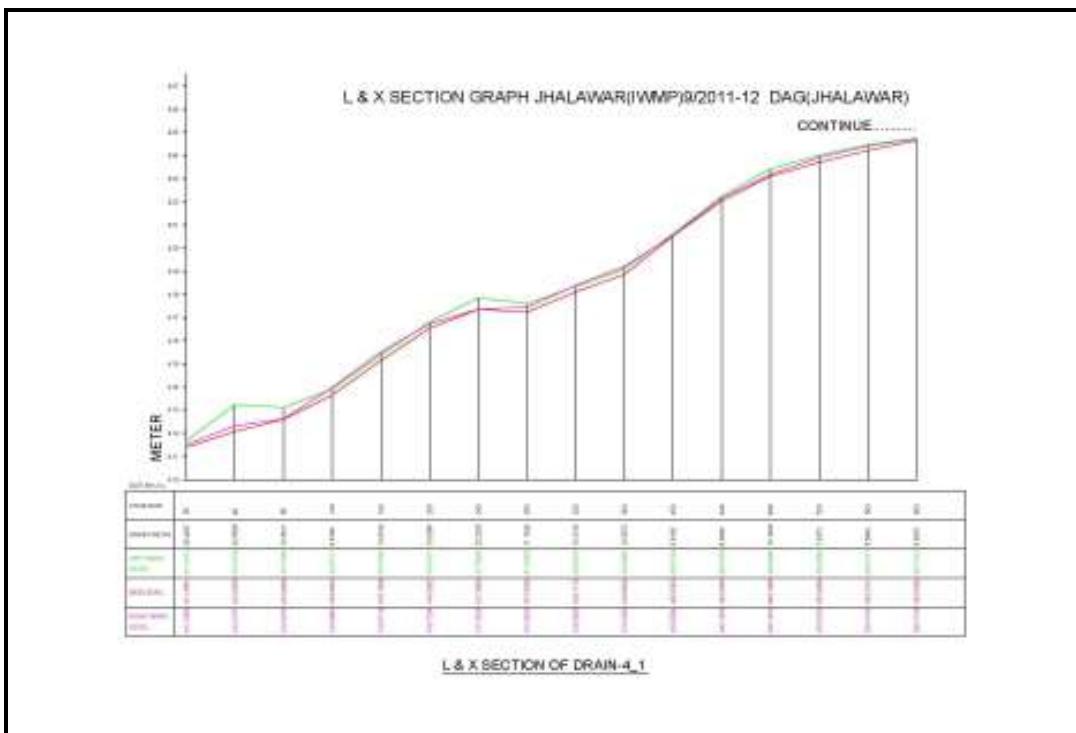


**L & X Section Map**

L Section and Cross Section map with Latest Drainage (lines and polygons i.e; nala, stream, all existing water bodies):

- Complete drainage orders
- Micro/ macro watershed codification
- Boundary delineation

Fig: L&X map generated Drain

**Fig: Drain wise L&X Sections Maps****Soft Copy Deliverable:**

Apart from thematic layers to be provided in the hard copies, following layers of the project area will be provided in soft copy:

- a. DEM
 - b. Aspect map
 - c. Soil Texture (subject to availability)
 - d. Ground water prospect maps
 - e. Geomorphology Map
- Desired non spatial attributes will be associated with spatial data
 - a. Khasara layers - with revenue details- Khasara No, Owner name, area, owner category, source of irrigation (to be provided by the Directorate)
 - b. Drainage- with Stream order,
 - c. Land use/ land cover map - for two seasons; pre monsoon and post monsoon
 - d. Base Map - Macro/ Micro ID, Name of Block, GP, and villages name, Village Census Code and Village Census data
 - Water bodies - Capacity, local name, type



1.6.6 Integrated Watershed Management 2011-2012

Assignment Name: Preparation of Various thematic layer for Watershed Project	Country: India
Location within Country: Rajasthan (18 District of Rajasthan State)	Key professional staff: Project Manager, Senior GIS analyst, RS/GIS executives, Survey Team Leader
Area Of Interest: 86 Watershed constituting the area of 4, 71,127 Hact.	
Customer Name:- WAPCOS Ltd.	
Status: Complete	

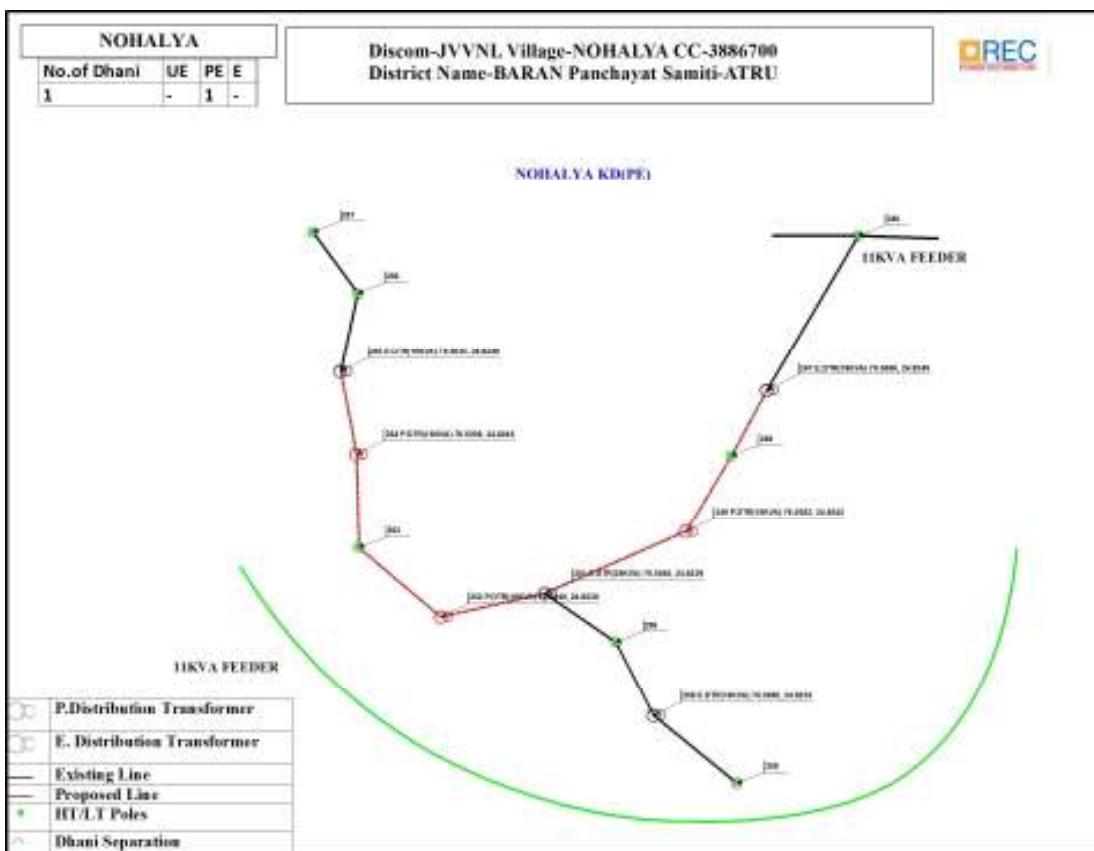
1.6.7 Preparation of Single Line Diagrams using GPS Data

By using GPS point information and other relevant information captured by survey Team and hand made drawing each diagram constitutes the Existing & proposed line, Existing/ Proposed distribution transformers along with capacity as well as existing /proposed Poles and no of Dhani etc.

Assignment Name: Preparation of Single Line Diagrams of Power System networks using GPS Data	Country: India
Location within Country: Rajasthan (10 District of Rajasthan State)	Key professional staff: Project Manager, Senior GIS Team Leader, RS/GIS Engineers
Area Of Interest: 10 Constitutes approximately 80,000 villages.	
Customer Name: REC Power Distribution Company Limited	
Status :- On Going	



Sample Output





1.6.8 Floodplain Mapping of Sitamarhi District Bihar

Floodplain mapping is a process of preparation of maps which provide the basis for flood management and regulation requirements, by identifying areas flood-prone areas that can threaten life and property. These maps guide flood management programs, including floodplain preservation and regulation, flood safety and preparation, and mitigation. Spatial Geotech has been entrusted part work of the above mentioned project. Scope of work includes -

- Field Survey using latest techniques & High end equipments to achieve the desired accuracy.
- Generation of Digital Elevation Model (DEM) for entire Sitamarhi district and adjoining areas using Stereo Images obtained from Passive Remote Sensing Instruments.
- Generation of Contours at 0.3 m intervals and preparation of Maps 1:2500 using High Resolution Satellite Imageries for entire Sitamarhi district and adjoining areas.
- Ground verification of contours at certain locations drawn from satellite imaginary

Assignment Name: Floodplain Mapping Of Sitamarhi District of Bihar	Country: India
Location within Country: Sitamarhi District of Bihar State	Key professional staff): Project Manager, RS/GIS/CAD Experts, Senior GIS Team Leader, RS/GIS/CAD Engineers
Area Of Interest: 2500 Sq KM	
Customer Name: WAPCOS Limited/ Ministry of Water Resources	
Status :- On Going	

Field Survey:-

As per the scope of work to generate the digital elevation model and contours with 0.30 meter contour interval, horizontal as well as vertical accuracy need to be maintained (better than 30 cm). Therefore, as discussed in the methodology, a detailed GNSS survey was planned to collect the 3 dimensional position of no of points throughout the project area using state of the art dual frequency DGPS systems.



1. Establishing Primary DGPS Primary Control Points



2. Establishing Primary DGPS Secondary Control Points



3. Establishing Primary DGPS Tertiary Control Points





1.6.9 *GIS Data Preparation for Lalitpur (UP) Canal System*

Working with Tahal Consulting for this particular project, we carried out topographical and cadastral survey of the project area, conducted a detailed study of the project area systems and identification of problems & redesigning of irrigation and drainage Systems. The assignment involved preparation of detailed project report to renovate and redesign the canal system linked to Sajnam, Jemini & Rohini Rivers.

Scope of work: Extraction of various GIS Layers, linkage of L Section & cross section drawing and site photographs with GIS data.

Assignment Name: Preparation of GIS data from CAD Drawing files	Country: India
Location within Country: Lalitpur District of UP State	Key professional staff: Project Manager, Senior GIS Team Leader, RS/GIS/CAD Engineers
Area Of Interest: 90000 Hectare	
Customer Name: Tahal Consulting and Engineering Limited/ Irrigation Department of UP	
Status: On going	



1.7 Key Clients



TAHAL
GROUP



REC
Endless energy. Infinite possibilities

H
bajaj hindusthan ltd.



WAPCOS
LIMITED

A Government of India Undertaking - Ministry of Water Resources

AVANTHA
POWER & INFRASTRUCTURE

lalitpur power generation
company limited

Department of Land Resources
Ministry of Rural Development
GALLANT



Wilbur Smith Associates
ENGINEERS
PLANNERS
ECONOMISTS

1.8 Contact Details:

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