



Role of Spatial Analysis in Rural Spatial Planning “Bongshor”



Progress review meeting
9th December 2020

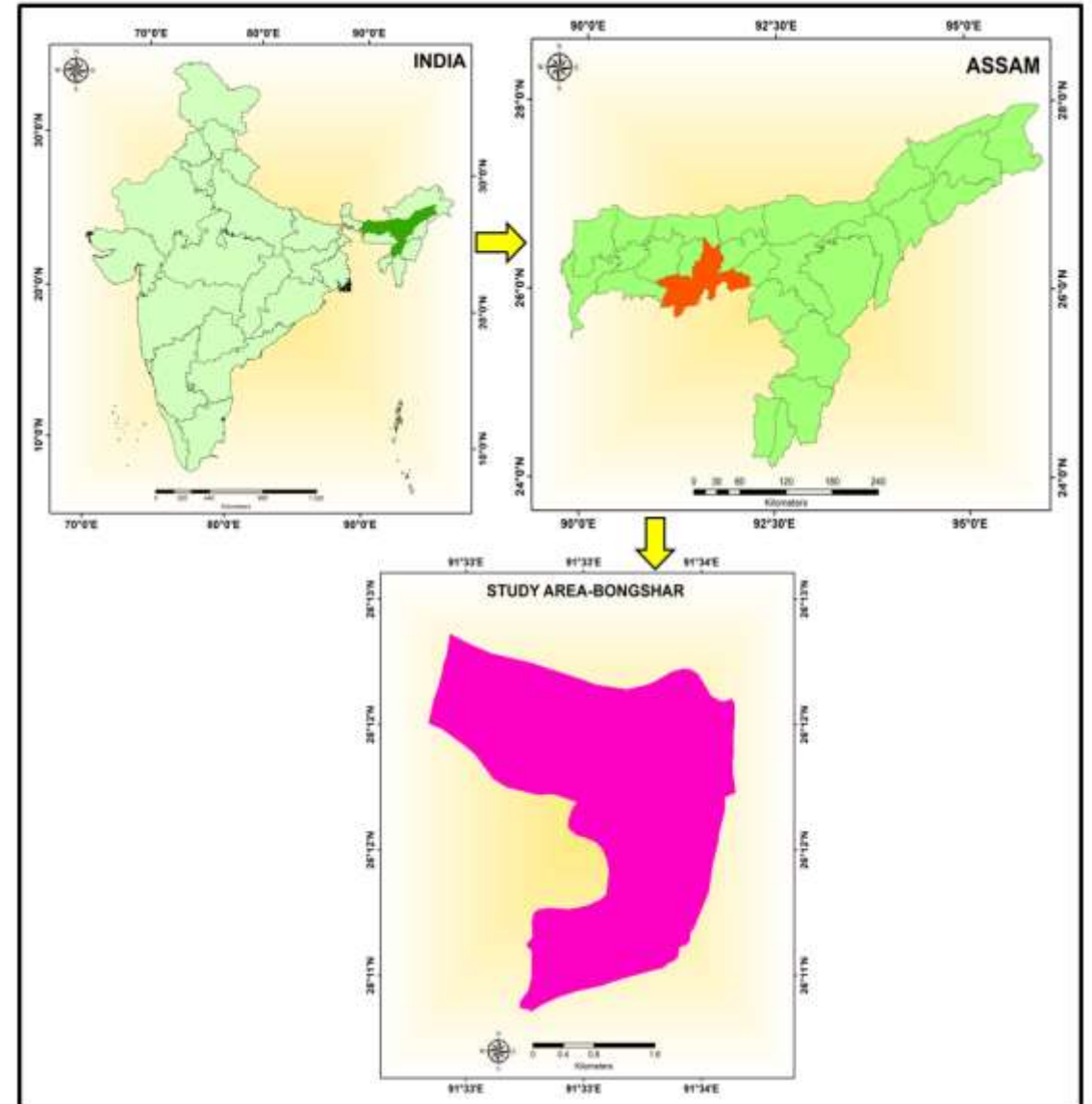
Indian Institute of Technology Guwahati

Bongshor

1. To explore the potential of RS-GIS data in rural spatial planning
2. To carry out the rural spatial planning for the selected GP - Bongshor
3. To propose a detailed architectural planning using RS-GIS and field data for overall development of the GPs.

Study Area: Bongshar

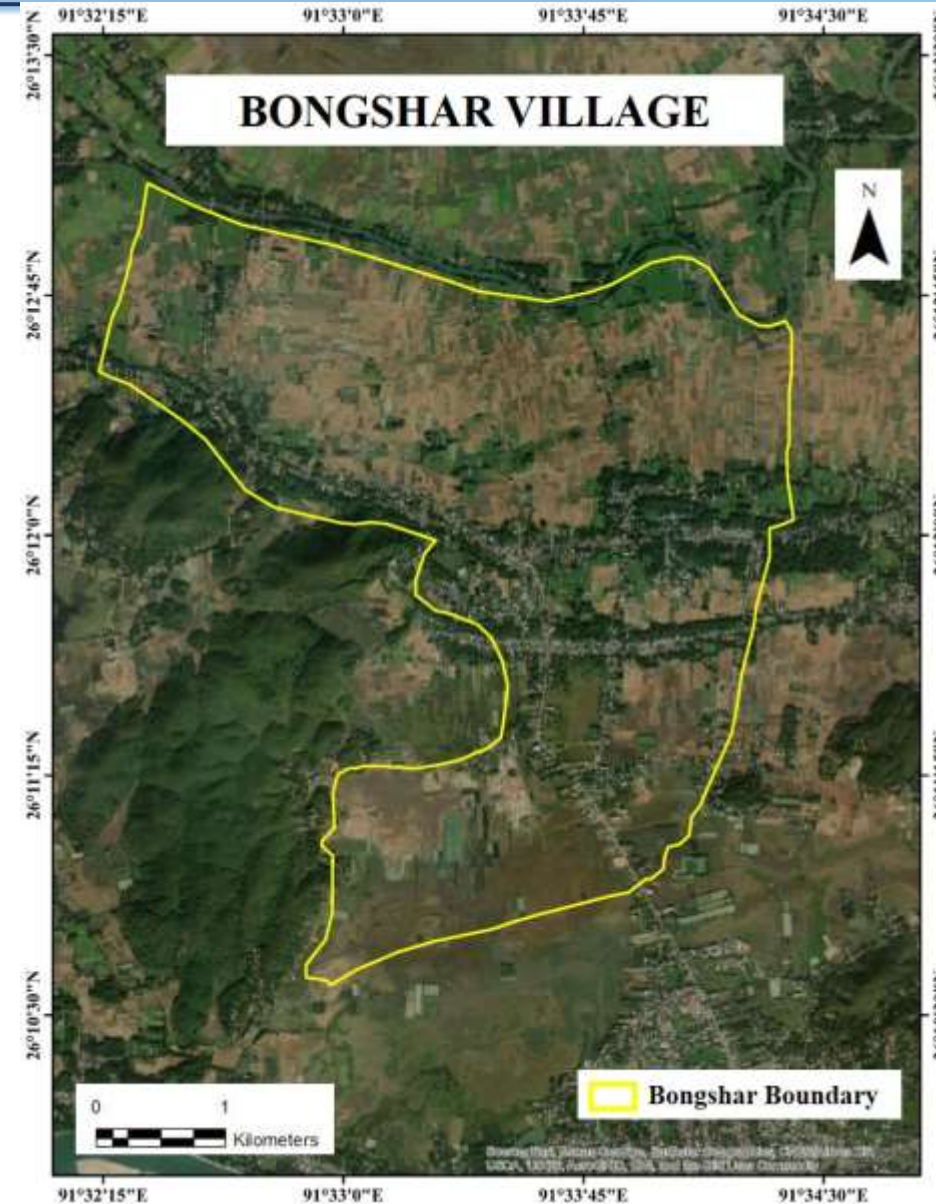
- Bongsor (PIN - 781103)
- Block – Sualkuchi
- District- Kamrup
- Population size – 9500
- Proximity to city - 25 km from Guwahati
- National Highway - NH 27
- State Highway - SH 41 and SH2
- Bongshor is reputed for cottage industry engaged in handloom.



Location Details

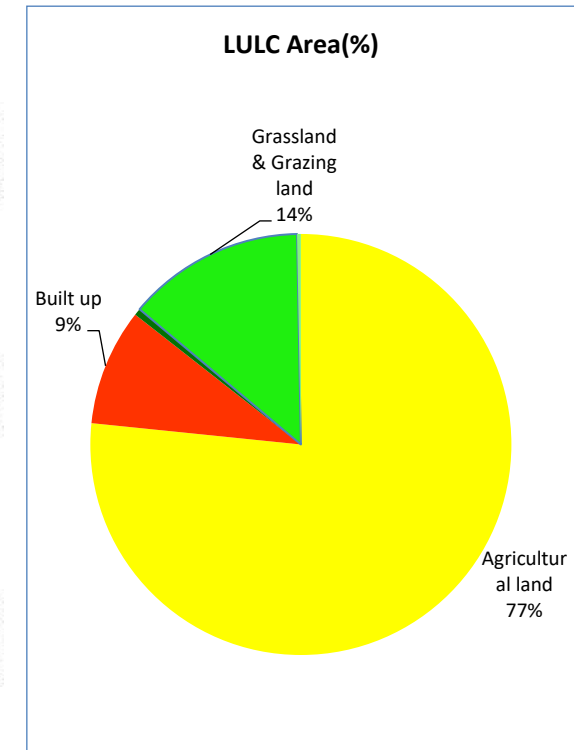
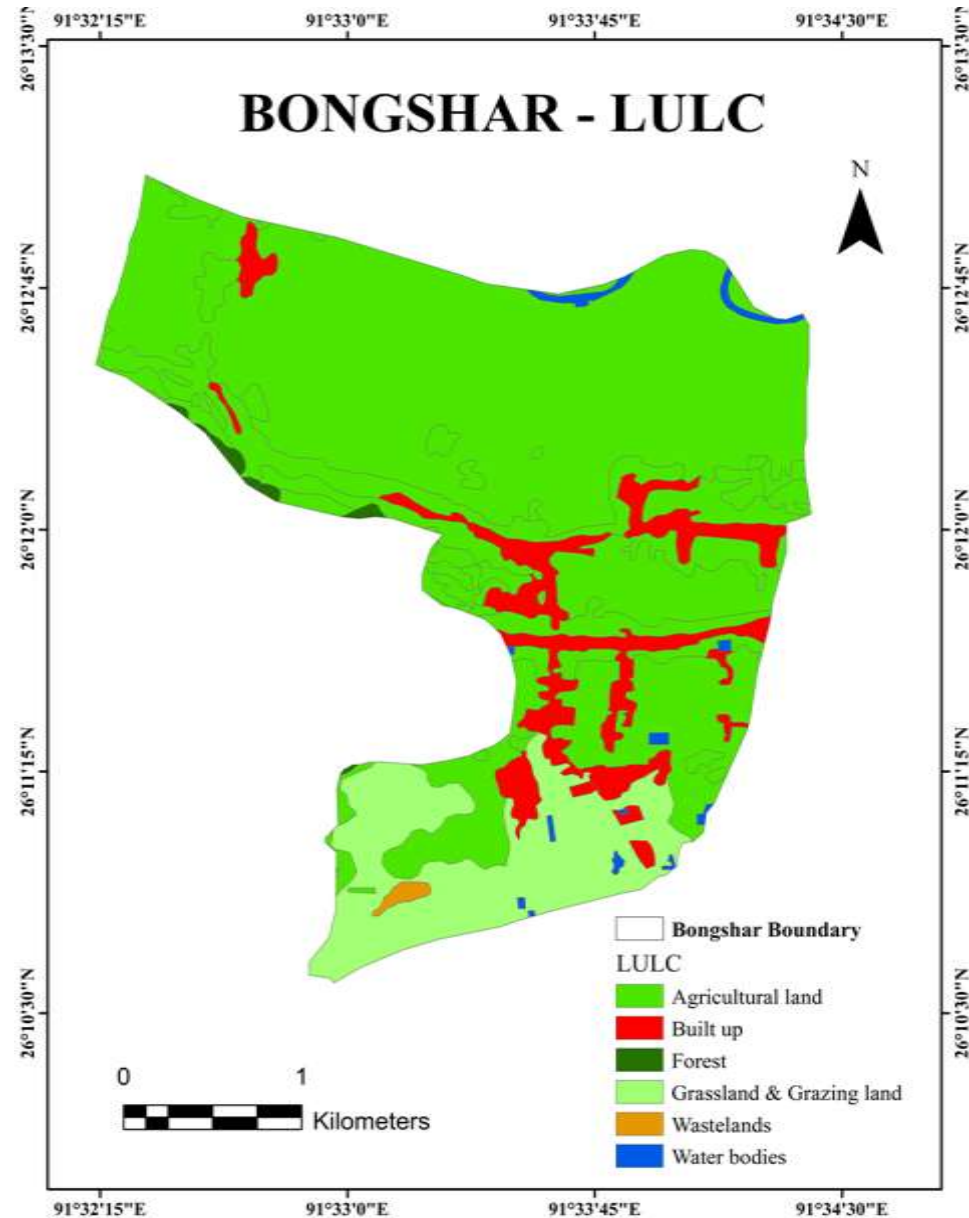


- Area = 8.64 sq. km
- Latitude = $26^{\circ}11' \text{ N} - 26^{\circ}13' \text{ N}$
- Longitude = $91^{\circ}32' \text{ E} - 91^{\circ}35' \text{ E}$



Landuse Land Cover :

- Vital for resources planning
- Necessary for assessment of groundwater availability and its management.
- Based on the land use the study area is classified into following :
 - Agriculture land – 77%
 - Built up – 9%
 - Grassland & Grazing land – 14%
 - Forest - Minimal
 - Wasteland – Swampy land
 - Water bodies – Stagnant water body as ponds and Flowing river



Agriculture – Continuous stretch hence, extensive agriculture is also possible.

Ex- Plantations of economically important crops/cash crops

Rice, jute, wheat, sugarcane

Vegetables – Potato, all green vegetables and leafy vegetables, raw banana

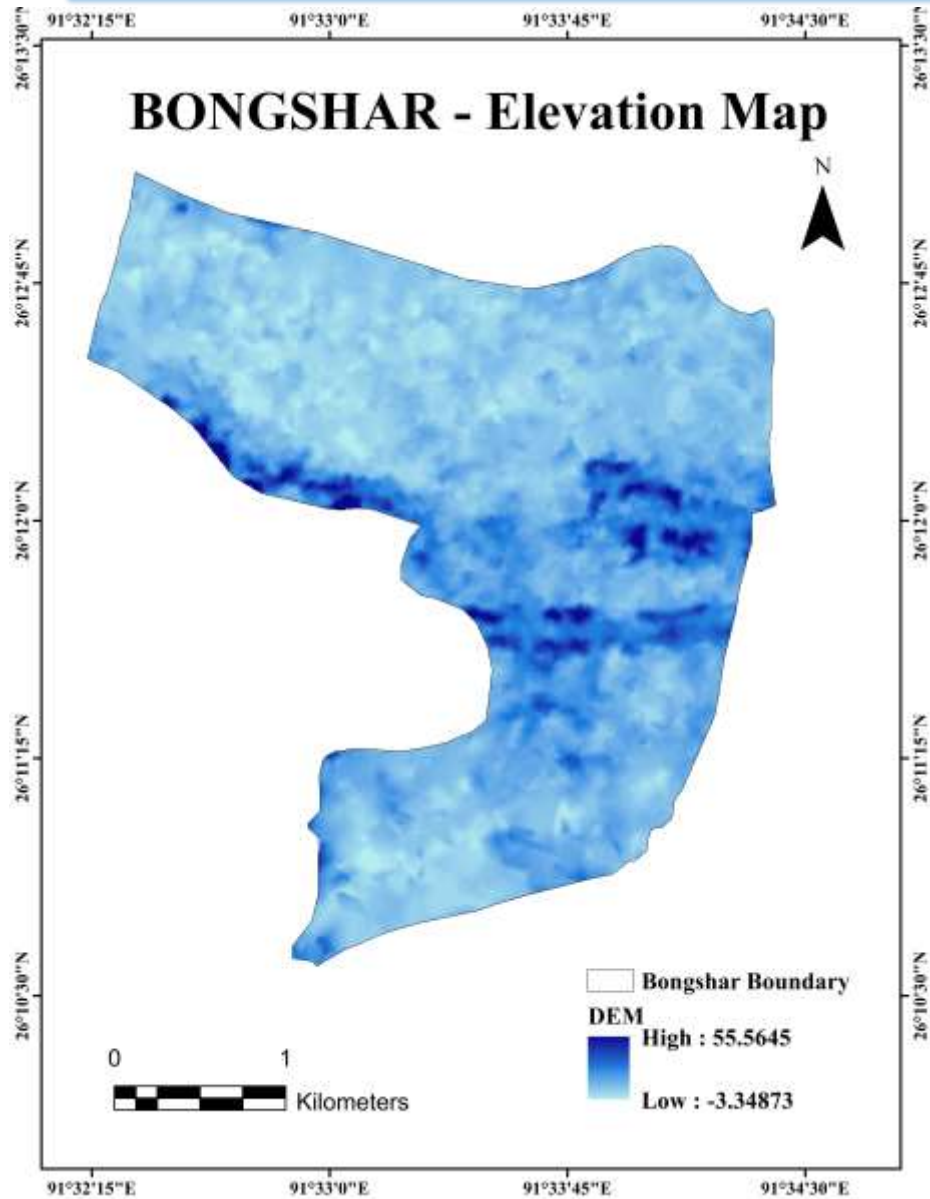
Crop type – suggestion - ??

Wasteland % is very less – swampy land

Reason for waste land



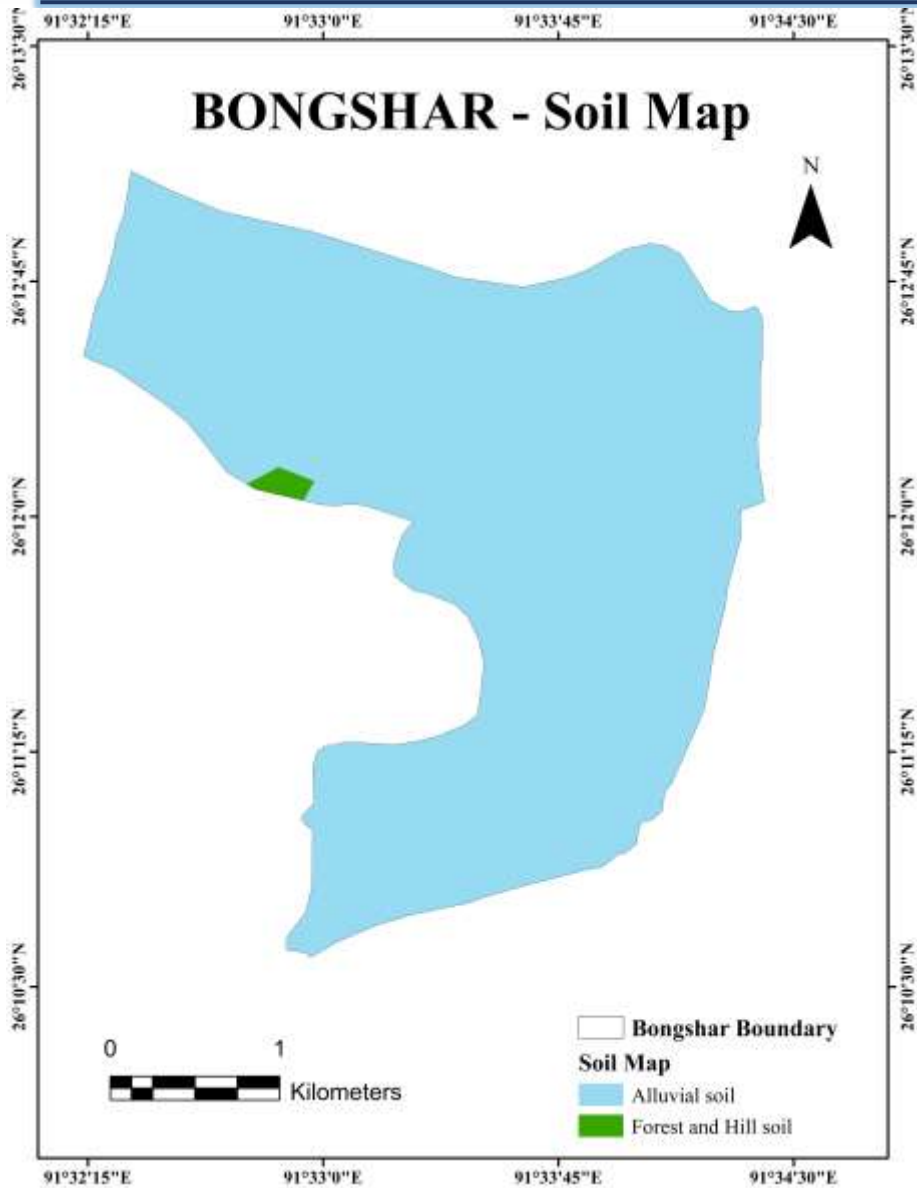
Rice, Jute, Sugarcane, Banana, Ginger, Garlic



Mean sea level

Lower value

Flat land – Good for construction, industry, agriculture

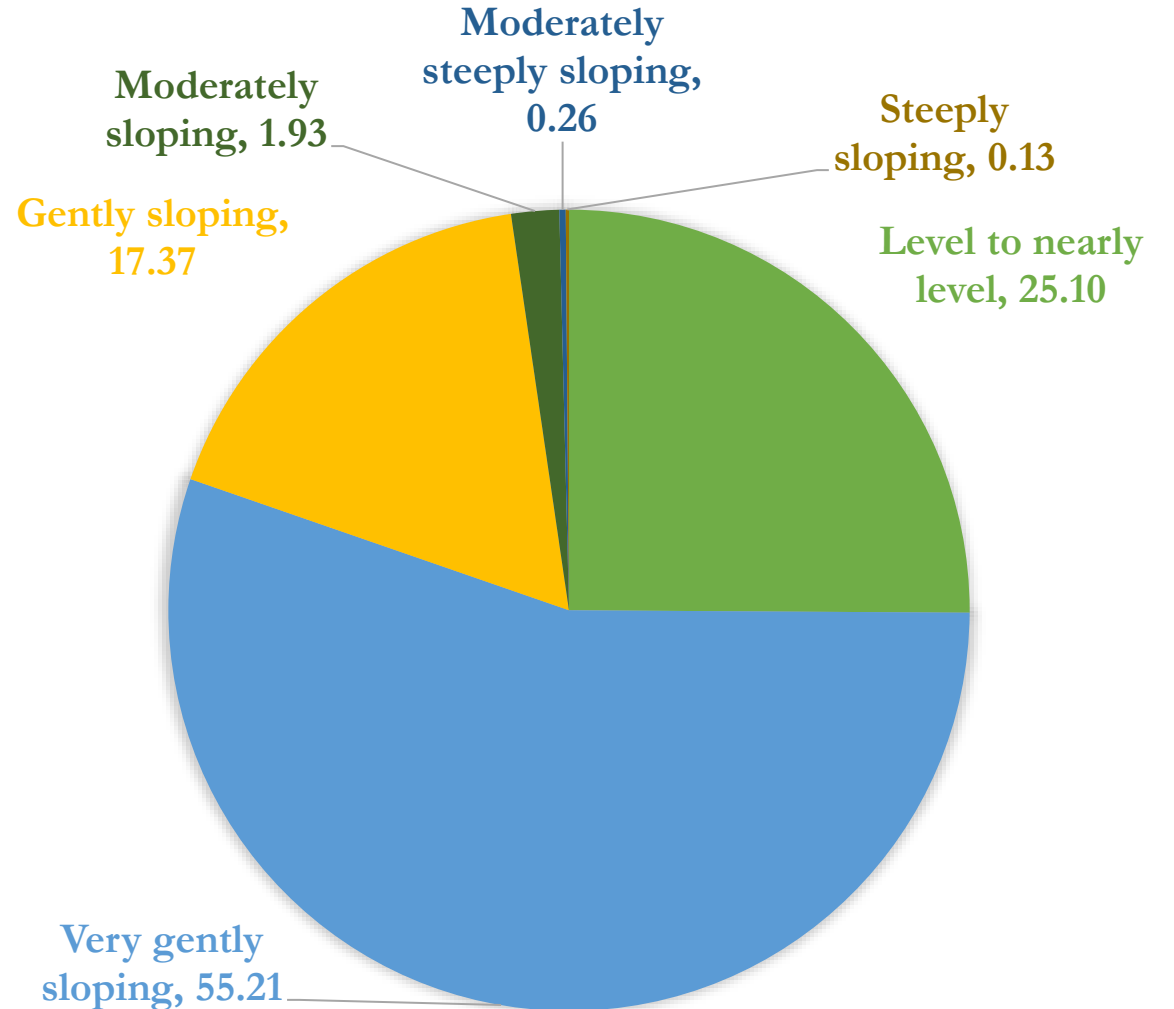


Alluvial soil – Supports vegetation of various types
Very less occupied by Forest and hill soil

SLOPE

Slope Classification	Range	Percentage Area
Level to nearly level	> 0% <= 1%	25.10
Very gently sloping	> 1% <= 3%	55.21
Gently sloping	> 3% <= 8%	17.37
Moderately sloping	> 8% <= 15%	1.93
Moderately steeply sloping	> 15% <= 30%	0.26
Steeply sloping	>30% <= 50%	0.13
Very steeply sloping	>50	0.00

SLOPE PERCENTAGE AREA



Forest Cover

Sal - *Shorea robusta*

Teak – *Tectona Grandis*

Bamboo - *Bambusoideae*

Cane

Banana: Manohar, Bhimkol, Cheni Champa, Tura

Fruits: Jackfruit, Local Mango, Lichi, Blackberry

Spices: Turmeric, Ginger, Garlic

Economically important crops and product development – Jute, cane, bamboo based products

Lumbering industry

Ethnobotanical importance -agar palnts, castor oil plants.





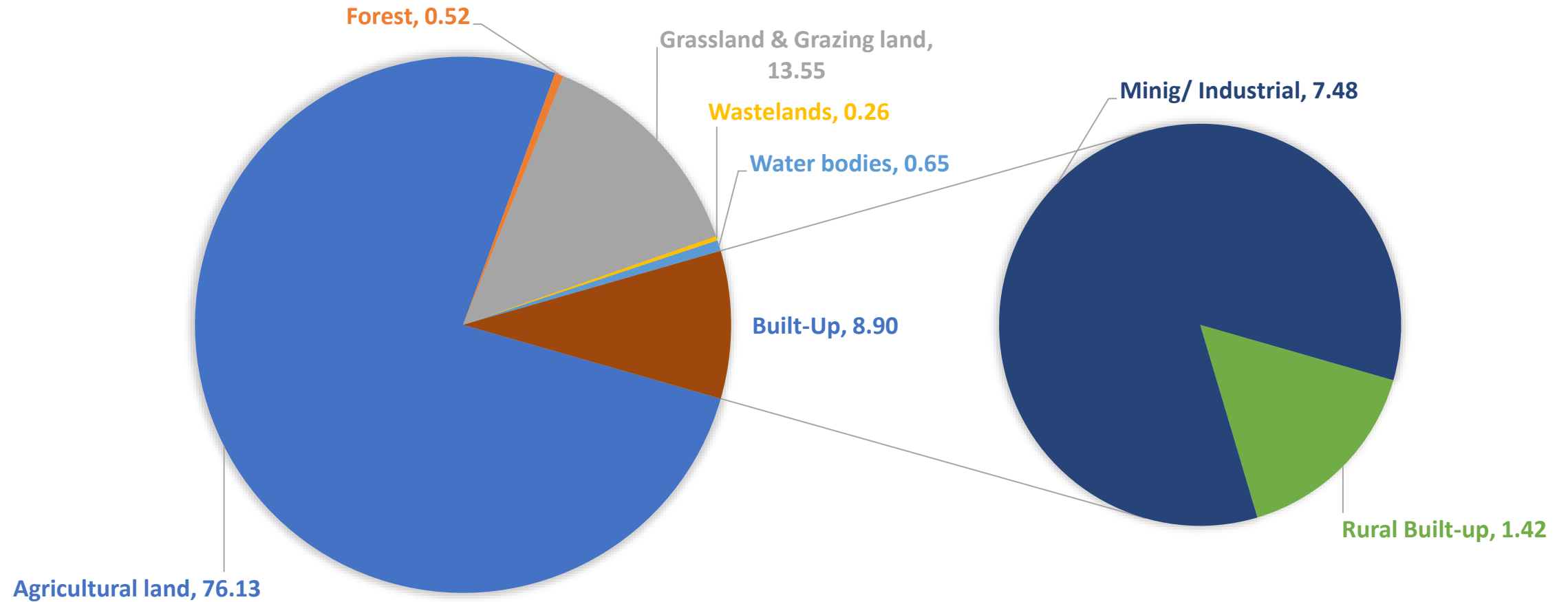
Flowing and stagnant waterbody



Waste land

LULC

LANDUSE LANDCOVER PERCENTAGE FOR EACH CLASS





- Industry – 2 brick kilns
- 30 permanent employs
- 65 people employed on temporary basis

Livelihood

- Agriculture
- Pisciculture
- Poultry
- Industry – Small scale
- Cottage Industry – Silk based
- Suggestions: Bamboo, Cane, jute based product development and association with organisations as Khadi
- Grassland and Grazing land - utilisation for animal husbandry
- Utilisation of waterbodies for Pisciculture



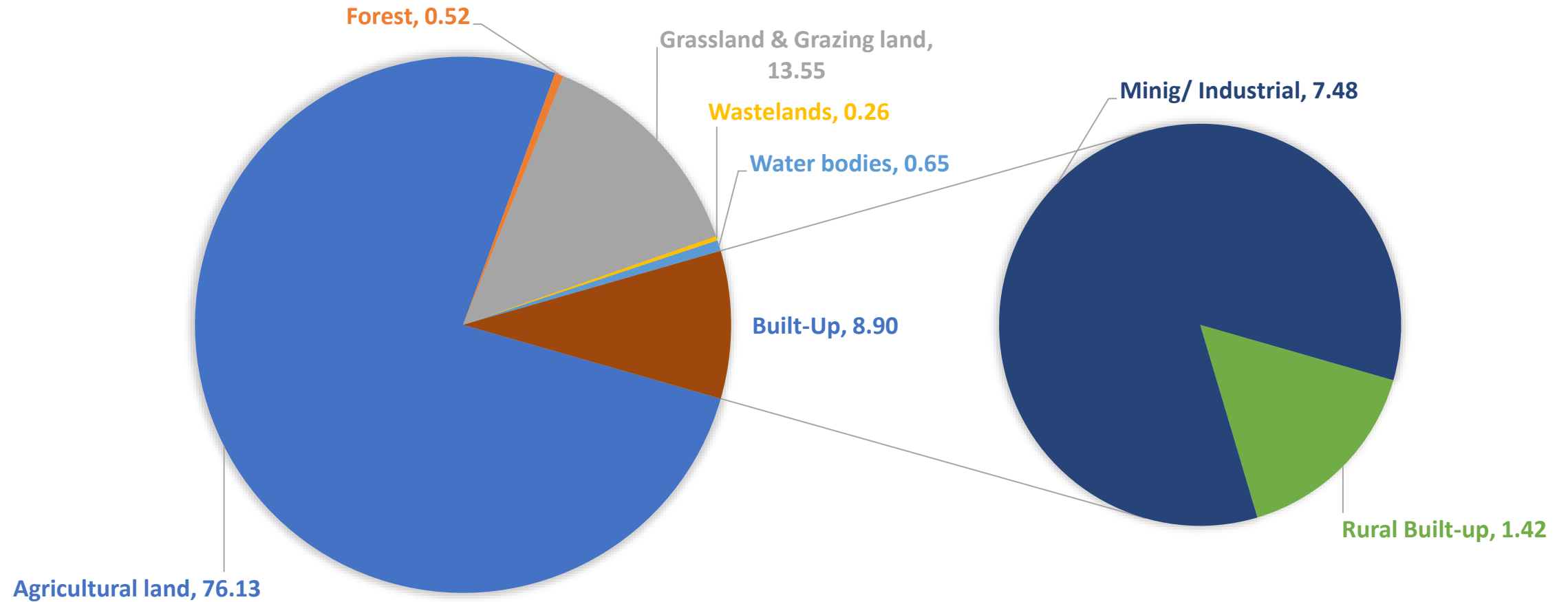




Local Fish and Vegetables

LULC

LANDUSE LANDCOVER PERCENTAGE FOR EACH CLASS

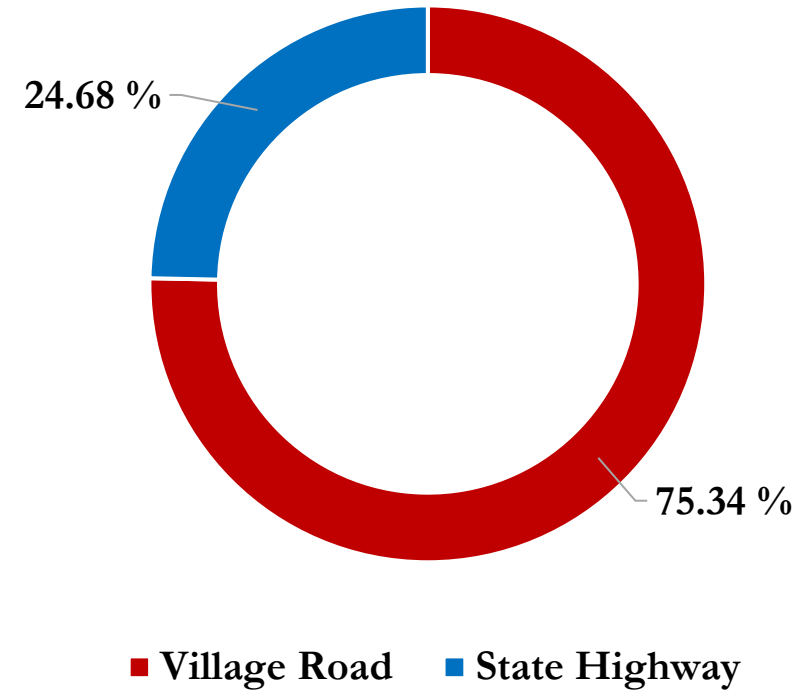


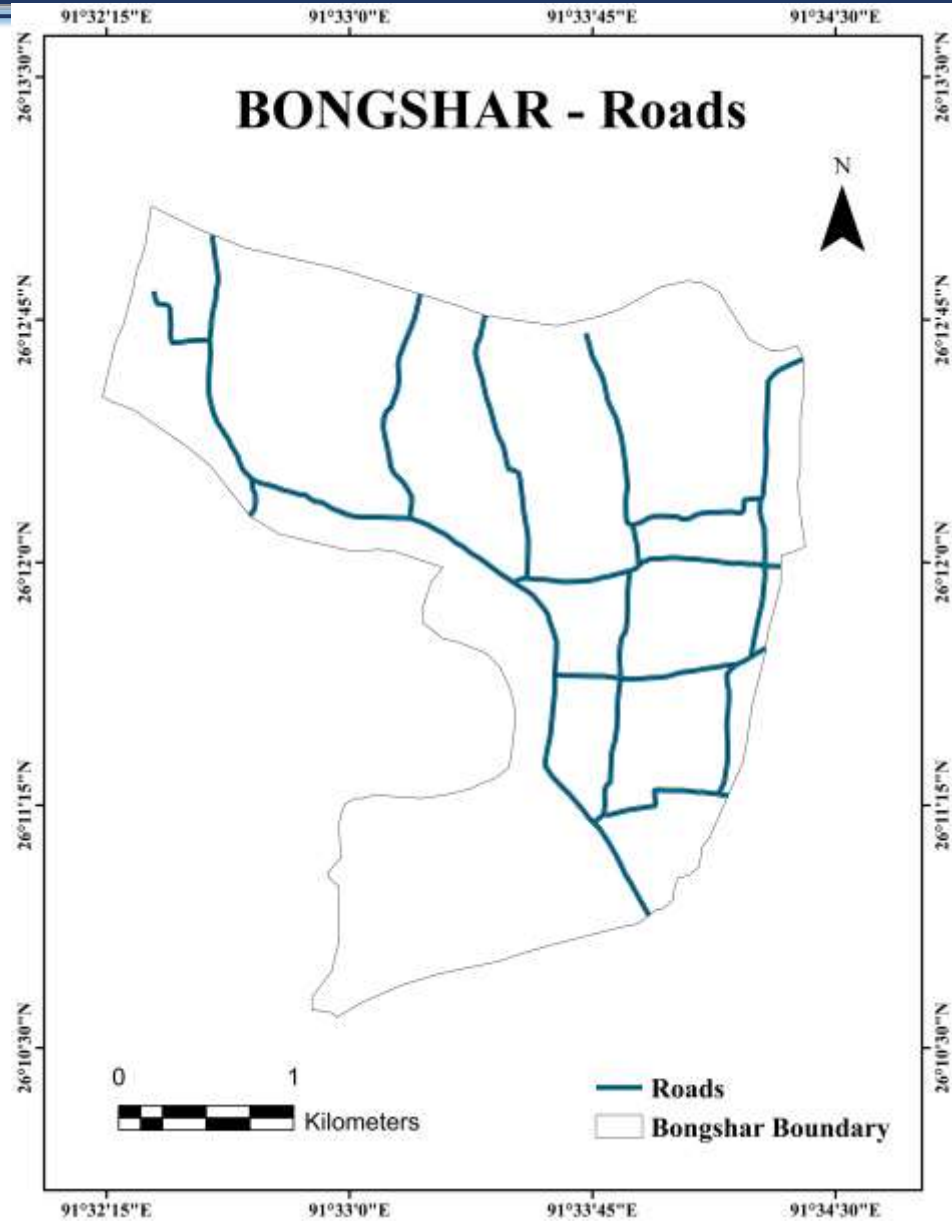
ROADS

Road Transportation (Pucca Roads)	Length Covered (Km)	Percentage Covered
Village Road	12.89	75.34
State Highway	4.22	24.68

- National Highway - NH 27
- State Highway - SH 41 and SH2

ROAD TRANSPORTATION

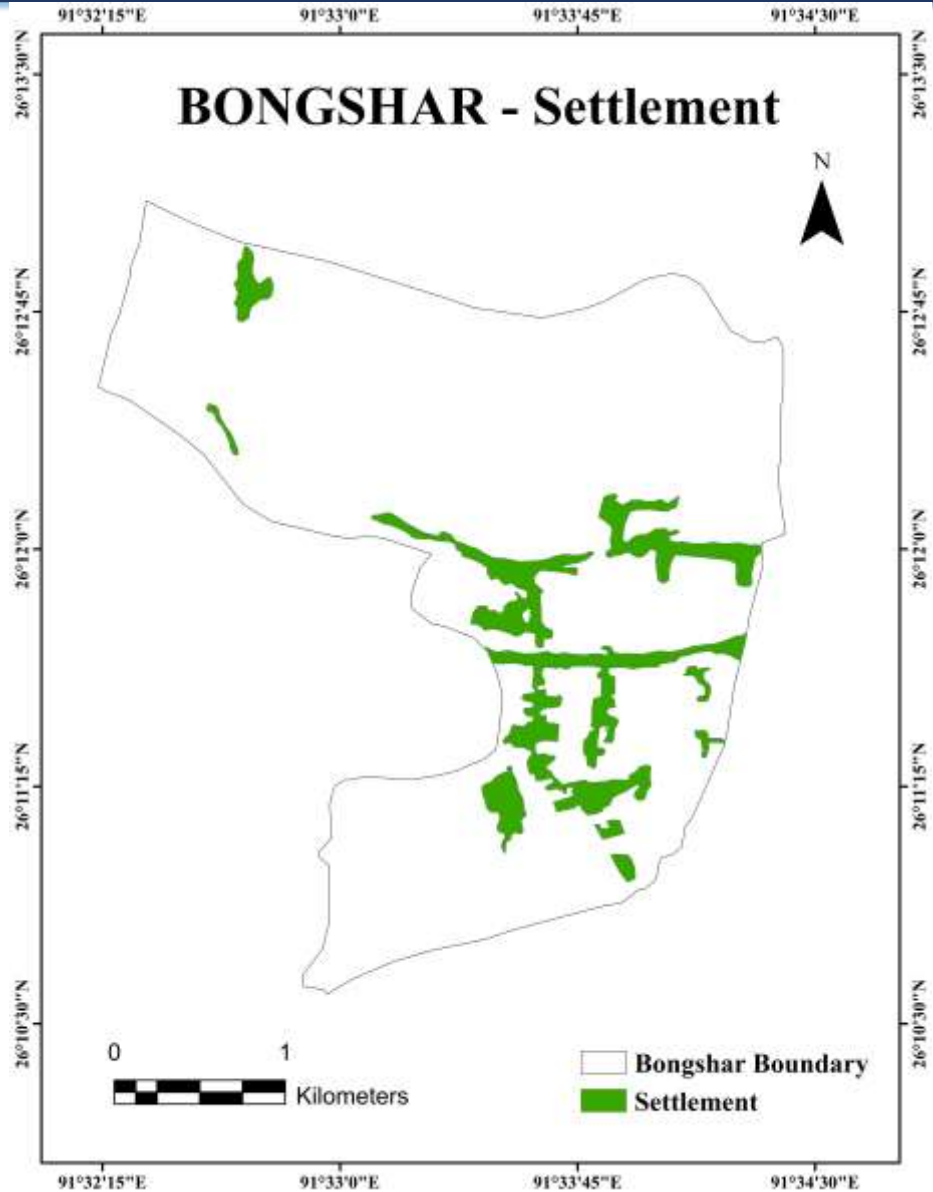




Well connected
Road type – Mostly pucca roads
Suggestion - Supply chain establishment



Road types of Bongshor



Population of Bongshor - 9652
(source :Census 2011)

Male- 4899 Female -4753

Child Population
1035 (0-6 yrs)

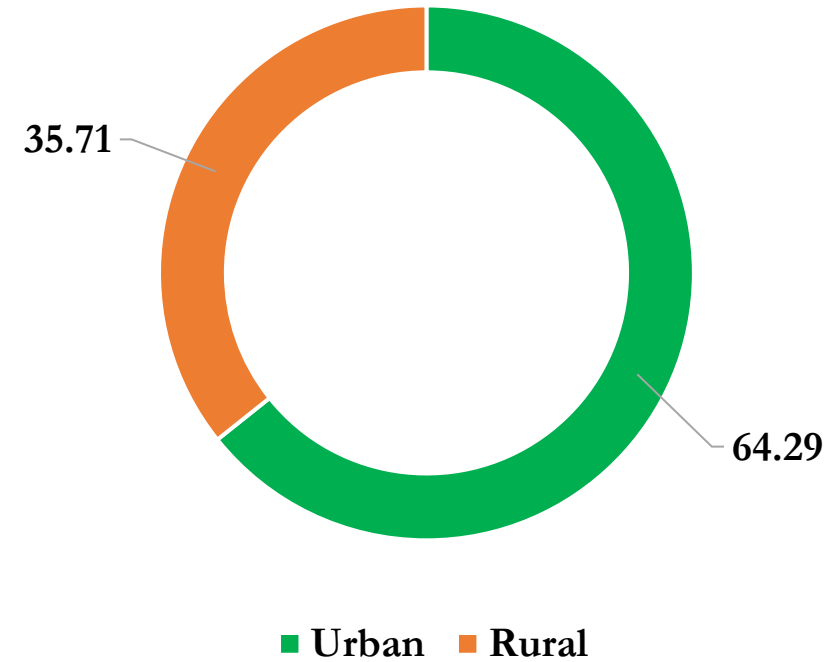
Population of People above 65 years - 323
Literacy rate - 73.29%

Major occupation
43% - having manual casual labour as main source of
income.

SETTLEMENT

Settlement Type	Percentage Settlement
Urban	64.29
Rural	35.71

PERCENTAGE SETTLEMENT





House type with established Toilet with No litter zone



Housing material – Bamboo, pucca houses

Educational Institutions

Government

Lower primary school – 08

ME schools – 03

High school – 02

Higher secondary – 01

Private school – 01

College - Nil

Art school - 01







Hospital

- 1 Primary health centre –
- OPD
- Laboratory for in house analysis
- 10 beds for in house patients
- Labour room
- Minor Operation Theatre and stabilisation room

- Requirement of more facility in the existing one

- Requirement for more number of health centres – Considering population of approximately 10,000







BONGSHOR PRIMARY HEALTH CENTRE
BONGSHOR, KAMRUP (ASSAM)
ESSENTIAL DRUG LIST
আসামৰ প্ৰাথমিক স্বাস্থ্য কেন্দ্ৰ
DATE: 1/12

Sl. No.	Generic Name	Strength	Form	Quantity	Sl. No.	Generic Name	Strength	Form	Quantity	Sl. No.	Generic Name	Strength	Form	Quantity	Sl. No.	Generic Name	Strength	Form	Quantity					
1	Aspirin	100 mg	Tablet	100	11	Paracetamol	500 mg	Tablet	100	21	Amoxicillin	250 mg	Tablet	100	31	Chloroquine	250 mg	Tablet	100					
2	Paracetamol	500 mg	Tablet	100	12	Ibuprofen	200 mg	Tablet	100	22	Cloxacillin	250 mg	Tablet	100	32	Hydroxychloroquine	200 mg	Tablet	100	41	Metformin	500 mg	Tablet	100
3	Ibuprofen	200 mg	Tablet	100	13	Cloxacillin	250 mg	Tablet	100	23	Amoxicillin	500 mg	Tablet	100	33	Folic acid	5 mg	Tablet	100	42	Insulin	100 IU	Injection	100
4	Amoxicillin	250 mg	Tablet	100	14	Amoxicillin	500 mg	Tablet	100	24	Chloroquine	250 mg	Tablet	100	34	Vitamin B12	1000 mcg	Injection	100	43	Insulin	500 IU	Injection	100
5	Amoxicillin	500 mg	Tablet	100	15	Chloroquine	250 mg	Tablet	100	25	Hydroxychloroquine	200 mg	Tablet	100	35	Insulin	100 IU	Injection	100	44	Insulin	100 IU	Injection	100
6	Chloroquine	250 mg	Tablet	100	16	Hydroxychloroquine	200 mg	Tablet	100	26	Insulin	100 IU	Injection	100	36	Insulin	100 IU	Injection	100	45	Insulin	100 IU	Injection	100
7	Hydroxychloroquine	200 mg	Tablet	100	17	Insulin	100 IU	Injection	100	27	Insulin	100 IU	Injection	100	37	Insulin	100 IU	Injection	100	46	Insulin	100 IU	Injection	100
8	Insulin	100 IU	Injection	100	18	Insulin	100 IU	Injection	100	28	Insulin	100 IU	Injection	100	38	Insulin	100 IU	Injection	100	47	Insulin	100 IU	Injection	100
9	Insulin	100 IU	Injection	100	19	Insulin	100 IU	Injection	100	29	Insulin	100 IU	Injection	100	39	Insulin	100 IU	Injection	100	48	Insulin	100 IU	Injection	100
10	Insulin	100 IU	Injection	100	20	Insulin	100 IU	Injection	100	30	Insulin	100 IU	Injection	100	40	Insulin	100 IU	Injection	100	49	Insulin	100 IU	Injection	100

Regular doctor, List of medicines available



Religious places

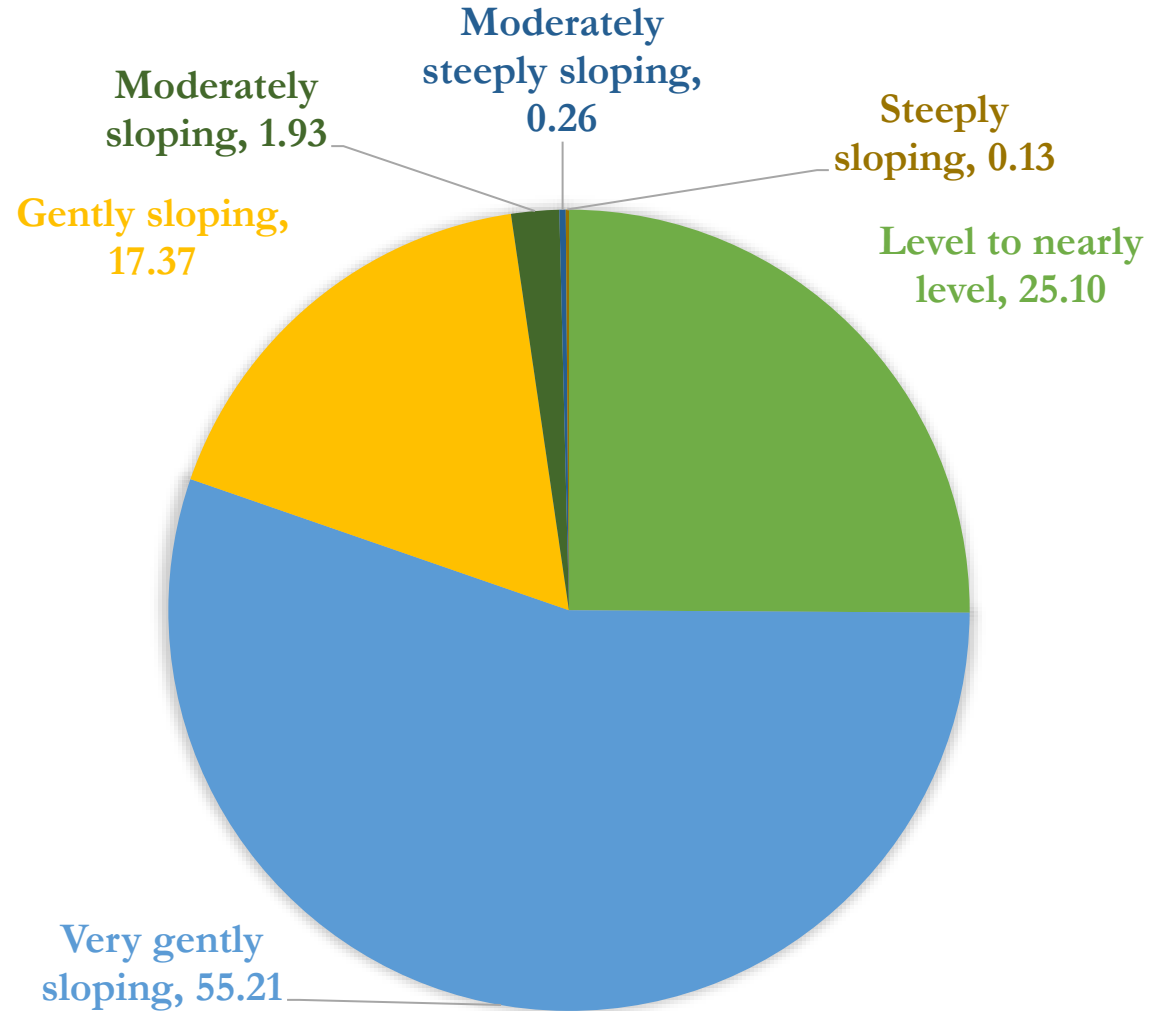


Agriculture

SLOPE

Slope Classification	Range	Percentage Area
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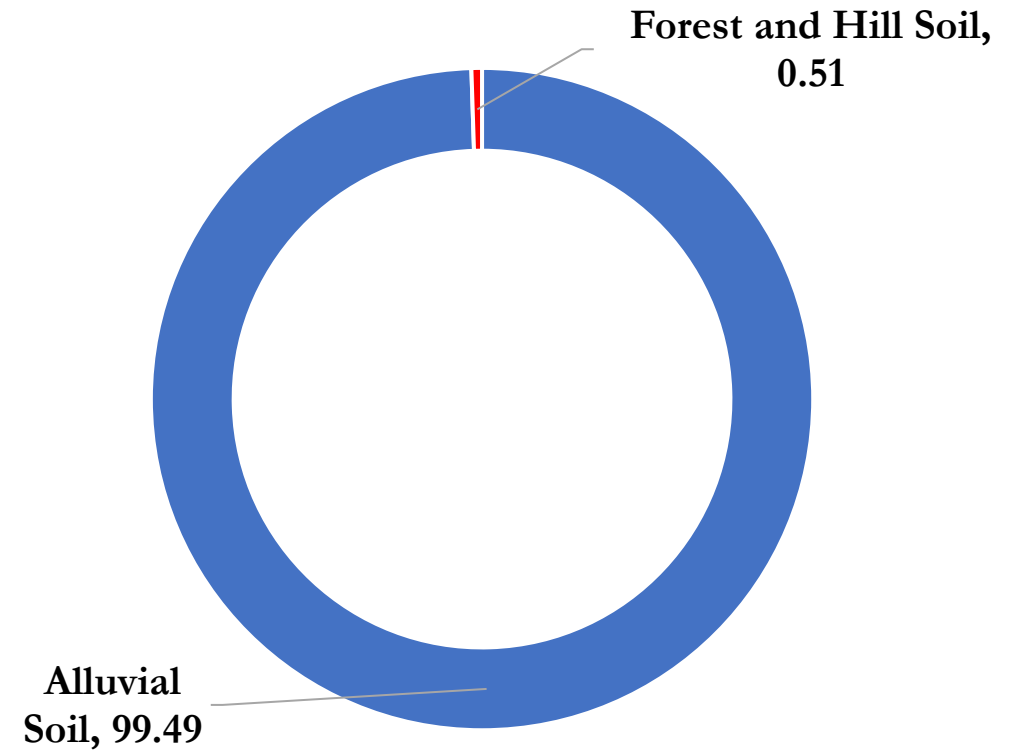
SLOPE PERCENTAGE AREA



SOIL

Soil Type	Soil Depth	Surface Texture	Percentage
Alluvial soil	Deep (>100cm)	Loamy	99.49
Forest and Hill soil	Deep (>100cm)	Loamy	0.51

SOIL TYPE PERCENTAGE





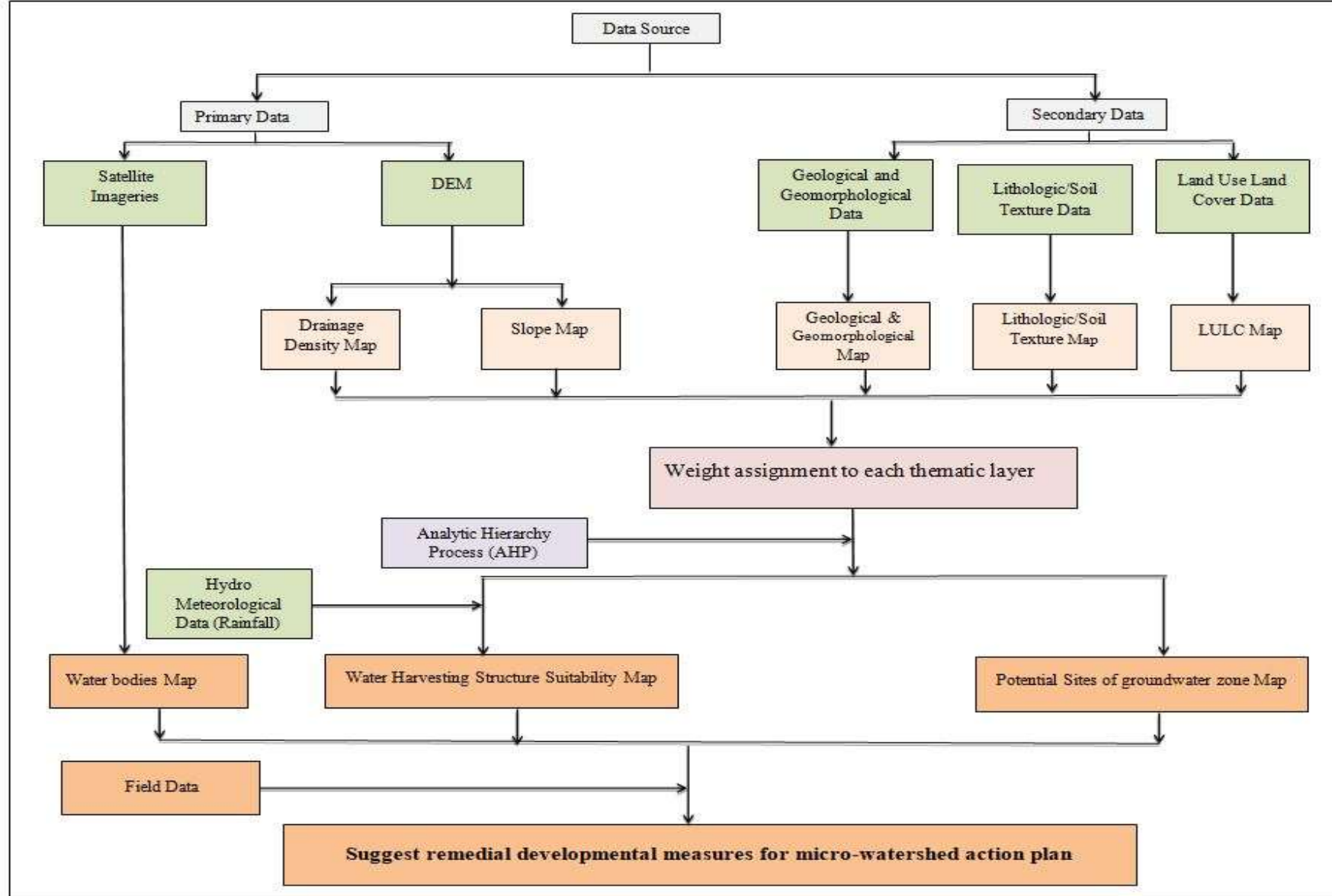
Water management

Water management

The main objectives of the study are as follows:

- ✓ Creation of Resources Information System for sustainable development at the micro watershed level
- ✓ To find suitable locations for water harvesting structures. The suitability map will help in selecting water harvesting structures such as percolation tanks, storage tanks, and retention ponds.
- ✓ To suggest remedial developmental measures for micro-watershed action plan considering land and agriculture resources for optimal utilization on a sustainable basis.

Methodology

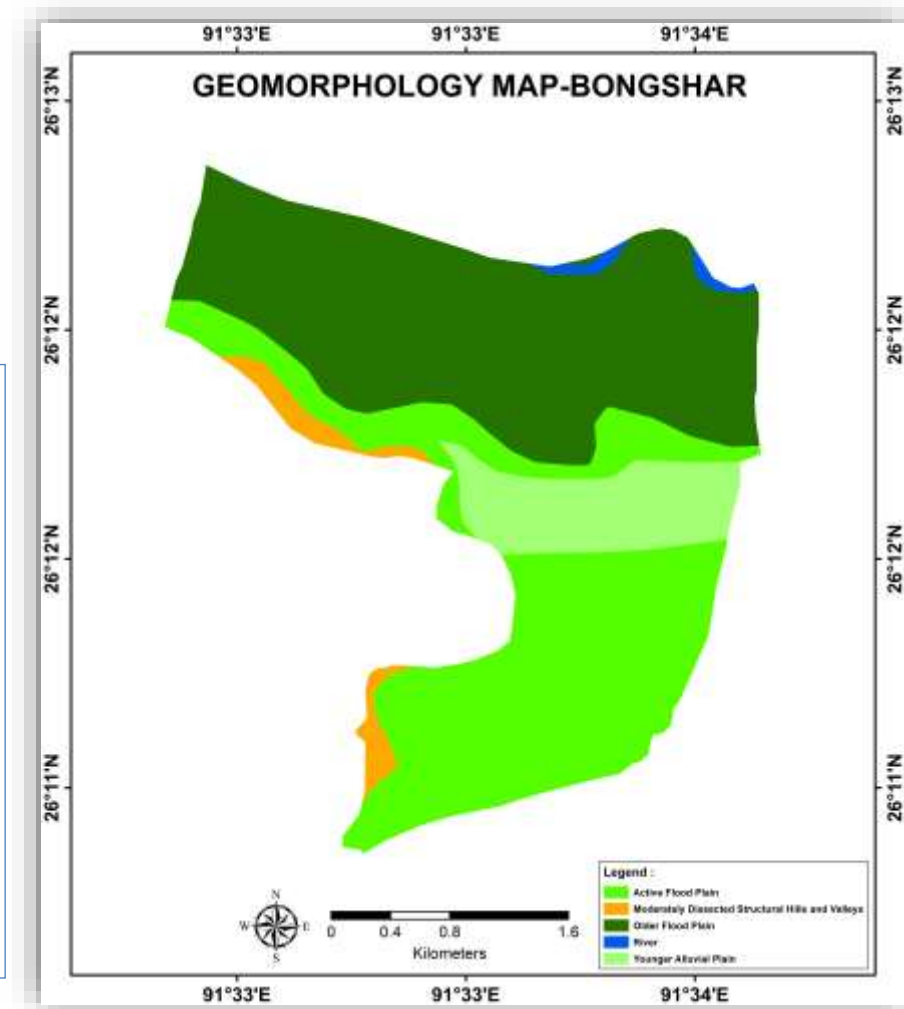
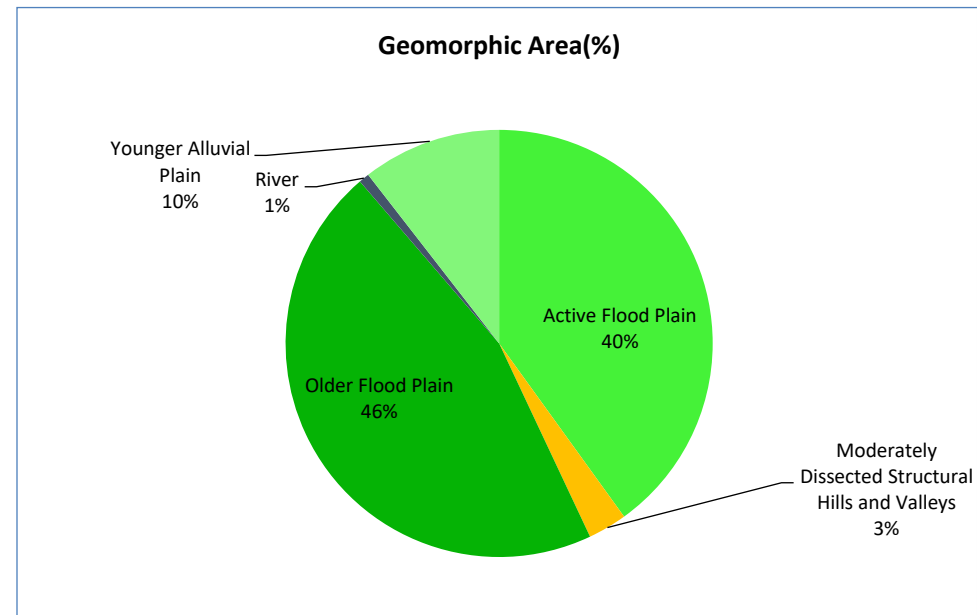


Preparation of Thematic maps for Resources information for Sustainable Development

A. Geomorphology and Geology:

- Geomorphologic as well as Geologic expressions exert tremendous control on the groundwater regime.
- Geologically the area is comprises Quaternary fluvial sediments and five types of geomorphic landforms are there. They are :

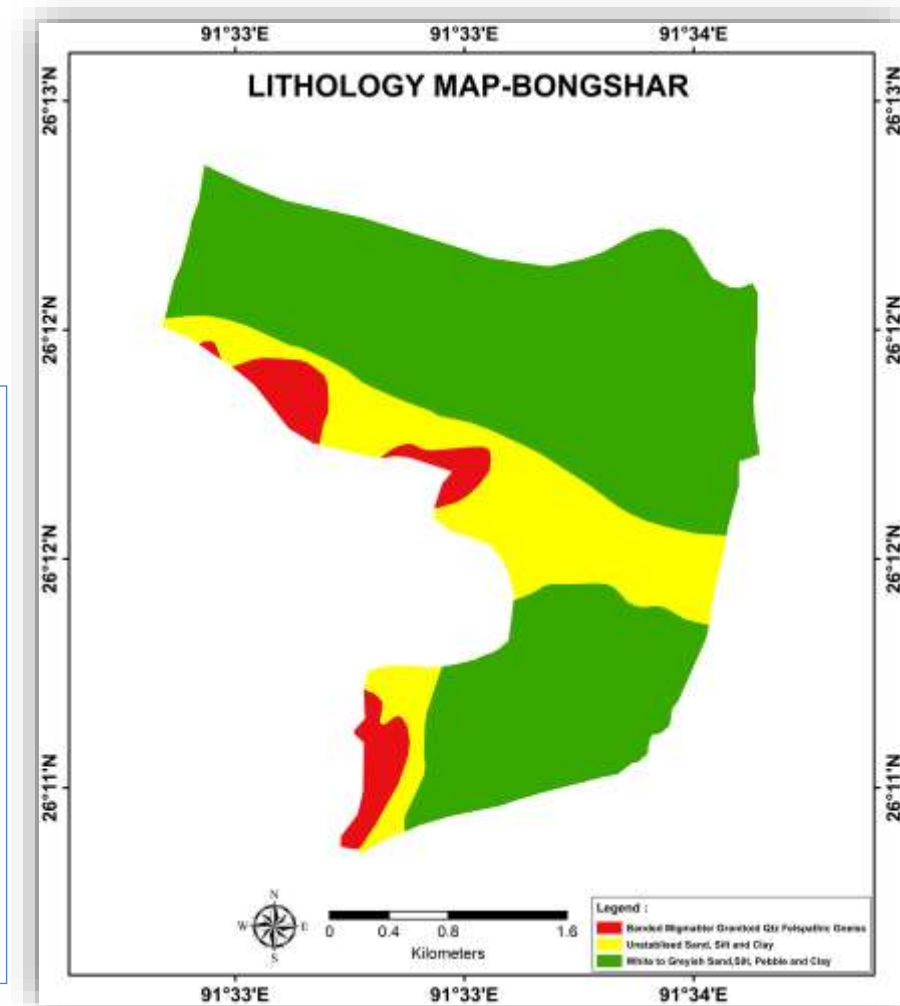
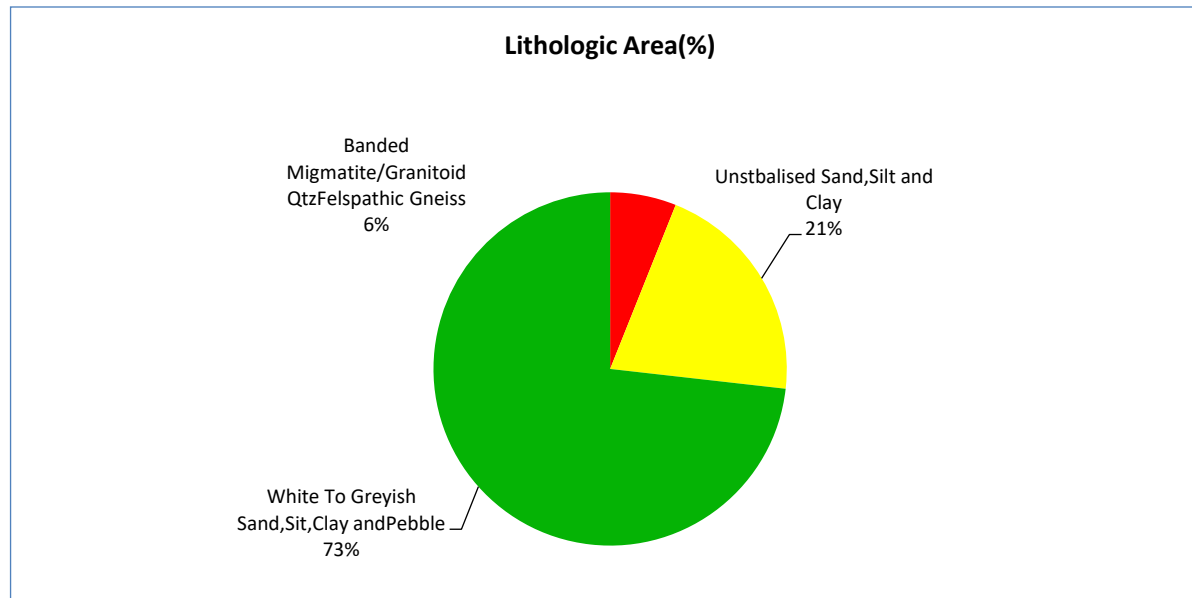
- Active Flood Plain
- Moderately Dissected Structural Hills and Valleys
- Older Flood Plain
- River
- Younger Alluvial Plain



Preparation of Thematic maps for Resources information for Sustainable Development

B. Lithology/ Soil Texture:

- Lithology/Soil texture is an important characteristic that will be taking into consideration of suggesting water harvesting structures and groundwater potential zones of the region.
- The present study area falls into three types such as :
 - Banded Migmatite/Granitoid Qtzfelspathic Gneiss
 - Unstabilised sand, silt and clay
 - White to grayish sand, silt, pebble and clay

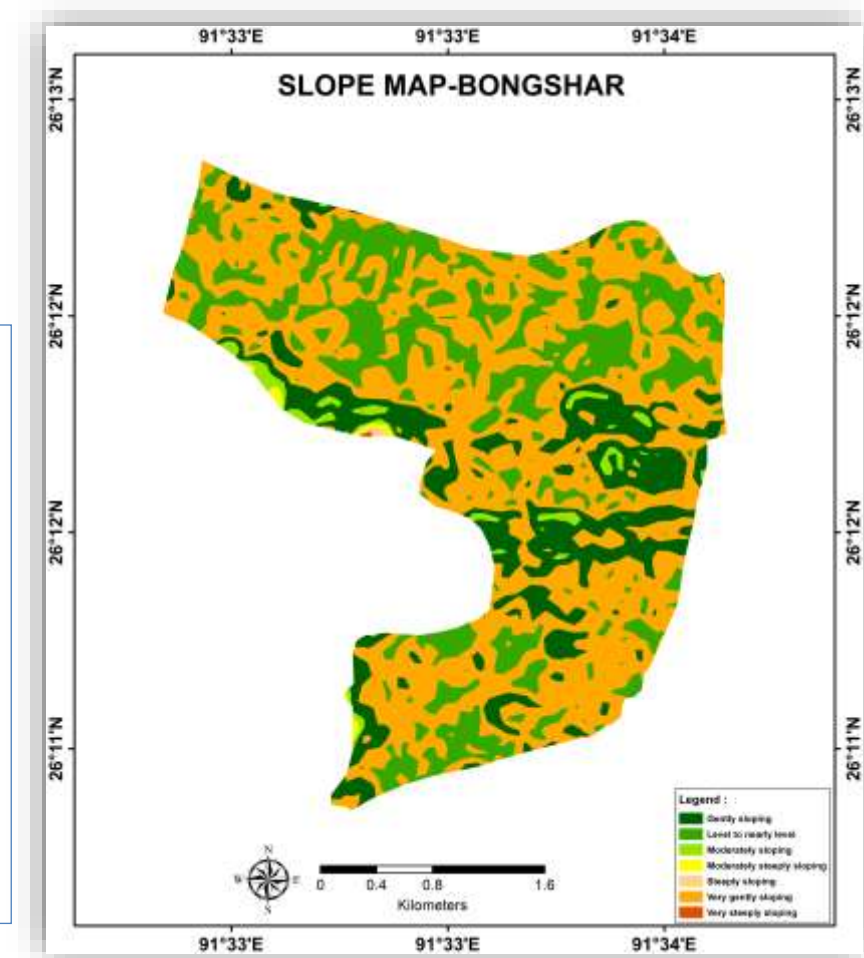
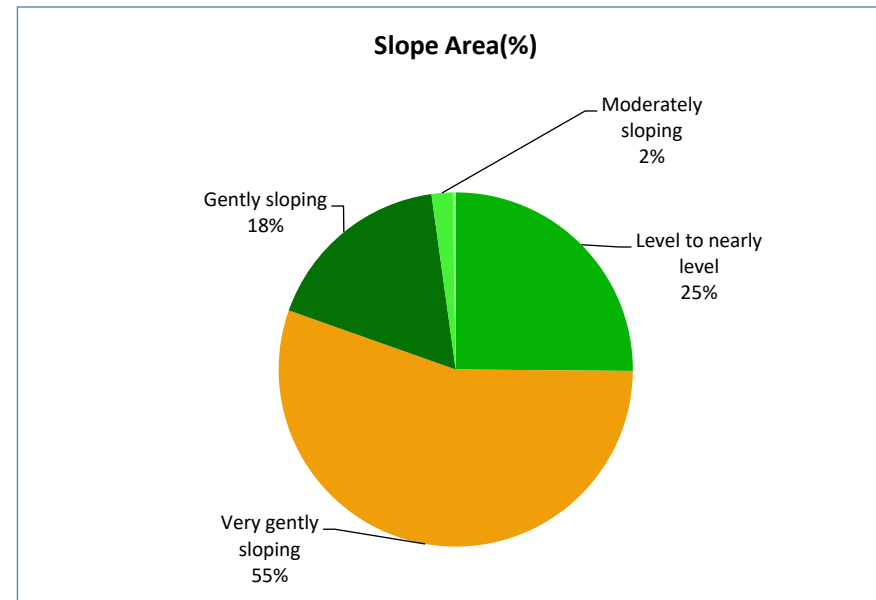


Preparation of Thematic maps for Resources information for Sustainable Development

C. Slope :

- The average slope of a watershed influences radically the value of the time of concentration and, directly, the runoff generated by the rainfall.
- Based on the slope the study area is classified into seven categories:

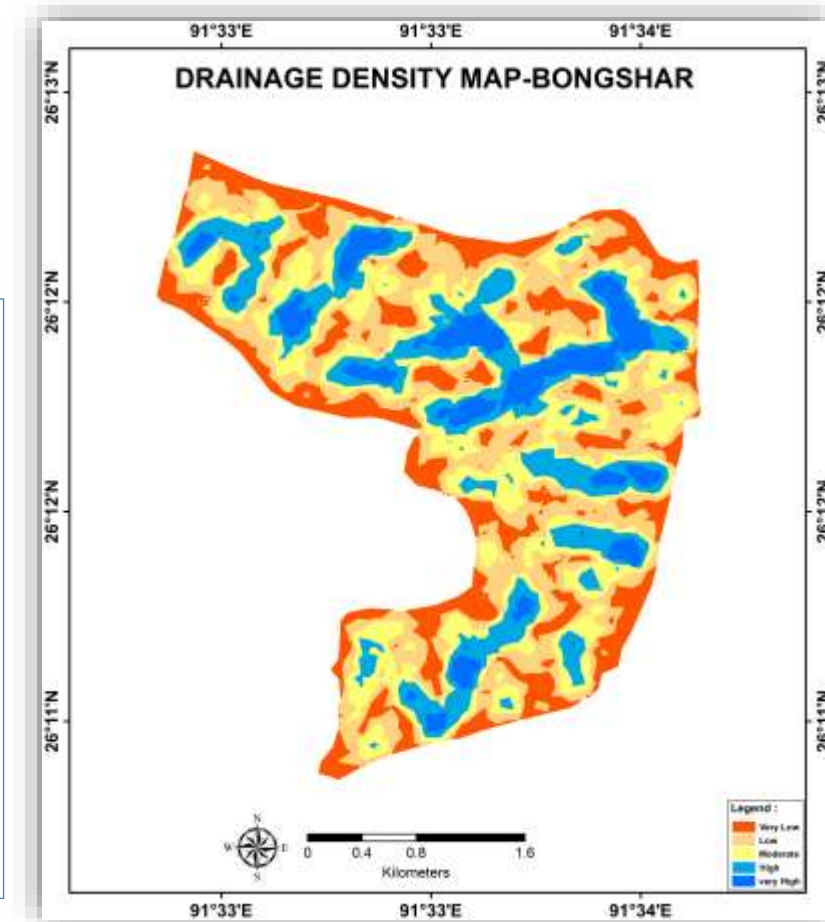
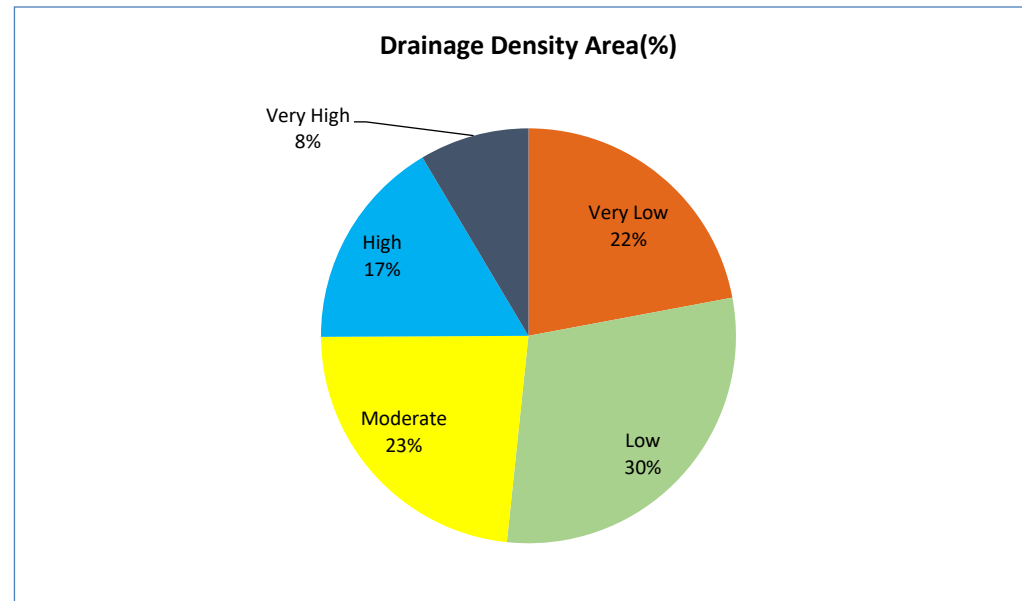
- Very gently sloping
- Level to nearly level
- Moderately sloping
- Gently sloping
- Moderately steeply sloping
- Steeply sloping
- Very steeply sloping



Preparation of Thematic maps for Resources information for Sustainable Development

E. Drainage Density:

- Drainage network helps in evaluation of recharge levels and suggesting various water harvesting structures and soil conservation measures.
- Based on the drainage network the study area is classified into following classes:
 - Very Low
 - Low
 - Moderate
 - High
 - Very High

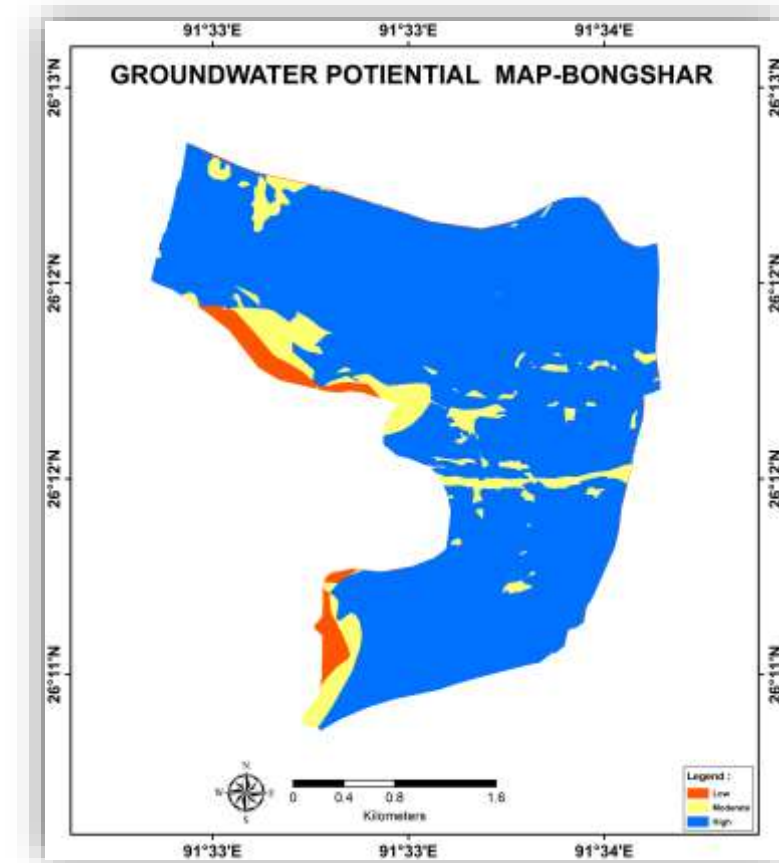
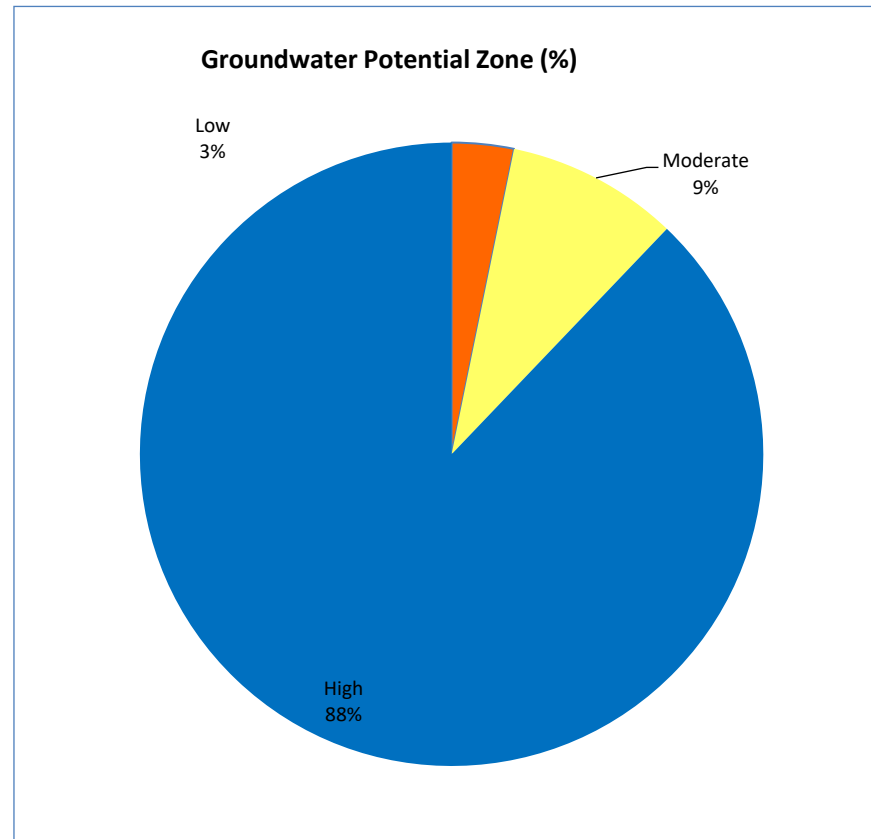


Preparation of Thematic maps for Resources information for Sustainable Development

Groundwater potential zones :

- The groundwater potential zone map generated through GIS modeling Based on Geomorphology, Geology, Soil texture, Slope, Landuse Land cover and Drainage density using Analytic hierarchy process (AHP) proposed by Saaty, 1980.
- Based on the groundwater potential the study area is classified into three categories:

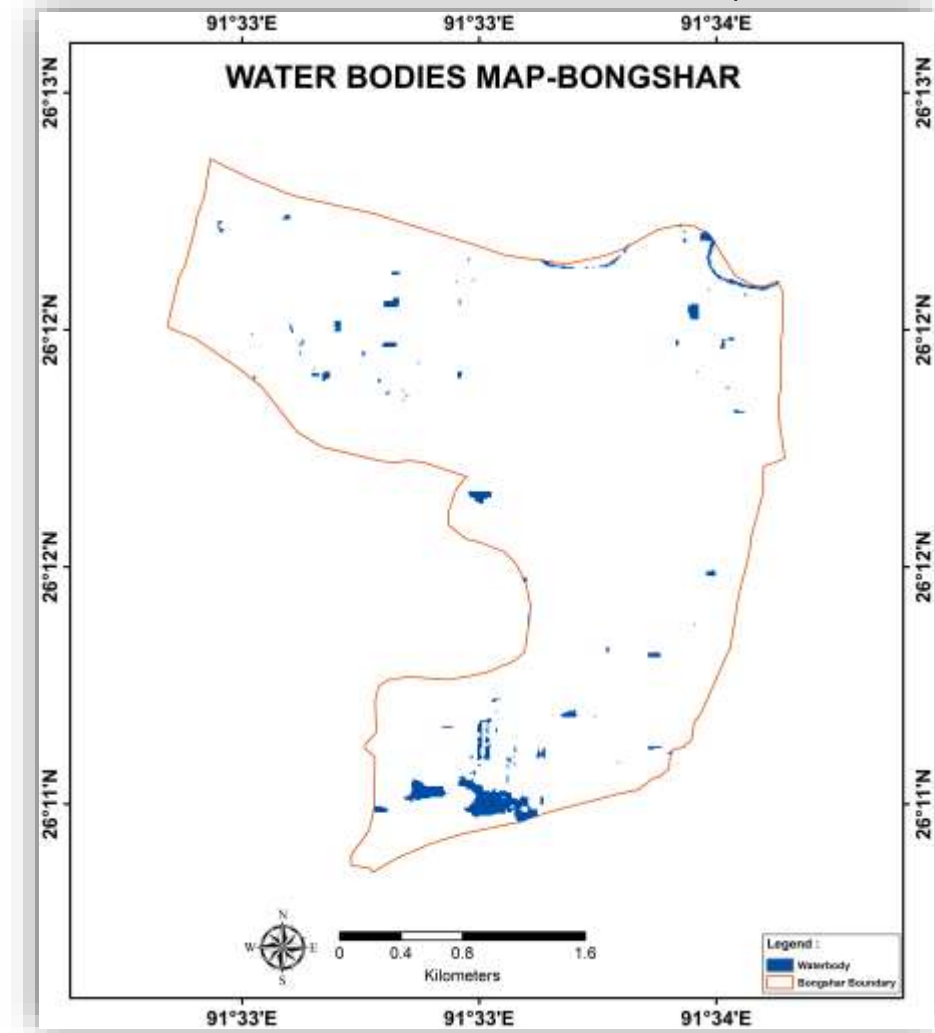
- Low
- Moderate
- High



Preparation of Thematic maps for Resources information for Sustainable Development

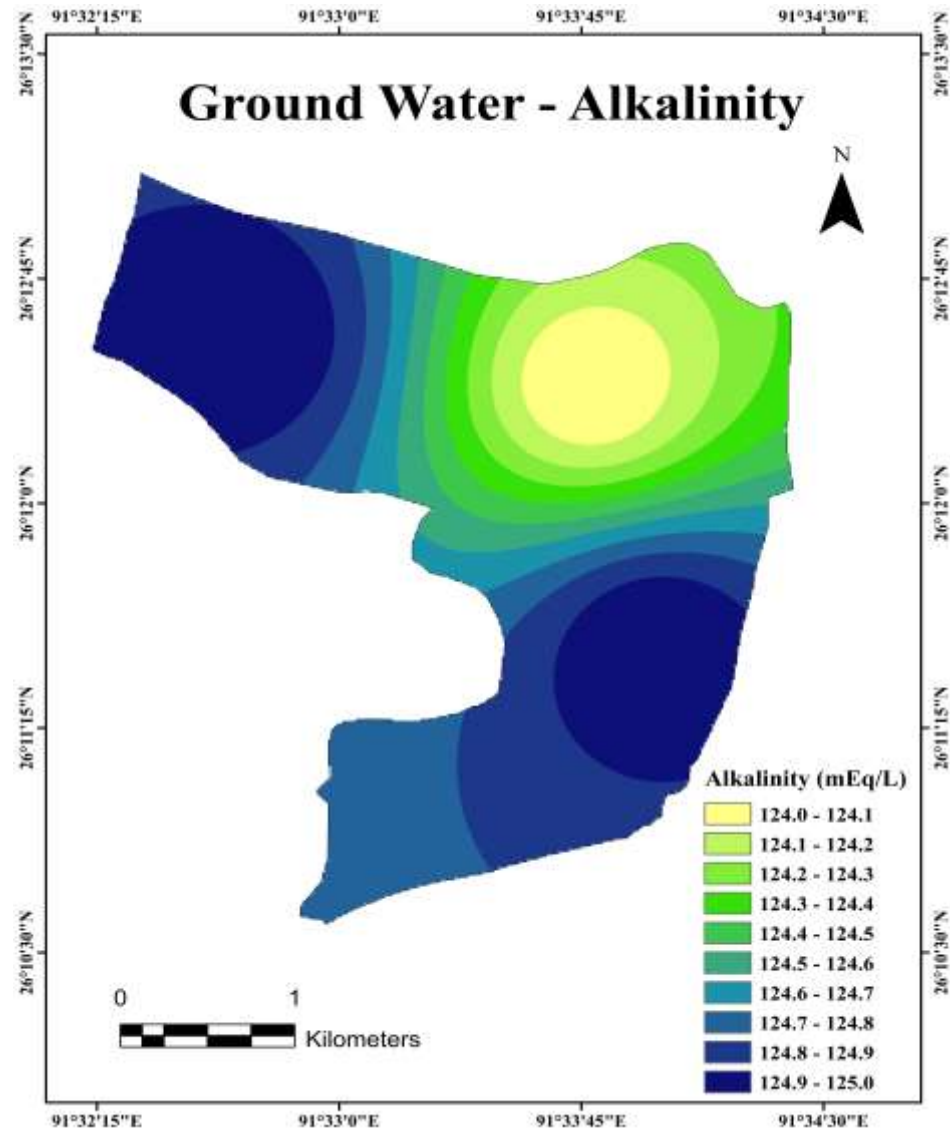
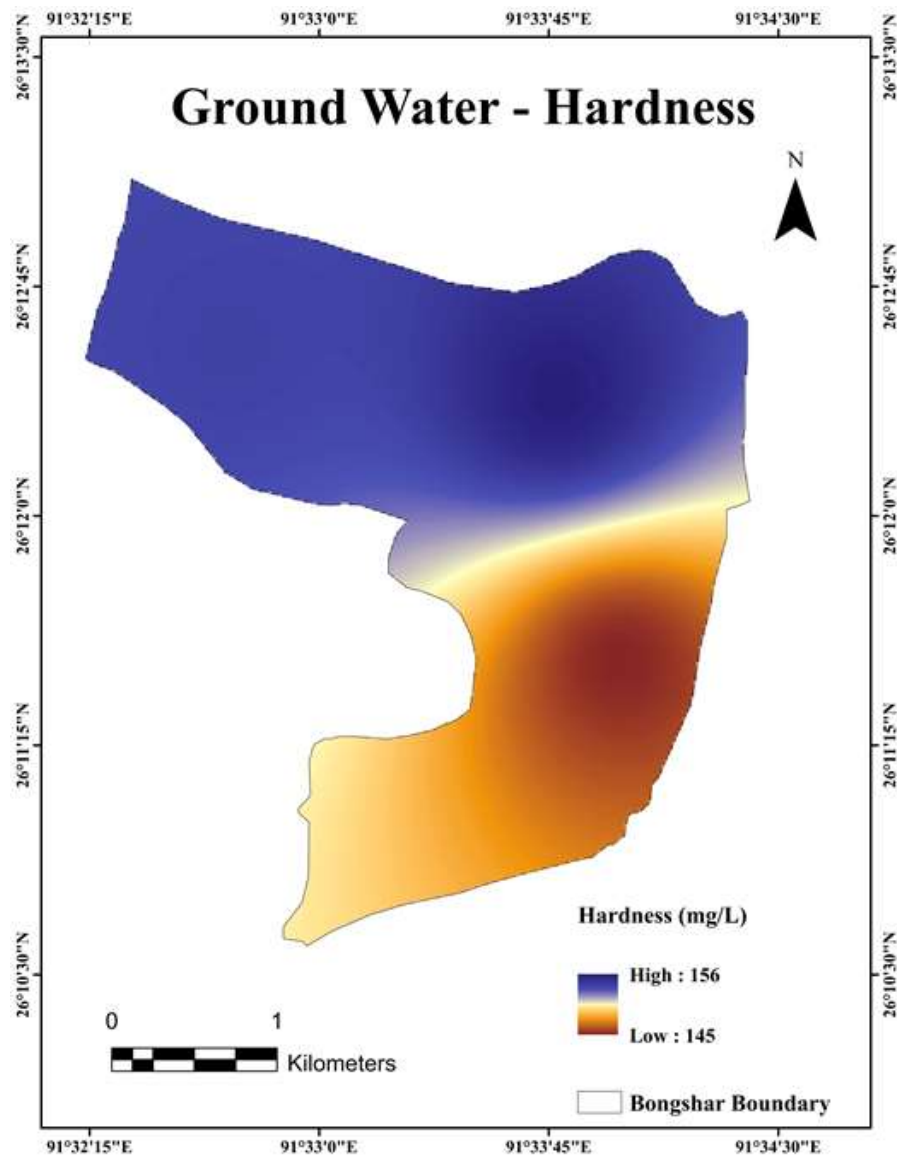
Existing Water bodies:

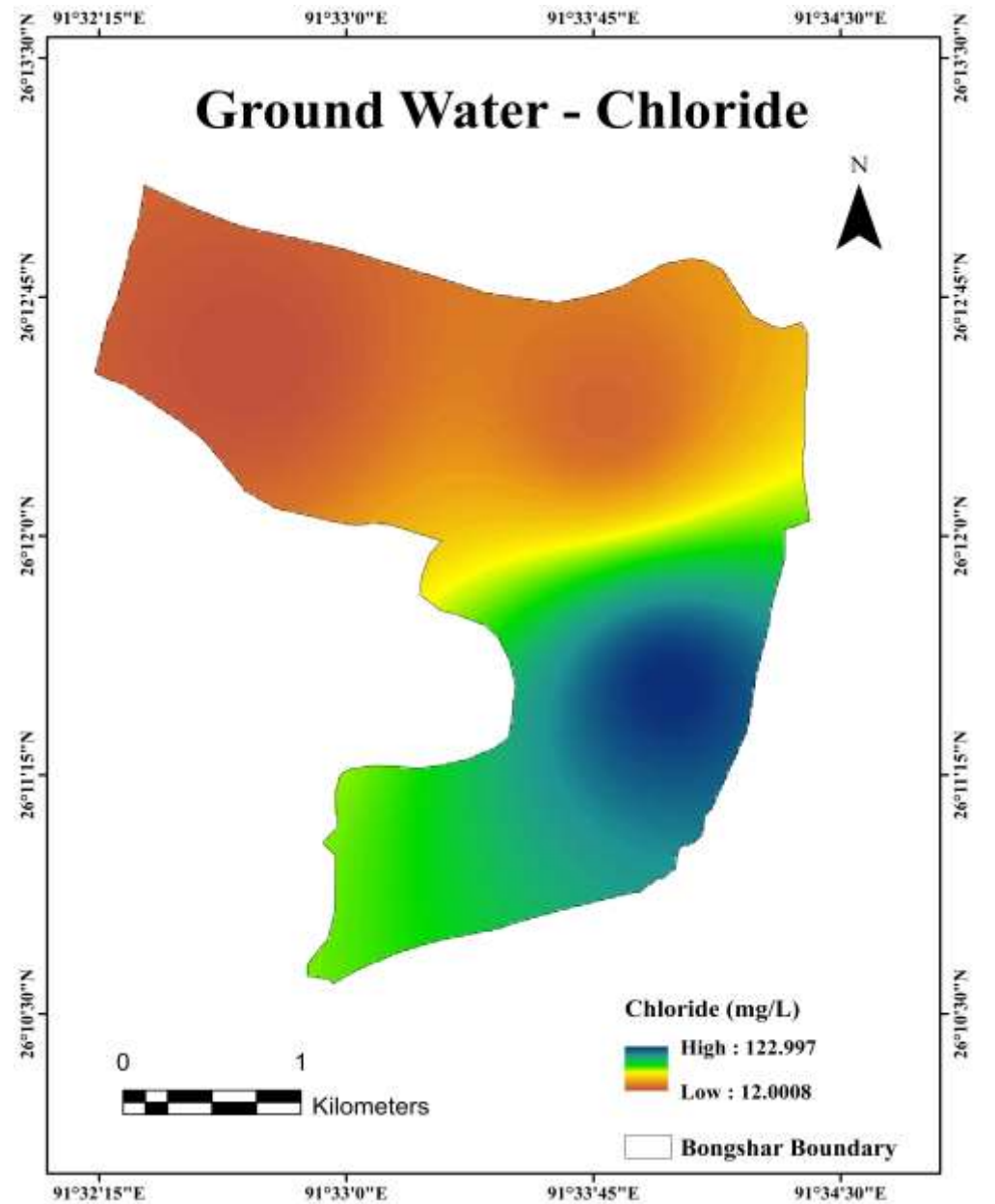
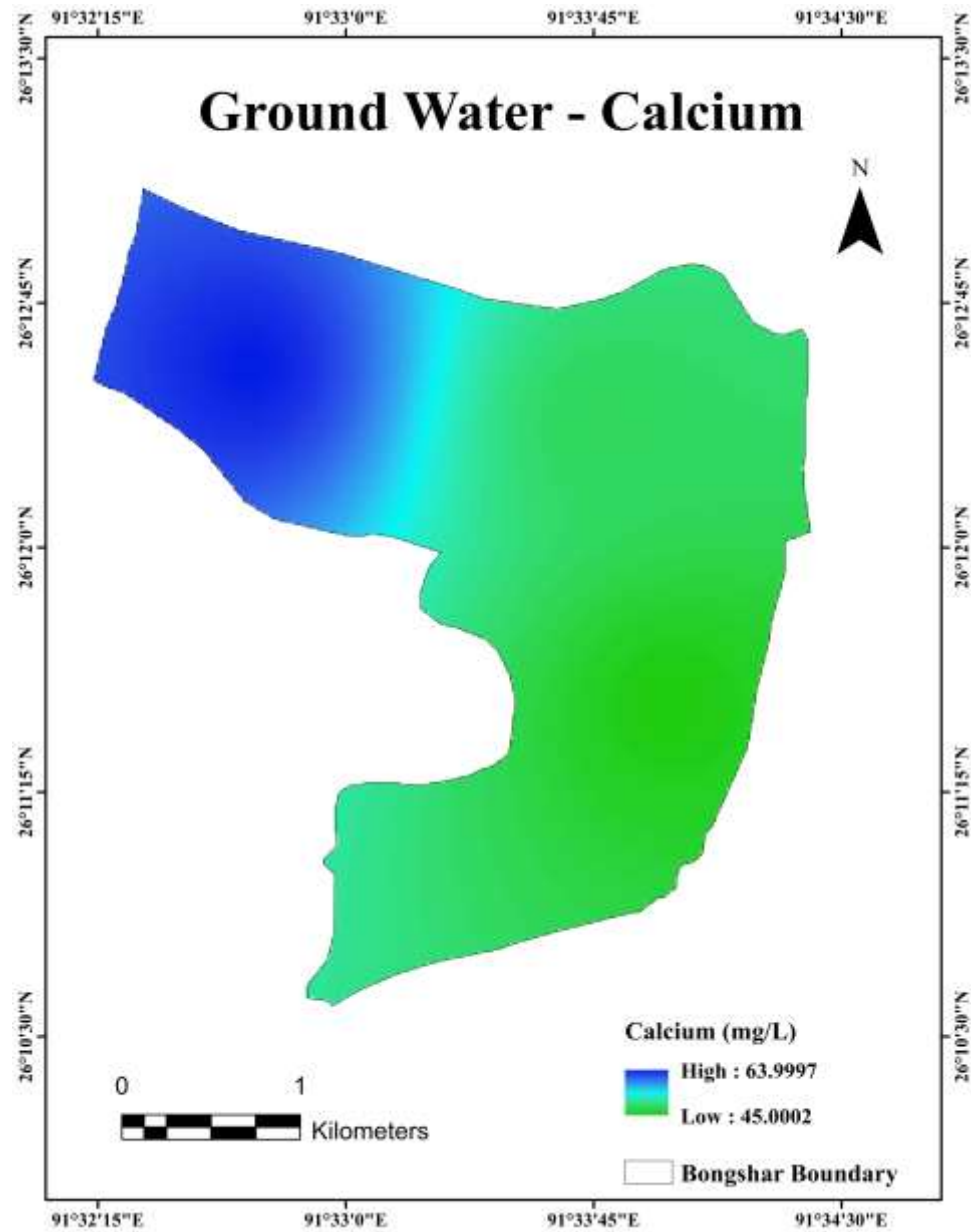
- Existing water bodies are identified using Normalized Difference Water Index(NDWI) of sentinel-2 data.
- It will help in evaluation of remedial developmental measures for micro-watershed action plan and suggesting various water harvesting structures.

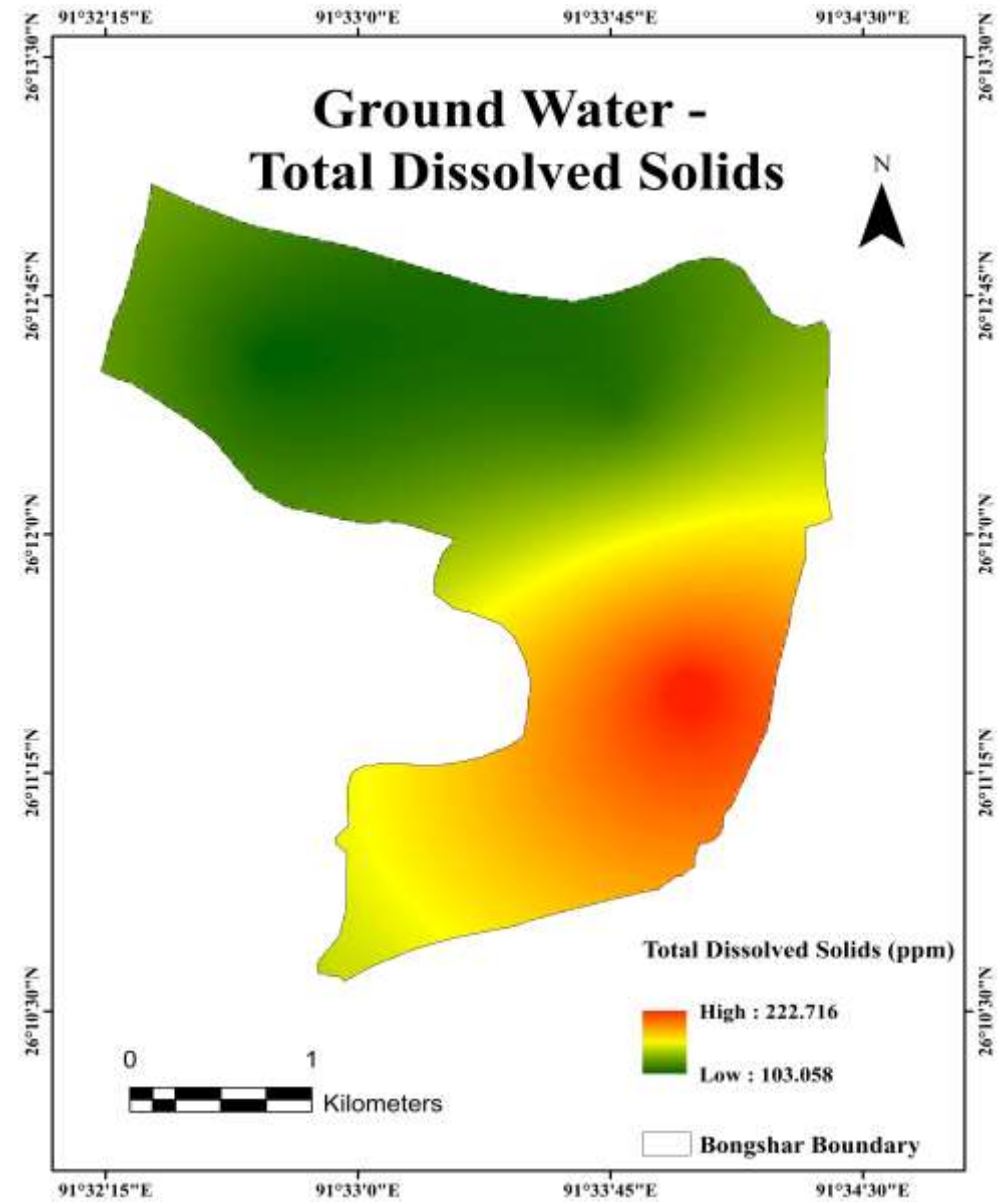
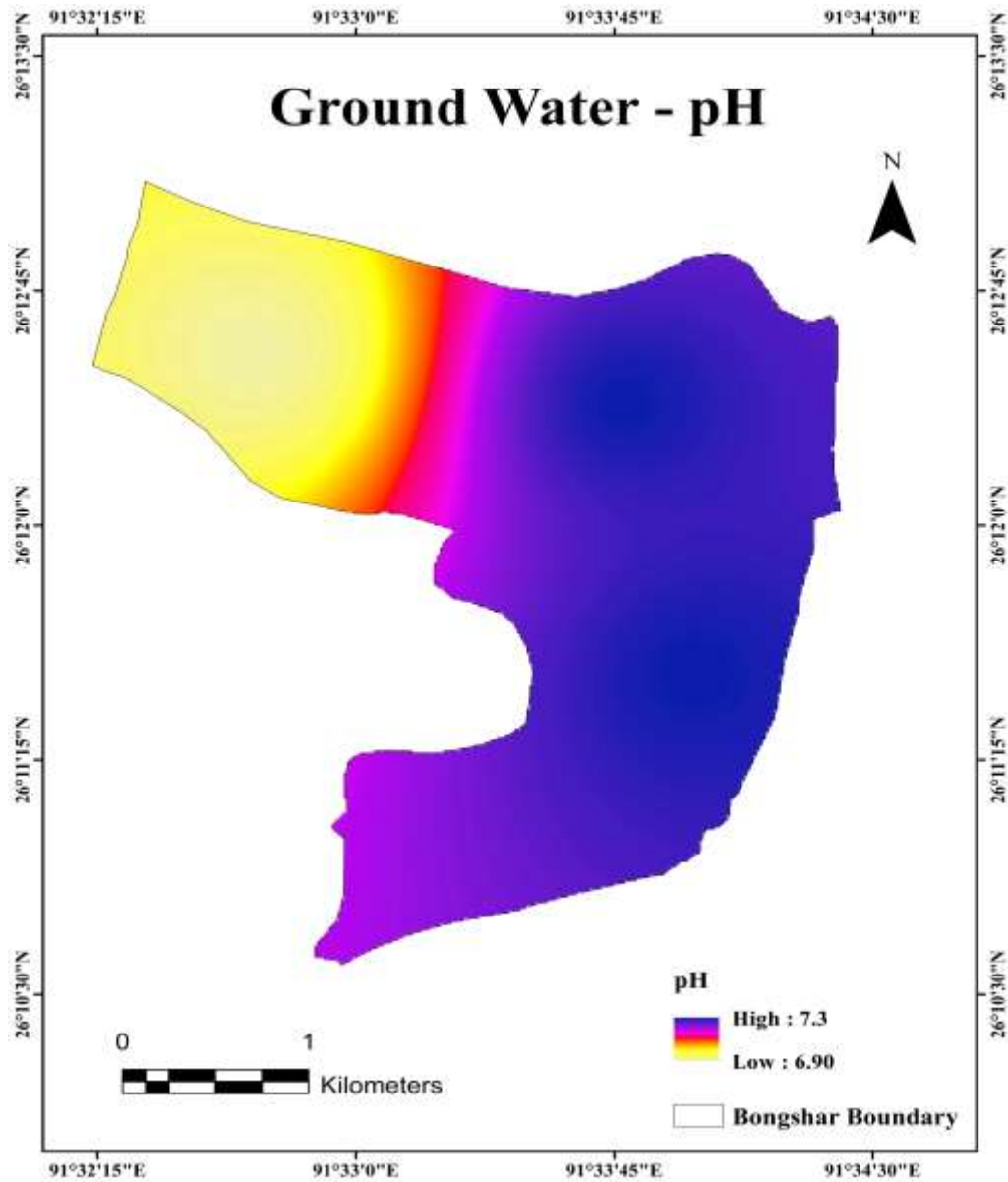


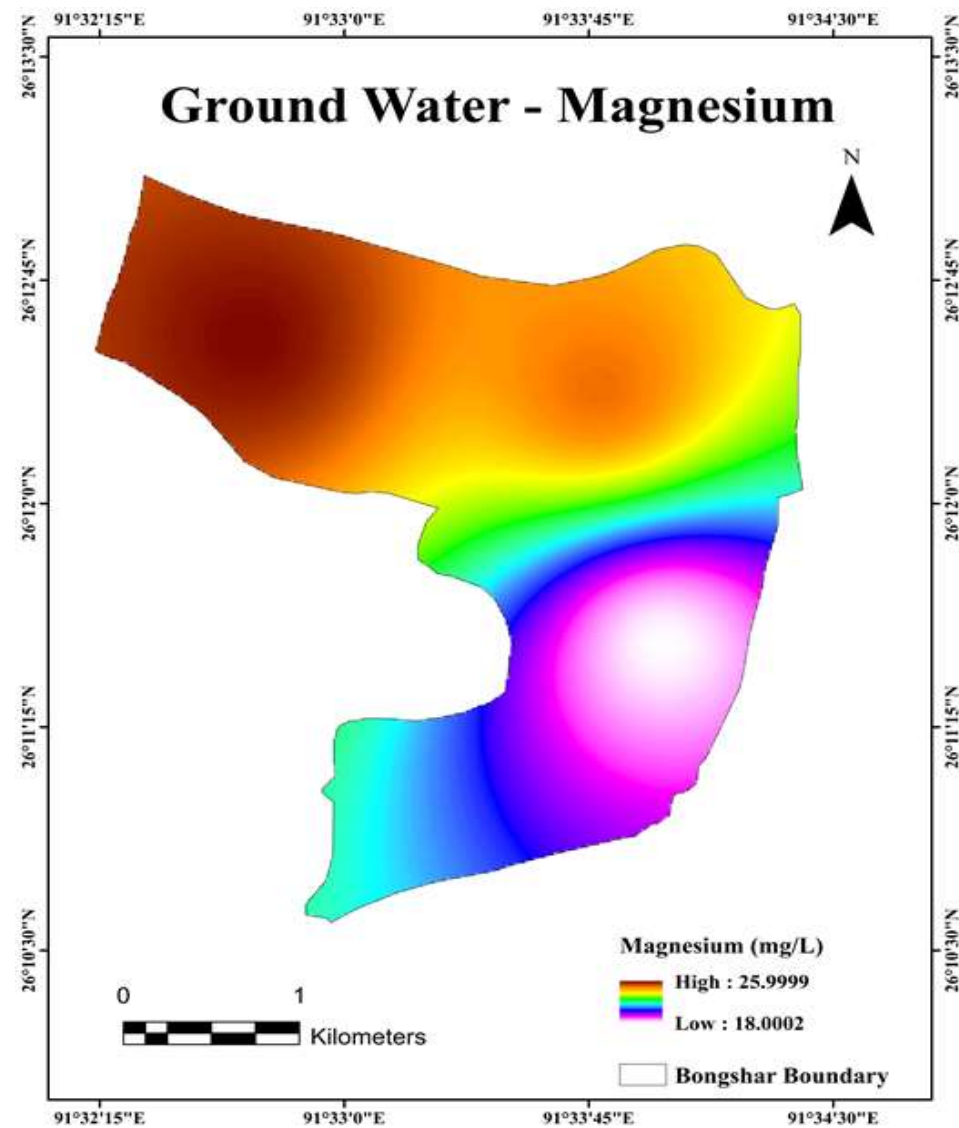
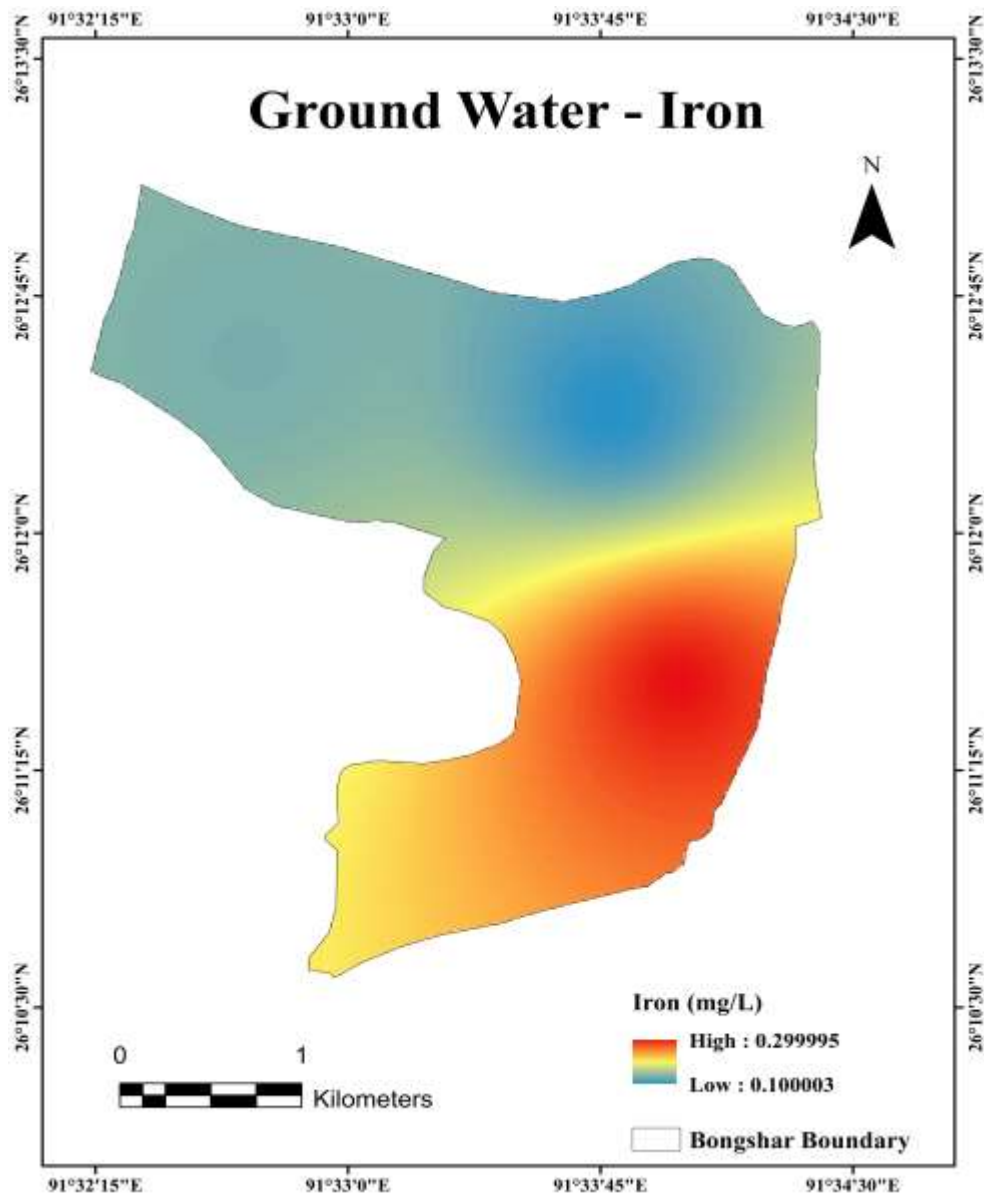
Ground water quality

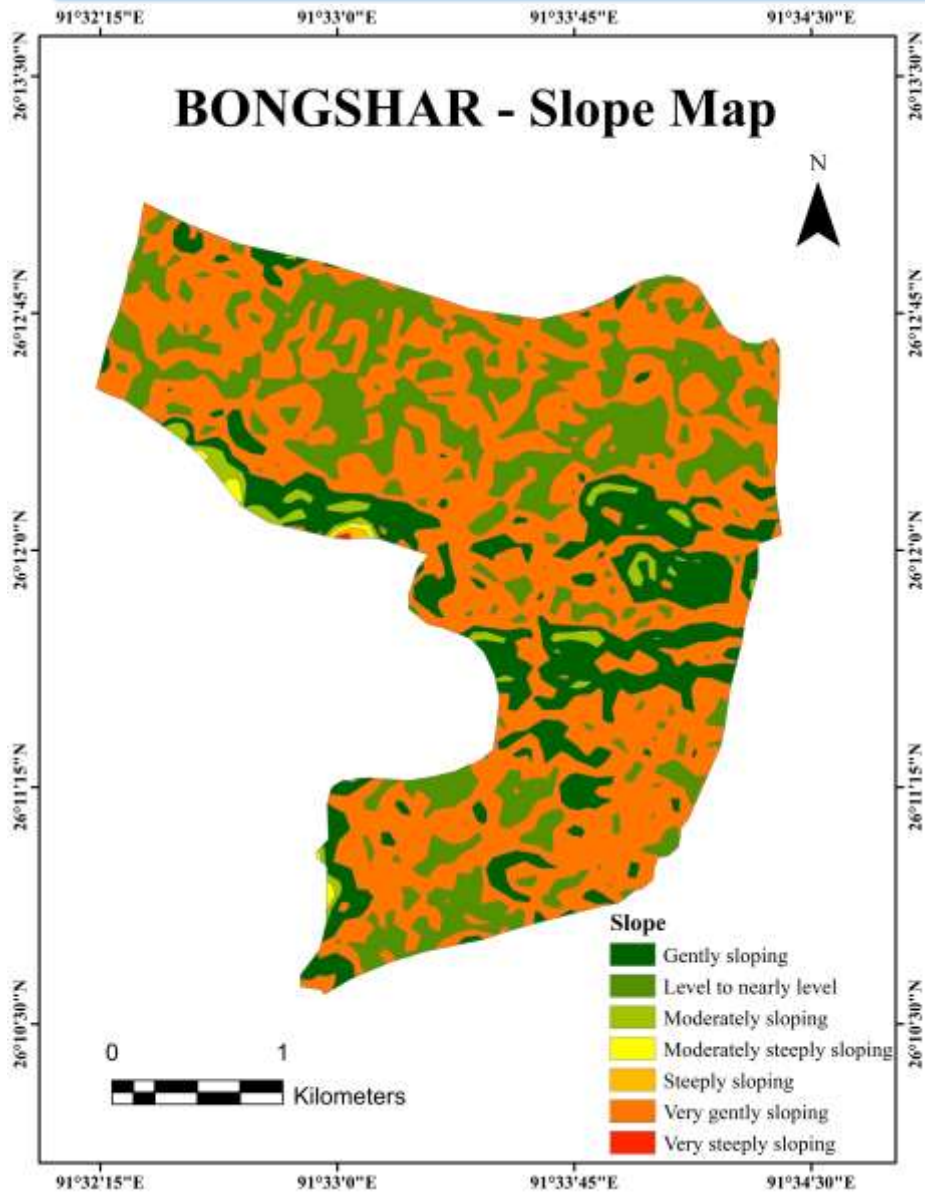
- Potable
- Water table – is reachable











Interpretation
Agriculture – normal – different crops
Water management



- Banks – Central Bank of India, State Bank of India Sualkuchi Branch
- Post office
- Telephone connection – Poor BSNL service, Mostly mobile phone connection
- Government Bus services – Through Bongshor from Sualkuchi, from Dampur through Bongshor

Available Govt schemes implemented till date









Health

Central Government Schemes

- i. Ayushman Bharat - Health and Wellness Centres (AB-HWCs)
- ii. Janani Suraksha Yojana (JSY)
- iii. Janani Shishu Suraksha Karyakram (JSSK)
- iv. Universal Immunization Programme (UIP)
- v. Home Based Care of Newborn and Young Children (HBNC/HBYC)
- vi. Rashtriya Bal Swasthya Karyakram (RBSK)
- vii. Family Planning
- viii. National Ambulance Service (NAS)
- ix. Disease Control Programs
- x. Direct Benefit Transfer (DBT)

Health

Assam State Government Schemes

- i. Atal Amrit Abhiyan
- ii. Assam Arogya Nidhi (AAN)
- iii. Chief Minister's Free Diagnostic Services
- iv. PPP with Tea Garden Hospitals
- v. Sanjeevani - Village Health Outreach Programme

Women and Child Development

Central Government Schemes:

- i. Integrated Child Development Services (ICDS)
- ii. Kishori Shakti Yojana
- iii. Protection of Women from Domestic Violence Act, 2005
- iv. Anganwadi Services Scheme under Umbrella ICDS Scheme
- v. POSHAN Abhiyaan

State Government Schemes:

- i. Assam Sneha Sparsha Scheme
- ii. Swanirbhar Nari – Atmanirbhar Assam
- iii. Wage Compensation Scheme for Pregnant Women in Tea Gardens

Education

Central Government Schemes:

- i. Samagra Shiksha
- ii. National Program for Education of Girls at Elementary Education (NPEGEL)
- iii. Mid-day Meal Scheme
- iv. National Means-cum-Merit Scholarship Scheme (NMMSS)
- v. National Scheme of Incentive to Girls for Secondary Education (NSIGSE)

State Government Schemes:

- i. Abhinandan Education Loan Subsidy Scheme
- ii. Pragyan Bharti Scheme
- iii. Anundoram Borooh Award
- iv. Assam Fee Waiver
- v. Gyan Deepika Scheme

Agriculture - Central Government Schemes:

- i. Pradhan Mantri Kisan Samman Nidhi Yojana (PM-KISAN)
- ii. Pradhan Mantri KisanMaan-Dhan Yojana (PM-KMY)
- iii. Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA)
- iv. Pradhan Mantri Fasal Bima Yojana (PMFBY) /Restructured Weather Based Crop Insurance Scheme (RWBCIS)
- v. The PMKSY-Per Drop More Crop
- vi. National Food Security Mission (NFSM)
- vii. Mission for Integrated Development of Horticulture (MIDH)
- viii. Rashtriya Krishi Vikas Yojana - Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RKVY-RAFTAAR)
- ix. Paramparag at Krishi Vikas Yojana (PKVY)
- x. Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)

Agriculture - Central Government Schemes continued:

xi. Rainfed Area Development (RAD)

xii. Sub-Mission on Agroforestry (SMAF)

xiii. National Bamboo Mission (NBM)

xiv. Sub-Mission on Agriculture Extension (SAME)

xv. Sub Mission on Seed and Planting Material (SMSP)

xvi. Sub-Mission on Agricultural Mechanization (SMAM)

xvii. National Agriculture Market (e-NAM)

xviii. Development and Up-gradation of Rural Haats to Gramin Agricultural Markets (GrAMs)

Agriculture - State Government Schemes:

- i. Tractor Distribution Scheme under the Chief Minister Samagra Gramya Unnayan Yojana (CMSGUY)
- ii. Mukhya Mantri Krishi Sa-Sajuli Yojana
- iii. Assam Farmer's Credit Subsidy Scheme (AFCSS)
- iv. Assam Farmers' Interest Relief Scheme (AFIRS)
- v. Assam Farmers' Incentive Scheme (AFIS)
- vi. Farm Loan Waiver Scheme
- vii. Zero Interest Crop Loan Scheme

Fisheries, Animal Husbandry & Dairy Central Government Schemes:

- i. Cattle and Dairy Development
 - Rashtriya Gokul Mission
 - National Dairy Plan-II
 - Dairy Processing and Infrastructure Development Fund
 - Supporting Dairy Cooperatives and Farmer Producer
- ii. National Livestock Mission
- iii. Livestock Health & Disease Control (Including National Animal Disease Control Programme (NADCP) for control of Foot & Mouth Disease and Brucellosis)
- iv. Livestock Census and Integrated Sample Survey

Fisheries, Animal Husbandry & Dairy State Government Schemes:

- i. Matsya Jagaran–Ghare Ghare Pukhuri Ghare Ghare Maach
- ii. Seed Bank Programme
- iii. Assistance To Women SHGs For Production Of Value Added Fish Products
- iv. Selection Of Matsya Mitra

Employment & Livelihood Generation

Central Government Schemes:

- i. MGNREGA
- ii. Deendayal Antyodaya Yojana – National Rural Livelihood Mission (DAY-NRLM)

Skill Development & Entrepreneurship

Central Government Schemes

- i. Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
- ii. National Apprenticeship Promotion Scheme (NAPS)
- iii. Jan Shikshan Sansthan
- iv. Skills Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP)
- v. Mahatma Gandhi National Fellowship (MGNF)
- vi. Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)
- vii. Rural Self Employment Training Institutes (RSETI)

Skill Development & Entrepreneurship

State Government Schemes

- i. Sarothi Start Up Fund Assam Loan Scheme
- ii. Swami Vivekananda Assam Youth Empowerment Yojana

Social Welfare Schemes

Central Government Schemes:

- i. National Social Assistance Programme (NSAP)
- ii. Indira Gandhi National Old Age Pension Scheme (IGNOAPS)
- iii. Indira Gandhi National Widow Pension Scheme (IGNWPS)
- iv. Indira Gandhi National Disability Pension Scheme (IGNDPS)
- v. National Family Benefit Scheme (NFBS)
- vi. Annapurna Scheme
- vii. Saansad Adarsh Gram Yojana (SAGY)
- viii. The Shyama Prasad Mukherji Rurban Mission (SPMRM)

State Government Schemes:

- i. Universal Old Age Pension Scheme for APL / BPL Ration Card Holders
- ii. Assam Orunodoi Scheme
- iii. Indira Miri Universal Widow Pension Scheme
- iv. Assam Deen Dayal Divyangjan Sahajya Scheme

Drinking Water & Sanitation

Central Schemes:

- i. National Rural Drinking Water Programme (NRDWP)
- ii. Swachh Bharat Mission Grameen (SBM-G)
- iii. Jal Jeevan Mission

Roads & Housing

Central Government Schemes

- i. Pradhan Mantri Gram Sadak Yojana (PMGSY)
- ii. Pradhan Mantri Awaas Yojana- Gramin (PMAY-G)
- iii. Rural Housing Knowledge Network

State Government Schemes

- i. Aponar Apon Ghar Home Loan Subsidy Scheme
- ii. Aamaar Aalohi (Rural Home Stay) Scheme

Energy

Central Government Schemes:

- i. Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA)
- ii. Pradhan Mantri Ujjwala Yojana (PMUY)
- iii. Solar Lanterns, Solar Home Lighting Systems, Solar Street lighting systems
- iv. National Bio-Mass Cook stoves Programme (NBCP)

Food Processing

Central Government Schemes

- i. Pradhan Mantri Kisan Samapda Yojana (PMKSY). This scheme has the following vertical schemes to address the farm to farm supply chain without any break
 - Mega Food Parks
 - Integrated Cold Chain and Value Addition Infrastructure
 - Creation/Expansion of Food Processing & Preservation Capacities
 - Infrastructure for Agro-Processing Clusters
 - Creation of Backward and Forward Linkages
 - Operation Greens (exclusively for Tomato, Onion and Potato crops)
 - Food Safety and Quality Assurance Infrastructure
 - Human Resources and Institutions
- ii. Prime Minister-Formalisation of Micro Food Processing Enterprises (PM-FME)

Tribals

Central Government Schemes

- i. Pre Matric Scholarship
- ii. Scheme of Post Matric Scholarship
- iii. National fellowship & scholarship for higher education of ST students
- iv. Eklavya Residential Model School (EMRS)
- v. National fellowship & scholarship for higher education of ST students
- vi. National Overseas Scholarship Scheme for Higher Studies abroad etc
- vii. Conservation-cum Development Plan for Particularly Vulnerable Tribal Groups
- viii. Grant to Tribal Research Institutes
- ix. Van Dhan Yojana



Focus area for planning:

Crop land

River/stream/Drain

Agriculture plantation

Grassland and grazing

Problems need to be addressed:

1. Water logging – 392 Hectare
2. Rain water harvesting

Proposals to be focussed:

1. The water cover in Bongshor GP is high hence can be used for developing aquaculture/pisciculture activities
2. The forest cover is high hence can be focussed towards various silviculture activities, growing of plants of economic activities etc.



Observable features:

- 1. Bongshor has good coverage of pucca road**
- 2. GP has a considerable good road cover hence can be exploited establishing various supply chain of locally developed products**
- 3. Soil cover is alluvial type indicating the scope for establishing different types agricultural produces towards livelihood of the native**
- 4. Livelihood development scope – agriculture, sericulture, silviculture, pisciculture etc.**



Future work:

- Spatial Planning
- Suggestions for improvement in agriculture, alternative forms of livelihood, improvement for cottage industries.
- Suggestions for implementation of various Government schemes
- Health, education, livelihood



Ongoing activities:

1. Data collection via physical visits to both the visits
2. Architecture planning based on the input data of GIS and physically verified data
3. Rural spatial plan based on above inputs

Challenges faced:

Flood situation in the selected GPs and around

Lockdown because of pandemic

Non availability of manpower for physical data collection

Ongoing semester

Extension required:



Suggestions/comments



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THANK YOU