GIS Mapping Usage for INRM Planning

Information Required for NARWA Plan

Non-Spatial Information

- Facts and figures for natural resources, production systems and human-natural resources interactions
- Various online sources provide access to data sets & departmental information
- MIS information available in NREGA soft

Spatial Information

- Topo sheet- SOI & Cadastral maps-Bhuiyan
- Thematic Outputs from Bhuvan Portals
- Geo MGNREGA
- Remote Sensing (RS) data sets/images /Google Earth Pro
- Mera Bhujal app (Central Ground Water Authority)

Spatial Information

S.N	Information	Source
Maps of Gram Panchayat/Catchment area		
A	1.Cadastral /Revenue Maps	Revenue Department/Bhuiyan Site
B	2.Watershed Map	Watershed Atlas (NRSC Atlas, WCDC-CGSWMA)
C	3.Contour Map	Global Mapper data validated with Topo sheet or Control points.
GIS & RS outputs (Thematic Maps)- 1:50,000		
D	1. Drainage Line Map 2. Erosion Map 3. Land use/Land cover Map 4. Lineament Map 5. Geomorphology Map 6. Wasteland Map 7. Ground Water Prospects Map	Bhuvan Portals
Others		
E	1.Location Map	Maps of India/others sources
F	2.Proposed Activity Map	After Ground truthing all structure
G	3.CLART Map	FES

What types of RS & GIS outputs are important for rational and scientific planning & It Sources?

How and which step of planning GIS & RS information would be used?

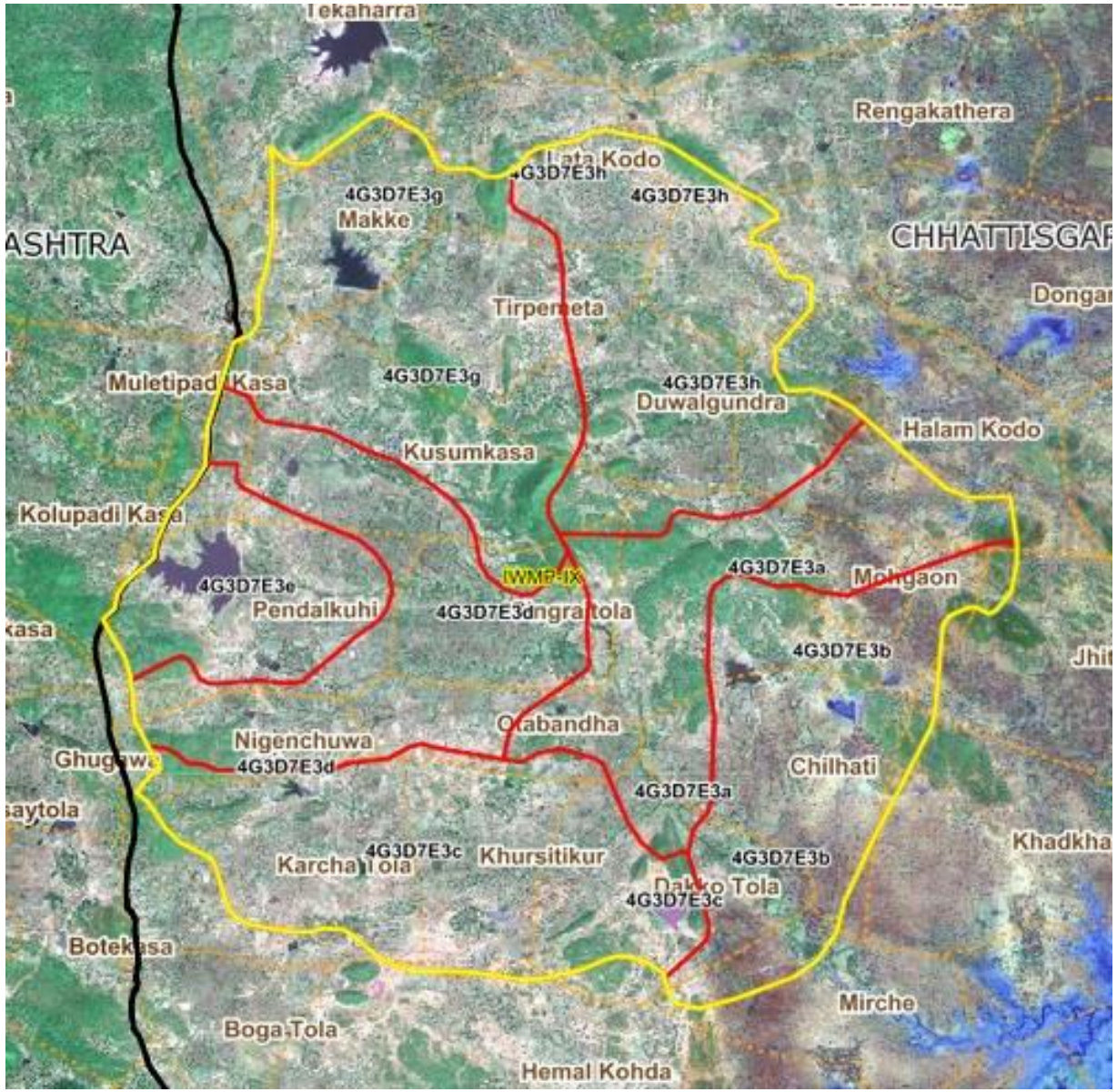
- Thematic outputs generated by GIS are important for rational and scientific planning with villagers in process of identifying of potential NRM works and site identification
- Identified works to be analyzed on economic, environmental and social aspect.
- The identified works to be listed and mapped on watershed principles.
- Simplified large-scale maps and thematic overlays are useful to validate results with the information providers or to enable their participation in applying the results.
- This exercise enables the community to express local needs into spatial information and further into plans, actions and results.
- It also ensures active participation of community in management of GP level INRM Plan.

Micro-watersheds and Satellite data:

-The micro and macro watershed boundaries are available Dist. WCDC and these are based on NRSC watershed atlas.

-As per the guidelines, it is important to identify the macro and micro watersheds belonging to GP areas.

-The related information of micro watershed can be referred for documenting the relevance of various interventions in an area treatment mode.



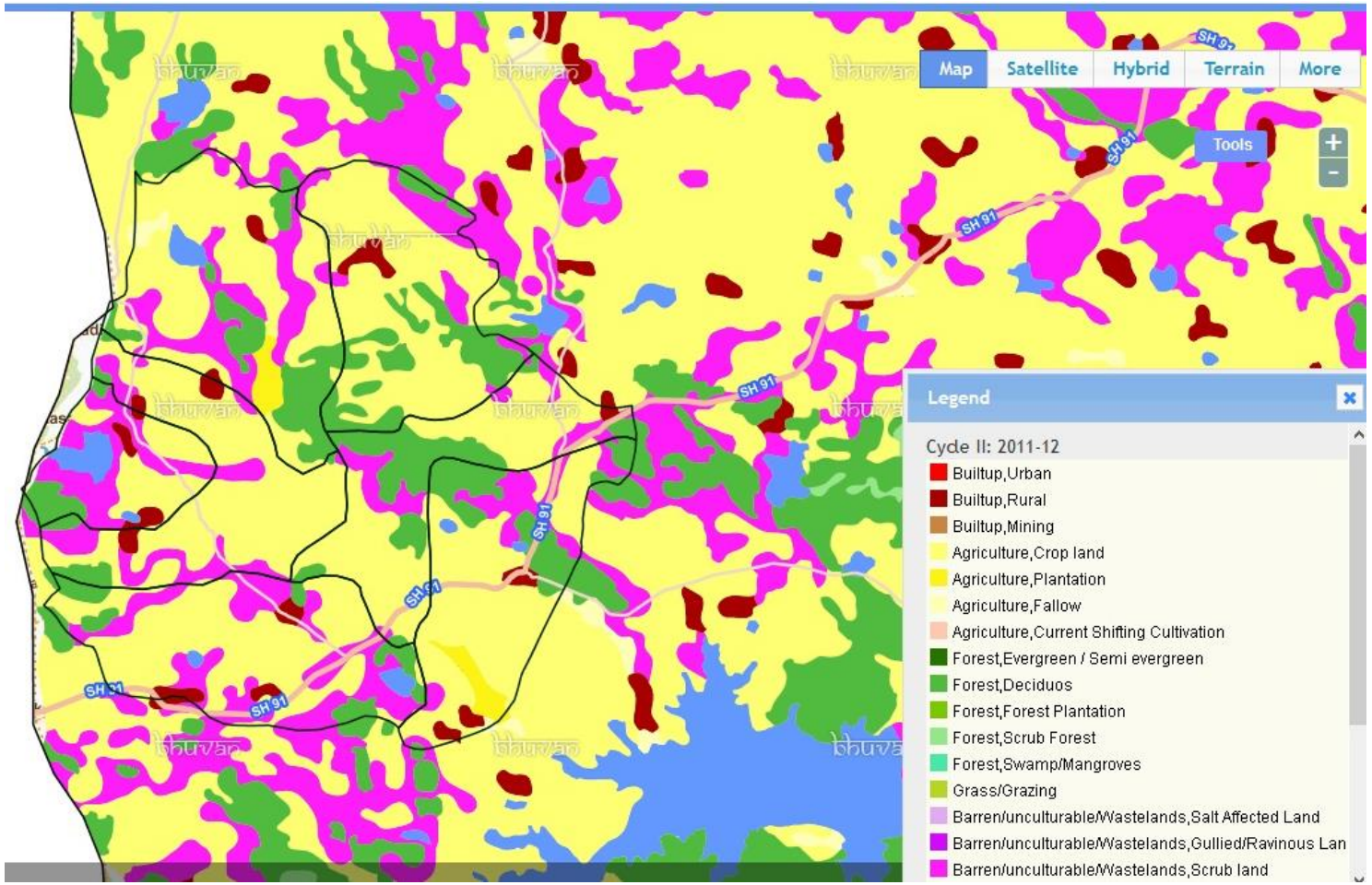
Land use / Land cover Map:

-This describes land use pattern of the area which is important for making decisions related to MGNREGA interventions.

-LULC map helps us in understanding the land status and its utilization.

-As shown in the map, there is contiguous patch of forest which require treatment for ensuring sustainability of assets in low lying, common and farm areas.

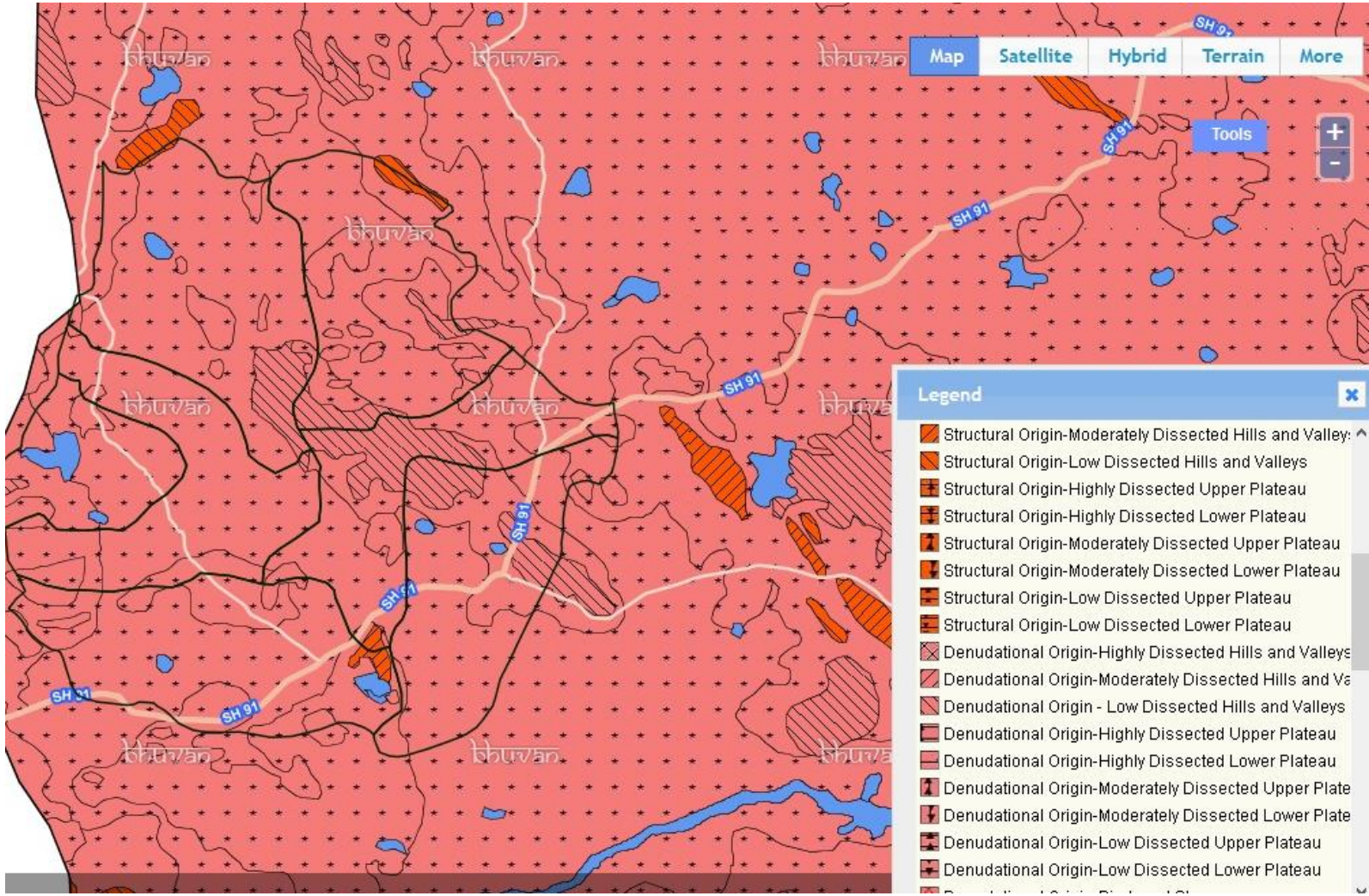
-The LULC maps are developed by NRSC for whole country and are available on 1: 50,000 scale at the interval of 5 & 10 years respectively.



Geomorphology Map:

-The geomorphology and related structural map depicting lineaments, faults, folds etc. important for understanding relevance of WHS particularly to assess the recharge or impounding nature of the asset.

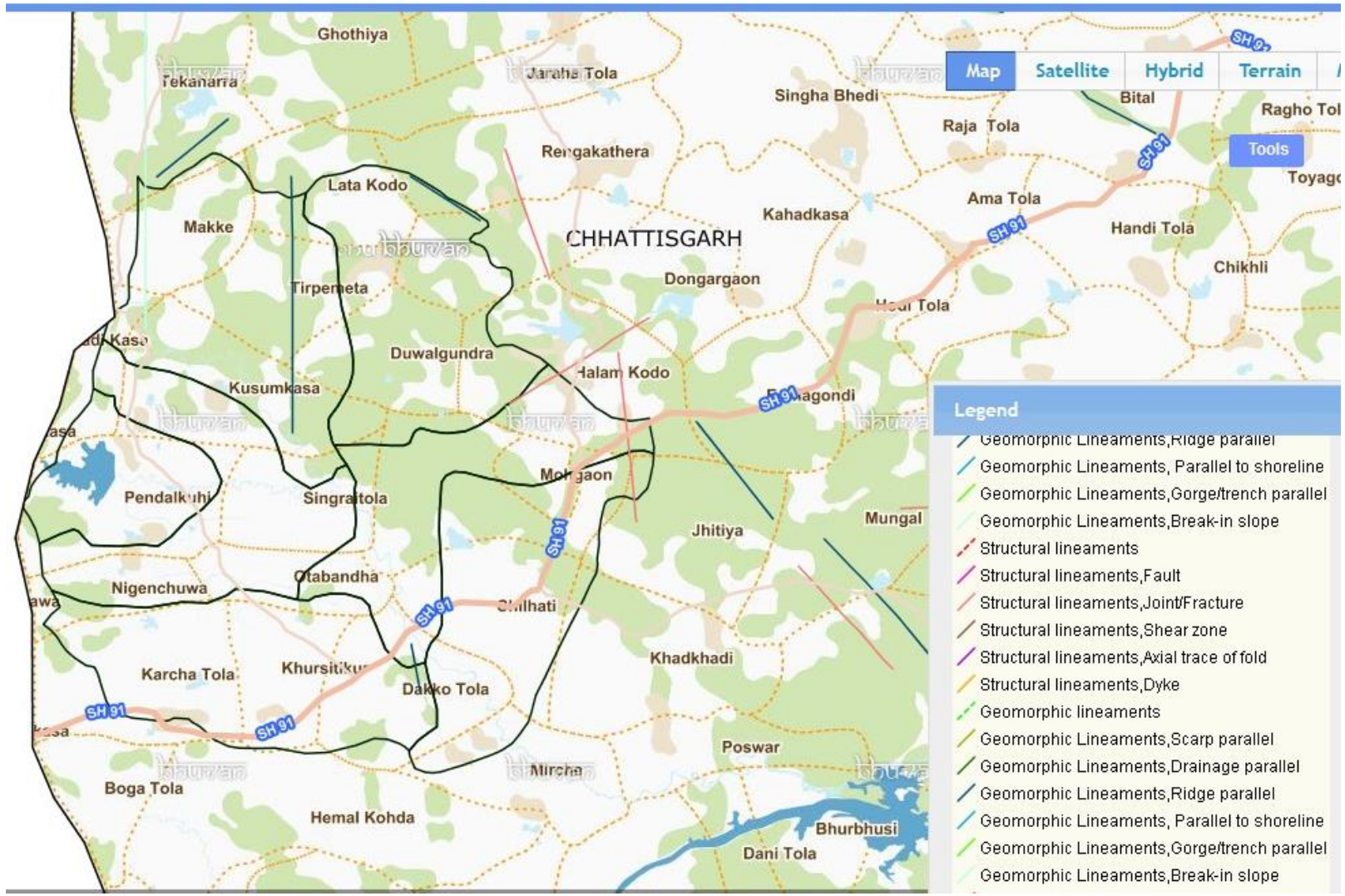
-The particular layer is available with Bhuvan and it provide important details for determining the interventions in particular location.



Lineament Map:

-The structural features are particularly important for making decisions related to ground water recharging structures like Percolation Tank & Recharge Pit Etc.

-A lineament is a linear feature in a landscape which is an expression of an underlying geological structure such as a fault. Typically, a lineament will appear as a fault-aligned valley, a series of fault or fold-aligned hills, a straight coastline or indeed a combination of these features. Fracture zones, shear zones and igneous intrusions such as dykes can also be expressed as geomorphic lineaments.



Drainage and water resources map:

-All the existing water conservation and harvesting structures geo-tagged and analyzed for scoping of required interventions

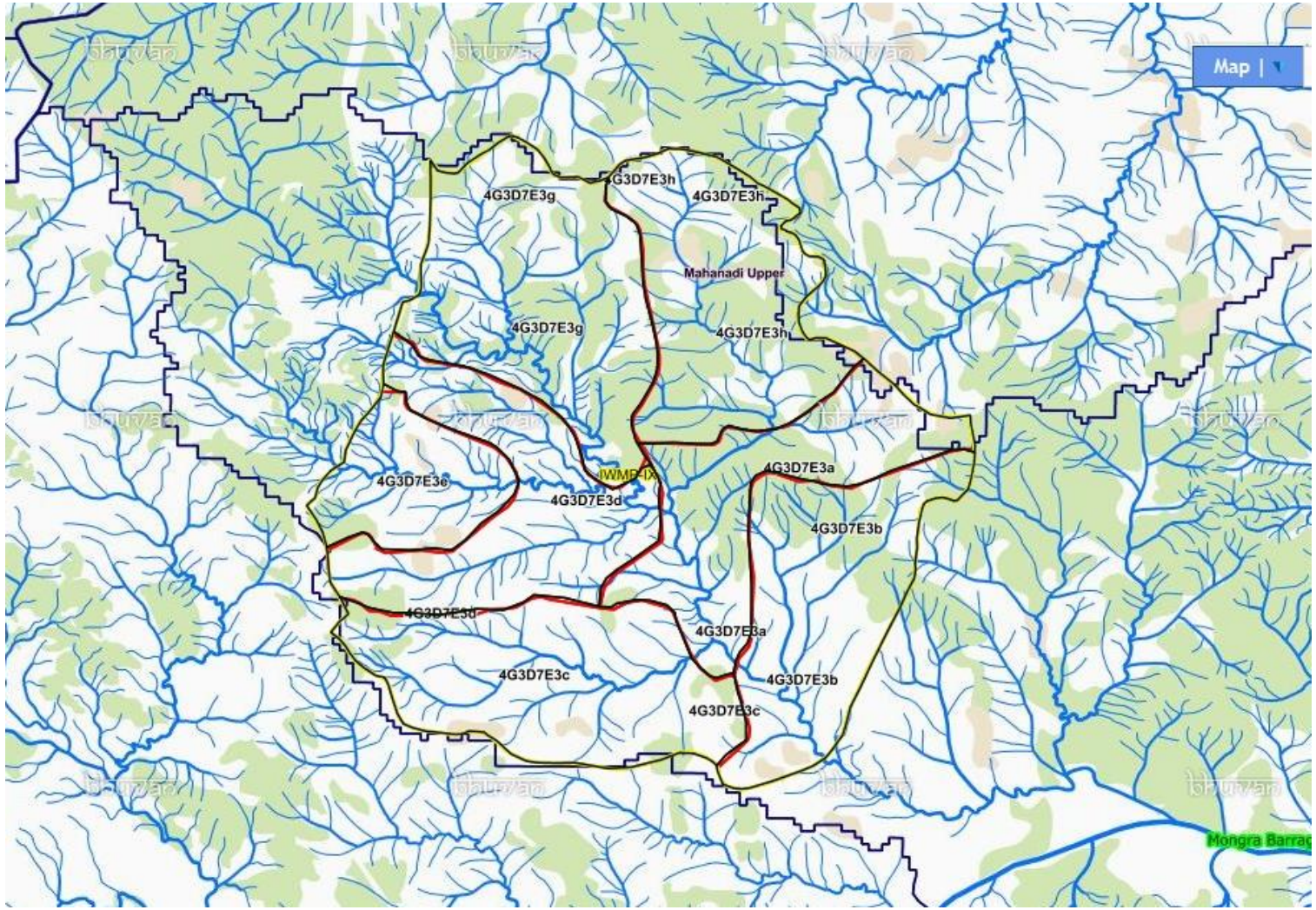
-Proposal of structures based on Stream order

Ist order stream- Brushwood dam, Gully plugs, LBC, MPT etc.

IInd order stream-Earthen Gully Plug,LBC, Gabion structures, PT etc.

IIIrd order stream-Gabon structure, Underground Dyke, Check dam, Stop Dam, PTs, Stream Bank Plantation etc.

IVrd order stream- Underground Dyke, Check Dam, Stop Dam, Anicut, Stream Bank Plantation etc.

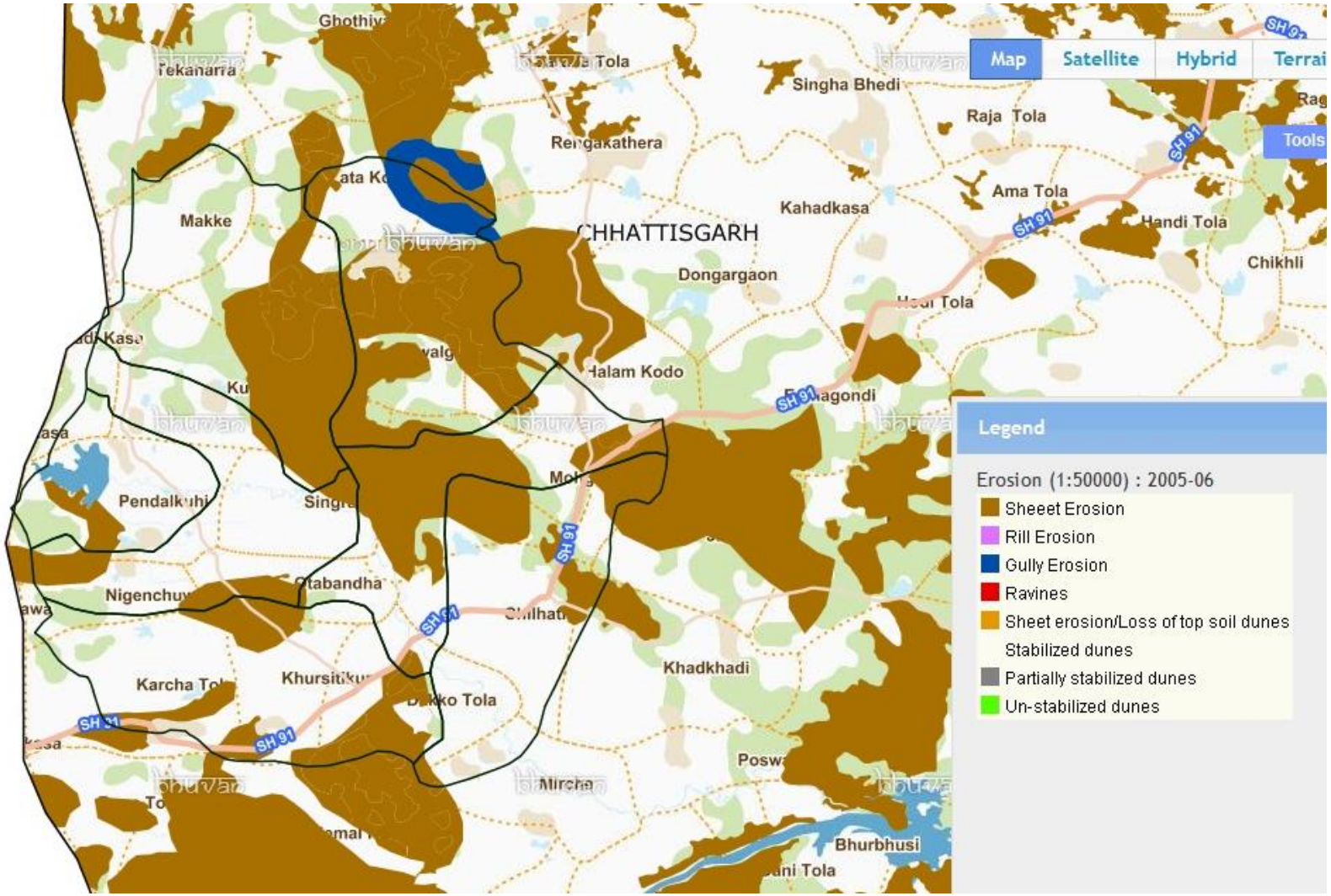


Above all are standard, Structure depends on field conditions. Ground truthing required for structure planning

Soil Erosion map:

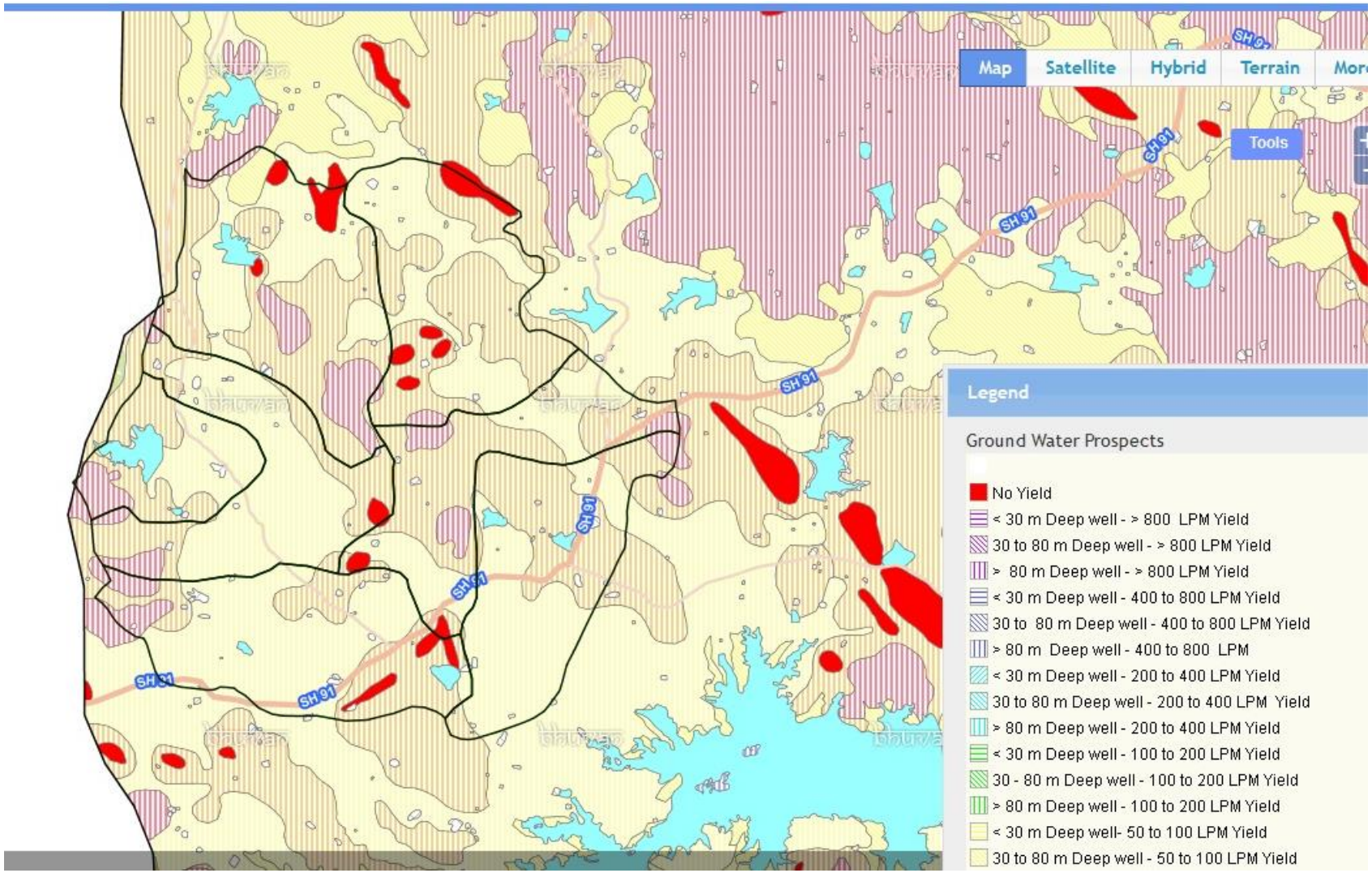
Soil erosion is defined as the wearing away of topsoil. Topsoil is the top layer of soil and is the most fertile because it contains the most organic, nutrient-rich materials. One of the main causes of soil erosion is water erosion, which is the loss of topsoil due to water.

Brownish colours patch mainly shows sheet erosion, soil conservation activity proposed like afforestation, plantation etc



Ground Water Prospects Map

The groundwater prospects maps contain comprehensive data on groundwater using remote sensing technology and Geographic Information System (GIS). Further the maps serve as a reference database for identifying potential locations both for drilling wells and constructing recharge structures specific to the site.

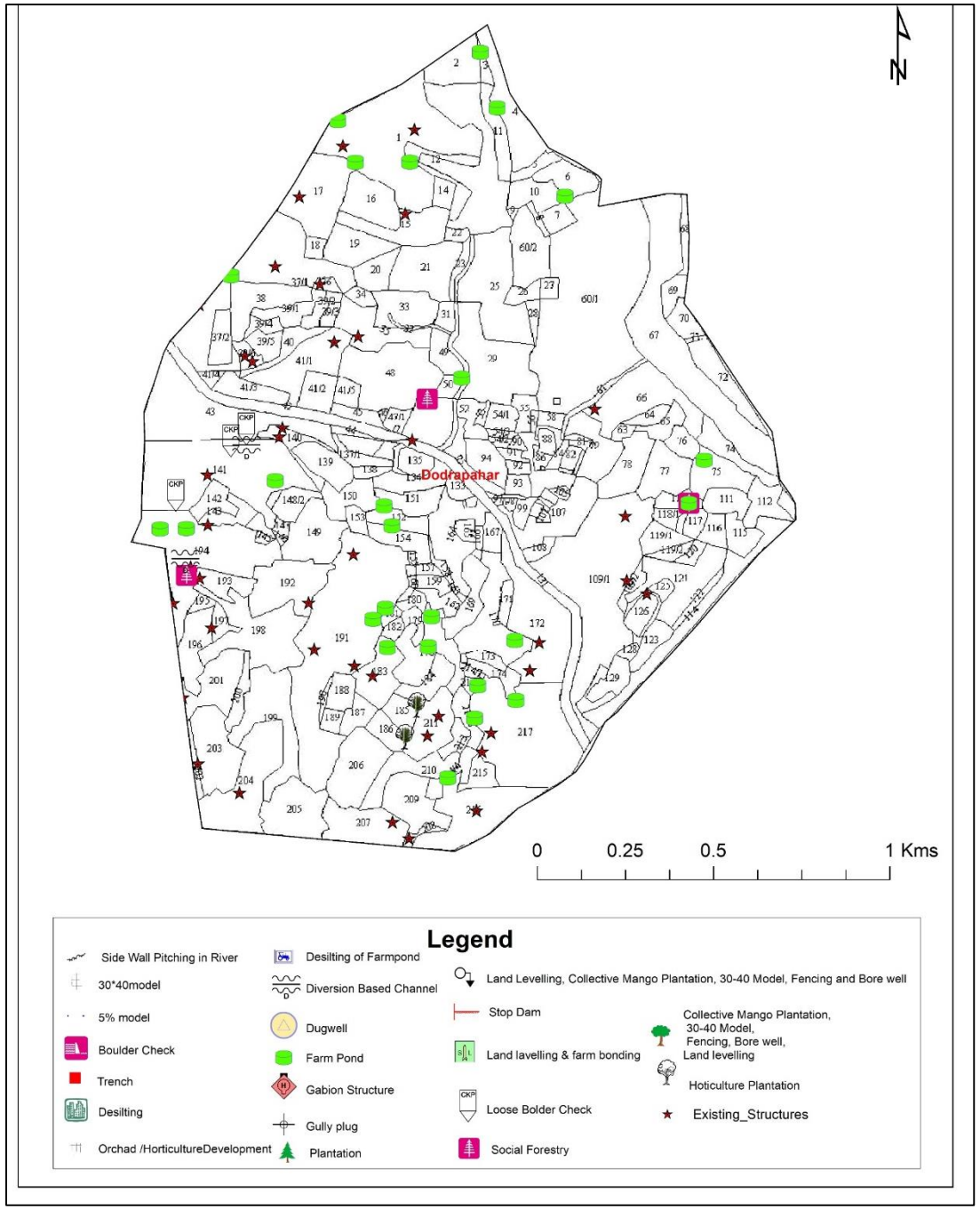


Scope of potential interventions sites maps of all villages

- These map are generated after over laying the village boundary and coordinates of proposed work sites over Google Earth.
- It helps in understating the relevance of specific intervention with an overview of hybrid satellite image showing current physical state of land parcels and need of conservation / regenerations measures for degraded areas.
- These provides insights for scoping of NRM works in a specific context. . The coordinates of planned works sites were overlayed on Google Earth with different legends for types of work.
- Overlaying of these information on satellite imagery provide clear preview of potential works keeping in mind the current physical status of GP area.

Proposed NRM works Map:

-This map is important for determining interventions based on watershed principles along with NRM approach.
-The specific interventions required in different landscapes such as ridges, drainage lines, open areas, farm lands based on ridge to valley concept.
-The priority of interventions can be determined more accurately with help of this thematic output.
-The map is generated through geo-tagging of proposed work sites to analyse and document the importance of the intervention in particular context.
- The expected outcomes of the intervention can also be recorded more objectively with the help of this thematic map.



Live demonstration on Bhuvan Portals & Google Earth Pro

- To understand the features and application of these portals
- To analyse a particular GP for its local characterization and natural resources
- Scoping for potential works in INRM context
- To Geo-Tag the potential work sites
- To record the outcomes of proposed interventions