AWARDS SCHEME FOR EXEMPLARY IMPLEMENTATION OF e-GOVERNANCE INITIATIVES

NAME OF CATEGORY- 'INNOVATIVE USE OF GIS TECHNOLOGY IN e-GOVERNANCE'

1. Coverage – Geographical and Demographic :-

(i) Comprehensiveness of reach of delivery centres,

GeoSearch **is** an Enterprise e-Governance G2C solution for P&RD, GoMP is fusion of Web & Geospatial Technology. It has access via internet https://gismp.nic.in/GeoSearch. Extent of geographical coverage is the entire state of M.P. covering around 55,000 villages/ around 23,000 Panchayats, Major Roads, Major Forest & Water Bodies. It has linkage with Google Map services and thus allows the coverage of each & every corner of the geographical area of the state.

(ii) Number of delivery centres

Can be accessed from anywhere/ anytime.

(iii) Geographical

(a)National level – Number of State covered	
(b) State/UT level- Number of District covered	51
(c) District level- Number of Blocks covered	313

Please give specific details:-

Any citizen can access.

(iv) Demographic spread (percentage of population covered)

Directly / Indirectly entire population of the state is covered & benefited.

2. Situation Before the Initiative (Bottlenecks, Challenges, constraints etc with specific details as to what triggered the Organization to conceptualize this project):

The situation before the initiative can be summarized as below:

- Due to non-availability of rational & scientific tool, policy framing, planning & decision making were fully dependent on the field inputs in the form of reports or paper maps.
- It consumed enormous manpower efforts, time & money.
- Preparation & verification of proposals/ DPR for various developmental schemes / projects is cumbersome in absence of ICT based Systems.
- Traversing / computation of distance & area were not possible with expected level of accuracy.
- Paper maps were difficult to handle, maintain & update.
- Digital data of villages/*panchayats* along with other geographical features (major roads, railway, rivers/ water bodies, forest etc.) was not centrally available.
- Creation of digital data by various state level agencies individually as per their needs leads to inconsistency and redundancy in the data. Thus data could not be organized in standard form.
- Spatial data sharing & its overlaying was not possible.
- No facility for updation of spatial data & its linkage with other attributes for decision making.
- Head of the Office & other executives were not having holistic view of the area for evaluation & verification.
- Citizens/ NGO/ academic persons were helpless to carry any studies on rural areas.

3. **Scope of Services** (Relevance of application for e-governance, extent to which service is delivered through GIS)

Following services/ activities are delivered through GIS:

- Built spatial data web services using digital data on villages/ Panchayats, major roads etc. of entire state of M.P.
- Offering Spatial data services using Tokens.
- Attribute integration for Census, National *Panchayat* Directory (NPD).
- Constitution/ verification of *Panchayat*
- Holistic view of entire Block facilitate proximity/ neighborhood analysis.
- Distance computation (aerial & traversed)
- Area calculation based on area selected (Circle, ellipse, polygon, free polygon)
- Zoom/ pan on the screen.
- Query/Search output in the form of Digital map
- E-mail facility to send maps/reports.

- Display of profiles
- Google Map Interface

4. Strategy Adopted

(i) The details of base line study done,

In view of the above constraints stated above, National Informatics Centre (NIC) M.P. was entrusted to offer a technology solution. NIC undertaken the feasibility study in light of above mentioned problems. Considering present & future requirements, it was envisaged that ICT-based system having Web & GIS can resolve the issues. Spatial data needs to be secure and response time should be satisfactory.

(ii) Problems identified,

Pioneering efforts in design & testing of framework to meet out Citizen Centric expectations. The solution is fusion of Web & Geomatics Technology. It was also challenging to offer solution in compliance with Map Guidelines of GoI and ensuring spatial data security. This lead to the conceptualization of Web-enabled Geomatics model with the following architectural features:

- Service Oriented Architecture (SOA) consuming / offering of web services.
- Open Geo-spatial Consortium (OGC) compliant.
- Secure Socket Layer (SSL) Compliant
- Token services enabled.

(iii) Roll out/implementation model,

- System is deployed in NIC IDC Centre and well supported by SAN infrastructure & planned (DR) Disaster Recovery. It is managed by qualified manpower ensuring the user data & application security. Salted MD-5 encryption has been used for accessing the application.
- Project management team is constituted for continuous support. In addition, presence of trained manpower of NIC at the Districts ensures the required support for long term sustenance of the project is ensured.

(iv) Communication and dissemination strategy and approach used.):

User having Browser-based machine with Internet connection can communicate by browsing the Geo-portal https://gismp.nic.in/GeoSearch for state-level search. District website are normally accessed by the specific district user for any e-Governance service requirement. GeoSearch web-link is available on every District (50) official web site of M.P. So search submitted on this web site (http://sehore.nic.in for example) will limit to that district only.

GeoSearch has been demonstrated in various state/ district level workshops to create awareness amongst the State/District officials. News in local Daily News Papers/ media coverage/ Web portal helped create awareness amongst Citizens.

5. **Technology Platform used-**

(i) Description

The platform for development / deployment is:

- ArcGIS Server
- Open Web Technology (J2EE & Adobe Flex)
- Open Source Apache JBOSS Web server
- Enterprise Geodatabase
- Secured Hash Algorithm 2 (SHA 2) SSL compliant
- Token services for consuming web services.
- High-end Rack mounted Servers with Windows Server 2008 support by SAN
- Open Source Eclipse IDE Development platform

(ii) Interoperability

- Spatial data offered through OGC compliant services.
- Data Formats / database & front-end as per e-Gov. standard ensuring interoperability.
- Development environment is Open Source and platform independent

(iii) Security concerns

- The application is SSL (SHA 2) compliant by using Digital signature obtained from NICCA, GoI.
- Token Services are used to consume the web services. These web services are shared using tokens only.
- System is deployed in NIC IDC Centre and well supported by SAN infrastructure & planned (DR) Disaster Recovery. It is managed by

qualified manpower ensuring the user data & application security.

- Salted MD-5 encryption has been used for accessing the application.

(iv) Any issue with the technology used

No issues.

(v) Service level Agreements(SLAs) (Give details about presence of SLA,whether documented, whether referred etc. #)

Continues review-based system development.

6. **Demonstrate Innovation in use of GIS Technology for e-Gov** (Give details of technology used - Architecture, Platform, Open Source tools, Front-end development, Remote Sensing & Mobile Technology integration, SMS & email)

GeoSearch solution offered by NIC is fusion of Web & Geospatial Technology. It proposes a system with the capabilities of integrating information (spatial and non-spatial) from multiple sources, its sharing, analysis and aid the concerned authorities in quick and effective decision making. This technology is evolving & maturing.

- GeoSearch is developed using Open GIS compliant (OGC) Web services supporting Service Oriented Architecture (SOA) on. Application is built under Adobe Flash Builder framework environment using Flex Technology, J2EE & ArcObjects API. Development took place in Integrated Development Environment (IDE) of Eclipse (Version 3.5.1). It is currently deployed on Windows 2008 Server platform in NIC-IDC Centre under Apache JBOSS Web Server.

- It has an interface with Goggle/ Bing maps and capable of integrating with any high resolution satellite data service.

- The application is SSL (128-bit) compliant by using Digital signature obtained from NICCA, GoI.

- Token Services are used to consume the web services. These web services are shared with other registered users using tokens only. This ensures that data sharing is accomplished in compliance of Map Policy and thus redundancy & inconsistency can be avoided.

- P&RD, GoMP has ambitious plan for providing bandwidth connectivity to all *Panchayats*. Geospatial modelling using the web services provided by this framework has resulted in optimization for maximum coverage of *Panchayats* for Bandwidth Connectivity.

- It is well known that Google helps to reach only known locations. It will not serve remote/ rarely known villages. Google Map Interface of GeoSearch resolves this problem and facilitates Google Map for every village of the state. Thus this innovative approach offers ground realty at high resolution (50 cm) for the village.

Salient Features

The following are some of the salient features of *GeoSearch.*

- Easy Remote Access

GeoSearch is an internet-based application in the public domain (http://gismp.nic.in) where a user sitting at any remote location is able to access the application through internet. User need to have only computer having high speed internet connection.

- Open-ended Design

Presently, it exhibits basic attributes attached with Villages/Panchayat for illustrative purpose only. However, GeoSearch offers a seamless integration of any additional thematic feature/attribute owing to its open-ended design.

- Search

This option facilitates search of a Village/Panchayat in M.P. User has to provide minimum three characters of the desired village. List of villages matching with given criterion appears along with their block name & district name. On selection of desired village, its location along with its neighbouring villages appears on the screen. Similarly any Panchayat in M.P. state can also be located. With Panchayat location, the villages covered under this Panchayat are also highlighted.

- Display of Profile

Profile is a template containing a set of predefined attributes of various entities like Village name, Panchayat Name, total population, SC/ST etc. of a village. User can view the profile of the village by clicking on the map.

- Built-in Traverse-aid

GeoSearch has a built-in traverse-aid which can be used for calculation of distances. It provides facility to measure distance between and two points by drawing a line between them. In addition user can also freely traverse on map and find length of total traversed path.

- Area Measurement

It facilitates measurement of user defined area. User has option to draw a definite shape like circle/ ellipse/ polygon of any size around a selected location and obtain its area. Facility for construction a free hand polygon and obtaining its area is also available.

- Verification of Panchayat formation

Sometimes spread of villages in a Panchayat is not suitable / appropriate. Such anomalies / errors may be brought into the notice of decision makers for corrections. This way Decision makers can harness the potential of *GeoSearch* for various planning activity.

- Legend

It helps the user to correctly read the map by providing information about the spatial features/symbols/ colours being displayed on the map.

- Scale-based display of Labels

System is designed such that labels (Village name, Road name etc.) start appearing once a particular scale/Zoom is attained. This provides convenience to the user to read the map.

- Printing Facility

The displayed map can be printed on the attached printer.

- User-friendly Interface

GeoSearch provides an interactive and user-friendly interface and it does not require any GIS expertise for its operation. Help option illustrates step-by-step procedure on use of various functions available in the application. Please refer **Annexure – I** to see the functionality.

7. **Interoperability & security** (Give details about ability to leverage sharing amongst stakeholders in accordance with map policy, Token services, SSL)

OGC compliant web services are consumed in the development of GeoSearch.

Spatial data offered through GeoSearch is also based on OGC compliant services and thus able to meet the interoperability issue.

The application is SSL (128-bit) compliant by using Digital signature obtained from NICCA, GoI. Token Services are used to consume the web services. These web services are shared with other registered users using tokens only.

System is deployed in NIC GIS-IDC Centre and well supported by SAN infrastructure & planned (DR) Disaster Recovery. It is managed by qualified manpower ensuring the user data & application security. Salted MD-5 encryption has been used for accessing the application.

8. **Scalability** (Give details with respect to technology (Platform, Hardware & software) & data (high and low Geographical and Demographic scale

ArcGIS Server of ESRI is a industry standard, Open Geo-spatial Consortium **(**OGC) compliant & scalable. Front-end chosen for the development is open

source Adobe Flex & J2EE which is scalable & industry standard platform independent. An open ended design concept has been used in the development which makes it scalable in the application domain.

The platform for development / deployment is:

- ArcGIS Server
- Open Source Flex & J2EE based front end
- Open Source Apache JBOSS Web server
- Enterprise Geodatabase
- Dual Core dual processor high-end Rack mounted Servers with Windows Server 2008
- Development platform is scalable, modular, compatible & platform independent

9. **Sustainability & adaptability** (Give details w.r.t architecture/ technology, updation of spatial data, training, human resource, research, local language)

- Technology components are industry standards, OGC compliant & from open source community. They are scalable, modular, compatible & platform independent. Architecture is Service Oriented.

- Updation of spatial data/ attribute data is based on systemic approach. Related attribute/ spatial data is consumed by using web services from various G2G GIS application (i-GeoApproach, GeoForest etc.) and thus continues updation of data is ensured. Thus data is free from redundancy & inconsistency. Other national databases (Census 2001, 2011 & NPD) need to upgrade the architecture so that their data can be consumed using services only. 53 Point of Interest (POI) (**Annexure – II**) pertaining to various dept. (Schools, Health facility, *Uprjan Kendra, Mandis* can be Geo-Tagged using GeoSearch.

- GeoSearch also facilitates searching of Khasra (Land Records Data).

- System is deployed in NIC GIS-IDC Centre and well supported by SAN infrastructure & planned (DR) Disaster Recovery. It is managed by qualified manpower ensuring the user data & application security, Salted MD-5 encryption has been used for accessing the application.

- Major cost items are software and hardware which were met through internal resources. Recursive & maintenance cost is negligible.

- Project management team is consisting of P&RD, M.P./ NIC officials for continuous support. In addition, presence of trained manpower of NIC/ P&RD at the District HQs. ensures the required support for long term sustenance of the project.

- The operation does not require any special training/ skills as it is very simple and user friendly to operate. User manual is already prepared & training has been imparted. The local language support facility is also provided in GeoSearch.

- Users/ Citizens can give feedback by sending mail/ letter so that system can further improve.

10. Adaptability Analysis

(i) Measures to ensure adaptability and scalability

- Hands-on Training

(ii) Measures to ensure replicability

Front-end, Database, Spatial data adopts standard ensuring replicability.

(iii) Restrictions, if any, in replication and or scalability

No restriction.

(iv) Risk Analysis

Disaster Recovery Site is already planned to mitigate the risk.

11. **Accountability** (Give details in regard to roles, responsibility, facility for audit trails)

P&RD & NIC officials are capable of ensuring the smooth functioning of GeoSearch. The data & content available in GeoSearch will be the responsibility of the concerned Dept. officials. IpTracker is also provided with the application for monitoring purpose

12. **New Models of service delivery** (Give details about Public/ private/ NGO/ academic linkages/ citizens)

It offers the framework for the stakeholders (Govt/ Private/ NGO/ Academic Institutions) & Citizens to share & utilize the spatial data as a web service. This innovative approach will arrest the re-creation of spatial data, its redundancy & inconsistency. This approach will help in the creation of SSDI in future.

13. Citizen Centricity (Give specific details on the following#)

(i) Impact on effort, time and cost incurred by user,

It has benefited Government & citizens..

(ii) Feedback/grievance redressal mechanism,

Feedback/ grievances can be communicated by sending email/letters.

(iii) Audit Trails,

Audit trail available

(iv) Interactive platform for service delivery,

GeoSearch supports interactive sessions.

(v) Stakeholder consultation

Regular discussions are conducted with P&RD Staff for continues improvement. Suggestions are reviewed and incorporated into the system.

14. Efficiency Enhancement (Give specific details about the following #)

(i) Volume of transactions processed,

Presently GeoSearch is handling data of all villages/ Panchayats, major roads, railway, major forest, major water bodies.

(ii) Coping with transaction volume growth

capable of coping with the volume growth.

(iii) Time taken to process transactions,

Satisfactory. But with using high speed internet connection at user-end will further improve.

(iv) Accuracy of output,

Accurate.

(v) Number of delays in service delivery

None.

15. User convenience (Give specific details about the followings #)

(i) Service delivery channels (Web, email, SMS etc.)

Web

(ii) Completeness of information provided to the users,

Complete details can be tracked.

(iii) Accessibility (Time Window),

24 X 7 availability.

(iv) Distance required to travel to Access Points

Nil. User can perform sitting at home also.

(v) Facility for online/offline download and online submission of forms,

No need

(vi) status tracking

Not required.

16. **Result Achieved/ Value Delivered** to the beneficiary of the project-(share the results, matrices, key learning's, feedback and stakeholders statements that show a positive difference is being made etc):

(i) To organization

With the development of *GeoSearch* following has been achieved:

- Madhya Pradesh is the first state in the country to offer such a cost effective solution fulfilling the above objectives for citizens.
- It offers the framework for the Citizens, Academic Institutions, Researchers, Organizations (Govt/ Private) & stakeholders to share & utilize the spatial data web services through this architecture in compliance with Government sharing/ restriction policy.
- Looking to the importance of *Panchayats* in Panchayati Raj, identification of *Panchayats* and their constitution becomes very important. GeoSearch offers rational & scientific approach in the constitution of Panchayats and Cluster *Panchayats*
- Digital data comprising of villages/, *panchayats*, roads, railway, major water bodies, administrative boundaries, major forest & its integration with various attributes is now available.
- Design of GeoSearch is such that it offers integration of additional web-services & its updation through other G2G Geo-spatial applications in the state.

- Data security is achieved conforming to Map Restriction Policy of GoI.
- This innovative approach arrested the re-creation of spatial data, its redundancy & inconsistency.
- Major cost items are software and hardware which were met through internal resources. Recursive & maintenance cost is negligible.
- Its powerful search engine expedites the process of locating any village on the map along with its profile just by a click.
- Google Map interface provided high resolution view of the village/ area. This is achieved by linkage of all villages of the state with Google Map.
- Distance & area computation is possible.
- Various Govt. departments (Power utilities, Food & Civil Supplies, Agriculture, Health, Education, Irrigation, Forest, PWD, Disaster Management, Planning, Railway etc.), District Collectors, CEO Zila *Panchayats* & other district authorities are benefited at large.
- Above set of services are adding towards savings in time & cost. Now officials are finding it very useful for preparation of proposal and examination of such proposals is also a few clicks away with the help of GeoSearch. So, it has drastically reduced response time.
- Its active use is expected to make decision making more effective, free from corrupting influences, in view of its inherent capacity to make the process of decision making rational and transparent.
- Extensive use in e-Uparjan project of Food & Civil Supplies, GoMP in grain procurement.
- Pilot attempt for BSNL, M.P. for assessment of Base Transceiver Station (BTS) coverage for Wi-Max service with the objective of providing connectivity to all the *Panchayats* in the district.
- Geospatial modelling using the web services provided by this framework has resulted in optimization for maximum coverage of *Panchayats* for Bandwidth Connectivity.
- This innovative approach will arrest the re-creation of spatial data, its redundancy & inconsistency and thus may lead towards realization of State Spatial Data Infrastructure (SSDI) in future.

(ii) To citizen

Earlier there was no means to have location of village / *panchayats* along with its neighbouring details. Manual retrieval of such information used to be a tedious job. Updation of map data was a challenging & time consuming process. Now availability of digital spatial data and its easy access have drastically saved time, efforts & cost.

It has benefited citizens/ villagers/ academic Institutions too. Now there is no need of Paper Maps in the state. They are accessing the GeoSearch for various activities related to rural areas. Villages are benefited from decision / proposal evaluated with of support of GeoSearch and it also helps organization to manage better with scarce resources. Its active use is expected to make decision making more effective, free from corrupting influences, in view of its inherent capacity to make the process of decision making rational and transparent.

(iii) Other stakeholders

Govt. Departments are also benefited at large.

17. **Extent to which the Objective of the Project is fulfilled**-(benefit to the target audience i.e.G2G, G2C, G2B, G2E or any other, size and category of population/stakeholder benefited etc):

The project **GeoSearch** has helped dispel several myths surrounding the GIS-based systems. It has demonstrated that GIS-based systems can be made simple, user friendly and can be used efficiently to facilitate a rational and transparent approach to decentralized planning & decision making to cater G2G needs. The design of the framework is able to offer the desired GIS functionality to the citizens meeting their expectations on bandwidth & simple usage. GeoSearch has shown that one need not require any special expertise to perform spatial & non-spatial data queries/ analysis and it can be used by decision makers directly.

It could gain wide appreciation at all levels of presentation. It has become essential & dependable tool for all decision makers at District / State level, Citizens, Academic Institutions, Researchers. It has been recommended for nation-wide replication.

18. **Comparative Analysis of earlier Vs new system with respect to the BPR, Change Management, Outcome/benifit, Change in legal system, rules and regulations**

Comparative Analysis

	Success Indicator	Response Time		Efforts	
		Before	After	Before	After
a.	DPR preparation in regard to various Rural Developmental schemes (PMGSY, MMGSY, Watershed management etc.) & creation of basic amenities (Education, Health, Agriculture *Mandis*, Seed & Fertilizer Depots, Warehouse etc.) (for one district)	12-15 weeks	One week	600 mandays	1 manday
b.	Location & attribute Search of village/ panchayat by citizen	4-5 weeks	Few mouse clicks	30 mandays	Negligible
c.	Block Map for citizen	4-5 week	Few mouse clicks	30 mandays (Pay cost)	Negligible (Free of cost)
d.	Grievance by villager/ public representative	15 – 21 days	Few mouse clicks	1-5 mandays	Negligible
e.	Remote village on High Resolution Satellite Imagery for verification (on Google)	Week Cannot predict	Few mouse clicks		Negligible
f.	Verification of DPR in view to length of roads, proximity analysis etc.	1-5 days	Few mouse clicks	1-5 mandays	Negligible
g.	Optimization of Broadband Connectivity to Panchayats	52 Weeks	One week	1000 mandays	7 mandays.

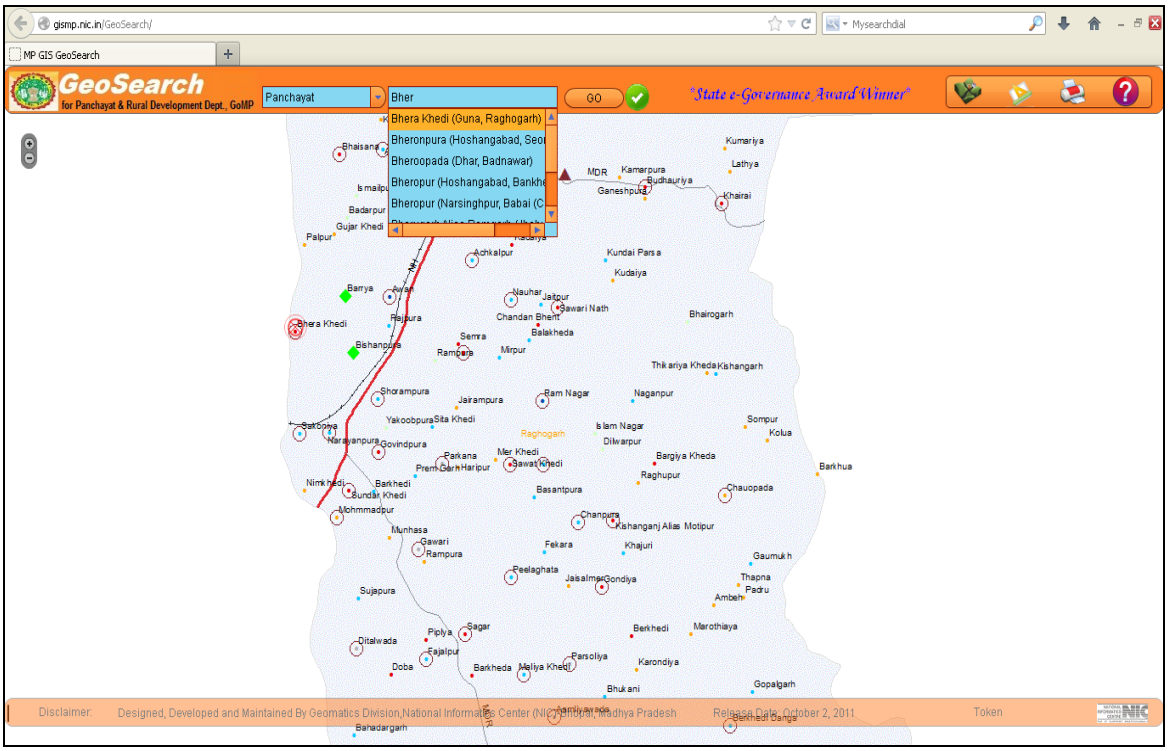
	Verification & re-allotment of e-Uparjan Kendra to 40 Lakhs villagers for grain procurement	1 week	Few mouse clicks	6 mandays	Negligible
h.	NOC for road works amongst various agencies	15- 30 days	Few mouse clicks	10 mandays	Negligible
i	Verification of Panchayat constitution	2-3 weeks	Few mouse clicks	15 mandays	Negligible

19. **Other distinctive features/ accomplishments of the project**:

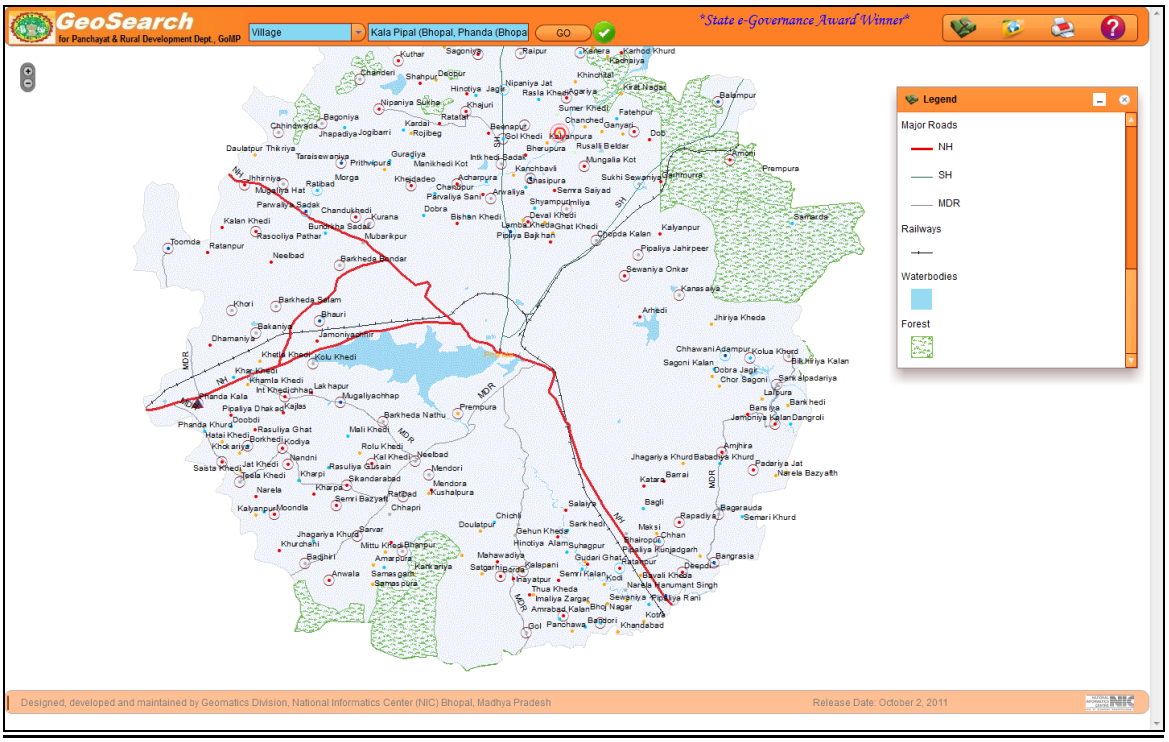
1. GeoSearch bagged "Excellence in e-Governance Initiatives" award in the category "Best use of GIS in brining e-Governance solutions in M.P."

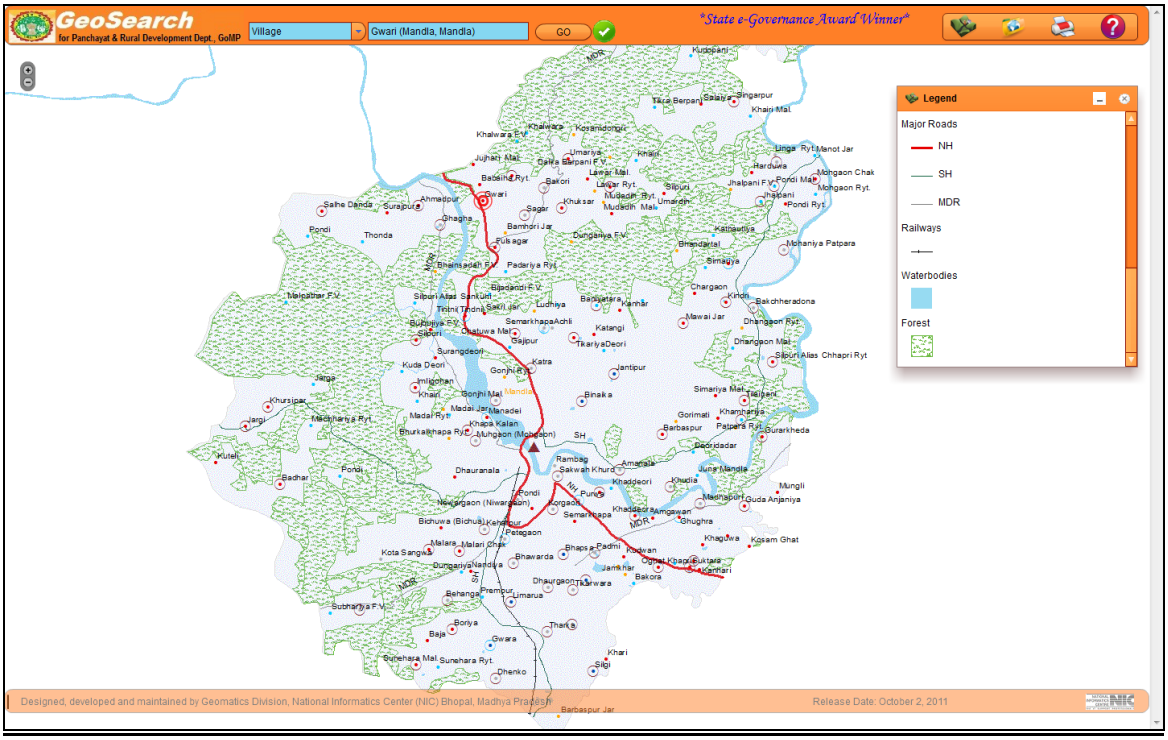
This is just an indicative list of indicators. Applicant can add on more information based on suitability of the project nominated.

Annexure - I

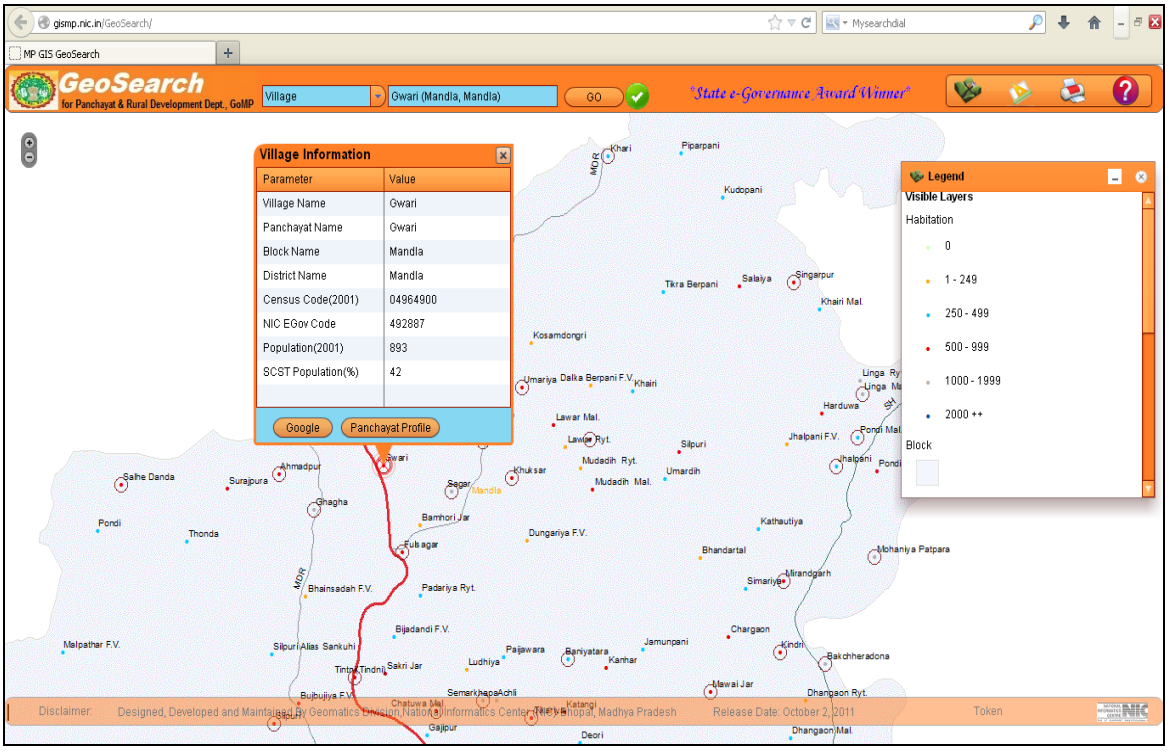


Map Having Forest, Water bodies and Railway

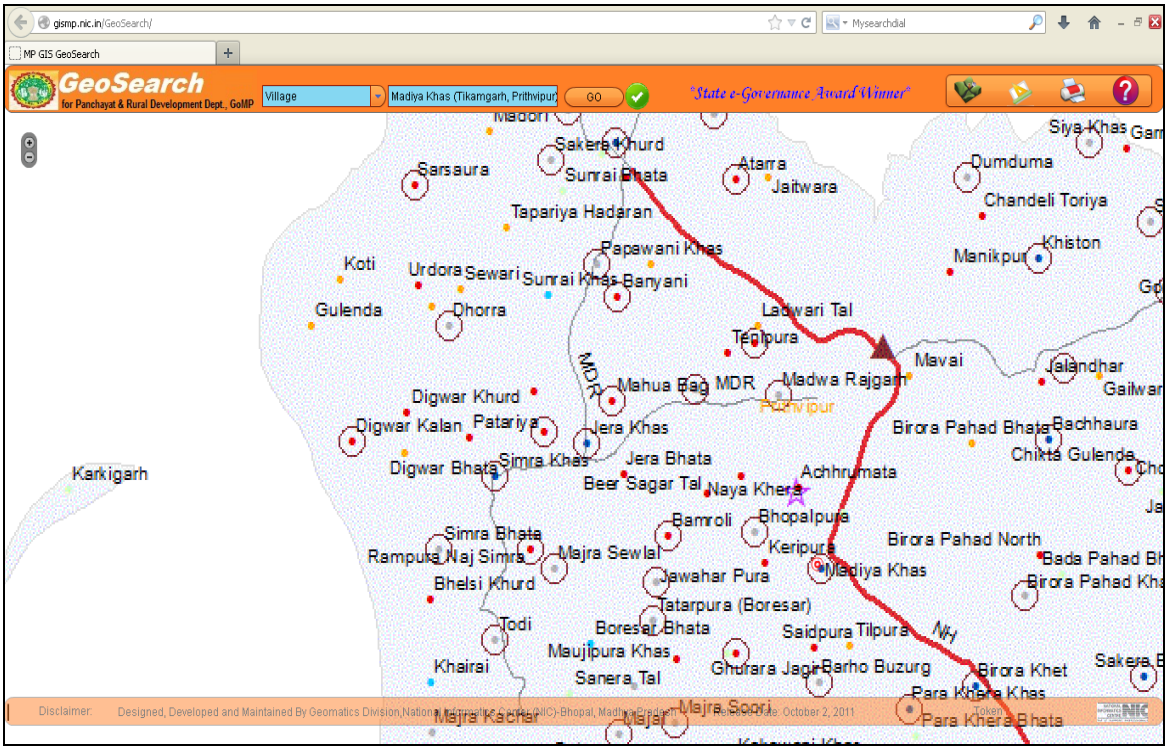




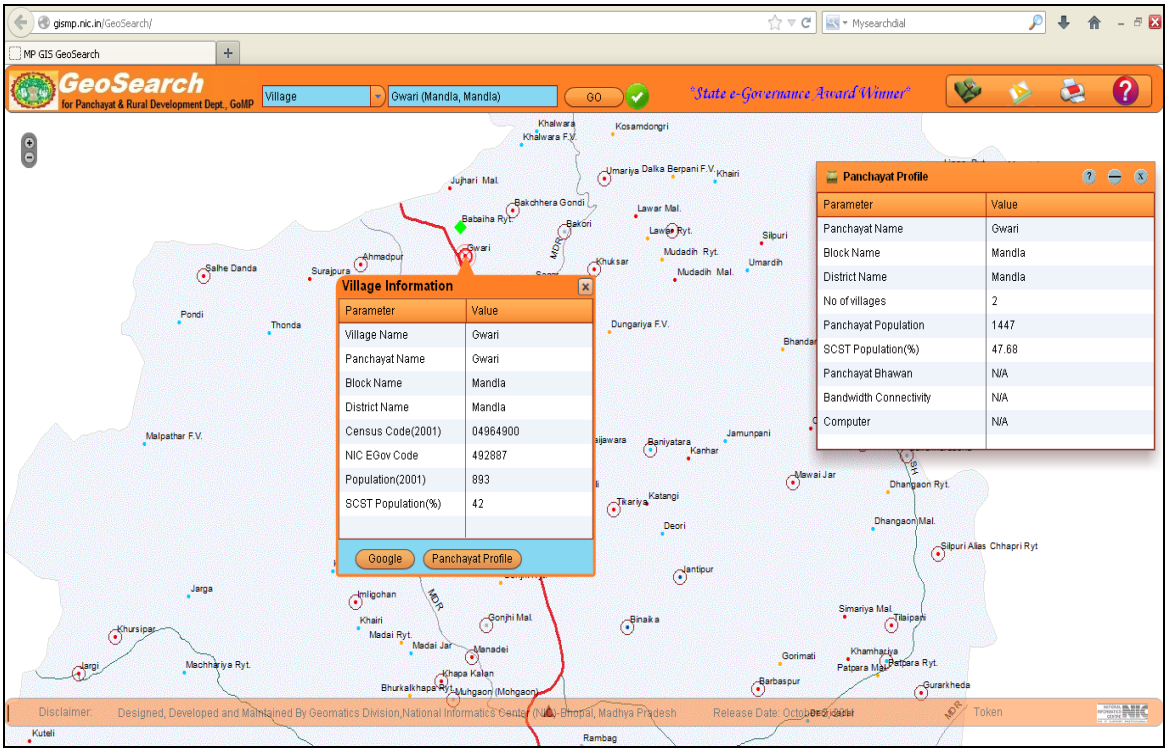
Search Result with Village Information and Legend



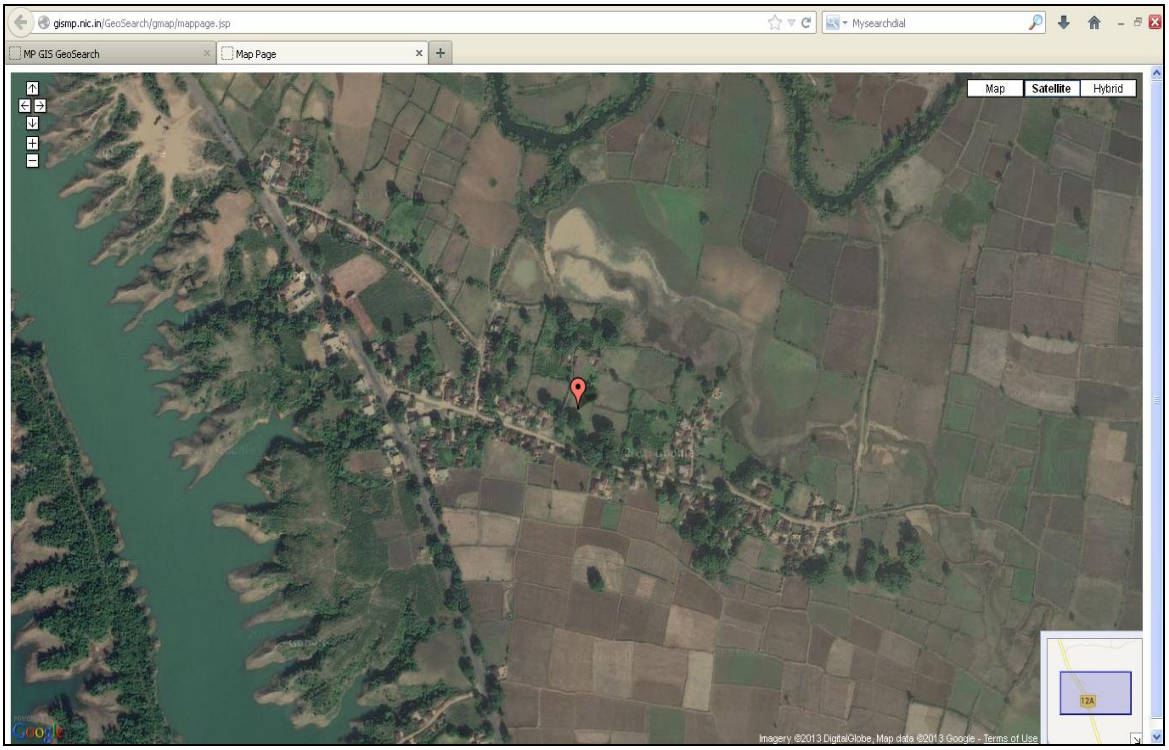
Village at Zoom level



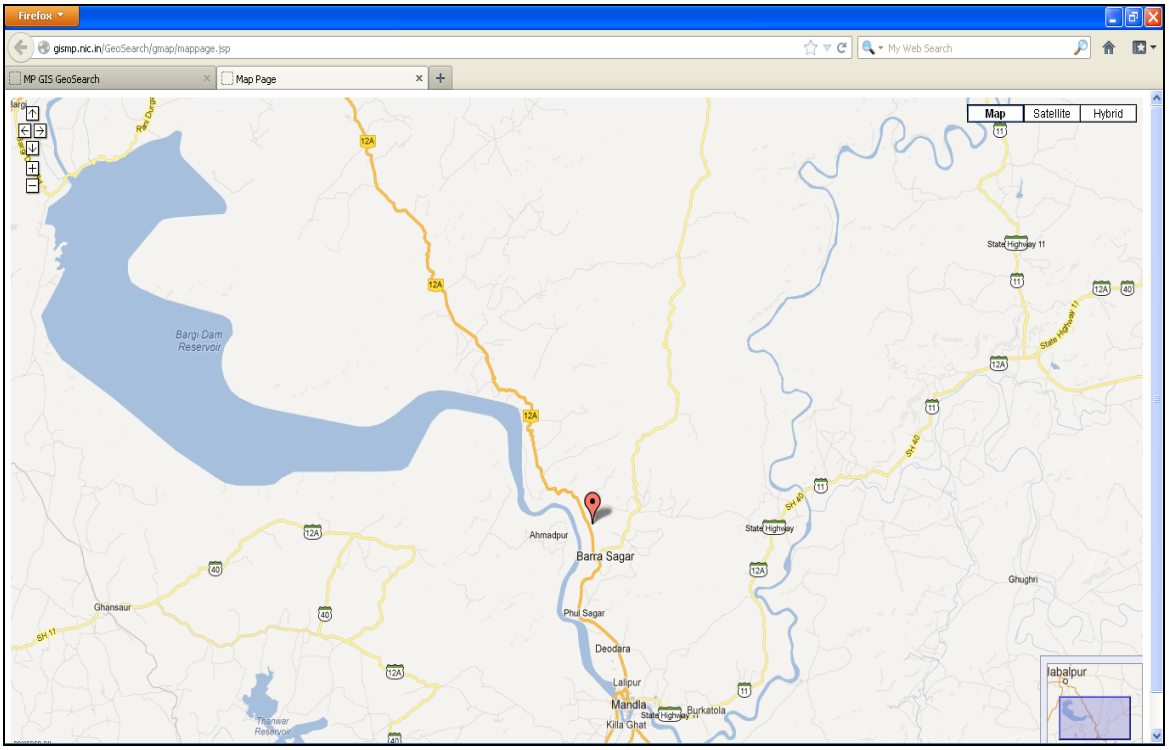
Village Information with its Panchayat Profile



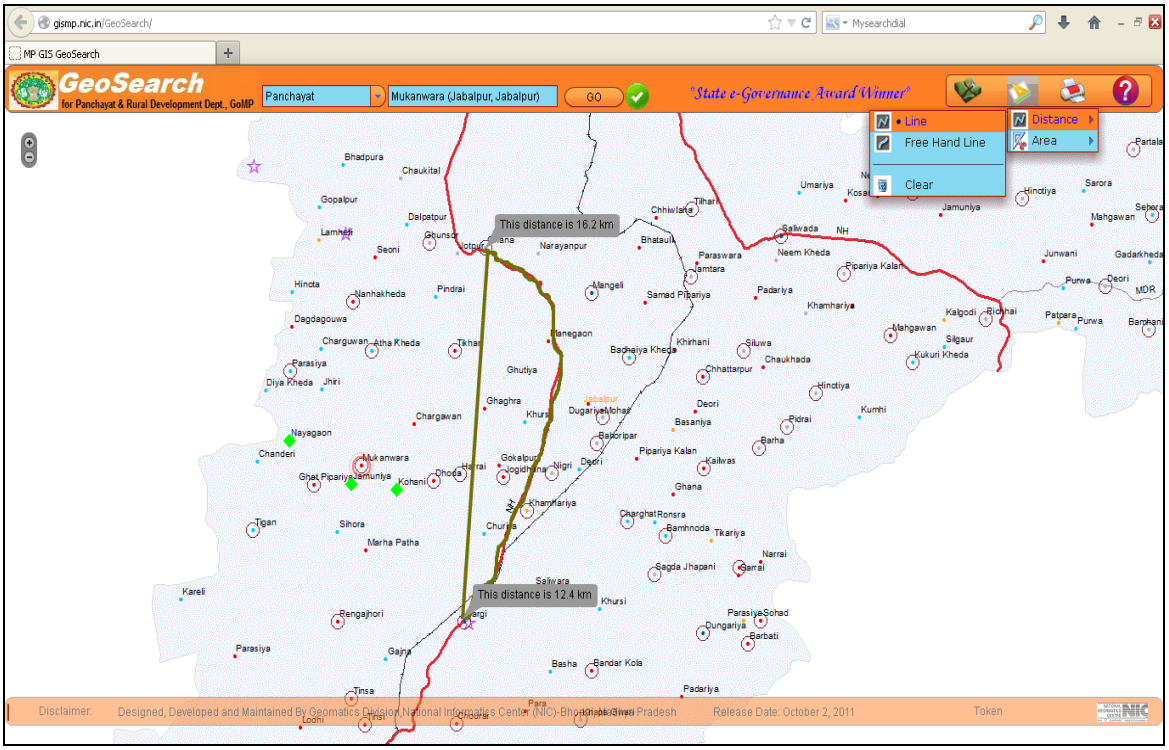
Village Location on Google (Satellite View)



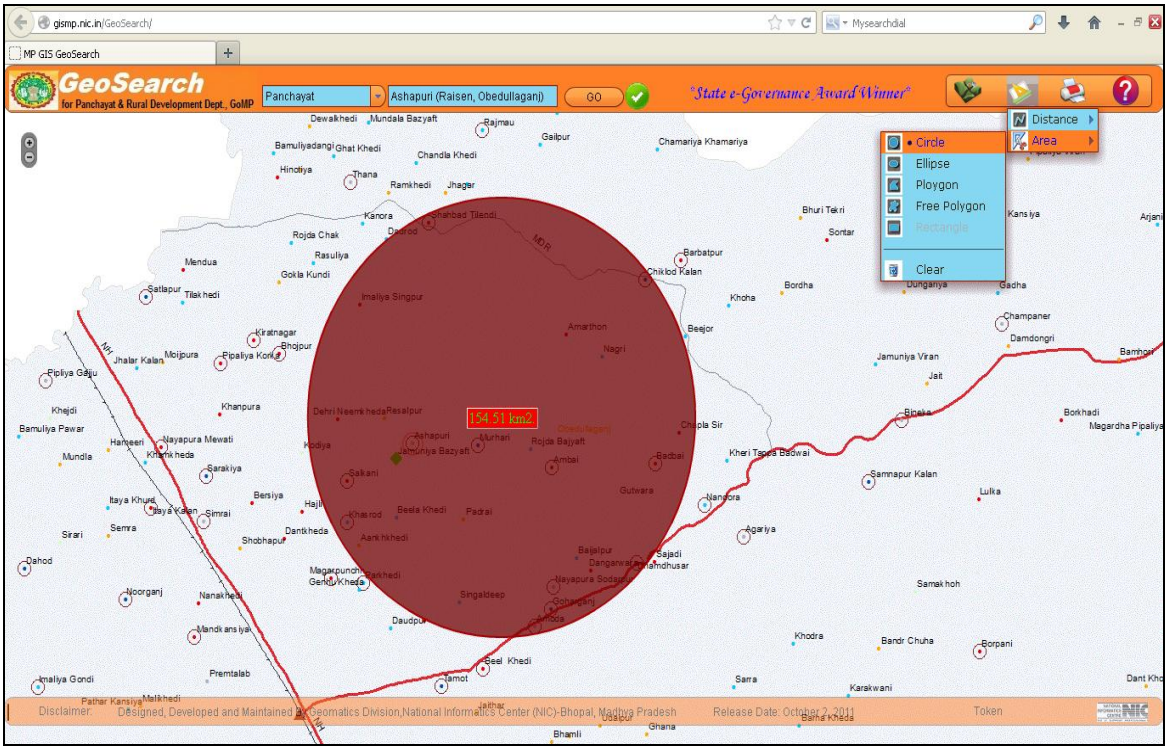
Village Location on Google (Map View)



Measure Line Distance between Villages/Panchayats



Measure Area



Annexure - II
Geo-Tagging Point Of Interest (POI) Categories

S. No.	Category Symbol	Category Name	Sub-Category Name
1		Medical Facility	• Aanganwadi • Ayurvedic Dispensary (operated by Municipal Corp) • Civil Dispensary • Civil Hospital • Community Health Centre (CHC) • District Hospital • ESI Dispensaries • ESI Hospital • Govt. Ayush Dispensary • Poly Clinic • Primary Health Centre (PHC) • Private Hospital / Nursing Home (>10 beds) • RLY / PSU Hospital • Super- speciality Hospitals (Govt./ Pvt.) • TB Hospital • TB Sanatorium • Trauma Centres • Trust Hospital • Urban Health Centre (Posts) • Veterinary Hospital
2		Education Facility	• Ayush Hospitals and Medical Colleges • College • Engineering College • High School • Higher Secondary School • ITIs • Krishi Vigyan Kendra • Medical Colleges - Govt and Private • Middle School • Polytechnics • Primary School • Skill Development Centers • Universities

3		Agriculture Facility	• Agriculture Warehouses • Fertilizer Depot • Mandi • Seed Depot • Uparjan Kendra
4		Water Bodies	• Anicut • Canal • Lake • Nalla • Pond • River • Spring • Tank/Reservoir • Well
5		Post Office	
6		Fair Price Shops	
7		Police Stations	
8		Govt. Buildings	
9		Mining Sites	
10		Sub Stations	
11		Tourist Spots	
12		Transportation	• Airport • Bus Stand • Railway Station
13		Religious Places	• Church • Gurudwara • Mosque • Temple

14		Others	• Common Service Centers • Industries • Lok Seva Kendra • Malls • Night Shelters • Petrol Pump • Slum Locations • Sports Ground • Urban Family Welfare Centre